El Dorado County
Air Pollution Control District

GUIDE TO AIR QUALITY ASSESSMENT

Determining Significance of Air Quality Impacts Under the California Environmental Quality Act

First Edition

February 2002

Contacting the District:

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Updates and Revisions:

Users of this Guide should call or check the District website to determine whether there have been any updates or revisions since the cover date.

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Table of Contents

List of Tables

List of Figures

El Dorado County APCD – CEQA Guide
Executive Summary

Purpose (Chapter 1). This document is a Guide, to be used during the Initial Study phase of the CEQA process, for determining whether a project will have "significant" air quality impacts. If significant air quality impacts are determined to exist, an Environmental Impact Report (EIR) must be prepared; if not, a Negative Declaration (or Mitigated Negative Declaration) can be prepared. This Guide will be used by the District for reviewing projects for which it is the Lead Agency; otherwise, the District will use it to provide comments as a Responsible Agency or Commenting Agency. The District recommends that the Guide be used by other county agencies in the Lead Agency role, and by project proponents.

Existing Air Quality Levels (Chapter 2). El Dorado County is divided among two air basins, Mountain Counties and Lake Tahoe. With two exceptions, the county is in attainment for all state and national ambient air quality standards (AAQS). The Mountain Counties portion of the County is a "severe" nonattainment area for the state and national 1-hour AAQS for ozone, and both the Mountain Counties and Lake Tahoe air basin portions of the county are nonattainment with respect to the state 24-hour PM_{10} AAQS.

Coordination With Other Air Districts (Chapter 2). This Guide is generally based on the criteria and technical approach being developed by all five air districts in the greater Sacramento area. In particular, it is coordinated with the Sacramento Region Ozone Air Quality Attainment Plan (AQAP).

Types of Emission Sources (Chapters 4, 5, and 6). Several types of emission sources need to be considered when evaluating the impacts of a project under CEQA. For many development projects, motor vehicle trips are the principal source of air pollution. Projects in this category, such as shopping centers, office buildings, arenas, and residential developments, are often referred to as "indirect sources." This is because they do not directly emit significant amounts of air pollutants from onsite activities, but cause additional emissions from motor vehicles traveling to and from the development.

Most development projects also generate "area source" emissions. Area sources are sources that individually emit fairly small quantities of air pollutants, but which cumulatively may represent significant quantities of emissions. Water heaters, fireplaces, lawn maintenance equipment, and application of paints and lacquers are examples of area source emissions.

Certain projects also may directly generate stationary or "point" source emissions from operations. Although most area sources discussed above are stationary, the term stationary or point source usually refers to equipment or devices operating at industrial and commercial facilities. Examples of facilities with stationary sources include manufacturing plants, quarries, print shops and gasoline stations.

Finally, consideration must be given to emissions from the operation of equipment and vehicles, as well as dust emissions, during the construction phase of a project. In some

cases, construction emissions, even though they are temporary, may be greater than emissions from subsequent operation of the project.

Quantitative Significance Criteria (Chapter 3). A project will be considered as having "significant" air quality impacts if any of the following quantitative conditions exist:

- **ROG and NOx**. The project will result in construction or operations emissions of either of the two primary precursors of ozone, reactive organic gases (ROG) or oxides of nitrogen (NOx), in excess of 82 lbs/day. These criteria are based on the emissions levels that trigger "offsets" for stationary sources under District Rule 523. Special requirements for determining significance may apply in the Lake Tahoe Air Basin, as imposed by the Tahoe Regional Planning Agency (TRPA) in interpreting its 0.08 ppm one-hour "significance threshold" for ozone.

- **Other Pollutants.** The project will result in construction or operation emissions of other pollutants (PM_{10}, CO, SO_2, NO_2, Sulfates, Lead) that could cause or contribute to violations of any applicable national or state AAQS (including visibility). The applicable AAQS are set forth in Appendix B. In the Lake Tahoe Air Basin, the TRPA visibility standard is applied.

- **Toxic Air Contaminants (Chapter 7).** The project will result in construction or operations emissions of toxic air contaminants (TACs) that cause a lifetime cancer risk greater than one in one million (10 in one million if best available technology for toxic air contaminants is applied), or ground-level concentrations of non-carcinogenic TACs with a Hazard Index greater than 1. Special attention is given to asbestos emissions and Diesel engine emissions.

- **Cumulative Impacts (Chapter 8).**

  – ROG and NOx. The project requires a change in the land use designation (e.g., general plan amendment or rezone) that increases ROG and NOx emissions compared to the prior approved use, and the increase in emissions exceeds the "project alone" significance levels shown above for ROG or NOx.

  – CO. Project CO emissions, if combined with CO emissions from other nearby projects, result in a "hotspot" that violates a state or national AAQS.

  – Other Pollutants. The project is primarily an industrial project and a modeling analysis indicates that the project's impacts would exceed Class III Prevention of Significant Deterioration (PSD) increments (Class II in Lake Tahoe) for PM_{10}, SO_2, or NO_2; or, the project is primarily a development project, and the emissions of ROG, NOx, or CO exceed the "project alone" significance criteria for those three pollutants noted above. (CO is used as a surrogate for other impacts in the latter case.)

– TACs. The project causes the risk analysis criteria above for "project alone" TACs to be exceeded when project emissions of TACS are considered in conjunction with TACs from other nearby projects.

Qualitative Significance Criteria (Chapter 3). In addition, the Guide considers a project significant if any of the following qualitative criteria are met:

- **CEQA Guidelines Appendix G.** The project triggers any of the air quality significance criteria in Appendix G of the CEQA Guidelines.

- **Odors.** The project results in excessive odors, as defined under the Health & Safety Code definition of an air quality nuisance.

- **Sensitive Receptors.** The project results in land use conflicts with sensitive receptors, such as schools, elderly housing, hospitals or clinics, etc.

- **District Rules and Regulations.** The project, as proposed, is not in compliance with all applicable District rules and regulations.

- **Conformity (Chapter 9).** The project does not comply with U.S. EPA general and transportation "conformity" regulations.

Project Screening and Calculations (Chapters 4, 5, and 6). Screening or "de minimis" levels of emissions are identified that may allow a smaller project or project with minimal emissions to be classified as not significant without going through calculation procedures or emissions modeling, unless special considerations apply. Where screening does not apply (or where calculation of actual emissions is otherwise desired), the Guide contains specific methods and techniques for calculating emissions, with references to applicable emissions models where appropriate. Screening and calculation approaches are given separately for construction emissions (Chapter 4), ROG and NOx emissions from operation (Chapter 5), and other pollutants emitted during operation such as CO and PM_{10} (Chapter 6).

Mitigation (Chapters 4, 5, and 6). The Guide states that exceeding the significance criteria can be avoided by incorporating mitigation measures into a project prior to undertaking or completing the Initial Study. Various mitigation measures are listed both for project construction and operation.

Chapter 1
Introduction

1.1 Purpose of CEQA

The California Legislature enacted the California Environmental Quality Act (CEQA) in 1970 (Public Resources Code §§21000 et seq.). CEQA requires that public agencies (i.e., local, county, regional, and state government) consider and disclose the environmental effects of their decisions to the public and governmental decision-makers. Further, it mandates that agencies implement feasible mitigation measures or alternatives that would mitigate significant adverse effects on the environment.

Perhaps the best known application of CEQA is the requirement that a public agency prepare an Environmental Impact Report (EIR) whenever a project has the potential to create significant effects on the environment. The purpose of an EIR is "to identify the significant effects of a project on the environment, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided" (PRC §21002.1).

CEQA is intended to address a broad range of environmental issues, including water quality, noise, land use, natural resources, transportation, energy, human health, and air quality. The guidance in this document addresses air quality analyses performed to satisfy CEQA requirements. However, this guidance also has implications for analyses of human health, water quality, risks of upset, and other environmental areas related to air quality.

An all-important tool in the implementation of CEQA is the CEQA Guidelines adopted by the Office of Planning and Research in the Governor's Office (14 CCR §§15000 et seq.). The CEQA Guidelines apply statewide and govern all environmental impact reviews of projects.

1.2 Purpose of This Guide

The purpose of the El Dorado County Air Pollution Control District (District) CEQA Air Quality Guide is to facilitate the evaluation and review of air quality impacts for projects in El Dorado County that are subject to CEQA.

This is an advisory document intended to provide lead agencies, consultants, and project proponents with uniform procedures for assessing potential air quality impacts of proposed projects and for preparing the air quality section of environmental documents. The Guide should be used when the District is the "lead agency" under CEQA, and also when the District's role is to participate as a "responsible agency" or "commenting agency" for air quality. The Guide is intended to streamline the CEQA review process for both the lead agency and the District.

This Guide is based on a technical approach that has been jointly developed by five air districts in the Sacramento area: the Sacramento Metropolitan Air Quality Management District, the Yolo-Solano Air Quality Management District, the Feather River Air Quality Management District, the Placer County Air Pollution Control District, and the El Dorado County Air Pollution Control District. The districts jointly prepared the text for a CEQA Guide that has been adapted, in the form of this document, for El Dorado County. This approach will assure that all development projects in the greater Sacramento area are evaluated using similar criteria – which is appropriate given the close economic and development ties between the five counties and the fact that they must address common air pollution problems (especially regional ozone).

This Guide can be applied to an air quality analysis for any project as defined by CEQA. This includes everything from a site-specific development to a general plan.

From a policy perspective, the Guide's intent is to facilitate and provide consistency in the preparation of analyses that inform decision-makers and the public about the air quality implications of a project. While this intent serves to protect the environment, it also demonstrates to the public that it is being protected. Ultimately, the Guide is designed to promote public dialogue about the air quality implications of a public agency's decisions.

1.3 District's Role Under CEQA

Under CEQA, the District can have one of three roles, depending on the nature of the project: Lead Agency, Responsible Agency, or Commenting Agency.

The District is considered a **lead agency** when it has principal responsibility to carry out or approve a project. This typically occurs when the District develops rules, regulations, and air quality plans. Pursuant to CEQA, when the District is a lead agency, the District is responsible for coordinating the environmental review of a project with other agencies and the public and determining whether an EIR or Negative Declaration is appropriate. Further, it is responsible for the preparation, consideration, and certification of environmental documentation prior to any decision on the project. When prior environmental documentation from another lead agency is inadequate to act upon, the District may also assume the role of lead agency by preparing an EIR for permits over which it has authority.

The District is a **responsible agency** when it has discretionary approval power over a project but does not have the principal authority to carry out or approve the project. The District is often a responsible agency for development projects that require air pollution permits. In this capacity, the District provides comments to the lead agency on its air quality analysis and mitigation measures, if applicable.[1] To help public agencies

[1] The CEQA Guidelines state that when commenting on Draft EIRs and Negative Declarations, responsible agencies are limited to those project activities within the agency's area of expertise or which are required to be approved by the agency (see 14 CCR §15096(a)(2)(d)).

determine whether air quality permits are required for a project, Figure 1-1, at the end of this chapter, identifies projects that often require air quality permits and those that are typically exempt from permitting. Public agencies can use this as a handout to inform project proponents of potential air quality permit issues.

Finally, the District is considered a **commenting agency** for any project that has the potential to impact air quality and for which it is not a lead or responsible agency.[2] To this end, the District provides comments to lead agencies that prepare environmental documents. This Guide builds on the District's role as a responsible and commenting agency by providing uniform instructions to lead agencies on assessing air quality impacts and preparing analyses.

1.4 How to Use This Guide

This Guide is intended for use by the District, other agencies, consultants, and project proponents at the "Initial Study" phase of the CEQA process in determining whether an Environmental Impact Report (EIR) or other document (such as a Negative Declaration) must be prepared. To use this document effectively, the following should be kept in mind:

- **Organization.** This document is organized to reflect the environmental review process for a lead agency. Because each chapter walks through a sequential step in a CEQA air quality analysis, the Guide can be used as a reference resource at any step of the environmental review process.

- **Early consultation.** One purpose of the Guide is to provide information to project proponents about air quality issues early in the planning process. Project proponents and Lead Agencies should contact the District early in the project planning phase about air quality issues and how this Guide should be applied, so that steps can be taken to minimize potential impacts before completing a project's scope or design. See Sections 1.6, 1.7, and 1.8.

- **District support.** The District staff is available to answer questions about the guidance in this document and air quality-related questions at (530) 621-6662.

- **Future updates.** The Guide will be updated periodically as legislative, legal, and technical changes dictate. Updates will be provided in a three-ring binder format for insertion into your current Guide.

- **Checklist.** As an aid for users of this Guide, a Checklist and Flow Chart have been prepared and included as Appendix A.

[2] CEQA Guidelines §15044 permits any person or entity that is not a responsible agency to comment to a lead agency on any environment impact of a project.

1.5 Relationship to NEPA

Some projects subject to CEQA may also require compliance under federal environmental law, namely the National Environmental Policy Act (NEPA). In such cases, a joint NEPA-CEQA analysis is appropriate. Under certain circumstances, the CEQA Guidelines allow public agencies to use an Environmental Impact Statement (EIS) under NEPA rather than prepare an EIR or Negative Declaration.[3] This document, which provides guidance for assessing air quality impacts and preparing environmental documents under CEQA, can also be used to prepare a NEPA or joint CEQA-NEPA analysis, unless noted otherwise.

1.6 Lead Agency Consultation with the District

The District is available for consultation at any time in the project review process, but there are certain times when consultation is required. For example, when the District has discretionary approval authority over a project for which another public agency is serving as Lead Agency, the District must be consulted as a Responsible Agency. When the District does not have approval authority over a project, it is to be consulted as a commenting agency. CEQA requires or provides opportunities for consultation at various times during the environmental review process. CEQA encourages Lead Agencies to consult with any individual or agency that will be concerned with the environmental effects of the project prior to the completion of the Draft EIR or Negative Declaration. This is often done in conjunction with the Notice of Preparation or scoping meeting.

The Lead Agency can proactively address air quality concerns before a project is ever submitted for environmental review by providing information to project proponents during initial consultation at the planning counter. In fact, CEQA Guidelines direct lead agencies to "encourage the (private) project proponent to incorporate environmental considerations into project conceptualization, design, and planning at the earliest feasible time."[4]

Addressing land use and site design issues while a proposed project is still in the conceptual stage increases opportunities to incorporate mitigation measures and modifications to minimize air quality impacts. By the time a project enters the CEQA process, it is usually more costly and time-consuming to redesign the project to incorporate mitigation measures. Early consultation may be achieved by including a formal step in the jurisdiction's development review procedures or simply by discussing air quality concerns at the planning counter when a project proponent makes an initial contact regarding a proposed development. Public agencies can use the initial consultation phase to address air quality issues most effectively by becoming familiar with this guidance document, running user-friendly computer programs that perform

[3] See PRC §§21083.5, 21083.6, and 21083.7 and CEQA Guidelines §§15220-15228 for more information on combined EIR-EIS projects.

[4] CEQA Guidelines §15004(b)(2)

screening-level air quality analyses, and using the District as a resource. Regardless of the specific procedures or resources a local jurisdiction employs, the objective should be to incorporate air quality control measures into a project before significant investment (public and private) has been devoted to the project.

1.7 District Rules and Regulations.

The District rules and regulations, including permit requirements, apply to most industrial processes (e.g., manufacturing facilities, cement terminals, food processing), many commercial activities (e.g., print shops, drycleaners, gasoline stations), and other miscellaneous activities (e.g., demolition of buildings containing asbestos and aeration of contaminated soils). See Figure 1.1 at the back of this chapter for a sample listing of activities subject to or exempt from District permit requirements. During early consultation, project proponents and Lead Agency staff should coordinate directly with the District prior to determining the applicability of District permit requirements.

Copies of District rules and regulations may be requested by writing the District at the address shown in Figure 1.1, or by telephoning the District at (530) 621-6662. Copies may also be downloaded from the District's website at http://co.el-dorado.ca.us/emd/apcd/index.html.

1.8 Land Use and Design Considerations

Land use decisions are critical to air quality planning because land use patterns greatly influence transportation needs, and motor vehicles are the largest source of air pollution in the District. The location, intensity, and design of land use development projects significantly influence how people travel. For example, land use strategies such as locating moderate or high-density development near transit stations increases opportunities for residents/employees to use transit rather than drive their cars. Similarly, design considerations such as orienting a building entrance towards a sidewalk and/or transit stop increases the attractiveness of walking and transit as an alternative to driving. Some important land use and design elements that help improve air quality include the following:

- Encourage the development of higher density housing and employment centers near transit stations.
- Encourage compact development featuring a mix of uses that locates residences near jobs and services.
- Provide neighborhood retail within or adjacent to large residential developments.
- Provide services, such as restaurants, banks, copy shops, post office, etc., within office parks and other large employment centers.
- Encourage infill development.
- Be sure that the design of streets, sidewalks, and bike paths/routes within a development encourages walking and biking.
- Orient building entrances towards sidewalks and transit stops.
- Provide landscaping to reduce energy demand for cooling.

- Orient buildings to minimize energy required for heating and cooling.

Local governments and other Lead Agencies are encouraged to consider land use and design measures to reduce auto use and promote energy conservation early in planning and development review processes. By incorporating such measures in local plans and addressing them during initial contacts with project proponents, Lead Agencies greatly increase the likelihood of their implementation. The environmental impacts of development proposals may be lessened and environmental review processes simplified.

The District encourages Lead Agency staff and project proponents to use computer tools that analyze emissions from development projects and assist in developing different designs or alternatives with reduced air quality impacts. Lead Agency staff may contact the District for information or assistance.

Figure 1.1

When do I need to check with the District?

State law requires any facility that has the potential to emit air contaminants to apply for a permit from the District. This list is provided to help you determine whether your project is covered by the District's permit requirement. If your project is listed below, or if you have any question about whether you need a permit, contact the District at the number shown below.

Asphalt Batch Plant
Abrasive Blasting Equipment
Aggregate Crushing & Screening Equipment
Boilers (>1 MM BTU/hr)
Bulk Material Transfer & Storage Equipment
Chrome Plating
Circuit Board Manufacturing
Coating Equipment (>2 lb/day emissions)
Coffee Roaster
Cogeneration Facility
Concrete Batch Plant
Cooling Tower
Crematories
Curing & Burnoff Oven
Degreasing Operation
Dredge
Dry Cleaning Equipment
Dust Collector
Emergency Diesel Generator (> 50 bhp)
Emission Control Equipment
ETO Sterilizer
Fiberglass Fabrication Operation
Fumigation Chamber
Furnace
Furniture Stripping Operation
Fume Hood
Gas Turbine (> 3 MMBtu/hr)
Gasoline Dispensing Equipment
Gasoline Storage Equipment
Graphic Arts Printing (>2 lbs/day emissions)
Incinerator
Internal Combustion Engine (> 50 bhp)
Kiln
Laboratory Hood
Landfill
Lumber Mill
Oil Production & Process Equipment
Oil Water Separator
Organic Liquid Storage Tank
Paint Manufacturing
Paint Spray Booth
Paint Equipment (>2 lbs/day emissions)
Pile Driver
Printed Circuit Board Manufacturing
Process Heaters (> 1 MMBtu/hr)
Product Dryer
Resource Recovery Facility
Sand and Gravel Crushing and Screening
Semiconductor Wafer Fabrication Equipment
Soil & Water Cleanup
Truck Loading & Receiving Equipment/Bulk Materials
Waste Gas Flare
Waste Water Treatment Plants (WWTP) & Pump Stations with Odor Control
Wave Solder/Solder Reflow Machine
Wet Scrubber
Wood Chipper/Tub Grinder
Wood Working Facility (if aggregate horsepower of stationary equipment exceeds 50 hp)

This list is not exhaustive. If you have any doubts or questions about whether you need a permit, please call the District at (530) 621-6662, an engineer will be happy to answer your questions.

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Figure 1.1 (Continued)

When do I need to check with the District?

Many projects do not require a permit from the District. The following information is provided to help you determine whether your project may be exempt from District permit requirements. The list is not exhaustive. If you have any doubts or questions about whether your project is exempt, please call the District at (530) 621-6662, and an engineer will be happy to answer your questions.

THE FOLLOWING PROJECTS ARE GENERALLY EXEMPT FROM REQUIRING A PERMIT ISSUED BY THE AIR DISTRICT:

1. Small internal combustion engines (50 bhp or smaller)
2. Small gas turbines (3 MMBtu/hr or smaller)
3. Small space heaters and boilers (1 MMBTU/hr or smaller) fired with natural gas or LPG
4. Residential structures
5. Agriculture operations for growing crops or raising animals
6. Some small cooling towers (10,000 gallons per minute or smaller)
7. Some refrigeration, air conditioning, ventilation, and vacuum cleaning systems.
8. Some electric kilns used for plastics or ceramics processing.
9. Storage of low volatility organic liquids, including diesel fuel.
10. Storage of some volatile organic liquids (6,076 gallons or smaller).
11. Storage of liquefied or compressed gases.
12. Unheated solvent dispensing containers (100 gallons or smaller).
13. Some surface coating and preparation operations.
14. Food processing equipment for restaurants, bakeries, etc.
15. Laboratory equipment.
16. Repairs and maintenance.
17. Equipment emitting less than 2 lbs/day of any pollutant without air pollution controls.

Many projects are exempt from permitting requirements, but it is better to be safe than sorry. If you have any questions about whether your project requires a permit from the District, please call (530) 621-6662 and ask to speak to an engineer.

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Chapter 2
Air Quality of El Dorado County

2.1 Air Quality Setting

El Dorado County has two distinct air quality settings, which have been recognized formally by division of the county into two separate air basins, the Mountain Counties Air Basin and the Lake Tahoe Air Basin.

Mountain Counties Air Basin

The MCAB (Figure 2.1 below) is comprised of Plumas, Sierra, Nevada, Placer (middle portion), El Dorado (western portion), Amador, Calaveras, Tuolumne, and Mariposa counties.

Figure 2.1

The basin lies along the northern Sierra Nevada mountain range, close to or contiguous with the Nevada border, and covers an area of roughly 11,000 square miles. The western slope of El Dorado County, from Lake Tahoe on the east to the Sacramento County boundary on the west, lies within the MCAB. Elevations range from over 10,000 feet at the Sierra crest down to

several hundred feet above sea level at the Sacramento County boundary. Throughout the county, the topography is highly variable, and includes rugged mountain peaks and valleys with extreme slopes and differences in altitude in the Sierras, as well as rolling foothills to the west.

The general climate of the MCAB varies considerably with elevation and proximity to the Sierra ridge. The terrain features of the basin make it possible for various climates to exist in relatively close proximity. The pattern of mountains and hills causes a wide variation in rainfall, temperature, and localized winds throughout the basin. Temperature variations have an important influence on basin wind flow, dispersion along mountain ridges, vertical mixing, and photochemistry. The Sierra Nevada receives large amounts of precipitation from storms moving in from the Pacific in the winter, with lighter amounts from intermittent "Monsoonal" moisture flows from the south and cumulus buildup in the summer. Precipitation levels are high in the highest mountain elevations but decline rapidly toward the western portion of the basin. Winter temperatures in the mountains can be below freezing for weeks at a time, and substantial depths of snow can accumulate, but in the western foothills, winter temperatures usually dip below freezing only at night and precipitation is mixed as rain or light snow. In the summer, temperatures in the mountains are mild, with daytime peaks in the 70s to low 80s F, but the western end of the county can routinely exceed 100 degrees F.

From an air quality perspective, the topography and meteorology of the MCAB combine such that local conditions predominate in determining the effect of emissions in the basin. Regional airflows are affected by the mountains and hills, which direct surface air flows, cause shallow vertical mixing, and create areas of high pollutant concentrations by hindering dispersion. Inversion layers, where warm air overlays cooler air, frequently occur and trap pollutants close to the ground. In the winter, these conditions can lead to CO "hotspots" along heavily traveled roads and at busy intersections. During summer's longer daylight hours, stagnant air, high temperatures, and plentiful sunshine provide the conditions and energy for the photochemical reaction between reactive organic compounds (ROG) and oxides of nitrogen (NOx) that results in the formation of ozone (O_3). Because of its long formation time, ozone is a regional pollutant rather than a local hotspot problem.

In the summer, the strong upwind valley air flowing into the basin from the Central Valley to the west is an effective transport medium for ozone precursors and ozone generated in the Bay Area and the Sacramento and San Joaquin valleys. These transported pollutants predominate as the cause of ozone in the MCAB and are largely responsible for the exceedances of the state and federal ozone AAQS in the MCAB. The California Air Resources Board (ARB) has officially designated the MCAB as "ozone impacted" by transport from those areas (13 CCR sec. 70500).

Lake Tahoe Air Basin

The LTAB (see Figure 2.2 below) is comprised of the surface of Lake Tahoe (roughly 20 miles long by 10 miles wide) and land up to the surrounding rim of mountain ridges. The southern portion of the air basin is in El Dorado County and the northern portion is in Placer County. The lake is at an altitude of 6,200 feet, and the ridges climb to over 10,000 feet. The mountain slopes surrounding the lake are quite precipitous, and are broken by deep valleys carved by streams that drain into the lake.

Figure 2.2

The meteorology of the LTAB in winter is typified by large amounts of precipitation from Pacific storms that fall mainly as snow, and temperatures below freezing accompanied by winds, cloudiness, and lake and valley fog. Winter days can also bring cool, brilliantly clear days between storms. In the summer, the LTAB experiences sunny, mild days, with daytime peaks in the upper 70s and low 80s F, with an occasional thunderstorm from southern flows of moisture.

The principal impact of these conditions in terms of air quality is excess wintertime concentrations of CO in the more congested/populated areas of the basin, primarily at South Lake Tahoe, from vehicles and residential wood stoves and fireplaces. Some summer transport of ozone from the west is also known to occur, but has not yet been officially recognized as a transport route by CARB.

2.2 National and State Ambient Air Quality Standards

At the federal level, acceptable ambient levels of air pollution, known as the National Ambient Air Quality Standards (national AAQS), have been established by the U.S. EPA for carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, inhalable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead. The National AAQS have been divided into primary and secondary standards. Primary standards refer to the levels of air quality necessary, with an adequate margin of safety, to protect the public health. Secondary standards refer to the levels of air quality necessary to protect the public welfare (e.g., agriculture, visibility, property) from any known or anticipated adverse effects of a pollutant. Pollutants for which a national primary AAQS has been established are referred to as “criteria” pollutants, because they are supported by exhaustive studies of health effects criteria used to establish a direct relationship between ambient concentrations and their effects, and to determine what levels are acceptable.

The California Air Resources Board (CARB) has likewise adopted state AAQS which address the national criteria pollutants and, generally, set more stringent limits. The State AAQS also include standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility.

All of the state and national AAQS are displayed in Table B.2.

The air pollutants of primary concern in El Dorado County are discussed in more detail below.

Ozone

Ozone in the lower atmosphere is one of the main components of smog. It is not directly emitted but is formed in the atmosphere over several hours from reactions of various precursors in the presence of sunlight. Nitrogen oxides (NO_x) and reactive organic gases (ROG) are the primary reactive compounds, or precursors, contributing to the formation of ozone. Ozone is treated as both a secondary pollutant (meaning that it is formed in the atmosphere from other pollutants) and a regional pollutant (because there are not ozone "hot spots" but, rather, broad geographic areas in which elevated ozone levels can be found).

Short-term exposure to ozone, a strongly oxidizing form of oxygen, results in injury and damage to the lung, decreases in pulmonary function, and impairment of immune mechanisms. These changes have been implicated in the development of chronic lung disease as the result of longer-term exposure. Symptoms of ozone irritation include shortness of breath, chest pain when inhaling deeply, wheezing, and coughing. Children and persons with pre-existing respiratory disease (e.g., asthma, chronic bronchitis, emphysema) are at greater risk. In addition, effects on vegetation have been documented at concentrations below the standards.

EPA set the national primary and secondary ozone AAQS at 0.12 ppm, averaged over a one-hour period. CARB has set a more stringent one-hour state AAQS for ozone at 0.09 parts per million (ppm). In 1997 EPA adopted a new ozone primary eight-hour standard of 0.08 ppm, ostensibly to replace the one-hour standard. Implementation of the eight-hour standard was delayed by litigation, but was determined to be valid and enforceable by the U.S. Supreme Court in a decision issued in February of 2001. However, the new federal ozone standard is not yet in effect pending final resolution of this litigation and adoption of implementing regulations.

In 2000, CARB inventory data show that average daily emissions of the principal ozone precursors, ROG and NOx, from all anthropogenic (non-natural) sources in El Dorado County were estimated at 116 and 66 tons, respectively, with on- and off-road mobile sources making up about 72% of ROG and 86% of NO_x emissions.

Inhalable Particulates

Inhalable particulates refer to particulate matter less than 10 microns in diameter (PM_{10}). Particulates are classified as primary or secondary depending on their origin. Primary particles are unchanged after being directly emitted (e.g., road dust) and are the most commonly analyzed and modeled form of PM_{10}. Because it is emitted directly and has limited dispersion characteristics, this type of PM_{10} is considered a localized pollutant. In addition, secondary PM_{10}

can be formed in the atmosphere through chemical reactions involving emissions of ROG, NOx, and sulfur oxides (SOx). Much of the PM_{10} and fine particulates ($PM_{2.5}$) that can be breathed into the lungs is comprised of secondary particulate matter.

Recent studies undertaken by EPA identify the following key adverse health effects associated with PM concentrations in excess of the national AAQS:

- premature mortality;
- aggravation of respiratory and cardiovascular disease as indicated by increased hospital admissions, emergency room visits, school absences, work loss days, and restricted activity;
- changes in lung function and increased respiratory symptoms;
- changes to lung tissues and structure; and
- altered respiratory defense mechanisms.

According to EPA, recent epidemiological information indicates that several subpopulations are apparently more sensitive to effects of community air pollution containing PM. Observed effects include decreases in pulmonary function reported in children and increased mortality reported in the elderly and individuals with cardiopulmonary disease.

EPA's 24-hour primary and secondary national AAQS for PM_{10} is 150 $\mu g/m^3$ and its annual average primary and secondary AAQS is 50 $\mu g/m^3$. CARB has established a more stringent 24-hour state AAQS for PM_{10} at 50 micrograms per cubic meter ($\mu g/m^3$), and has also set an annual average state AAQS for PM_{10} at 30 $\mu g/m^3$. In 1997, EPA set a national AAQS for $PM_{2.5}$ at 65 $\mu g/m^3$ over 24 hours and 15 $\mu g/m^3$ as an annual geometric mean; implementation of this standard has also been delayed by litigation and will not occur until EPA has issued court-approved guidance.

In 2000, CARB inventory data show that average daily anthropogenic emissions of PM_{10} in El Dorado County were estimated at 122 tons per day. Of this, about 60% came from road dust, 15% from residential fuel combustion (such as wood-burning stoves and fireplaces), and 13% from construction, demolition and waste burning. Wildfires added another 6 tons per day.

Carbon Monoxide

Carbon monoxide is formed by the incomplete combustion of carbon-containing fuels. Because it is directly emitted from combustion engines, carbon monoxide can have adverse localized impacts, primarily in areas of heavy traffic congestion. Because it is emitted directly and has limited dispersion characteristics, CO is considered a localized pollutant.

When carbon monoxide combines with hemoglobin in the blood, the oxygen-carrying capacity of the blood is reduced and the release of oxygen is inhibited or slowed. This condition places angina patients, persons with other cardiovascular diseases or with chronic obstructive lung disease, asthmatics, persons with anemia, and fetuses at risk. At higher levels, CO also affects the central nervous system. Symptoms of exposure may include headaches, dizziness, sleepiness, nausea, vomiting, confusion, and disorientation.

EPA's primary and secondary AAQS is 35 ppm for one hour. CARB's AAQS for carbon monoxide is 20 ppm for a one-hour period. For an eight-hour average, EPA and CARB have the same AAQS of 9 ppm. CARB also has adopted a special eight-hour CO primary standard, applicable only in the LTAB, of 6 ppm.

CARB inventory data indicate that average daily anthropogenic carbon monoxide emissions in El Dorado County were estimated at 891 tons per day in 2000, with motor vehicles contributing approximately 70% of that total. Residential fuel combustion, utilities, and manufacturing contributed the remainder.

Nitrogen Dioxide (NO_2)

NO_2 is a reddish brown gas that is a by-product of fuel combustion, mostly from motor vehicle and industrial sources. Aside from its contribution to ozone formation, nitrogen dioxide can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as the active coloring agent in a brown cloud on high pollution days, especially when both NO_2 and high ozone levels are present. The national primary and secondary AAQS for NO_2 is 0.053 ppm (annual arithmetic mean). The state AAQS is 0.25 ppm for one hour.

Sulfur Dioxide (SO_2)

Sulfur dioxide is produced by the combustion of sulfur-containing fuels, such as oil, coal and diesel. SO_2 is a colorless acid gas with a strong, acrid odor. Like nitrogen dioxide, sulfur dioxide can irritate lung tissue and increase the risk of acute and chronic respiratory disease. For SO_2 the primary national AAQS is 0.030 ppm (annual geometric mean) and 0.14 ppm (1-hour), and the secondary national standard is 0.5 ppm (over 3-hours). The state AAQS is 0.04 ppm (24-hour) and 0.25 ppm (1-hour).

2.3 Attainment Status

Under state and federal law, CARB is required to designate areas of the state as attainment, nonattainment, or unclassified with respect to any AAQS. An "attainment" designation signifies that pollutant concentrations did not exceed the standard over the requisite number of years; "nonattainment" indicates that an area exceeded the standard one or more times in a year (excluding exceptional events such as a forest fire); and "unclassified" means that sufficient data do not exist to support classification as attainment or nonattainment. The federal and California Clean Air Acts divide nonattainment air basins into moderate, serious, or severe categories for some pollutants, depending on how high pollutant concentrations are, and impose increasingly stringent emission control requirements as the category designation moves from moderate to severe.

Table 2.1 below summarizes the attainment status of the El Dorado County portion of the MCAB.

Table 2.1 Attainment Status of the El Dorado County Portion of the Mountain Counties Air Basin

Pollutant	Federal	State
Ozone (O_3) - 1 hour	Severe Nonattainment	Nonattainment
Carbon Monoxide (CO)	Unclassified/Attainment	Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Inhalable Particulates (PM_{10})	Unclassified	Nonattainment
Sulfates	*(No federal standard)*	*Attainment*
Lead (particulate)	*No designation*	*Attainment*
Hydrogen Sulfide	*(No federal standard)*	*Attainment*
Visibility Reducing Particulates	*(No federal standard)*	*Unclassified*

Source: Air Resources Board, "Area Designations for State and National Ambient Air Quality Standards."

The El Dorado County portion of the LTAB is designated attainment or unclassified for all pollutants, except with regard to the state standard for PM_{10}, for which it is designated nonattainment.

The Federal Clean Air Act has not established national AAQS for toxic air contaminants; nor has ARB done so for California. As a result, they are not considered criteria pollutants; however, they are regulated under separate programs, and are described further in Chapter 7 of this Guide.

2.4 Existing Ambient Air Quality

In El Dorado County, ambient air quality has been monitored at several locations for over 20 years. The most recent data are from monitoring conducted at three CARB-operated monitoring stations in Placerville, Cool, and South Lake Tahoe in 1998-2000. In 2000, a fourth station at Echo Summit started providing data. Table 2.2, below, summarizes pollutants and meteorology monitored at these stations.

Table 2.2 Ambient Air Monitoring Stations in El Dorado County

Pollutants and Meteorology Monitored	Placerville	Cool	S. Lake Tahoe	Echo Summit
Ozone	X	X	X	X
Nitrogen Dioxide			X	X
Nitric Oxide				
Sulfur Dioxide				
Carbon Monoxide	X		X	X
Inhalable Particulates (PM_{10})	X			X
Fine Particulates ($PM_{2.5}$)			X	X
Wind Speed	X	X	X	X
Wind Direction	X	X	X	X
Ambient Temperature	X	X	X	X
Source: California Air Resources Board, 2001				

Based on the most recent three-year set of monitoring data available for complete years (1998-2000), the state and national AAQS for ozone (1-hour) and the state AAQS for PM_{10} (24-hour) have been exceeded in El Dorado County. The ozone exceedances were recorded on a regular basis in the summer "ozone season" each year at the Placerville and Cool stations; there have been no recent ozone exceedances at South Lake Tahoe or Echo Summit. The PM_{10} exceedances were at South Lake Tahoe, and only for the state 24-hr standard in 1998. There have been no recent exceedances of the national or state AAQS for CO, including the special CO standard applicable in Lake Tahoe. Table 2.3, below, summarizes the most recent exceedance data for all measured pollutants from 1998 through 2000 in El Dorado County.

Table 2.3 Number of AAQS Exceedances in El Dorado County 1998-2000

	1998			1999			2000			
	PLA	COO	SLT	PLA	COO	SLT	PLA	COO	SLT	ECH
State 1-hr Ozone	22	30	0	21	36	1	19	34	0	0
National 1-hr Ozone	2	5	0	2	2	0	0	2	0	0
State 24-hr PM_{10}	0	--	2	0	--	0	0	--	0	0
National 24-hr PM_{10}	0	--	0	0	--	0	0	--	0	0
State 8-hr CO	0	--	0	0	--	0	0	--	0	0
National 8-hr CO	0	--	0	0	--	0	0	--	0	0
State 1-hr NO_2	--	--	0	--	--	0	--	--	0	0

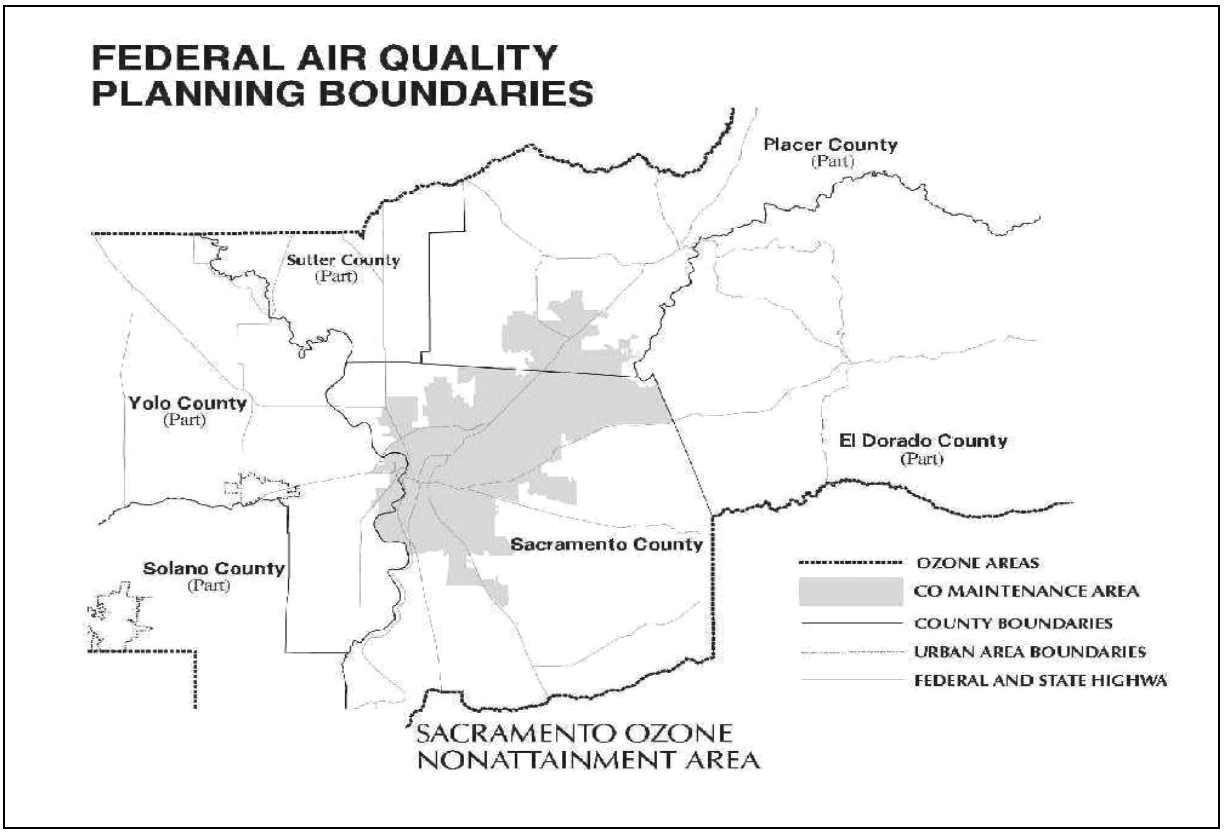
PLA = Placerville
COO = Cool
SLT = South Lake Tahoe
ECH = Echo Summit
Source: California Air Resources Board, 2001

Agencies and project proponents should contact the District to determine whether other data are available to depict air quality in the vicinity of the project site, such as monitoring or meteorological data from permitted facilities. Projects located close to the Sacramento County border should refer to air quality data for the eastern-most portion of Sacramento, particularly data from the Folsom monitoring station.

2.5 Sacramento Federal Ozone Nonattainment Area

The MCAB portion of El Dorado County lies within the area designated by the U.S. Environmental Protection Agency (EPA) as the Sacramento Federal Ozone Nonattainment Area, comprised of Sacramento and Yolo counties, and parts of El Dorado, Solano, Placer, and Sutter counties. See Figure 2.3, below.

Figure 2.3
Sacramento Federal Ozone Nonattainment Area



As the EPA nonattainment designation suggests, this region does not meet the federal ozone standard. The standard was set by the EPA to help achieve one of the primary federal Clean Air Act goals – to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population."[1] The Nonattainment Area is required under state and federal law to meet the federal ozone standard by 2005, or face significant consequences that range from the imposition of financial penalties and permit bans to the adoption of even more stringent federal air emission control requirements.

In response to the complex factors that contribute to the regional ozone problem, the three Air Quality Management Districts (AQMDs) and two Air Pollution Control Districts (APCDs) that govern in the region jointly developed and approved a plan for achieving attainment. The El Dorado APCD is one of the two APCDs involved in the development of the plan. This plan, the Sacramento Area Regional Ozone Attainment Plan – commonly referred to as the 1994 State Implementation Plan (1994 SIP) for Sacramento – identifies a comprehensive regional strategy to reduce emissions to the level required for attainment of the federal standards.

[1] 42 U.S.C.S. § 7401, subs. (b)(1).

Although the Sacramento region currently does not meet the federal ozone standard, it has made significant progress towards attainment. The five nonattainment area air districts in the region completed an assessment of progress in a 1999 Milestone Report. The report, which is available from any of the five districts, details the substantial progress already made, and reinforces the need to aggressively pursue the strategies laid out in the 1994 SIP. This guide addresses one of those strategies — the reduction of air quality emissions from land use development through the review of projects under the California Environmental Quality Act (CEQA).[2]

2.6 Air Quality Management

Various local, regional, state, and federal government agencies share the responsibility for air quality management in El Dorado County. At the local level, the APCD adopts and enforces regulations to control emissions from all sources other than motor vehicles (collectively referred to as stationary sources). As noted above, the APCD takes action to address its part of the regional ozone problem along with four other air districts: Sacramento Metropolitan AQMD, Feather River AQMD, Placer County APCD, and Yolo-Solano AQMD. At the state level, the California Air Resources Board (CARB) sets emission standards for motor vehicles and oversees the actions of all air districts in the state in their efforts to control stationary sources emissions. Together, CARB and the air districts have the responsibility for attaining and maintaining the national and state ambient air quality standards. The air districts and CARB work jointly with the U.S. EPA to develop and implement the State Implementation Plan, or SIP, which is designed to achieve and maintain federal ambient air quality standards; EPA has authority under federal law to step in if state authorities do not meet their obligations in this regard. Local Councils of Governments, county transportation agencies, cities and counties, and various non-governmental organizations also join in the efforts to improve air quality through a variety of programs. These programs include the adoption of regulations and policies, as well as implementation of extensive education and public outreach programs. In the Lake Tahoe Air Basin portion of the county, the Tahoe Regional Planning Agency (TRPA) takes air quality into consideration in its planning and permitting activities.

Appendix B provides further information about these agencies and includes an overview of federal and state laws and programs that affect air quality.

[2] Pub. Resources Code, § 21000, et seq.

Chapter 3
Thresholds of Significance

3.1 Overview

Discretionary projects that are subject to CEQA generally undergo a preliminary evaluation in an Initial Study. The Initial Study is used to determine if a project may have a significant effect on the environment. The Initial Study should evaluate the potential impact of a proposed project on air quality, using the criteria laid out in this Chapter.

The air quality impact of a project is determined by examining the types and levels of emissions generated by the project, the existing air quality conditions, and neighboring land uses. The Initial Study should analyze project construction and operation, as well as cumulative impacts. When considering a project's impact on air quality, a lead agency should provide substantial evidence that supports its conclusions in an explicit, quantitative analysis whenever possible. Lead Agencies are encouraged to use the methodologies provided in this document, or approved computer programs, to perform quantified screening-level air quality analyses. Lead Agencies can use the District as an additional resource in preparing the air quality analysis in an Initial Study.

Set forth below are two categories of significance criteria: qualitative and quantitative. Both categories of criteria should be applied to each project, and either category can result in a finding of significance.

3.2 Qualitative Significance Criteria

3.2.1 CEQA Guidelines Appendix G Environmental Checklist Criteria. The CEQA Guidelines[1] define a "significant effect on the environment" as "a substantial adverse change in the physical conditions that exist in the area affected by the proposed project." Appendix G to the Guidelines contains a checklist of qualitative criteria for determining whether a project will have a "potentially significant impact" on air quality, which is to be used at the Initial Study phase. According to the criteria, a project will have a "potentially significant impact" on air quality if it will:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors).
- Expose the public (especially schools, day care centers, hospitals, retirement homes, convalescent facilities, and residences) to substantial pollutant concentrations.

[1] CEQA Guidelines, §15002(g)

- Create objectionable odors affecting a substantial number of people.

The CEQA Guidelines' Appendix G criteria should be used as "screening" level criteria. A project that is "potentially" significant under these criteria may be shown not to have significant air quality impacts using the quantitative approaches in this Guide. However, if a quantitative analysis is not done, or if the analysis shows that the quantitative significance criteria (set forth in the following sections of this chapter) are exceeded, then a project that is "potentially" significant under the Appendix G criteria will be considered to have a significant impact on air quality.

3.2.2 Land Use Conflicts and Exposure of Sensitive Receptors. The location of a development project is a major factor in determining whether it will result in localized air quality impacts. The potential for adverse air quality impacts increases as the distance between the source of emissions and members of the public decreases. While impacts on all members of the population should be considered, impacts on sensitive receptors are of particular concern. Sensitive receptors are facilities that house or attract children, the elderly, people with illnesses or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, and convalescent facilities are examples of sensitive receptors.

Localized impacts to sensitive receptors generally occur in one of two ways:

- A (new) source of air pollutants is proposed to be located close to existing sensitive receptors. For example, an industrial facility is proposed for a site near a school.
- A (new) sensitive receptor is proposed near an existing source of air pollutants. For example, a school is proposed near a wastewater treatment plant.

There are several types of land use conflicts that should be avoided:

- A sensitive receptor in close proximity to a congested intersection or roadway with high levels of emissions from motor vehicles. High concentrations of carbon monoxide or toxic air contaminants are the most common concerns.
- A sensitive receptor close to a source of toxic air contaminants or to a potential source of accidental releases of hazardous materials.
- A sensitive receptor close to a source of odorous emissions. Although odors generally do not pose a health risk, they can be quite unpleasant and often lead to citizen complaints to the District and to local governments.
- A sensitive receptor close to a source of high levels of nuisance dust emissions.

Lead agencies and project proponents should use these land use conflict criteria to identify issues that may require a project to be designated as having a potential significant air quality impact, but which can be rebutted or eliminated through quantitative analysis or mitigation. Early consultation between project proponents and Lead Agency staff can avoid or minimize localized impacts on sensitive receptors. Often, the provision of an adequate buffer zone between the source of emissions and the receptor(s) is sufficient to mitigate the problem. This underscores

the importance of addressing these potential land use conflicts during the preparation of the general plan and as early as possible in the development reviews for specific projects.

3.2.3 Compliance with District Rules and Regulations. The District considers any proposed project that does not demonstrate compliance with all applicable District rules and regulations, and its permitting requirements in particular, as one that has a significant impact on air quality. Satisfaction of this requirement is straightforward, and can be achieved through identification of and compliance with the applicable rules and regulations. See Figure 1-1 in Chapter 1 for a listing of typical facilities subject to or exempt from District permit requirements. Because the CEQA process must be completed prior to the issuance of District permits, the District will consider this requirement met as long as the project proposal demonstrates that the project design and operation will meet the applicable rules and regulations.

In general, larger sources of air pollutant emissions complying with District new source review permitting rules and regulations will have to offset any emission increases and, therefore, will not be considered to have a significant air quality impact.[2] Likewise, stationary sources that are exempt from District permit requirements because they fall below emission thresholds for permitting will generally not be considered to have a significant air quality impact. However, permitted or exempt facilities can still be considered not significant under CEQA operations. Consideration must be given to construction activities (if any), to pollutants allowed under a permit, to any unregulated pollutants, and to other criteria not directly addressed in the rule or regulation, including effects on sensitive receptors, toxic air contaminants, conformity, and cumulative impacts. Permitted facilities should be evaluated against these other criteria, just as any other project. Similarly, cumulative impacts are not accounted for in the permitting process, but must be considered under CEQA; for example, a permitted facility may not be significant on a stand-alone basis, but may have a significant impact when its emissions are combined with other projects in a cumulative impacts analysis. Likewise, a permitted facility that meets applicable permit limitations on emissions of reactive organic gas (ROG) compounds must also be evaluated under Chapter 7 if any of the ROG components are listed as toxic air contaminants.

3.2.4 Compliance with U.S. EPA Conformity Regulations. The U.S. EPA has adopted regulations requiring transportation and other types of projects funded by federal agencies, or subject to approval by federal agencies or state/local agencies that are federally funded, to demonstrate compliance with the State Implementation Plan (SIP) for achieving and maintaining federal ambient air quality standards. If a project is not in compliance with the EPA conformity regulations, it will be considered as having a significant environmental impact. See Chapter 9 for more details regarding conformity determinations.

3.2.5 Odors. A qualitative assessment should be made as to whether a project has the potential to generate odorous emissions of a type or quantity that could meet the statutory definition for nuisance, i.e., odors

> "which cause detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which may endanger the comfort, repose, health, or

[2] CEQA Guidelines, §15064(h)

> safety of any such person or the public, or which may cause, or have a natural tendency to cause, injury or damage to business or property. " [3]

While offensive odors usually do not cause any physical harm, they can be unpleasant enough to lead to considerable distress among the public and generate citizen complaints to local governments and the District. Any project with the potential to expose members of the public to objectionable odors in a manner that meets the statutory definition of nuisance will be deemed to have a potential significant effect. Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, schools, etc., warrant the closest scrutiny, but consideration should be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas.

For projects locating near a source of odors where there is currently no nearby development and for odor sources locating near existing receptors, the determination of significance should be based on the distance and frequency at which odor complaints from the public have occurred in the vicinity of a similar facility.

Table 3.1, below, includes common types of facilities that have been known to produce odors. The Lead Agency should recognize that this list of facilities is not meant to be all-inclusive. If a proposed project is determined to be a potentially significant source of odors, mitigation measures should be required. For some projects, operational changes, add-on controls or process changes, such as carbon absorption, relocation of stack/vents, can reduce odorous emissions. In many cases, however, the most effective mitigation strategy is to provide a sufficient distance, or buffer zone, between the source and the receptor(s).

Table 3.1 Common Types of Facilities Known to Produce Odors

Wastewater Treatment Plant	Chemical Manufacturing
Sanitary Landfill	Fiberglass Manufacturing
Transfer Station	Painting/Coating Operations (e.g., auto body shop)
Composting Facility	Food Processing Plant
Petroleum Refinery	Rendering Plant
Asphalt Batch Plant	Coffee Roaster

3.3 Quantitative Significance Criteria

3.3.1 Introduction. The Lead Agency should determine whether the proposed project or plan would exceed any of the thresholds set forth in this section. If any of the thresholds are exceeded, then the project is deemed to have a significant air quality impact and an EIR should be prepared. The more comprehensive analysis of an EIR will provide a more detailed discussion of the project or plan impacts and will help identify the most appropriate and effective mitigation measures to minimize the impacts. Where no significant air quality impacts of a project or plan can be identified in the Initial Study (i.e., none of these significance thresholds

[3] Health & Safety Code § 41700

are exceeded), the District recommends that the Lead Agency prepare a Negative Declaration or, if an EIR is required because of non-air quality impacts, the Lead Agency should include a statement in the EIR explaining the reasons for concluding that air quality impacts are insignificant.

Tests of significance are not limited to the quantitative criteria listed below. The qualitative criteria in section 3.1 above must also be satisfied, although in many cases the quantitative analysis will have the effect of showing that some or all of the qualitative criteria have been met.

Chapter 4 covers the methods for calculation of construction emissions and comparison to the applicable significance criteria. Chapter 5 explains how to calculate daily mass emissions from project operation for ROG and NOx and the comparison of those emissions to the applicable mass emission significance criteria. Chapter 6 does the same for operation emissions of other pollutants, such as CO, PM_{10}, NO_2, and SO_2, which are to be compared against the applicable ambient air quality standards for determining significance. The methodologies provided are intended to assist the Lead Agency and project proponents in determining whether these quantitative thresholds have been exceeded.

3.3.2 Significance Criteria for Ozone. Since ozone is not directly emitted in significant amounts, and modeling impacts of individual projects on a region-wide pollutant like ozone is not feasible, it is necessary to focus on emission levels of the two directly emitted primary precursors of ozone, reactive organic gases (ROG) and oxides of nitrogen (NOx). As explained in § 2.5 of Chapter 2, the western portion of El Dorado County is in the federally designated Sacramento nonattainment region for ozone, and, along with the other counties in the region, is obligated to come into attainment by 2005. The District has determined that mass emissions in excess of the ROG and NOx levels shown in Table 3.2, below, from any project, could affect the District's commitment to attain the federal one-hour ozone standard in the Sacramento Region, and thus could have a significant adverse impact on air quality in the Sacramento Region.

Table 3.2 Ozone Precursor Significance Thresholds

Pollutant	Pounds Per Day
Reactive Organic Gases (ROG)	82
Oxides of Nitrogen (NOx)	82

These thresholds are based on the emissions offset thresholds that apply to new or modified stationary emission sources under District Rule 523. Rule 523, in turn, conforms with the "no net increase" policy adopted by the California Clean Air Act, which requires offsets for permitting of new or modified sources having the potential to emit 15 tons or more per year of any nonattainment pollutant or its precursors in a district, such as is the case in El Dorado for ozone, classified as having "serious" violations of a state ambient air quality standard.[4] Emissions from sources that are below these levels are considered small enough to be accepted as not requiring further mitigation. (Note that although these thresholds are based on criteria used for stationary sources, they are applied in these guidelines to the total emissions from

[4] See Health & Safety Code § 40919.

proposed projects, including stationary, area, and mobile source emissions.) Emissions below these thresholds are considered not significant for industrial sources under the state and federal air quality control programs. It is logical to extend these thresholds as significance criteria under CEQA.

For the Lake Tahoe Air Basin portion of the District, the Tahoe Regional Planning Agency (TRPA) has designated an air quality "significance threshold" of 0.08 ppm over one hour for ozone, which is slightly more stringent than the state AAQS for ozone of 0.09 ppm for one hour. However, there is no reason to adopt a more stringent significance threshold for individual projects in the Tahoe region for CEQA purposes in light of the TRPA threshold; this is because there is no direct relationship between the TRPA threshold, which is expressed as an ozone concentration in ppm, and the CEQA ozone precursor significance thresholds designated above, which are expressed as mass emissions. Accordingly, the same criteria are considered appropriate for the Lake Tahoe Air Basin portion of the county as well as the Mountain Counties Air Basin portion. However, for any projects in the Tahoe region, project proponents and Lead Agencies are advised to check separately with TRPA for any special TRPA requirements imposed by that agency under CEQA for determining the significance of projects within the TRPA jurisdiction.

The method for determining whether a project will exceed these thresholds, along with applicable mitigation measures, is set forth in Chapter 4 for the construction phase and Chapter 5 for project operation.

3.3.3 Significance Criteria for Other Criteria Pollutants. For the other criteria pollutants, including CO, PM_{10}, SO_2, NO_2, sulfates, lead, and H_2S, a project is considered to have a significant impact on air quality if it will cause or contribute significantly to a violation of the applicable national or state ambient air quality standard(s). (See Appendix B for a list of the AAQS.) The determination of whether emissions of these pollutants from a project will cause or contribute to a violation of an applicable AAQS, with applicable mitigation measures, should be done in accordance with the methods laid out in Chapter 4 for construction activity impacts and Chapter 6 for project operation.

3.3.4 Significance Criteria for Visibility. A project in the Mountain Counties Air Basin portion of the county will be considered as having a significant impact on visibility if it will cause or contribute significantly to a violation of the state visibility standard, which is 10 miles (when relative humidity is less than 70%). The state standard in the Lake Tahoe Air Basin is 30 miles, but for evaluating the significance of proposed projects in the Lake Tahoe area, the District will apply the more stringent 100-mile visibility standard imposed by TRPA. For a project that has the potential for adversely affecting visibility under these criteria, the Lead Agency or project proponent should consult with District staff to determine the appropriate method to be used in applying the visibility criteria and the appropriate mitigation. If a project is not expected to result in a significant impact for ozone or PM_{10}, based on the criteria for those pollutants in paragraphs 3.3.2 and 3.3.3 above, it may be presumed that no significant visibility impacts will result. However, the District may determine that this presumption is not applicable if there are special factors, such as project size or location, indicating that a more detailed analysis of visibility impacts is needed.

3.3.5 Significance Criteria for Toxic Air Contaminants. For toxic air contaminants, or TACs, the District will apply the following two alternative significance criteria. Exceeding either of these criteria will lead to a conclusion that a project has a significant impact with respect to toxic air contaminants:

1. the lifetime probability of contracting cancer is greater than one in one million (ten in one million if T-BACT is applied); or
2. the ground-level concentration of non-carcinogenic toxic air contaminants would result in a Hazard Index of greater than 1.

Further details on TACs and the methodology for performing the required health risk assessment are provided in Chapter 7. In addition, Chapter 7 contains provisions for evaluating the significance of asbestos emissions, which can be of concern in El Dorado County for road or development projects.

3.3.6 Significance Criteria for Determining Cumulative Impacts. A proposed project is considered cumulatively significant if one or more of the following conditions is met:

1. The project requires a change in the existing land use designation (i.e., general plan amendment, rezone), and projected emissions (ROG, NOx, CO, or PM_{10}) are greater than the emissions anticipated for the site if developed under the existing land use designation;
2. The project would individually exceed any significance criteria in this Guide;
3. For impacts that are determined to be significant under this Guide, the lead agency for the project does not require the project to implement the emission reduction measures contained in and/or derived from the Air Quality Attainment Plan (AQAP; see Appendix E); or
4. The project is located in a jurisdiction that does not implement the emission reduction measures contained in and/or derived from the AQAP (See Appendix E).

Chapter 8, Cumulative Air quality Impacts, sets forth the method for assessing cumulative impacts.

Chapter 4
Construction Activities - Air Quality Impacts and Mitigation

4.1 Construction and Air Quality

Construction activities can generate a substantial amount of air pollution. In some cases, the emissions from construction represent the largest air quality impact associated with a project. While construction-related emissions produce only temporary impacts, these short-term impacts can contribute to an exceedance of national and/or state ambient air quality standards. To minimize construction air quality impacts so that a project can be deemed not significant in terms of air quality impacts under CEQA, the emissions from construction should be assessed and if necessary the appropriate mitigation strategy implemented. This chapter provides the recommended methodologies to estimate emissions from common construction activities associated with land development and mitigation strategies to neutralize unnecessary air pollutant emissions.

A project's most common construction activities include site preparation, earthmoving, and general construction. General construction includes adding improvements such as roadway surfaces, structures, and facilities. Earthmoving activities include cut and fill operations, trenching, soil compaction, and grading. Site preparation includes activities such as general land clearing and grubbing. In some cases, a project requires buildings and other obstacles demolished as part of site preparation.

The emissions generated from these common construction activities include the following:

- Combustion emissions (ROG, NOx, CO, SOx, PM_{10}) from mobile heavy-duty diesel- and gasoline-powered equipment, portable auxiliary equipment, and worker commute trips;
- Fugitive dust (PM_{10}) from soil disturbance or demolition; and
- Evaporative emissions (ROG) from asphalt paving and architectural coating applications.

Demolition and earth disturbance may also result in airborne entrainment of asbestos, a toxic air contaminant, particularly where structures built prior to 1980 are being demolished or with regard to soil disturbance in areas of the county where there are naturally occurring surface deposits of ultramafic rock. If there is a possibility that asbestos-containing dust may be generated during the construction phase of a project, the procedures for addressing toxic air contaminants set forth in Chapter 7 should be followed for determining significance and undertaking any required mitigation.

The Air Pollution Control Officer (APCO) may apply significance criteria and/or mitigation measures for evaluating the air quality impacts of construction activities, other than the criteria and mitigation measures set forth in the following sections of this chapter, provided they have been approved for use in another district in the Sacramento federal ozone nonattainment area.

4.2 Project Screening

Either of two approaches may be used for screening construction equipment exhaust emissions for significance: one is based on fuel use, the other on the incorporation of mitigation measures into the

project design. If exhaust emissions are determined to be not significant under either approach, then further calculations to determine construction equipment exhaust emissions, as set out in subsequent sections of this chapter, are not necessary. For fugitive dust (PM_{10}) emissions, the screening approach is based on specific dust suppression measures that will prevent visible emissions beyond the boundaries of the project. If those measures are incorporated into the project design, then further calculations to determine PM_{10} fugitive dust emissions are not necessary.

4.2.1 Screening of Construction Equipment Exhaust Emissions Based on Fuel Use.

Based on conservative assumptions regarding emissions and fuel use rates for Diesel-powered equipment used for construction, Table 4.1, below, sets forth the average daily fuel use per quarter for all construction equipment at a single site that would ensure that emissions remain below the combined 82 lbs/day significance thresholds for ROG and NOx on a quarterly basis (i.e., total ROG plus NOx emissions remain below 164 lbs/day). The quarterly averaging approach is based on the quarterly calculation of emission offsets used for stationary facilities in the District's New Source Rule 523. If average daily fuel use is kept below the levels shown in Table 4.1 on a quarterly basis, ROG and NOx emissions from construction equipment may be deemed not significant. Where the construction period is shorter than 90 days, fuel use should be determined using average daily fuel use over the full duration of the construction period. If the final construction period of a project scheduled to take more than 90 days is less than one calendar quarter, it may be combined with the previous quarter for averaging purposes. Where construction takes place over two complete quarters or more, the quarter with the highest average daily emissions must be used.

Table 4.1 Construction Equipment Fuel Use Screening Levels

Equipment Age Distribution	Average Daily Fuel Use Per Quarter (Gal. Per Day)
All equipment 1995 model year or earlier	337
All equipment 1996 model year or later	402
Assumptions: 12.5 g/hp-hr ROG+NOx for 1995 and earlier equipment (from EPA Nonroad Model); 10.5 g/hp-hr ROG+NOx for 1996 and later equipment (Based on EPA and CARB Tier 1 standards). Notes: Determination of fuel use should be documented based on the equipment manufacturer's data. Use linear interpolation between 337 and 402 gal. per day in proportion to distribution of equipment into the two age categories; e.g., 50/50 age distribution yields allowable fuel use of (337+((402-337)/2)), or 370 gal. per day.	

The fuel use values in Table 4.1 may be increased based on reasonably documented reductions in ROG or NOx emissions attributed to mitigation measures such as the use of emulsified fuel, alternative fuels, etc. For example, if an emulsified fuel has been certified by CARB (or other testing acceptable to the District) to reduce NOx by 15%, then the values above would be raised to 396 gal. per day (337/(1-0.15)) for 1995 and earlier equipment and 472 gal. per day (402/(1-0.15)) for 1996 and later equipment.

If ROG and NOx emissions are deemed not significant under Table 4.1, then exhaust emissions of CO and PM_{10} from construction equipment, and exhaust emissions of all constituents from worker commute vehicles, may also be deemed not significant. Likewise, the District has determined that keeping total construction phase fuel use under the limits shown in Table 4.2, below, will not result in a health risk from Diesel particulate matter that exceeds the significance criteria for toxic air contaminants (1 in 1 million if T-BACT is not used; 10 in 1 million if T-BACT is used.)

4.2.2 Screening of Construction Equipment Exhaust Emissions Based on Incorporation of Mitigation Measures. Based on its experience with construction activities, and taking into account the temporary and non-continuous nature of construction emissions, ROG and NOx emissions during construction may be assumed to be not significant if:

(a) the project encompasses 12 acres or less of ground that is being worked at one time and at least one of the mitigation measures relating to such pollutants described in Section 4.4.1 of this chapter (or an equivalent measure) is incorporated into the project; or

(b) the project proponent commits to pay mitigation fees in accordance with the provisions of an established mitigation fee program in the District (or such program in another air pollution control district that is acceptable to District).

If ROG and NOx mass emissions are determined to be not significant under the provisions above, then it can be assumed that exhaust emissions of other air pollutants from the operation of equipment and worker commute vehicles are also not significant. In such event, the steps for estimating exhaust emissions of these other pollutants in Section 4.3 need not be undertaken. The potential health risk analysis for Diesel exhaust particulate matter must still be performed, as specified in Chapter 7 of this Guide, unless total Diesel fuel use for construction equipment for the duration of the construction phase is less than shown in Table 4.2, below. The District has determined that fuel use below these levels will not exceed the health risk criteria in Chapter 7.

Table 4.2 Fuel Use Screening Criteria for Acceptable Diesel PM Health Risk

PM Control Technology	Maximum Gallons of Diesel Fuel Consumption During Construction Phase
T-BACT applied	37,000
T-BACT not applied	3,700

Notes: For the purposes of this screening test, T-BACT is defined as the use of 1996 and later model year engines in all Diesel construction equipment. Determination of fuel use should be documented based on the equipment manufacturer's data. Maximum gallons of fuel may be interpolated between 37,000 and 3,700 gallons based on the fraction of T-BACT and non T-BACT engines. Risk calculation to support the above screening values is based on fuel use under the "high risk" Prime Engine Scenario in Table 6, Appendix VII, Risk Characterization Scenarios, from the CARB October 2000 "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles."

The fuel use values in Table 4.2 may be increased based on reasonably documented reductions in PM emissions attributed to such mitigation measures as the use of emulsified Diesel fuel,

alternative fuels, etc. For example, if an emulsified Diesel fuel has been certified through testing by CARB or other similar testing to reduce PM by 60%, then the values above would be raised to 92,500 gal. (37,000/(1-0.60)) when T-BACT is applied and 9,250 gal. (3,700/(1-0.60)) when T-BACT is not applied.

4.2.3 Screening of Fugitive Dust PM_{10} Emissions Based on Incorporation of Mitigation Measures. Mass emissions of fugitive dust PM_{10} need not be quantified, and may be assumed to be not significant, if the project includes mitigation measures that will prevent visible dust beyond the project property lines, in compliance with Rule 403 of the South Coast AQMD. See Section C.6 in Appendix C-1, where the mitigation measures in Rule 403 are set forth.

4.2.4 Caveat. The District may determine that any of the screening-level assumptions stated above should not be applicable to a given project due to project-specific considerations, such as especially heavy use of equipment, unique meteorological or soil conditions, or project size. The District recommends that project proponents and Lead Agencies contact the District early in the Initial Study process to confirm whether construction emissions screening may be used for a given project.

4.3 Methodologies for Estimating Construction Emissions

The heart of any CEQA document, especially an EIR, is the analysis of impacts to determine if a proposed project will cause significant adverse environmental effects. For projects that do not qualify for project screening under Section 4.2 above, this chapter discusses three approaches recommended for estimating localized air quality impacts associated with the construction of land development projects: Manual Calculation, URBEMIS, and the Roadway Construction Model. The manual calculation and URBEMIS approaches include shortcomings when used for new road construction, road widening, and bridge and overpass construction projects. Therefore, the Roadway Construction Emissions Model, developed by the Sacramento Metropolitan AQMD, is recommended for estimating emissions from these types of projects. The manual calculation method requires some project-specific information concerning construction activities that usually is available from the project proponent. However, we recognize that detailed project-specific information is sometimes unavailable or unknown at the time the CEQA document is being prepared. In this case, the URBEMIS computer program may be used to calculate emissions from construction activities. This involves using the construction emission module of the program.[1] URBEMIS users are cautioned that the construction module of the URBEMIS uses conservative assumptions as well as generic or dated information that tend to overestimate construction emissions. Therefore, the URBEMIS model should be used only if the Lead Agency or project proponent cannot, with reasonable effort, obtain the necessary specific information that the manual calculation approach requires. URBEMIS users should check with the District to be sure that the most recent version of the model is being used.

[1] If the URBEMIS program is used to calculate construction emissions, run the program separately for the construction emissions and for the operational emissions; the results should not be combined for purposes of comparison to applicable thresholds.

Although the following sections provide methodologies for estimating localized air quality impacts from various activities associated with a project's construction, the Lead Agency is not precluded from using other approaches provided that they are based on proven air quality analytic tools or based on reasonable estimates from past experiences. However, all approaches used to estimate construction emissions should be fully explained and documented in the appropriate section of the CEQA document, with references to this guideline or other supporting documents.

4.3.1 Manual Calculation Method. In this section, we provide in detail a methodology for manually estimating emissions from construction equipment. The manual calculation method includes predictive emission rates for 22 types of equipment, where multiplying the emission rate for a piece of equipment by the number of pieces of equipment would provide a reasonable calculation of daily emissions associated with a land development construction activity. Specific information will need to be supplied by the Lead Agency, such as the number and type of construction equipment and a daily schedule of construction equipment use and activities. As noted above in Section 4.2, these steps need not be undertaken if the screening-level assumptions in Section 4.2 are applicable or if the project proponent or Lead Agency prefers to conduct emissions modeling.

The total daily emissions from construction activities can vary from day-to-day, depending on the size of the project, the number and type of equipment used, and phasing or scheduling of the construction activities. However, because construction emissions are temporary and typically involve a limited number of emission sources, the approach taken in this Guide is to determine average daily construction emissions on a quarterly basis, in the same manner as specified in the screening approach described in Section 4.2. Where construction takes place over two complete quarters or more, the quarter with the highest average daily emissions must be used. Where the construction period is shorter than 90 days, average daily emissions over the full duration of the construction period should be determined. If the final construction period of a project scheduled to take more than 90 days is less than one calendar quarter, it may be combined with the previous quarter for averaging purposes.

As an exception to the average daily emissions approach, where the construction schedule indicates that peak construction activities on consecutive days are considerably greater than the mean level of activity, such that the District considers an averaging approach unrepresentative, the District may require emissions from the peak level of daily activity from one or more categories of activity, or some other representative level of activity, to be used in the calculation.

The following steps generally outline the manual calculation method:

1. Determine the size of the project in acres, square feet, and dwelling units (e.g., houses, apartments, etc).
2. Determine the activities required for constructing the project, such as site preparation, earthmoving, and general construction.
3. Determine the type and number of pieces of construction equipment to be used on each day.
4. Determine the daily hours of operation for each piece of equipment for each specific construction activity.

5. Calculate the average daily engine combustion emissions from construction equipment.
6. Calculate average daily fugitive dust emissions from construction equipment for each specific construction activity; include unpaved travel, paved road travel (if soil trackout will occur), and soil-handling activities.
7. Calculate average daily ROG evaporative emissions from paving activities.
8. Calculate average daily ROG evaporative emissions from architectural coatings activities.
9. Calculate average daily combustion emissions from construction worker trips for each specific construction activity.
10. Sum the average daily construction emissions and compare to the significance criteria.

Further details on how to accomplish these steps are provided in the following sections. Use Table 4.10 in Section 4.3.1.6 to record and sum the calculations described in steps 5 through10.

4.3.1.1 Estimating Engine Combustion Emissions from Heavy-Duty Diesel and Gasoline-Powered Construction Equipment. The combustion of fuel to provide power for equipment used during construction results in the generation of emissions of ROG, NOx, CO, and PM_{10}. The manual calculation procedure involves determining a daily emission rate for each piece of equipment, multiplied by the number of pieces of equipment, for each day of construction activity. The emissions from all equipment categories are then added together and averaged on a quarterly basis. The Lead Agency will therefore need to determine the type of daily construction activities that are likely to occur based on the project's size, duration, and location. The contractor(s) responsible for construction should be able to provide specific information about the number and type of equipment operation during the various phases of project construction. This information would provide for accurate calculation of combustion emissions.

However, in the initial planning phase of a project, the exact type and number of equipment may be unknown or unavailable for the construction activity. In this situation, conservative estimates can be derived using standard construction industry reference materials such as Walker's Building Estimator's Reference Book, 26th Ed.; Richardson Engineering Services' Process Plan Construction Estimating Standards, National Construction Estimator; and Dodge Unit Cost Book. Alternatively, an estimate can be prepared based on Table 4.3, below.

Table 4.3, below, shows the type and number of equipment that construction activities typically may require. Not all of the construction activities listed will be part of a proposed project. For example, the smaller the project the less likely that the large cut and fill activity will occur. The analyst will need to determine the type of construction activities that are likely to occur based on the project's actual size, duration, and location.

Table 4.3 Example Construction Activity Equipment Types and Number Requirements for a 10-Acre Project

Construction Activity	Type of Equipment	Number of Pieces of Equipment
Demolition [1]	Loader Haul Truck	1 1
Land Clearing/Grubbing [1]	Loader Haul Truck	1 1
Backhoe Excavation [1]	Backhoe/Loader Haul Truck	1 1
Bulldozer Excavation [1]	Bulldozer Loader Haul Truck	1 1 1
Small Cut and Fill [2]	Bulldozer Water Truck	1 1
Large Cut and Fill [2]	Scraper Bulldozer Water Truck	1 2 1
Trenching [1]	Trencher and Loader	1 each
Grading [1]	Bulldozer Motor Grader Water Truck	1 1 1
Concrete Slab Pouring [3]	Cement Truck	1
Portable Equipment Operation [4]	Generator Air Compressor	1 1
Paving [1]	Paving Machine Roller	1 1
Architectural Coatings [1]	Air Compressor	1

Sources: [1] Richardson Engineering Services' Process Plan Construction Estimating Standards, 1996; [2] National Construction Estimator, 1998; [3] Dodge Unit Cost Book, 1998; [4] SMAQMD.

Important factors that influence the exact number and type of equipment for the construction activity that should not be overlooked include the project's size, schedule, and location. The number of construction equipment pieces should proportionally increase for every 10 acres of project size. For example, if normally one bulldozer, one motor grader, and one water-truck (3 pieces of equipment) are required to grade 10 acres, then 30 acres require three bulldozers, three motor graders, and three water-trucks (9 pieces of equipment).

Some construction activities may occur simultaneously using the same type of equipment. For example, the same loader used in land clearing activities could be used for stockpiling activities. Therefore, the analyst must take care to account for scheduling on a given day when calculating daily mass emissions to avoid emissions double counting. Conversely, if construction activities occur simultaneously where different pieces of equipment are being used, the analyst will need to account for this so that emissions are not underestimated. In this case, the overlapped daily mass emissions

would be higher than if the construction activities occurred separately. Whatever construction equipment configuration is chosen for each construction activity, it should be supported by a schedule of equipment and activities; reasonable grouping of activities over longer periods (e.g., for several weeks) may be used to simplify the presentation of construction schedule information, unless the District determines that such an approach is unrepresentative of how construction will actually be conducted.

To calculate emissions from construction equipment, an emission factor must also be used. Table 4.4, below, shows the predictive emission factors in pounds of pollutant per day recommended for use in estimating exhaust emissions from 22 different types of construction equipment in years 2000 through 2010. The emission factors in this table are derived from several sources including default parameters from the Roadway Construction Emissions Model, rather than the U.S. EPA AP-42 publication, as the former are more current. See Section 4.3.3 for a more detailed explanation about the model.

Table 4.4 Construction Equipment Emission Rates (pounds/day) for Years 2000-2010

Bore/ Drill Rigs	ROG	CO	NOx	PM_{10}	Paving Equipment	ROG	CO	NOx	PM_{10}
2000	2.88	24.45	33.74	1.15	2000	1.03	5.66	10.59	0.55
2001	2.80	23.80	28.33	0.90	2001	1.03	5.95	10.13	0.50
2002	1.65	14.02	14.03	0.40	2002	1.04	6.23	9.68	0.46
2003	2.21	18.75	15.22	0.35	2003	1.04	6.52	9.22	0.42
2004	2.99	25.43	20.64	0.48	2004	1.04	6.81	8.77	0.37
2005	2.22	18.91	15.35	0.36	2005	1.04	7.09	8.31	0.33
2006	2.21	18.75	15.22	0.35	2006	1.04	7.38	7.93	0.30
2007	1.57	13.37	10.85	0.25	2007	1.04	7.66	7.54	0.28
2008	1.88	15.97	12.97	0.30	2008	1.04	7.95	7.16	0.25
2009	2.38	20.21	16.41	0.38	2009	1.04	8.23	6.78	0.22
2010	2.26	19.23	15.61	0.36	2010	1.04	8.52	6.39	0.19
Concrete/ Industrial Saws	**ROG**	**CO**	**NOx**	**PM_{10}**	**Rollers**	**ROG**	**CO**	**NOx**	**PM_{10}**
2000	1.08	5.89	11.01	0.57	2000	0.86	5.91	7.52	0.41
2001	1.08	6.18	10.53	0.52	2001	0.86	6.39	6.76	0.33
2002	1.08	6.48	10.06	0.48	2002	0.86	6.86	6.00	0.26
2003	1.08	6.78	9.59	0.43	2003	0.86	7.34	5.24	0.19
2004	1.08	7.08	9.11	0.39	2004	0.86	7.34	5.13	0.16
2005	1.08	7.37	8.64	0.34	2005	0.86	7.34	5.01	0.14
2006	1.08	7.67	8.24	0.32	2006	0.86	7.34	5.01	0.14
2007	1.08	7.97	7.84	0.29	2007	0.86	7.34	5.01	0.14
2008	1.08	8.26	7.44	0.26	2008	0.86	7.34	5.01	0.14
2009	1.08	8.56	7.04	0.23	2009	0.86	7.34	5.01	0.14
2010	1.08	8.86	6.65	0.20	2010	0.86	7.34	5.01	0.14

Table 4.4 (Cont.) Construction Equipment Emission Rates (pounds/day) for Years 2000-2010

Cranes	ROG	CO	NOx	PM_{10}
2000	1.44	9.44	13.05	0.70
2001	1.44	10.14	11.93	0.59
2002	1.44	10.85	10.80	0.48
2003	1.44	11.56	9.67	0.38
2004	1.44	12.27	8.55	0.27
2005	1.44	12.27	8.37	0.23
2006	1.44	12.27	8.37	0.23
2007	1.44	12.27	8.37	0.23
2008	1.44	12.27	8.37	0.23
2009	1.44	12.27	8.37	0.23
2010	1.44	12.27	8.37	0.23

Rough Terrain Forklifts	ROG	CO	NOx	PM_{10}
2000	0.79	5.40	6.87	0.37
2001	0.79	5.83	6.18	0.30
2002	0.79	6.27	5.48	0.24
2003	0.79	6.70	4.79	0.17
2004	0.79	6.70	4.68	0.15
2005	0.79	6.70	4.57	0.13
2006	0.79	6.70	4.57	0.13
2007	0.79	6.70	4.57	0.13
2008	0.79	6.70	4.57	0.13
2009	0.79	6.70	4.57	0.13
2010	0.79	6.70	4.57	0.13

Crawler Tractors	ROG	CO	NOx	PM_{10}
2000	1.45	7.94	14.85	0.77
2001	1.45	8.34	14.21	0.71
2002	1.45	8.74	13.57	0.65
2003	1.45	9.14	12.93	0.59
2004	1.45	9.54	12.30	0.52
2005	1.45	9.95	11.66	0.46
2006	1.45	10.35	11.12	0.43
2007	1.45	10.75	10.58	0.39
2008	1.45	11.15	10.04	0.35
2009	1.45	11.55	9.50	0.31
2010	1.45	11.95	8.96	0.27

Rubber Tired Dozers	ROG	CO	NOx	PM_{10}
2000	3.66	20.03	37.45	1.93
2001	3.66	21.04	35.84	1.78
2002	3.66	22.05	34.23	1.63
2003	3.66	23.06	32.62	1.48
2004	3.66	24.07	31.01	1.32
2005	3.66	25.09	29.40	1.17
2006	3.66	26.10	28.05	1.07
2007	3.66	27.11	26.69	0.98
2008	3.66	28.12	25.33	0.88
2009	3.66	29.13	23.97	0.78
2010	3.66	30.14	22.61	0.68

Crushing/ Proc. Equipment	ROG	CO	NOx	PM_{10}
2000	2.12	11.60	21.68	1.12
2001	2.12	12.18	20.75	1.03
2002	2.12	12.77	19.82	0.94
2003	2.12	13.35	18.88	0.85
2004	2.12	13.94	17.95	0.77
2005	2.12	14.52	17.02	0.68
2006	2.12	15.11	16.23	0.62
2007	2.12	15.69	15.45	0.57
2008	2.12	16.28	14.66	0.51
2009	2.12	16.86	13.88	0.45
2010	2.12	17.45	13.09	0.40

Rubber Tired Loaders	ROG	CO	NOx	PM_{10}
2000	1.35	9.27	11.80	0.64
2001	1.35	10.02	10.61	0.52
2002	1.35	10.77	9.42	0.41
2003	1.35	11.52	8.23	0.30
2004	1.35	11.52	8.04	0.26
2005	1.35	11.52	7.86	0.22
2006	1.35	11.52	7.86	0.22
2007	1.35	11.52	7.86	0.22
2008	1.35	11.52	7.86	0.22
2009	1.35	11.52	7.86	0.22
2010	1.35	11.52	7.86	0.22

Table 4.4 (Cont.) Construction Equipment Emission Rates (pounds/day) for Years 2000-2010

Excavators	ROG	CO	NOx	PM_{10}
2000	1.84	13.32	15.24	0.83
2001	1.84	14.48	13.39	0.66
2002	1.84	15.64	11.54	0.48
2003	1.84	15.64	11.25	0.42
2004	1.84	15.64	10.96	0.36
2005	1.84	15.64	10.67	0.29
2006	1.84	15.64	10.67	0.29
2007	1.84	15.64	10.67	0.29
2008	1.84	15.64	10.67	0.29
2009	1.84	15.64	10.67	0.29
2010	1.84	15.64	10.67	0.29

Scrapers	ROG	CO	NOx	PM_{10}
2000	3.64	21.58	35.39	1.85
2001	3.64	22.92	33.26	1.65
2002	3.64	24.26	31.12	1.45
2003	3.64	25.60	28.99	1.25
2004	3.64	26.94	26.86	1.04
2005	3.64	28.28	24.72	0.84
2006	3.64	29.62	22.92	0.71
2007	3.64	30.96	21.12	0.58
2008	3.64	30.96	21.12	0.58
2009	3.64	30.96	21.12	0.58
2010	3.64	30.96	21.12	0.58

Graders	ROG	CO	NOx	PM_{10}
2000	1.76	11.09	16.42	0.87
2001	1.76	11.87	15.18	0.75
2002	1.76	12.65	13.94	0.63
2003	1.76	13.43	12.70	0.52
2004	1.76	14.21	11.46	0.40
2005	1.76	14.98	10.22	0.28
2006	1.76	14.98	10.22	0.28
2007	1.76	14.98	10.22	0.28
2008	1.76	14.98	10.22	0.28
2009	1.76	14.98	10.22	0.28
2010	1.76	14.98	10.22	0.28

Signal Boards	ROG	CO	NOx	PM_{10}
2000	1.72	9.39	17.55	0.91
2001	1.72	9.86	16.80	0.83
2002	1.72	10.33	16.04	0.76
2003	1.72	10.81	15.29	0.69
2004	1.72	11.28	14.53	0.62
2005	1.72	11.75	13.78	0.55
2006	1.72	12.23	13.14	0.50
2007	1.72	12.70	12.50	0.46
2008	1.72	13.18	11.87	0.41
2009	1.72	13.65	11.23	0.37
2010	1.72	14.12	10.60	0.32

Off-Highway Tractros/ Compactors	ROG	CO	NOx	PM_{10}
2000	1.84	10.07	18.83	0.97
2001	1.84	10.58	18.02	0.90
2002	1.84	11.09	17.21	0.82
2003	1.84	11.60	16.40	0.74
2004	1.84	12.11	15.60	0.67
2005	1.84	12.61	14.79	0.59
2006	1.84	13.12	14.10	0.54
2007	1.84	13.63	13.42	0.49
2008	1.84	14.14	12.74	0.44
2009	1.84	14.65	12.05	0.39
2010	1.84	15.16	11.37	0.34

Skid Steer Loaders	ROG	CO	NOx	PM_{10}
2000	0.56	4.78	3.88	0.23
2001	0.56	4.78	3.76	0.20
2002	0.56	4.78	3.63	0.17
2003	0.56	4.78	3.51	0.14
2004	0.56	4.78	3.39	0.12
2005	0.56	4.78	3.26	0.09
2006	0.56	4.78	3.26	0.09
2007	0.56	4.78	3.26	0.09
2008	0.56	4.78	3.26	0.09
2009	0.56	4.78	3.26	0.09
2010	0.56	4.78	3.26	0.09

Table 4.4 (Cont.) Construction Equipment Emission Rates (pounds/day) for Years 2000-2010

Off-Highway Trucks/ Water Trucks	ROG	CO	NOx	PM_{10}
2000	3.60	22.67	33.55	1.78
2001	3.60	24.26	31.02	1.54
2002	3.60	25.85	28.49	1.30
2003	3.60	27.44	25.96	1.06
2004	3.60	29.03	23.42	0.82
2005	3.60	30.62	20.89	0.58
2006	3.60	30.62	20.89	0.58
2007	3.60	30.62	20.89	0.58
2008	3.60	30.62	20.89	0.58
2009	3.60	30.62	20.89	0.58
2010	3.60	30.62	20.89	0.58

Surfacing Equipment	ROG	CO	NOx	PM_{10}
2000	3.77	20.62	38.56	1.99
2001	3.77	21.66	36.90	1.83
2002	3.77	22.70	35.24	1.68
2003	3.77	23.75	33.59	1.52
2004	3.77	24.79	31.93	1.36
2005	3.77	25.83	30.27	1.21
2006	3.77	26.87	28.87	1.11
2007	3.77	27.91	27.48	1.01
2008	3.77	28.95	26.08	0.90
2009	3.77	29.99	24.68	0.80
2010	3.77	31.03	23.28	0.70

Other Construc-tion Equipment	ROG	CO	NOx	PM_{10}
2000	2.08	11.37	21.26	1.10
2001	2.08	11.95	20.35	1.01
2002	2.08	12.52	19.44	0.92
2003	2.08	13.09	18.52	0.84
2004	2.08	13.67	17.61	0.75
2005	2.08	14.24	16.69	0.67
2006	2.08	14.82	15.92	0.61
2007	2.08	15.39	15.15	0.55
2008	2.08	15.96	14.38	0.50
2009	2.08	16.54	13.61	0.44
2010	2.08	17.11	12.84	0.39

Tractors/ Loaders/ Backhoes	ROG	CO	NOx	PM_{10}
2000	0.65	3.56	6.66	0.34
2001	0.65	3.74	6.37	0.32
2002	0.65	3.92	6.08	0.29
2003	0.65	4.10	5.80	0.26
2004	0.65	4.28	5.51	0.24
2005	0.65	4.46	5.23	0.21
2006	0.65	4.64	4.98	0.19
2007	0.65	4.82	4.74	0.17
2008	0.65	5.00	4.50	0.16
2009	0.65	5.18	4.26	0.14
2010	0.65	5.36	4.02	0.12

Pavers	ROG	CO	NOx	PM_{10}
2000	1.37	9.36	11.91	0.64
2001	1.37	10.12	10.71	0.53
2002	1.37	10.87	9.51	0.41
2003	1.37	11.62	8.31	0.30
2004	1.37	11.62	8.12	0.26
2005	1.37	11.62	7.93	0.22
2006	1.37	11.62	7.93	0.22
2007	1.37	11.62	7.93	0.22
2008	1.37	11.62	7.93	0.22
2009	1.37	11.62	7.93	0.22
2010	1.37	11.62	7.93	0.22

Trenchers	ROG	CO	NOx	PM_{10}
2000	1.00	7.26	8.31	0.45
2001	1.00	7.90	7.30	0.36
2002	1.00	8.53	6.29	0.26
2003	1.00	8.53	6.14	0.23
2004	1.00	8.53	5.98	0.19
2005	1.00	8.53	5.82	0.16
2006	1.00	8.53	5.82	0.16
2007	1.00	8.53	5.82	0.16
2008	1.00	8.53	5.82	0.16
2009	1.00	8.53	5.82	0.16
2010	1.00	8.53	5.82	0.16

Using the emission factors in Table 4.4, emission estimates can be calculated from the number and type of pieces of construction equipment used for each construction activity by multiplying the equipment's specific emission rate by the number of pieces of equipment. For example, if an activity of land clearing on a particular day includes a maximum area disturbed per day of 5 acres, and requires a dozer, two scrapers, and a water truck to complete the activity during the year 2002, then total NOx emissions for that day would equal 125 pounds (see computation below).

Emissions per day are calculated by the following equation:

$$Em = ER \times Eq$$

Where: Em = amount of pollutant in pounds per day
ER = emission rate in pounds per day for pollutant by target year (see Table 4.2)
Eq = number of pieces of equipment

For the given example then:

$$Em_{(NOx)} = [(ER_{(Dozer\ Yr\ '02\ NOx)} \times Eq) + (ER_{(Scraper\ Yr\ '02\ NOx)} \times Eq) + (ER_{(H2O\ Truck\ Yr\ '02\ NOx)} \times Eq)]$$
$$Em_{(NOx)} = [(34.23 \times 1) + (31.12 \times 2) + (28.49 \times 1)]$$
$$Em_{(NOx)} = 125$$

The emission factors in Table 4.4 assume equipment is operated continuously for 8 hours each day. Results should be adjusted proportionately if it is known that equipment will in fact be used for more or less than 8 hours per day.

To obtain average daily ROG and NOx exhaust emissions from construction activities, ROG and NOx emissions from all equipment operated on each day of construction should be totaled over the life of the construction project and then divided by the total number of construction days. The result should then be entered in line one of Table 4.10.

4.3.1.2 Estimating Fugitive Dust Emissions from Construction. Demolition, clearing, grading, excavating, use of heavy equipment or trucks on unpaved surfaces, and loading/unloading of trucks create large quantities of fugitive dust, including PM_{10}. Fugitive dust emissions may have a significant impact on local air quality.

As explained in Section 4.4.3 below, construction fugitive dust emissions will be considered not significant and estimation of fugitive dust emissions is not required if complete mitigation is undertaken as part of the project (or made a mandatory condition of the project) in compliance with the requirements of Rule 403 of the South Coast AQMD, such that there will be no visible dust beyond the boundaries of the project. If screening is not applied under Section 4.2.3, fugitive dust emissions may be quantified and inserted in Table 4.10 using the generalized emission factors set forth below in Table 4.5 and the equation following that table.

Table 4.5 Fugitive Dust (PM_{10}) Emissions from Construction

Activity	Units of Measure	Emission Factor (EF)
Demolition	Cu. Ft. of Building Demolished Per Day	0.00004 lbs/day
Dirt/Debris Pushing/Grading	No. of Pieces of Equipment Operating During One Hour	21.8 lbs/hr.
Exposed Graded Surfaces	Acres of Exposed Surface Per Day	26.4 lbs/day
Exposed Storage Piles	Acres Per Day	85.6 lbs./day
Truck Dumping	Tons of Material Dumped Per Day	0.009 lbs/day
Truck Travel/Dirt Hauling	Miles Traveled On-Site Per Day	10.0 lbs/mile
Truck Travel on Unpaved Roads	Miles Traveled On-Site Per Day	23.0 lbs/mile
Source: SCAQMD, CEQA Air Quality Handbook, April 1993.		

Completing the equation below with the predictive emission factors from Table 4.5 yields uncontrolled construction-related PM_{10} emissions.

$$Em = AM \times EF$$

Where: Em = Fugitive Dust (PM_{10}) Emissions, lbs
AM = Amount per Unit of Measure for the Activity
EF = Emission Factor

To obtain average daily fugitive dust emissions from construction activities, PM_{10} emissions on each day of construction should be totaled over the life of the construction project and then divided by the total number of construction days. The result should be entered in line 2 of Table 4.10.

Based on project-specific facts, such as the number of pieces of equipment to be used, the size of the project, or the existence of special or unique soil characteristics or meteorology, the District may recommend that a project's potential to affect ambient particulate concentrations be analyzed with an appropriate air pollutant dispersion model, such as ISCST3. The purpose of such an analysis is to help determine if the amount of dust that will be generated by project-related activities will cause an exceedance of an ambient particulate air quality standard. If the analysis indicates that construction fugitive dust emissions will contribute more than five percent to a violation of a particulate ambient air quality standard, a finding of significant impact should be made and appropriate mitigating measures identified. The District will recommend that particulate modeling be conducted if project-related activities and operations may generate airborne PM_{10} in such quantities as to cause an effect in an area where sensitive receptors live or work, including residential areas, schools, day care centers, office complexes, and hospitals. Examples of projects that may require supplemental modeling include mining and quarrying operations, landfills, and excavation and grading operations for large development projects. When the District recommends a particulate modeling analysis, it will provide guidance as to appropriate models and modeling protocols.

4.3.1.3 Estimating Evaporative Emissions from Asphalt Paving. In addition to the emissions generated from combustion of fuel associated with the operation of paving equipment used to apply asphalt (see §4.3.1.1above), ROG emissions are released from the evaporation of solvents contained in asphalt paving materials. The following equation estimates evaporative emissions.

$$Em = EF \times Ac$$

Where: Em = Emissions
EF = Emission Factor, (lbs/acre/day)
Ac = Acres paved per day

The emission factor in Table 4.6, below, may be used in the equation.

Table 4.6 Asphalt Paving ROG Emissions (lbs/acre/day)

Pollutant	ROG
Emission Factor (EF)	2.62
Source: URBEMIS7G.	

To obtain average daily ROG emissions from asphalt paving, the emissions on each day when asphalt paving is scheduled to be done should be totaled over the life of the construction project and then divided by the total number of construction days. The result should be entered in line 3 of Table 4.10.

4.3.1.4 Estimating Evaporative Emissions from Architectural Coating Application. Architectural coatings release ROG emissions from the evaporation of solvents contained in the paints, primers, lacquers, varnishes, and other surface coatings applied to structures. In the context of a land development project, the vast majority of architectural coatings applied are flat paints for interior walls, ceilings, and exterior walls. The methodology provided below calculates ROG emissions, based on coatings compliant with District Rule 215, from the application of architectural coatings at a project site. Separate procedures are used to estimate evaporative emissions from application of residential and nonresidential architectural coatings. (Assumptions: single family unit = 1,800 sq ft; multi-family units = 850 sq ft; one coat of paint, spray-applied on wood, plasterboard, or metal; no more than 10 units to be painted at one time. Proportional adjustments should be made for larger or smaller units or for more or fewer units.)

For residential (single and multi-family units):

$$Em = (EF \times DU) / (T_d + 3)$$

Where: Em = ROG Emission, $\frac{lbs}{day}$

EF = Emission Factor, $\frac{lbs}{du}$ (from Table 4.5 below)

DU = Number of dwelling units

T_d = Number of painting days, otherwise use 17 days.

For non-residential:

$$Em = (EF \times \sqrt{Bsize}) \times (T_d + 3)$$

Where: Em = ROG emissions, $\frac{lbs}{day}$

EF = Emission Factor, $\frac{lbs}{sq\ ft}$ (from Table 4.7, below)

Bsize = Building size, sq ft

T_d = Number of painting days, if known; otherwise use 17 days.

Table 4.7 Architectural Coatings Emissions (lbs/day)

Land Use	Applicable Units	ROG Emissions Factor[3] (EF)
Single Family[1]	dwelling units	65.6 lbs/du
Multi-Family[1]	dwelling units	49.2 lbs/du
Non-Residential[2]	square feet (sq ft)	1.63 lbs/sq ft

Source: SMAQMD.
Notes:
[1] Not to exceed 10 units, which assumes no more than 10 units will be painted at one time.
[2] Square root of gross square feet.
[3] Factor based upon coatings compliant with El Dorado Co. APCD Rule 215.
Assumptions: Single Family equal 1,800 sq ft and Multi-Family equal 850 sq ft; 1-coat paint, spray painted on wood, plasterboard, or metal.

To obtain average daily ROG emissions from architectural coating application, the emissions on each day when coating activity is scheduled to be done should be totaled over the life of the construction project and then divided by the total number of construction days. The result should be entered in line 4 of Table 4.10.

4.3.1.5 Estimating Combustion Emissions from Construction Worker Trips. Construction activities also contribute to mobile emissions generated by commute trips to and from the project site and non-work trips associated with lunch or other errands. In some cases, construction vehicle trips are typically difficult to accurately quantify at the time environmental documents are prepared. In all cases, a good-faith effort should be made to quantify these emissions to the degree practical. Rather than manually calculating vehicle emissions associated with construction activities, the analyst may use the vehicle emission factor model, EMFAC2001, to estimate vehicle emissions. The EMFAC2001 model uses CARB's motor vehicle emission factor inventory program to obtain daily emissions from total VMT per day multiplied by the emission factor (grams per mile). However, set forth below is a methodology that the analyst may use to manually calculate worker vehicle emissions, particularly when the analyst does not have project-specific information about the number of daily trips associated with project construction.

The approach to estimating combustion emissions from worker vehicle trips includes estimating worker daily trips by land use type. This approach groups the project into one of four general land

use categories: multi- and single-family residential, commercial and/or retail, and office and/or industrial. Then for each category, the number of trips is estimated using the following equation.

$$Tr = TrF \times U$$

Where: Tr = Number of trips per land use type, $\frac{\text{trips}}{\text{day}}$

TrF = Trip Factor, see Table 4.8

U = Number of dwelling units or 1,000 square feet of building.

Table 4.8 Construction Worker Trip Generation (Trips/day)

Land Use	Trip Factor	Unit Type
Multi-Family	0.36/Unit	Dwelling units
Single-Family	0.72/Unit	Dwelling units
Commercial/Retail	0.32/1,000 sq. ft.	1,000 sq. ft.
Office/Employment	0.42/1,000 sq. ft.	1,000 sq. ft.
Source: SCAQMD, CEQA Planners Handbook, 1993.		

Using the total daily construction employee trips, review Table 4.9 below and locate the pollutant values for each pollutant for the amount of emissions generated by the daily trips; if necessary, add the amount of emissions to determine total vehicular emissions. Note: Use the values corresponding with the year of analysis, which should be the build-out year of the project or phase of larger projects.

Table 4.9 Lookup Table for Construction Worker Trip Emissions (Lbs)
Years 2000, 2005, 2010, 2015

	Year 2000				Year 2005			
Trips	ROG	NOx	PM_{10}	CO	ROG	NOx	PM_{10}	CO
1	0.04	0.04	0.001	0.38	0.03	0.02	0.001	0.21
10	0.44	0.35	0.012	3.78	0.26	0.19	0.012	2.10
100	4.38	3.55	0.116	37.79	2.56	1.93	0.117	20.96
1000	43.82	35.47	1.164	377.88	25.62	19.29	1.173	209.56
10000	438.21	354.67	11.640	3778.84	256.23	192.91	11.727	2095.57
	Year 2010				Year 2015			
Trips	ROG	NOx	PM_{10}	CO	ROG	NOx	PM_{10}	CO
1	0.02	0.01	0.001	0.12	0.01	0.01	0.001	0.08
10	0.16	0.11	0.011	1.25	0.10	0.07	0.012	0.75
100	1.59	1.13	0.113	12.46	1.03	0.66	0.119	7.55
1000	15.85	11.25	1.125	124.62	10.31	6.64	1.191	75.49
10000	158.53	112.50	11.250	1246.23	103.07	66.42	11.910	754.92

Source: California Air Resources Board, EMFAC2000, version 2.02.
Runs performed for El Dorado County, Mountain Counties Air Basin, using weighted fleet mix of light-duty autos, light-duty trucks, and medium-duty vehicles, annual average emission rates, and a 10-mile one-way trip. Use linear interpolation or extrapolation if actual number of trips is different from numbers shown. Use linear interpolation for intervening years.

To obtain average daily emissions from construction worker trip emissions, the emissions on each day when workers are scheduled to be present should be totaled over the life of the construction project and then divided by the total number of construction days. The result should be entered in line 5 of Table 4.10 below.

4.3.1.6 Construction Emissions Summary. Using Table 4.10, below, sum the totals of the average daily construction emissions as calculated manually for each category and compare the Total Average Daily Emissions for all categories combined with the significance threshold to determine the project's level of significance. For ROG and NOx, if the Total Average Daily Emissions value in lbs/day is less than the 82 lbs/day significance threshold, then the project does not generate levels of those pollutants that are considered significant. For CO and PM_{10}, Total Average Daily Emissions in lbs/day must be converted to ambient concentrations in line 7 for comparison to the applicable AAQS; use the modeling techniques described in Section 6.3.2 for operation emissions, or an alternative technique acceptable to the District, to make this conversion.

To be sure that the project remains below the significance level during construction, the lead agency should include the following as enforceable conditions of project approval:

1. The number of pieces of equipment operating at the construction site should be limited to the number used in the emissions calculations.
2. The amount of grading on any one day should be limited to the area used in the emission calculations.

If the emission calculations are based on the use of newer, low-emitting equipment, then the project construction must be conducted using only the specified low-emission equipment.

Table 4.10 Average Daily Construction Emissions Summary

Emission Source	ROG (lbs/day)	NO_x (lbs/day)	PM_{10} (lbs/day)	CO (lbs/day)
Construction Equipment Exhaust Emissions				
Fugitive Dust (PM_{10})				
Asphalt Paving ROG				
Architectural Coating ROG				
Construction worker vehicles				
Total Average Daily Emissions (Sum of 5 categories above)				
Modeling Results in ambient concentrations				
Significance Threshold	82	82	AAQS	AAQS
Significance Determination				

Note: "AAQS" refers to the national and state ambient air quality standards for the pollutant indicated. See Appendix B for a listing of the AAQS. Modeling of ROG and NOx impacts is not feasible.

4.3.2 Estimating Construction Emissions Using URBEMIS. URBEMIS is a computer program that can be used to estimate emissions associated with land use development projects in California, such as residential neighborhoods, shopping centers, office buildings, etc. CARB originally created URBEMIS, which stands for "Urban Emissions Model," in the early 1980s. Since that time it has undergone several revisions. The latest version, URBEMIS7G, was developed by Jones and Stokes Associates as consultants for the San Joaquin Valley Unified Air Pollution Control District, in coordination with several other air districts. Previous versions of URBEMIS were designed to estimate only motor vehicle emissions from trips generated by land use development. URBEMIS7G has been enhanced so that the user can estimate construction and area-source emissions. In addition, URBEMIS has been modified to allow the user to estimate motor vehicle trip emissions using EMFAC7G, CARB's motor vehicle emission factor model; hence the name URBEMIS7G. URBEMIS7G also allows the user to select mitigation measures for construction emissions, area sources, and motor vehicle trips.

The URBEMIS7G model and user's manual can be downloaded from CARB's web site at http://www.arb.ca.gov. URBEMIS7G only allows the user to print results (output) from program runs. Currently, the input data cannot be printed from the program. Therefore, to allow the public and other responsible agencies to corroborate the results from URBEMIS7G program runs, the user should provide input data tables indicating the input parameters selected and the assumptions made in running the URBEMIS7G program.

As noted above, users are cautioned that URBEMIS can produce very conservative results; users should also contact the District to be sure that they have the most recent version.

4.3.3 Estimating New Road Construction Emissions Using the Roadway Construction Emission Model. The District recommends use of the roadway construction emissions model, developed by the Sacramento Metropolitan AQMD, for estimating emissions from construction of roads. The model can be used to estimate vehicle exhaust and fugitive dust (PM_{10}) emissions from one of three types of road projects: 1) new road construction, 2) road widening, and 3) bridge construction. For each of these project types, the model estimates emissions for four activities of road construction: 1) grubbing/land clearing, 2) grading/excavation, 3) drainage/utilities/sub-grade, and 4) paving. These four activities are based on published construction information and conversations with individuals working for firms involved in road construction and with individuals at the California Department of Transportation.

The model estimates emissions for load hauling (on-road heavy-duty vehicle trips), worker commute trips, construction site fugitive PM_{10} dust, and off-road construction vehicles. Although exhaust emissions are estimated for each activity, fugitive dust estimates are currently limited to grubbing/land clearing, and grading/excavation.

The road construction model is a public domain spreadsheet model formatted as a series of individual worksheets. The model enables users to estimate emissions using a minimum amount of project-specific information. The user is required to enter information on project type (new road construction, road widening, or bridge/overpass construction), project length (miles), project duration (years), soil type, emission factors, total project area, and maximum area disturbed per

day. The model uses this information to calculate emissions. The data on which these default parameters have been developed are based on several sources of information, including discussions with several individuals involved in road construction. Future updates to the model will be used to broaden the data on which the default information is based. If detailed construction information is available, that information can be entered into the model to provide more refined emission estimates.

Off-road construction emissions are estimated for each construction activity. The program generates estimates of the number of each type of construction equipment based on information provided by the user and on information incorporated into the program. The program includes up to 25 different types of construction equipment (see Table 4.11 below).

Table 4.11 Construction Equipment Types Included in the Road Construction Model

Backhoes	Off-Highway Trucks
Bore/Drill Rigs	Other Construction Equipment
Concrete/Industrial Saws	Pavers
Compactors	Paving Equipment
Cranes	Rollers
Crawler Tractors	Scrapers
Crushing/Processing Equipment	Signal Boards
Dozers	Skid/Steer Loaders
Excavators	Surfacing Equipment
Forklifts, Rough Terrain	Tractors
Graders	Trenchers
Loaders, Rubber Tired	Water Trucks

For example, the program will select different numbers and types of vehicles depending on the project type selected, the length of the project, and maximum acreage disturbed per day. The user can override the number and type of construction vehicles selected by the program. Emissions for each piece of construction equipment are estimated by multiplying that equipment's emission factor (grams per horsepower hour) by that equipment's vehicle horsepower rating, the equipment's load factor, and by the number of hours per day. The worksheet's default horsepower rating, load factor, and hours per day values can be overridden by the user.

4.3.3.1 Off-Road Construction Emission Rates. Off-road construction emission rates (grams per horsepower hour) and associated emissions (pounds per day) are estimated separately for each type of equipment. Several steps are involved in estimating off-road vehicle emissions. Emissions are based on the Appendix D worksheet, which is taken directly from the California Air Resources Board's off-road emissions model documentation, Appendix D. Appendix D lists average emissions per engine horsepower category and year. Average emission rates are calculated for pre-1996 engines. Post-1996 emission rates are based on emission standards for heavy-duty off-road engines.

The next step involves estimating replacement rates for each type of construction vehicle. Those replacement rates are based on Appendix B of the California Air Resources Board's off-road emissions model documentation. The replacement rates are used to estimate the percentage of vehicles in each of three classes: pre-1996, 1996-2000, 2001 or later. The percentage of vehicles in

each of three categories is then used to estimate average emissions (grams per horsepower-hour) for each year. For each year, the percentage of vehicles in each of the three age classes is multiplied by the emissions for that age class and the three resulting values are summed. Then, pounds per day emissions are estimated by multiplying the grams per hp-hour value by horsepower, load factor, and hours operating per day.

The off-road construction emissions calculation is based on using Appendix D and Appendix B. The on-road emissions are calculated based on either EMFAC7F or EMFAC7G (selected by the user) at 30 miles per hour (mph). EMFAC7F and EMFAC7G represent two versions of the California Air Resources Board's motor vehicle emission factor inventory program. EMFAC7F was superseded by EMFAC7G in the late 1990s. Major improvements made to EMFAC7G include:

- Redefining starts and redistributing starts by vehicle age;
- New start emissions methodology;
- Fuel corrections for diesel;
- High emitter adjustments; and
- Driving cycle adjustments.

The EMFAC2000 and MOBILE5b models are not yet supported. At this time, the District requires the use of EMFAC7G.

4.3.3.2 Load Hauling (On-Road Heavy-Duty Vehicle Trips). Load-hauling emissions are estimated for the grading/excavation construction phase only. Hauling emissions are based on the total miles per day for on-road vehicle trips. The daily vehicle miles traveled (VMT) is estimated by multiplying the vehicle miles per round trip by the number of trips traveled per day. The trips-per-day estimate is derived by dividing the total amount of material imported to and exported from the site per day by the average truck capacity. The amount of material imported and exported is a user input to the model. The average truck capacity is assumed to be 20 cubic yards unless the user overrides that value.

The total VMT per day is then multiplied by the emission factor (grams per mile) to obtain daily emissions. The emission factor is based on the vehicle emission factor model selected by the user, on the project construction start year, and on the project length. The user has the option of selecting the EMFAC7F model or the EMFAC7G model, but as noted above the District requires the use of EMFAC7G. For projects in which the grading/excavation phase spans more than one year, emissions are weighted based on the percentage of time in the year that they occur.

4.3.3.3 Worker Commute Trips. Worker commute trips are estimated for all four activities of construction. Emissions are estimated by multiplying the emission rate (grams per mile) by the total worker commute miles traveled per day. The user has the option of selecting the EMFAC7F model, or the EMFAC7G model; again, EMFAC7G must be selected. EMFAC2000 and MOBILE5b models are not yet supported. Emissions are weighted based on the year in which they occur.

The total worker commute miles traveled per day is calculated by multiplying the average one-way

trip distance (default: 20 miles) by the total one-way trips per employee per day (default two trips/employee), which is then multiplied by the total number of employees per construction phase. The total number of employees is assumed to equal 125 percent of the total number of off-road vehicles used for each construction activity. The user has the option of overriding the default values estimated for worker commute trips.

4.3.3.4 Fugitive Dust (PM_{10}). The model uses a simple approach for estimating fugitive PM_{10} dust emissions. Fugitive dust is estimated for two activities of construction: grubbing/land clearing and grading/excavation. Emissions are multiplied by the maximum acreage disturbed per day as entered by the user. That value is multiplied by the California Air Resources Board's emission factor of 220 pounds per day divided by 22 workdays per month. Future improvements to the model will likely focus on providing the user with the option of conducting more detailed estimates of fugitive PM_{10} emissions.

Further information on user instructions for the Roadway Construction Emissions Model is contained in Appendix C-2.

4.4 Reducing Significant Construction Emissions

Public Resources Code §21002 states that " . . . it is a policy of the state that public agencies not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects." This policy may be applied at the design stage of a project so that its emissions and air quality impacts are diminished and thereby deemed not significant in the Initial Study, by incorporating mitigation measures recommended by the District as part of the original project design. Alternatively, mitigation measures may be accepted as project revisions after the project has been submitted for CEQA review, to allow the preparation of a Mitigated Negative Declaration in lieu of an EIR. This section suggests various measures for mitigation that can be used under either approach. If mitigation is not undertaken at this stage, and an EIR is required, mitigation will likely have to be undertaken later.

If the emissions of a proposed project have been estimated using URBEMIS, then we recommend that the mitigation component of the program also be used. The following methodologies include the least complex method of calculating control efficiencies. These mitigation efficiencies are averages based on research; they do not account for the particular variables of a specific project and may over- or underestimate actual emission reductions. URBEMIS allows for a more refined calculation since project-specific data are used. The most refined approach would be to manually calculate control efficiencies based on project-specific data.

The emission reduction that can be expected from implementation of a mitigation measure is identified as that measure's control efficiency and is expressed as a percentage of total emissions. For example, a 25% control efficiency implies that a mitigation measure or series of measures results in emission reductions equal to 25% of uncontrolled values. Efficiencies may differ for each pollutant depending on the mitigation measure, emission source, and specific process affected. Justification must be provided when using control efficiencies other than those provided below.

It must be noted that the control efficiencies listed are general in nature and alternative methods of calculating mitigation efficiencies may be used to prepare an air quality analysis. Any alternative method should be supported by legitimate research, thoroughly documented, and reproducible.

4.4.1 Mitigating Construction Equipment Exhaust Emissions. Construction mitigation measures involve emission reductions of NOx, ROG, and PM_{10} which may include reformulated fuels, emulsified fuels, catalyst and filtration technologies, cleaner engine repowers, and new alternative-fueled trucks, among others. Many of the heavy-duty diesel mitigation measures may qualify for state and air district incentive funding programs. Additional construction mitigation measures include emission reductions from controlling visible emissions from diesel-powered equipment and particulate matter emission control measures. The Lead Agency is encouraged to explore and incorporate additional mitigation measures than listed below as technology advances and less emissive products become available. Contact the District either to determine which measures are available or to customize the measures appropriately for the project. The following measures are provided as examples for Lead Agency consideration.

- Require the prime contractor to provide an approved plan demonstrating that heavy-duty (i.e., greater than 50 horsepower) off-road vehicles to be used in the construction project, and operated by either the prime contractor or any subcontractor, will achieve, at a minimum, a fleet-averaged 15 percent NOx reduction compared to the most recent CARB fleet average. Successful implementation of this measure requires the prime contractor to submit a comprehensive inventory of all off-road construction equipment, equal to or greater than 50 horsepower, that will be used an aggregate of 40 or more hours during the construction project. Usually the inventory includes the horsepower rating, engine production year, and hours of use or fuel throughput for each piece of equipment. In addition, the inventory list is updated and submitted monthly throughout the duration of when the construction activity occurs.

- Obligate the prime contractor to use an alternative fuel, other than Diesel, verified by the California Air Resources Board or otherwise documented through emissions testing to have the greatest NOx and PM_{10} reduction benefit available, provided each pollutant is reduced by at least 15%.

- Obligate the prime contractor to use aqueous emulsified fuel verified by the California Air Resources Board or otherwise documented through emissions testing to have the greatest NOx and PM_{10} reduction benefit available, provided each pollutant is reduced by at least 15%.

4.4.2 Mitigating Asphalt Paving and Architectural Coating Emissions. Mitigation for asphalt paving requires the use of materials that comply with District Rule 224. The emissions factors used to generate the emissions values in § 4.3.4 above are reflective of the use of compliant materials; therefore no additional mitigation is feasible or available. Likewise, the mitigation for architectural coatings involves the use of materials that comply with District Rule 215. The emissions factors used to generate the emissions values in § 4.3.5 above are reflective of the use of compliant materials, and additional mitigation is generally not considered feasible; however, an investigation may be undertaken to determine if new lower VOC products are available.

4.4.3 Mitigating Fugitive Dust. To qualify for the screening presumption in Section 4.2 that fugitive dust emissions from project construction are not significant, a project must commit to implement fugitive dust control measures sufficient to prevent visible dust beyond the project property lines. This commitment can be satisfied by compliance with all the measures listed in the exemption tables in Rule 403 of the South Coast Air Quality Management District, pertaining to control of fugitive dust emissions. For ease of reference, the exemption tables are contained in Tables C.6 and C.7 of Appendix C-1.

If screening is not used, Table 4.12, below, shows estimated dust emissions reductions for a variety of PM_{10} control measures. These measures are expressed as a percentage of total fugitive dust PM_{10} from project construction. Note that only one mitigation measure may be used for each of the sources. This is because the first mitigation measure for each heading is incorporated in the second measure of each heading. For example, with the source "Soil Piles" you may not claim PM_{10} emissions reduction for watering twice daily and for automatic sprinklers.

Table 4.12 Fugitive Dust Emission Mitigation

Source	Mitigation Measure	Control Efficiency
Soil Piles	Enclose, cover or water twice daily all soil piles	16%
	Automatic sprinkler system installed on all soil piles	39%
Exposed Surface/Grading	Water all exposed soil twice daily	37%
	Water exposed soil with adequate frequency to keep soil moist at all times	75%
Truck Hauling Road	Water all haul roads twice daily	3%
	Pave all haul roads	7%
Truck Hauling Load	Maintain at least two feet of freeboard	1%
	Cover load of all haul/dump trucks securely	2%

Source: SCAQMD, weighted for percentage contribution of PM_{10} emissions.

4.4.4 Mitigating Construction Worker Trips. Currently, no standardized approach to quantify construction employee commute reductions has been approved. Mitigation may exist, and may be quantified by the anticipated reduction in trips from carpooling, use of transit, or other alternative nonpolluting modes of transportation such as walking or biking. To determine the estimated emission reduction, first estimate the number of trips reduced through carpooling or other similar measures and see Appendix D to estimate emissions reduced from trip reduction measures.

4.4.5 Construction Emissions Reduction. Use Table 4.13, below, to estimate emission reductions from mitigation measures proposed for construction.

Table 4.13 Mitigation of Average Daily Construction Emissions

Emission Source	ROG (lbs/day)	NO_x (lbs/day)	PM_{10} (lbs/day)	CO (lbs/day)
Construction Equipment Exhaust Emissions				
Mitigation reduction				
Subtotal				
Fugitive Dust (PM_{10})				
Mitigation reduction				
Subtotal				
Asphalt Paving ROG				
Architectural Coati ng ROG				
Mitigation reduction				
Subtotal				
Construction worker vehicles				
Mitigation reduction				
Subtotal				
Total Average Daily Emissions				
Modeling Results (in ambient concentrations)				
Significance Threshold	82	82	AAQS	AAQS
Significance Determination				

In Table 4.13, sum all Subtotal figures in the line labeled Total Average Daily Emissions, and convert the lbs/day Total Average Daily Emissions values for CO and PM to ambient concentrations in line 8 per the instructions for Table 4.10 in Section 4.4.1. If the Total Average Daily Emissions value for ROG and NOx, and the modeling result for CO and PM_{10}, is less than the applicable significance threshold, then the proposed mitigation will reduce the impact of the project to a less than significant level for that pollutant. If the Total Average Daily Emissions value for ROG or NOx, or the modeling result for CO or PM_{10}, is greater than the significance threshold, then the mitigation measures will not reduce emissions to a less than significant level for that pollutant and, therefore, construction impacts are considered significant.

Chapter 5
ROG and NOx Emissions and Mitigation For Project Operation

This chapter addresses emissions of reactive organic gases (ROG) and oxides of nitrogen (NOx) from the operation of a proposed project. Evaluating the significance of these ozone-precursor pollutants based on mass emissions is appropriate because these pollutants have primarily regional air quality impacts, rather than localized effects, that are difficult to predict reliably through modeling. Other pollutants, such as CO, PM_{10}, SO_2, and NO_2, should be evaluated in accordance with their direct impact on ambient air quality as set forth in Chapter 6.

Several sources of emissions need to be considered when evaluating the ozone precursor impacts of a project's operation. For some types of development projects, motor vehicle trips are the principal source of air pollution. Projects in this category, such as shopping centers, office buildings, arenas, and residential developments, are often referred to as "indirect sources." This is because they do not directly emit significant amounts of air pollutants from onsite activities, but cause additional emissions from motor vehicles traveling to and from the development.

Most development projects also generate "area source" emissions. Area sources are sources that individually emit fairly small quantities of air pollutants, but which cumulatively may represent significant quantities of emissions. Water heaters, fireplaces, lawn maintenance equipment, and application of paints and lacquers are examples of area source emissions.

Certain projects also may directly generate stationary or "point" source emissions from operation. Although most area sources discussed above are stationary, the term stationary or point source usually refers to equipment or devices operating at industrial and commercial facilities. Examples of facilities with stationary sources include manufacturing plants, quarries, print shops, and gasoline stations.

This chapter describes the evaluation methodology and mitigation strategies for ROG and NOx emissions from all types of development projects, whether indirect, area, or point sources, or some combination thereof.

5.1 Significance Criteria for Project Operation Emissions

The significance thresholds for ROG and NOx emissions from project operation are shown in Table 5.1 below.[1] The thresholds are compared against all emissions of a project, including motor vehicles, area sources, and stationary or point sources. A credit is allowed for elimination of existing emissions at the project site (e.g., an office building currently in use that will be demolished at the site where the proposed project is planned). The District should be contacted regarding the credit procedure.

[1] Note: For projects in the Lake Tahoe region, Lead Agencies and project proponents should check with the Tahoe Regional Planning Agency (TRPA) to determine if any special requirements apply for determining significance under CEQA, in addition to the thresholds mentioned in Table 5.1.

Table 5.1 Quantitative Operation Emission Thresholds

Pollutant	Pounds Per Day
Reactive Organic Gases (ROG)	82
Oxides of Nitrogen (NO_X)	82

5.2 Project Screening

In some cases the Lead Agency may know that a project requires an EIR as the appropriate environmental review document. In such cases, the Lead Agency may forego preparing an Initial Study and immediately begin preparing an EIR.[2] In other cases, it can be safely assumed that a project does not have significant ROG or NOx emissions even under worst-case conditions. This section contains criteria for identifying projects in the latter category.

5.2.1. Development Projects. For development projects whose only operational emissions come from increased vehicular traffic (e.g. a mall or residential development), screening based on project size or activity may be used to determine whether the project will exceed the threshold of significance for total emissions from project operation. Table 5.2, below, provides size or activity cut-points for various types of land uses that the District has determined, based on conservative assumptions, would, if exceeded, result in emissions above the District's thresholds of significance for ROG and NOx (82 lbs/day). The values provided in Table 5.2 are based on average, default assumptions for modeling inputs using the URBEMIS7G model. Therefore, the values in Table 5.2 represent approximate sizes of projects for which total emissions may exceed the threshold. The values should be used only for project screening, and should not be considered absolute thresholds of project significance. Projects approaching or exceeding the levels indicated in Table 5.2 should undergo a more detailed analysis as described in the following sections. The District recommends that a more detailed analysis be conducted for any project whose size is within 10% of the values indicated in Table 5.2. Note that Table 5.2 only addresses ROG and NOx emissions. There are other air quality issues, such as emission of other pollutants (see Chapter 6), odors, toxics, and cumulative impacts that must be considered when evaluating a project's potential for causing adverse air quality impacts. Depending on the nature of the project and local conditions, a project below the values in Table 5.2 could still have a significant air quality impact.

[2] CEQA Guidelines, §15060 (d).

Table 5.2 Projects With Potentially Significant ROG and NOx Operation Emissions

Development Type	Project Size Likely to Generate 82 lbs/day or more of ROG or NOx[1]
Single Family Housing (with fireplaces/wood stoves)	230 Dwelling Units (48 Dwelling Units)
Apartments, low-rise (with fireplaces/wood stoves)	350 Dwelling Units (47 Dwelling Units)
General Office	260,000 Square Feet
Medical Office Building	110,000 Square Feet
Warehousing	825,000 Square Feet
Manufacturing [2]	620,000 Square Feet
Industrial Park [2]	350,000 Square Feet
Hospital	125,000 Square Feet
Bank/Financial Institution (with drive-thru)	30,000 Square Feet
Quality Restaurant	55,000 Square Feet
Fast Food Restaurant (with drive-thru)	8,000 Square Feet
Office Park	210,000 Square Feet
Convenience Market (24 Hr.)	8,500 Square Feet
Convenience Market (24 Hr.) w/ gasoline pumps	7,600 Square Feet
Supermarket	45,000 Square Feet
Shopping Center	62,000 Square Feet
Motel	480 Rooms
Hotel	490 Rooms
Elementary School	2,100 Students
High School	2,300 Students

[1] Based on URBEMIS7G for Windows, Version 5.1.0; Mountain Counties Air Basin; Rural location; Target year 2002; Maximum daily emissions for Winter conditions (40°F average temperature) or Summer conditions (85°F average temperature), whichever is greater.
[2] Based on emissions from indirect sources (motor vehicles) only. Emissions associated with manufacturing or industrial processes, if any, must also be accounted

If a project type is not listed in Table 5.2 but the Lead Agency or project proponent desires to conduct screening, the District can provide assistance in making a custom run of URBEMIS.

For mixed-use projects (e.g., a combined warehouse-office park project), the impact of each type of use must be separately determined and then combined with the impact of the other use. URBEMIS can be used to do this automatically. For some mixed-use projects, the District will allow impacts to be determined through proportional application of Table 5.2 between uses. For example, if a warehouse-office park project consists of 330,000 sq. ft. of warehousing, or 40% of the 850,000 sq. ft. limit for warehousing, then up to 60% of the limit for office park, or 126,000 sq. ft., could be included. However, because many of the emission calculations in URBEMIS are

not linear and the impact of each use may be based on a different scale, there are practical constraints to simple proportional evaluation of mixed use projects. The District may require that URBEMIS be run to verify the accuracy of the proportional approach for any mixed use project. In general, verification will be required where the number of units for any one use is within 20% of the maximum allowable for that use under Table 5.2.

5.3 Estimating Operation Emissions

When screening does not indicate whether a project is significant, or if the project proponent desires to demonstrate that a project is not significant through more detailed calculations, an estimate of emissions should be performed as specified in this section. The estimate should evaluate all three categories of emissions - indirect, area, and point - when determining impacts from project operation. The District has developed a methodology for manually calculating emissions associated with land use development, which is presented in this section. To assist in estimating these emissions, the analyst should complete Table 5.3 to determine significance.

5.3.1 Determining Project Operation Emissions. The first three lines of Table 5.3 below direct the analyst to determine excess stationary source emissions, vehicular emissions, and energy use. After completing the determination for these three sources, the analyst will sum them for the estimated total daily operation emissions.

Table 5.3, line 1: Excess Stationary Source Emissions – The District currently permits approximately 30 types of stationary sources. It is difficult to determine emissions generated by a stationary source without specific design parameters and without ascertaining what Best Available Control Technology (BACT) requirements would apply to the source. Figure 1-1 at the back of Chapter 1 lists stationary sources that currently require a permit from the Air Districts. Projects that include permitted sources require analysis by the Districts' engineering division to determine excess regulated stationary source emissions. Stationary source emissions in excess of BACT and offset levels (if applicable) should be entered on line 1 of Table 5.3. An estimate of unregulated ROG and NOx emissions from exempt stationary sources should also be included in line 1, since CEQA looks at all air quality impacts; District staff can help with this estimate.

Table 5.3 Project Operation Emissions

Source	ROG (lbs/day)	NO_X (lbs/day)
1. Excess Stationary Source Emissions		
2. Motor Vehicle Emissions (Appendix D)		
3. Energy Use (Area Sources)		
4. Total Emissions		
5. Emission Location Transfer		
Subtotal		
6. Emission Reduction Credits		
Subtotal		
7. Existing Emissions		
8. Net Operation Emissions		
9. Significance Threshold	82	82
10. Significant Emissions (If less than zero, enter zero)		

Table 5.3, line 2: Motor Vehicle Emissions - Whenever possible, the air quality impact analysis for a project should be based on the results of a traffic study conducted specifically for the project. The number of vehicle trips that a project will generate and the average speed and length of the trips, will vary depending on a variety of factors such as the specific nature of the project and its location. If project-specific data are not available, then the default values provided in Appendix D may be used to calculate vehicle trips and emissions. Enter the emission totals calculated in Appendix D on line 2 of Table 5.3.

The URBEMIS computer model can be used as an alternative vehicle emissions methodology to complete line 2 of Table 5.3. CARB developed the URBEMIS model to calculate mobile source emissions associated with various types of land use projects, using EMFAC emission factors and ITE trip generation rates. URBEMIS calculates emissions of ROG, NOx, CO, and PM_{10}, as well as total vehicle trips. The program provides default values for all modeling parameters for several regions within California, including the Sacramento Valley. The analyst may use the default values or may provide project-specific values for parameters including trip generation, trip length, trip speed, vehicle fleet mix, percentage of cold starts, and temperature. We recommend the analyst use the latest version and limit its use to calculating criteria air pollutant emissions from land use development projects. URBEMIS is not appropriate for calculating air pollutant emissions associated with plans. Other models, such as the Direct Travel Impact Model (DTIM), may be used to quantify mobile source air pollutant emissions associated with plans.

Table 5.3, line 3: Energy Use - Electricity and natural gas are used by almost every project, and are the predominant area sources associated with development projects. Pollution is emitted through the generation of electricity and consumption of natural gas. Because electrical generating facilities for the Sacramento Region are located either outside the region or are offset through the use of pollution credits, pollution from generation of electricity is excluded from the

evaluation of project significance. Use Table 5.4, below, to determine emissions associated with natural gas consumption for the applicable land use type and sum together pollutant values from appropriate rows until project size is equaled or exceeded (mixed–use projects must combine totals from each table that applies). Enter the combined total for each pollutant on line 3 of Table 5.3.

Table 5.4 Natural Gas Emissions

Land Use Type	Unit of Measurement	ROG (lbs/day)	NOx (lbs/day)
Residential	50 d.u.	0.1	0.9
	100 d.u.	0.1	1.8
	500 d.u.	0.6	8.9
	1000 d.u.	1.2	17.8
	5000 d.u.	5.9	88.9
Industrial	1 parcels	0.5	11.8
	2 parcels	1.0	23.5
	3 parcels	1.6	35.3
	4 parcels	2.1	47.0
	5 parcels	2.6	58.8
Commercial/Office	0.25 million sq ft	0.1	2.0
	0.50 million sqft	0.2	4.0
	1.00 million sqft	0.4	8.0
	2.00 million sqft	0.7	16.0

Table 5.3, line 4: Total Emissions - Total lines 1 through 3 in Table 5.3 and enter the result on line 4 for each pollutant. Line 4 is the estimated total daily operation emissions.

5.3.2 Determining Net Project Operation Emissions. The calculation of a project's net daily emissions takes into account modification to or the elimination of an existing emissions source (e.g., agricultural fields changed to land development, or replacing industrial development with residential development as part of an urban renewal project). Consequently, it is necessary to characterize the actual emissions from the existing source in order to be able to calculate emissions increases or reductions expected to occur as part of the project.

Table 5.3, line 5: Emission Location Transfer - Enter the total amount of emissions relocated from other sites within the District to the new project site on line 5. Subtract line 5 from line 4 and determine the subtotal. Note: The emission location transfer credit cannot include sources with replacement potential (e.g., offices relocating to a new site where the previous offices have a potential for future office use). This credit is generally used for stationary sources moved from one location to another.

Table 5.3, line 6: Emission Reduction Credits - Enter the total amount of Emission Reduction Credits applied to the proposed project on line 6. Subtract line 6 from the subtotal of line 5 and

subtotal. Note: The District, in compliance with Rule 524, its Emission Reduction Credits rule, must approve Emission Reduction Credits. Contact the District to determine if a project qualifies for emission reduction credits. Also note that Emission Reduction Credits required for stationary sources subject to District permit requirements should NOT be entered on this line; this is because the emissions from these sources were excluded from line 1.

Table 5.3, line 7: Existing Emissions - An emissions credit is allowed for quantifiable reductions in existing emissions at a project site. If the site is currently in use and the project description includes vacating and demolishing existing uses, an emissions credit is allowed for those activities that will cease to operate. Include in this calculation only those emission sources that could be included on lines 1 through 3 for the uses that will cease to operate, and enter the result on line 7. Note: This credit is not allowed for uses vacated or demolished prior to submittal of the current application.

Table 5.3, line 8: Net Project Operation Emissions - Subtract line 7 from line 6 and enter the result on line 8. Line 8 is the project's net daily emissions due to operation.

5.3.3 Determining Significance. The next step is to compare the daily operation emissions to the significance criteria for determination of significance. Subtract the significance threshold on line 9 from the net emissions total on line 8 and enter the result on line 10 (if line 10 is less than zero, then enter zero). If line 10 is zero, emissions from project operation will not generate ozone precursors at a level that is considered significant and no mitigation measures are required. If line 10 is greater than zero, emissions from project operation are considered significant and mitigation measures should be applied to reduce emissions to less-than-significant, if feasible. If there is an increase in emissions of one ozone precursor, and a decrease in the emissions of the other ozone precursor, you may add the two numbers together and compare the net change to the significance level of 82 lbs/day. If the net combined change in ozone precursors is less than 82 lbs/day, then the project's impacts are considered not significant with respect to ozone, and no additional mitigation will be required for these pollutants.

5.4 Mitigating Significant Emissions Due to Project Operation

CEQA requires lead agencies to mitigate or avoid significant environmental impacts associated with discretionary projects.[3] Environmental documents for projects that have any significant environmental impacts must identify feasible mitigation measures or alternatives to reduce the impacts below a level of significance. By applying this same policy at the project design stage, and incorporating mitigation as part of the Initial Study, a project may be able avoid having a significant impact on air quality and the necessity for doing an EIR. This section describes what the District considers to be feasible mitigation in light of existing regulations and research.

The District recognizes that the final determination of feasibility will be made by the Lead Agency. In addition to meeting CEQA requirements, mitigation of significant impacts is needed to achieve state and national ambient air quality standards. All significant impacts associated with air emission sources, including those associated with land development, must be mitigated

[3] Pub. Resources Code, § 21002.1(b).

to the greatest extent possible in order to achieve and maintain the health-based ambient air quality standards. Failure to meet clean air commitments in the State Implementation Plan could result in a loss of federal transportation funds for local roadway projects, and could subject new and modified stationary sources to costly, more stringent emission offset requirements.

Air quality mitigation measures must, by definition, go beyond what is already required by existing air quality regulations. Regulatory programs are in place at the federal, state and air district level to reduce air pollutant emissions from nearly all sources, yet they are not always sufficient to eliminate all air quality impacts. For example, the CARB motor vehicle program has dramatically reduced average tailpipe emissions from the vehicle fleet. Nonetheless, motor vehicle emissions will remain a major source of Sacramento Valley Air Basin pollution problems in the foreseeable future due to growth in the number of vehicles and miles traveled.

Vehicle-related measures available to mitigate a project's long-term emissions are listed in Appendix E. If any mitigation measures are included in the project, use Appendix E to estimate the emission reductions associated with the measure(s). If the URBEMIS computer emission estimate model was used to estimate project emissions, and if mitigation credit was already reflected in the URBEMIS calculations, do not calculate benefits associated with the same mitigation measures from Appendix E. For non-vehicle related emissions mitigation for an industrial or commercial project with direct emissions, consult with the District.

Use Table 5.5 and the steps following the table to estimate emissions after the inclusion of mitigation measures. Currently, the only quantified mitigation measures readily available to reduce long-term operational emissions involve the reduction of vehicle trips. The District must be consulted regarding any non-vehicle related emission measures.

Table 5.5 Project Operation Emissions After Mitigation

Source	ROG (lbs/day)	NOx (lbs/day)
1a. Vehicle Emissions (Table 5.3, line 2)		
1b. Non-vehicle emissions (if applicable)		
1c. Total emissions from Operation		
2. Reduction Factor (Appendix E)		
3. Vehicle Emission Reductions		
4. Net Project Operation Emissions (Table 5.3, line 8)		
5. Vehicle Emission Reductions (From line 3 Above)		
6. Non-Vehicle Emissions Reductions (see District)		
7. Emissions After Mitigation		
8. Significance Threshold	82	82
9. Significant Emissions (If Less than zero, enter zero)		

5.4.1 Determining Emissions After Mitigation. Follow the steps outlined below for Table 5.5 to determine emissions after mitigation measures are applied.

Table 5.5, line 1a: Vehicle Emissions - Transfer the vehicle emissions totals from line 2 of Table 5.3 to line 1a of Table 5.5.

Table 5.5, line 1b: Non-vehicle Emissions – Insert any direct emissions from non-vehicle (e.g., industrial) activities; see the District for the proper method for calculating this line.

Table 5.5, line 1c: Total Emissions from Operation – Total of lines 1a and 1b.

Table 5.5, line 2: Reduction Factor - Use Appendix E to estimate the trip reduction factor and transfer the calculated factors to line 2 of Table 5.5.

Table 5.5, line 3: Vehicle Emission Reductions - Multiply the trip reduction factor on line 2 by the vehicle emissions on line 1 and enter the result on line 3 of Table 5.5. Line 3 is the total emissions reduction available from the application of mitigation measures.

Table 5.5, line 4: Net Project Operation Emissions - Transfer the net project operation emissions total from line 8 of Table 5.3 to line 4 of Table 5.5.

Table 5.5, line 5: Vehicle Emission Reductions - Transfer the vehicle emission reduction totals from line 3 to line 5 of Table 5.5.

Table 5.5, line 6: Non-Vehicle Emissions Reductions – If applicable, insert any emissions reductions for non-vehicle related activities (e.g., from more stringent stack emission controls).

Table 5.5, Line 7: Emissions After Mitigation - Subtract the vehicle emission reductions on line 5 and the non-vehicle emission reductions on line 6 from the net project operation emissions on

line 4 and enter the result on line 7 of Table 5.5. Line 7 is the total estimated project non-vehicle operation emissions after the application of mitigation measures.

5.4.2 Determining Significance After Mitigation. Complete the step for Table 5.5, line 7 to determine the significance of project operation emissions after the application of mitigation measures. Subtract the significance threshold on line 8 from line 7 for each pollutant and enter the result on line 9. (If line 9 is less than zero, enter zero.) If line 9 is zero, the proposed mitigation will reduce the impact to a less-than-significant level. If line 9 is greater than zero, the proposed mitigation will not reduce long-term emissions to a less-than-significant level and are still considered significant. If the applicant has implemented all feasible on-site mitigation measures and the project's emissions remain above the significance level, the project may be eligible for an off-site mitigation strategy to reduce long-term air quality impacts below the significance level. The off-site mitigation strategy is described below.

5.5 Off-Site Mitigation

Other air districts, such as the Placer County APCD, operate voluntary or incentive programs that can generate emission reductions in addition to those mandated by rules and regulations. These programs give a project proponent the opportunity to support a specific, independent emission control project, unrelated to the proposed project, that has been previously identified by the District. The resulting emission reductions can be used to "offset" project emissions, particularly where on-site mitigation may not be possible or is too expensive. Examples of such projects include purchasing emission credits from the District (where available), the re-power of off-road and on-road vehicles and equipment with cleaner engines, purchase of alternative-fueled equipment/vehicles, new or expanded bus service, vanpools and shuttles, signal coordination, bicycle facilities, wood stove replacement, telecommuting programs, and ridesharing and pedestrian facilities.

The District does not have formal off-site mitigation programs in place at this time. However, the District is willing to consider such projects for project mitigation under CEQA. In general, off-site mitigation projects that are implemented in El Dorado County in accordance with the programs operated by other districts may be eligible for similar credit for CEQA purposes in the District. Lead agencies and project proponents should contact the District to determine whether off-site mitigation is feasible.

Chapter 6
CO, $PM_{10,}$ and Other Pollutant Air Quality Impacts and Mitigation For Project Operation

6.1 Introduction

This Chapter addresses the recommended techniques for quantifying emissions of carbon monoxide (CO), inhalable particulate matter (PM_{10}) and other pollutants from project operations, and for determining how those emissions impact ambient air quality. If the result is to cause or contribute to a violation of an ambient air quality standard, then project emissions will be deemed significant under CEQA and an EIR will have to be prepared unless mitigation is applied to eliminate the projected violation. This chapter also provides mitigation measures that may be used for the latter purpose.

6.2 AAQS Significance Criteria for CO, PM_{10}, and Other Pollutants

The El Dorado County APCD evaluates ROG and NOx emissions from project operations for significance under CEQA on a daily mass emission basis, as explained in Chapter 5 of this Guide. CO, $PM_{10,}$ and other pollutants are evaluated for significance by comparison against the applicable national and state ambient air quality standards (AAQS). Though all criteria pollutants are of concern, and a project is considered significant if it is projected to cause a violation of any national or state AAQS, CO is of special importance because of the localized health impacts it can pose at concentrated levels. Similarly, PM_{10} can be associated with adverse health effects. Depending on the type of project and its proposed location, the project may also have to be evaluated for other criteria pollutants such as nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, sulfates, hydrogen sulfide (H_2S), vinyl chloride, and visibility impacts.

The relevant AAQS are displayed in Appendix B. As noted in Chapter 2, both the Mountain Counties Air Basin and Lake Tahoe Air Basin portions of El Dorado County are classified as attainment (or are unclassified) for all national and state AAQS for CO, PM_{10}, NO_2, SO_2, sulfates, lead, and H_2S, except that both the Mountain Counties Air Basin and the Lake Tahoe Air Basin portions of the county are classified as nonattainment for the state 24-hour PM_{10} standard. (In the future, this Guide will be revised to incorporate the new national standard for $PM_{2.5}$, after EPA has implemented the standard.)

If a project is located in an area where high pollutant concentrations already exist, a project may be significant even if it generates only small amounts of pollutants. Emissions of CO, PM_{10}, and other pollutants from project operation, which are subject to the AAQS significance criteria as described above, are considered significant if:

1. The project's contribution by itself would cause a violation of the AAQS; or
2. the project's contribution plus the background level would result in a violation of the AAQS, and either
   a. a sensitive receptor is located within a quarter-mile of the project, or

b. the project's contribution exceeds five percent of the AAQS.

6.3 Estimating Emissions Concentrations

6.3.1 Project Screening. The District has identified the following screening techniques to identify projects that can be conservatively assumed not to be associated with significant emissions of CO, PM_{10} or other pollutants. Application of air pollution modeling techniques need not be applied to emissions that can be addressed through screening. Please note that this section applies only for purposes of evaluating "project alone" emissions; cumulative impacts, toxic emissions, impacts on sensitive receptors, etc., must be separately evaluated as set forth in other chapters of this Guide.

- CO and NO_2 Emissions From Development Projects – The District considers development projects of the type and size that fall below the significance cut-points in Table 5.2 in Chapter 5 for ROG and NOx also to be insignificant for CO emissions. CO emissions from projects listed in Table 5.2 would be adequately controlled by state and federal vehicle and engine emission control programs, and CO violations are now associated only with very large concentrations of vehicles. NO_2 emissions are accounted for as NOx in Table 5.2.

- PM_{10}, and SO_2 Emissions from Development Projects – PM_{10} and SO_2 emissions from development projects, if they are of the type and size below the cut-points in Table 5.2 for ROG and NOx, may likewise be considered not significant. However, this policy applies only to projects that do not generate trips by heavy-duty Diesel vehicles in greater proportion than such trips occur generally on public roadways. For example, if a development project involves warehousing or heavy-duty Diesel vehicle fleet operations, PM_{10} and SO_2 emissions should be evaluated in more detail using the techniques described below in Section 6.3.2.

- Industrial Sources – The District allows industrial sources that have CO, NOx, and PM_{10} emissions below the significance levels in Table 6.1, below, to be considered not significant. If any industrial source covered by Table 6.1 does not combust sulfur-containing fuel (i.e., more than 50 ppm sulfur), it may be considered insignificant for SO_2 without further analysis. It is not expected that Table 6.1 will allow a Negative Declaration for projects with components that typically have higher NOx and/or SO_2 emissions, such as power generation or petroleum refining.

- Lead, Sulfates and H_2S -- These pollutants may be assumed to be not significant except for industrial sources that have specific processes resulting in direct emissions of lead, sulfates, or H_2S, such as a foundry, acid plant, or pulp mill.

- Small Sources – Sources that have emissions associated with project operations that are less than 10 pounds per day of a pollutant, including indirect, area, and stationary source

emissions of that pollutant, may be presumed to have impacts that are not significant for that pollutant.

- Visibility – It may be assumed that visibility impacts from development projects in the Mountain Counties Air Basin portion of the county are not significant; such impacts will be controlled to the maximum extent feasible through state and national regulatory programs governing vehicle emissions, and through mitigation required for ozone precursors and particulate matter under this Guide. In the Lake Tahoe Air Basin portion of the county, development project proponents (or the Lead Agency) should consult with TRPA to determine if visibility is potentially significant under the more stringent TRPA standard. For industrial projects, visibility impacts may be assumed to be insignificant for the same reasons as apply to development projects, unless the project involves an electrical power generating facility over 50 MW capacity, or consists of or includes operations such as surface mining or quarrying, which are inherently more likely to interfere with visibility.

Table 6.1 De Minimis Emission Levels for Industrial Sources

Total Heat Input Capacity For All Stationary Combustion Equipment (MM BTUs/hr)	NO_2 (as NOx) (lbs/hr)	CO (lbs/hr)	PM_{10} (lbs/hr)
Noncombustion Sources	0.068	3.7	0.41
Combustion Sources			
<2	0.20	11.0	1.2
>2 <5	0.31	17.1	1.9
>5 <10	0.47	25.9	2.8
>10 <20	0.86	47.3	5.2
>20 <30	1.26	69.3	7.6
>30 <40	1.31	72.1	7.9
>40	Screening table cannot be used		
Source: South Coast Air Quality Management District Rule 1303, Appendix A.			

The District may require modeling for projects that might otherwise be deemed not significant under this section, where there are indications that the screening assumptions may not be applicable, such as for combined development and industrial projects, or projects in areas where there may be special meteorological considerations.

6.3.2 Techniques for Estimating Emissions. The following techniques should be used for pollutants not deemed insignificant under the screening assumptions in Section 6.3.1 above, or if the project proponent or Lead Agency otherwise desires to calculate impacts. For a preliminary estimate of emissions for the project, complete Table 6.2 below to determine the concentration and significance determination for CO. If a more detailed analysis is needed, the CALINE computer model should be used.

Table 6.2 may be used to calculate PM_{10} concentrations as well. For modeling PM_{10}, the District recommends the use of SCREEN3 to develop an emissions value for smaller or simpler projects;

alternatively, a more sophisticated model, ISCST3, may be used. Modeling techniques are also available for determining ambient impacts of SO_2, NO_2, lead, sulfate, and vinyl chloride emissions, and for determining visibility impacts. The District should be consulted before such modeling is conducted for a project.

Table 6.2 Pollutant Concentration and Significance Determination

1. Background Concentration	
2. Project-Related Pollutant Concentration	
3. Anticipated Total Concentration	
4. Ambient Air Quality Standard	
5. Significance Determination: Significant if >0	

6.3.3. Table 6.2, line 1: Background Concentration. Before evaluating the significance of a project's impacts, the Lead Agency must first determine the background concentration in the vicinity of the project site. Figures 6.1 through 6.7 are maps that show the levels and spatial distribution of background CO, PM_{10}, SO_2, and NO_2 values in the Sacramento region, including the western portion of El Dorado County. A background map for each applicable air quality standard is included, since there is more than one standard for each pollutant. Described below are the steps for completing the Background Concentration row for CO, PM_{10}, SO_2, and NO_2 in Table 6.2.

Step 1: On the appropriate map, find the isopleth that totally encloses the project. The number appearing on that isopleth represents the highest background value on that isopleth. The area that lies between two isopleth lines will contain a range of background concentrations. For example, on the one-hour CO concentration map, the area within the 6 parts per million (ppm) isopleth contains a range of values from 6 to 8 ppm. On the eight-hour concentration map, the 3 ppm isopleth contains a range of values from 3 to 5 ppm.

Note: A persistence factor of 70 percent can be used to derive eight-hour CO concentration values. A persistence factor is the ratio between the 8-hour and 1-hour concentrations. A factor of 70% was developed as an average after several studies were conducted at urban, rural, and suburban sites.

Step 2: Interpolate the base-year background values between two isopleth lines using the following guidelines:

A. For projects located between two isopleth lines:
   1. Projects located in rural areas or in urban areas with a low density of emission sources are assigned the lower isopleth line's value.
   2. Projects located in or near high volume traffic intersections or areas with a high density of emission sources are assigned the higher isopleth value.
B. Sources located within the highest concentration isopleth are assigned the value that appears nearest to the project location.
C. Sources located outside the lowest concentration isopleth are assigned the value that appears nearest to the project location.

Note: The portion of El Dorado County to the east of the areas shown on the maps should be assigned the lowest base-year background concentration value shown on the map at any location.

Step 3: Determine the analysis year background concentration (for phased projects, each phase should be separately examined). For the CO analysis, an adjustment must be made to account for reduced levels of CO projected in future years due to more stringent vehicle emission control standards. Use Table 6.3, below, to make the adjustment. Find the CO concentration value obtained from the background map in the left column. Then find the appropriate analysis year (the year in which the project will be constructed) in the top row of the table. The number in the CO concentration row that falls under the analysis year column is the anticipated CO background concentration for the project during the year of construction. Enter this estimated background rollback value that corresponds to the one- and eight-hour background level on line 1 of Table 6.2

Table 6.3 Carbon Monoxide Background Rollback Values

Background Level (CO in ppm)	Analysis Year Factors							
	2000	2001	2002	2003	2004	2005	2007	2010
	0.82	0.78	0.73	0.67	0.63	0.58	0.51	0.35
3	2.46	2.34	2.19	2.01	1.89	1.74	1.53	1.32
4	3.28	3.12	2.92	2.68	2.52	2.32	2.04	1.76
5	4.10	3.90	3.65	3.35	3.15	2.90	2.55	2.20
6	4.92	4.68	4.38	4.02	3.78	3.48	3.06	2.64
7	5.74	5.46	5.11	4.69	4.41	4.06	3.57	3.08
8	6.56	6.24	5.84	5.36	5.04	4.64	4.08	3.52
9	7.38	7.02	6.57	6.03	5.67	5.22	4.59	3.96
10	8.20	7.80	7.30	6.70	6.30	5.80	5.10	4.40
11	9.02	8.58	8.03	7.37	6.93	6.38	5.61	4.84

For a PM_{10}, NO_2, or SO_2 analysis, the background concentration as found on the appropriate background map can be entered on line 1 of Table 6.2. This is because the background concentrations for these pollutants are expected to remain at or near current levels over time.

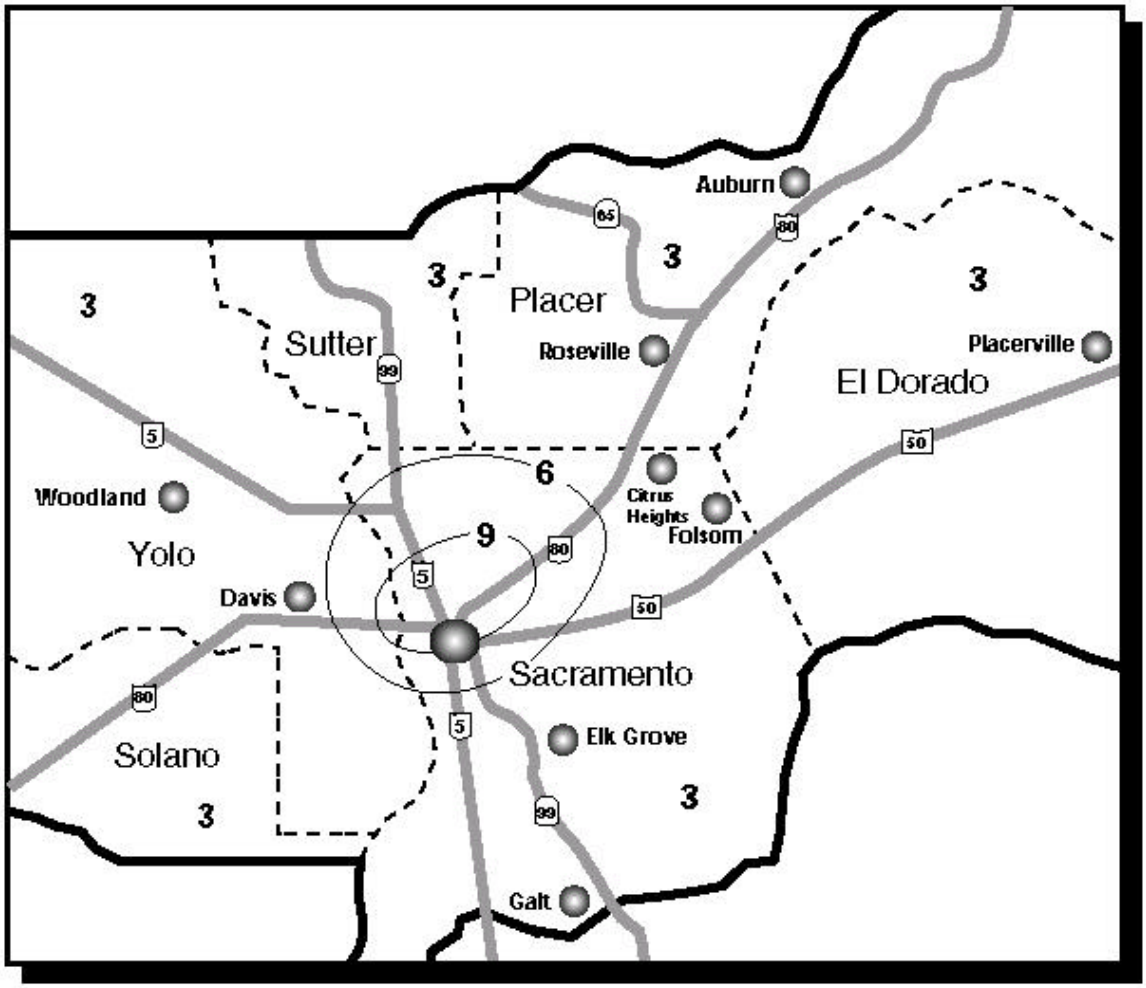


Figure 6.1 Regional Background Map for Carbon Monoxide 1-Hour Standard (Concentration in Parts per Million)

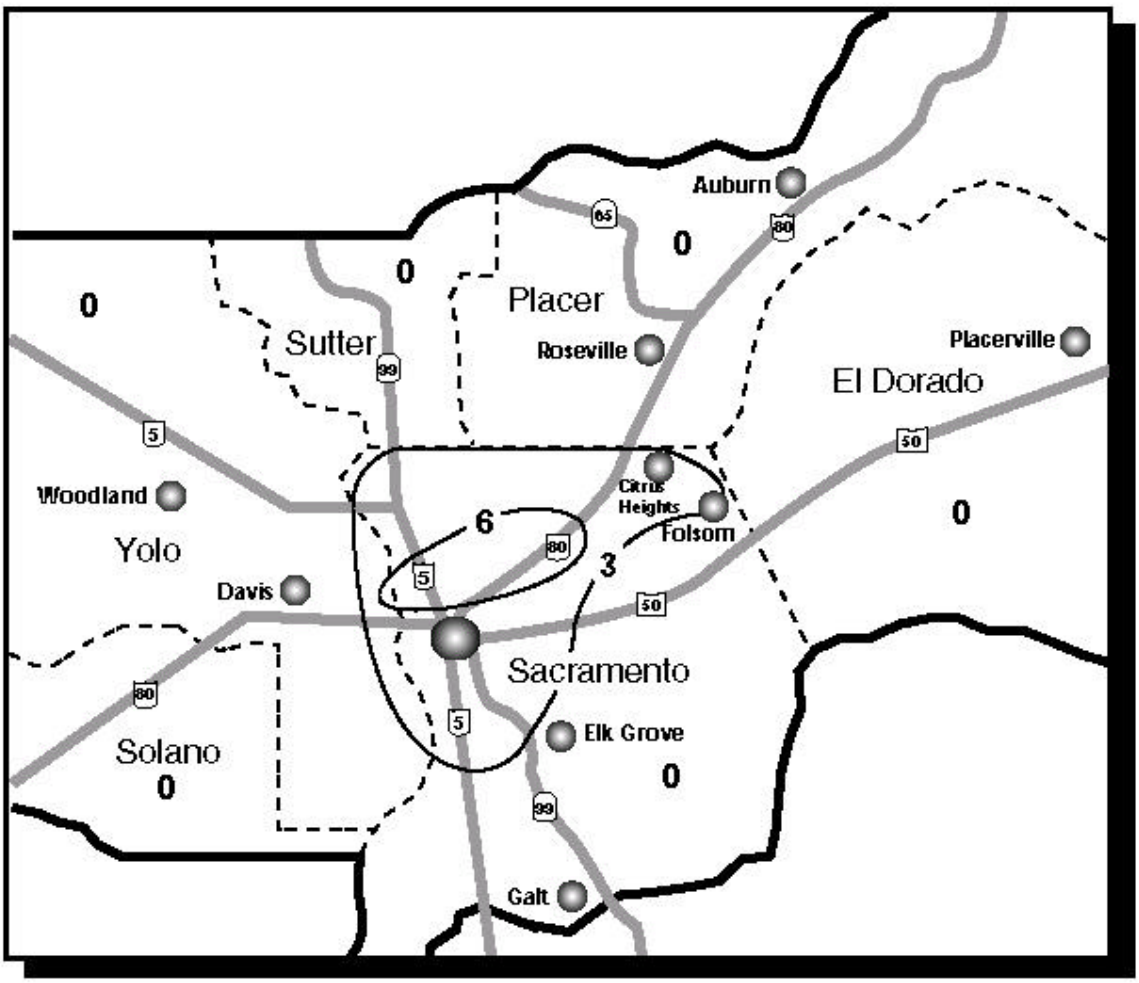


Figure 6.2 Regional Background Map for Carbon Monoxide 8-Hour Standard (Concentration in Parts per Million)

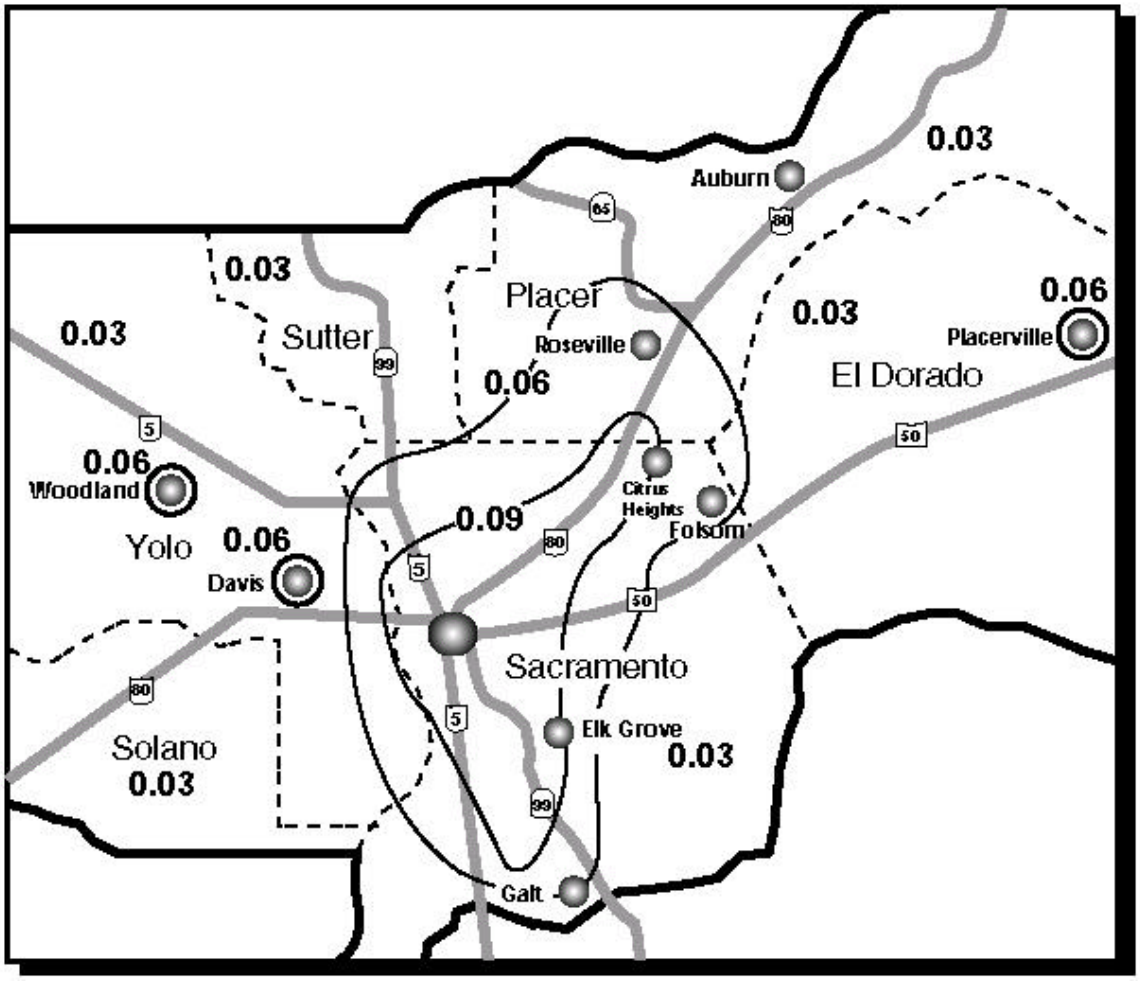


Figure 6.3 Regional Background Map for Nitrogen Dioxide 1-Hour Standard (Concentration in Parts per Million)

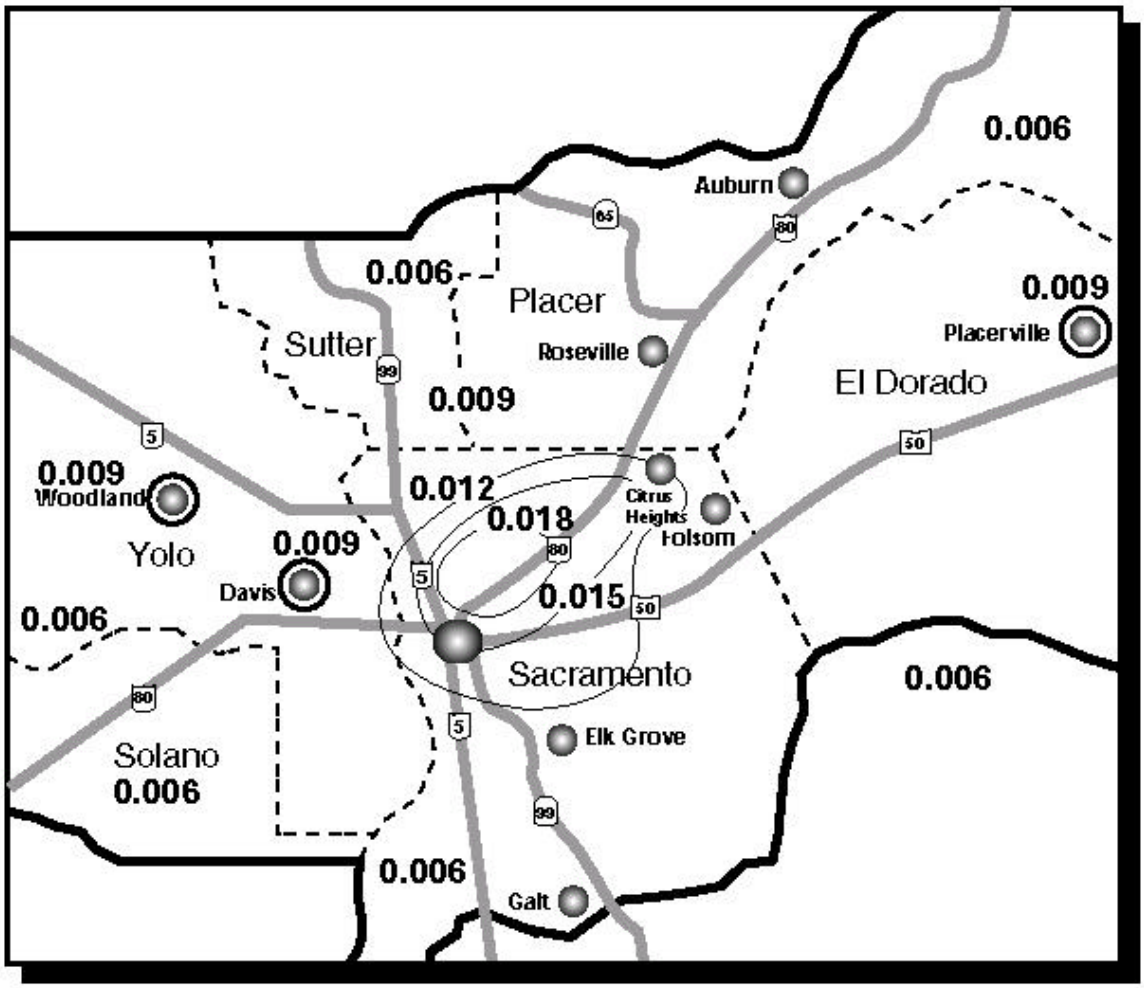


Figure 6.4 Regional Background Map for Nitrogen Dioxide Annual Standard (Concentration in Parts per Million)

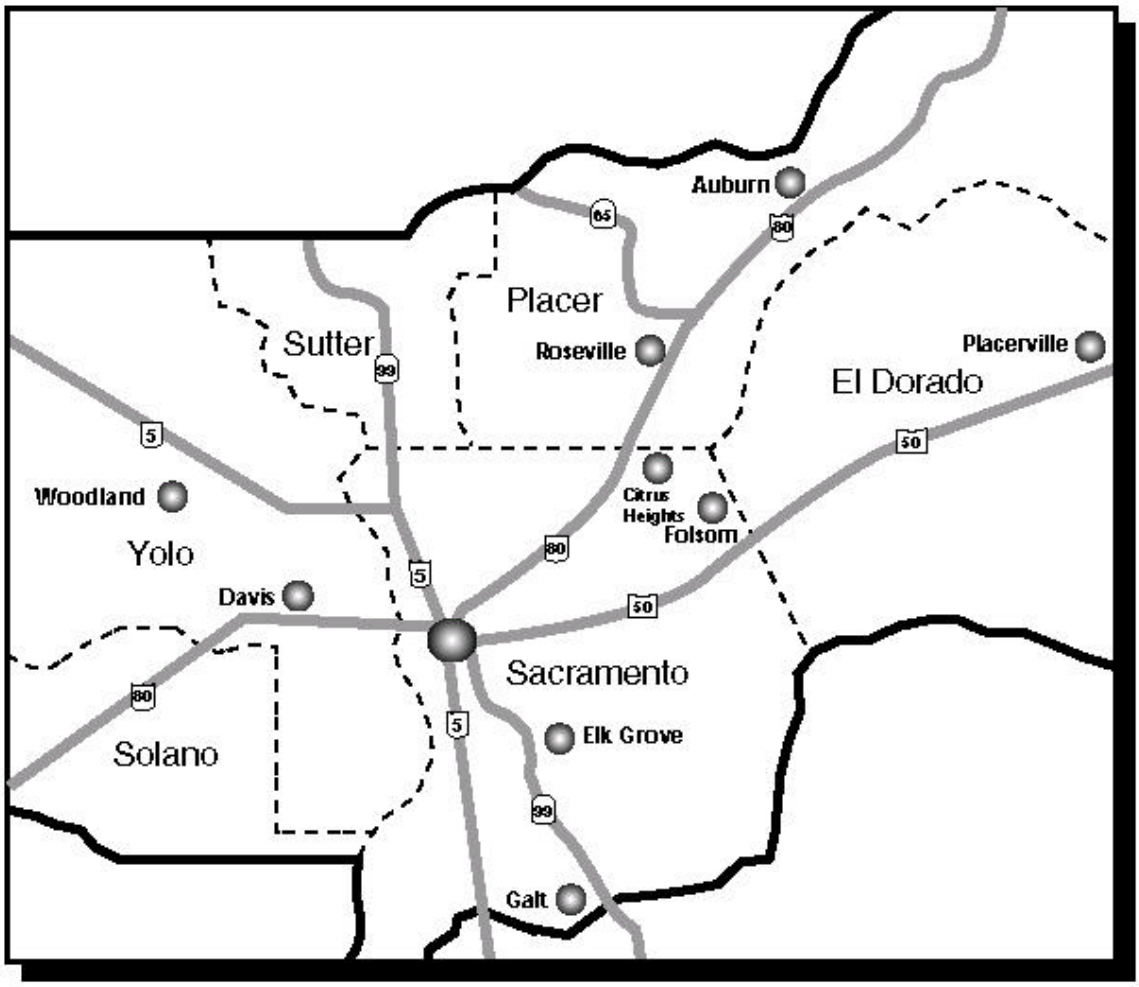


Figure 6.5 Regional Background Map for Sulfur Dioxide 1-Hour Standard (Concentration in Parts per Million)

[Values still being developed]

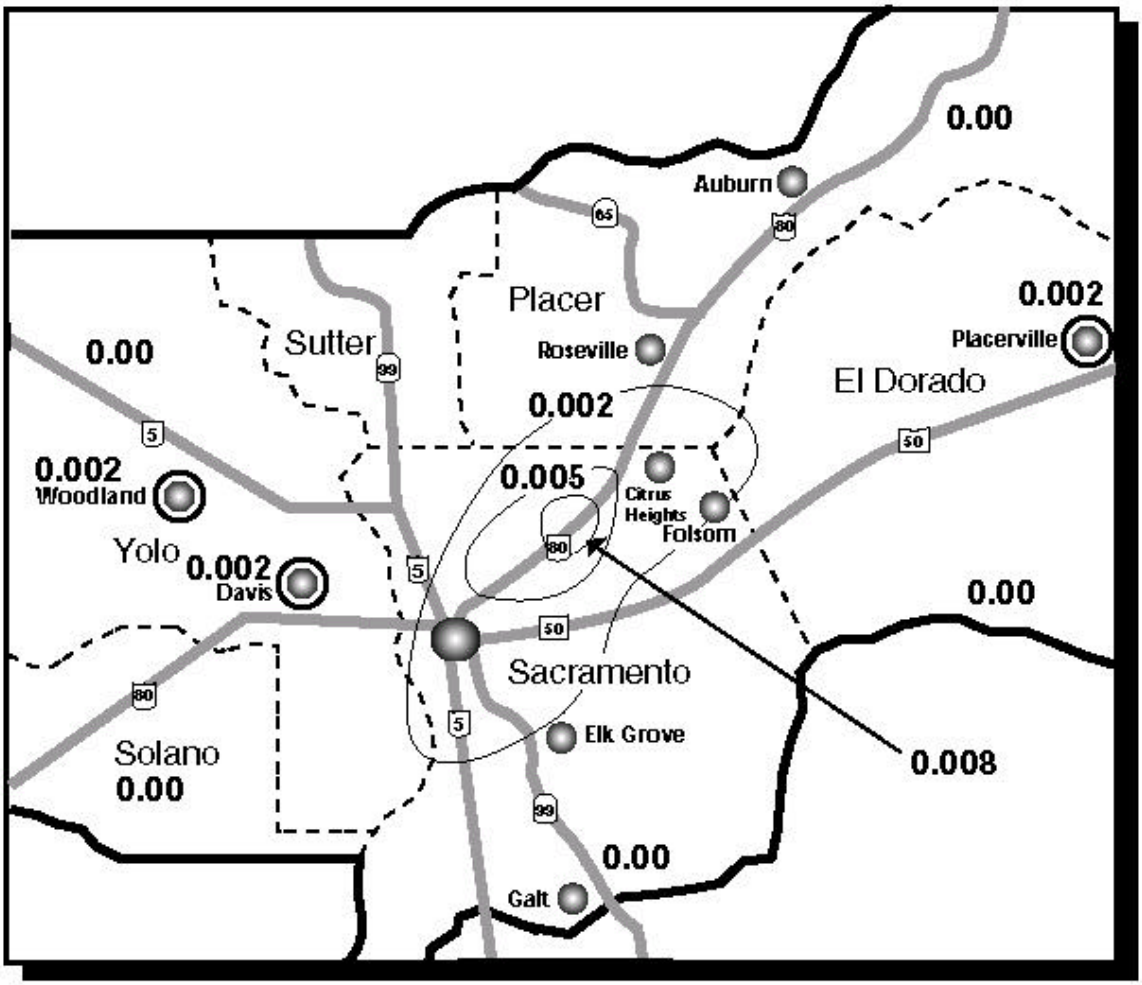


Figure 6.6 Regional Background Map for Sulfur Dioxide 24-Hour Standard (Concentration in Parts per Million)

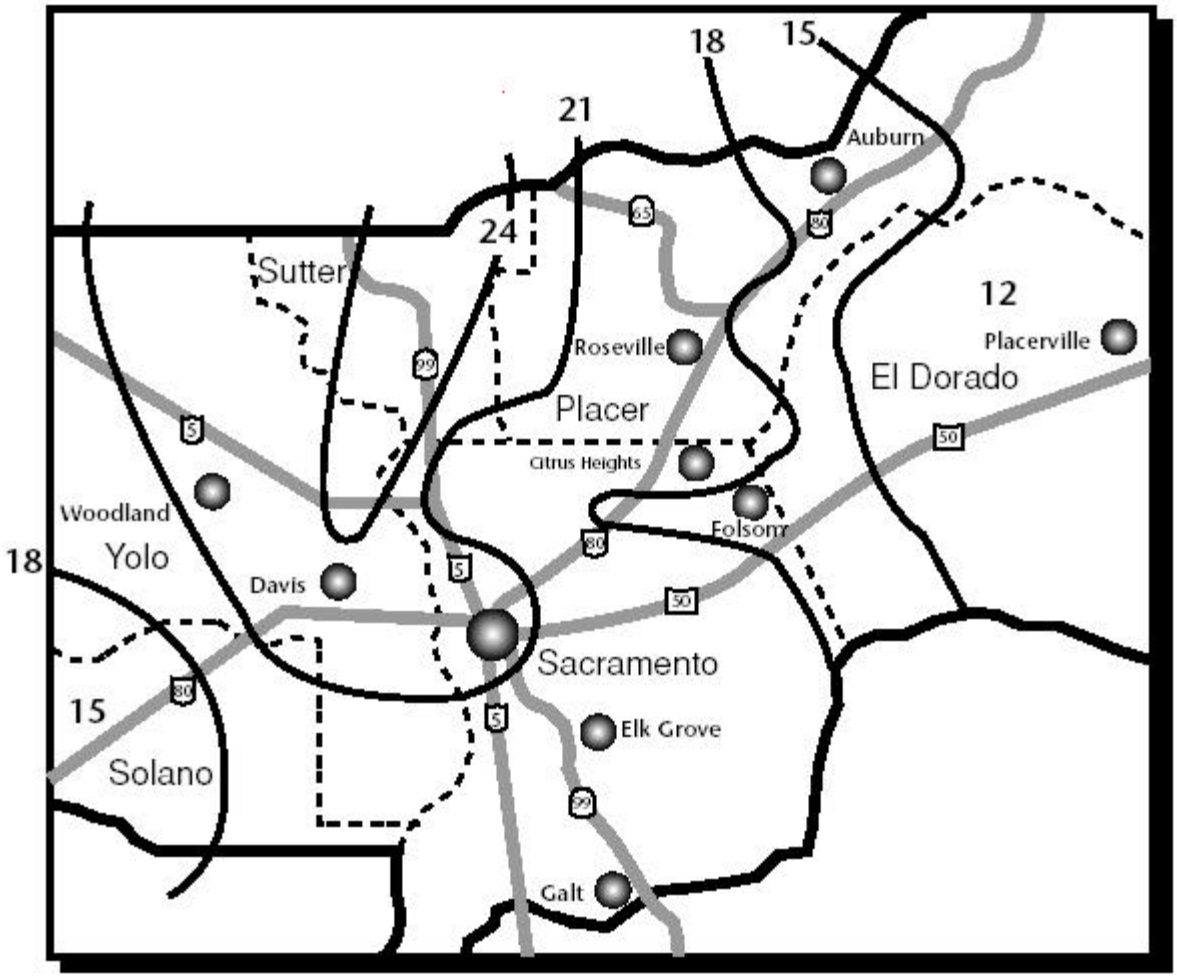


Figure 6.7 Regional Background Map for PM_{10} 24-Hour Standard (Concentration in Parts per Million)

6.3.4. Table 6.2, line 2: Project-Related Emissions Concentration. The first step to determine a project's contribution to CO concentration levels requires an estimate of peak-period trip generation. Appendix D includes information and procedures for estimating daily trip generation.

Step 1: Multiply total daily trips by 0.1 to estimate peak-period trip generation.

Step 2: Table 6.4 shows CO emission concentrations associated with project-related peak-period traffic levels. Locate the level of peak period traffic estimated for the project in column one to determine the project-related pollutant concentration contribution (intermediate values may be interpolated). Enter the result on line 2 of Table 6.2. (Use 70 percent of the one-hour value for the CO eight-hour concentration.)

For land development projects primarily associated with indirect emissions from gasoline-powered vehicles, PM_{10} may be assumed to be insignificant and zero may be entered on line 2 of Table 6.2; the same measures that limit vehicular ROG and NOx emissions to *de minimis* levels for such projects will assure that PM_{10} emissions are *de minimis* as well. For development projects that will induce Diesel-powered vehicle activity greater than occurs in the general mix of vehicular activity (such as a warehouse development, or stores that receive frequent truck deliveries) project-specific estimates of PM_{10} emissions must be developed and ambient effects must be demonstrated through modeling, in a manner acceptable to the District, unless truck activity or fuel use is below the *de minimis* thresholds used for analysis of toxic air contaminants in Chapter 7 (10 trucks/day). Similarly, for industrial projects that directly emit PM_{10} (or SO_2 or NO_2 as precursors to PM_{10} aerosols), unless full emission offsets are provided, emissions analysis and modeling must be used.

For directly emitted SO_2 or NO_2, project-related concentrations need only be estimated if the project is one that contains components that are known to produce SO_2 or NO_2, such as sources that burn sulfur-based fuels or that have components such as power plants or oil refineries, or projects that generate more heavy-duty vehicle trips than occur generally. The District staff should be consulted for projects of this type. For all other cases, zero may be entered for Project-Related Emissions Concentration.

Table 6.4 Project-Related CO Concentration Levels

Additional Peak-Hour Trips[1]	Parts Per Million CO[2]
100	0.4
200	0.7
300	1.1
500	1.7
1000	3.1
2000	5.6
3000	7.7

[1] Approximately ten percent of total daily trips.
[2] Assumes average speed of fifteen miles per hour. Calculations based on CALINE4 computer modeling.

6.3.5 Table 6.2, line 3: Anticipated Concentration. Sum the Background Concentration and the Project-Related Concentration Contribution for the pollutant being evaluated and enter the result as the Anticipated Total Concentration in Table 6.2.

6.3.6 Table 6.2, line 4: AAQS. Insert the appropriate standard for the pollutant evaluated from Appendix B for the AAQS Threshold in Table 6.2.

6.3.7 Table 6.2, line 4: Significance Determination. Subtract the AAQS from the Anticipated Total Concentration and enter the result for Significance Determination. If the value calculated for the Significance Determination is greater than zero, then a project's impacts are considered significant for that pollutant if either of the two following conditions is met:

1. The project is located within one quarter mile of a sensitive receptor; or
2. The Project Related Pollutant Concentration exceeds 5% of the applicable air quality standard.

If the analysis indicates that a project's impacts are significant, a more refined modeling analysis may be required. The District can assist the Lead Agency in identifying dispersion models for site-specific analysis. The use of CALINE4 is recommended to estimate the potential for CO hot spots or possible significant NO_2 concentrations. The CALINE4 software and user's manual can be accessed and downloaded from the CALTRANS website at www.dot.ca.gov. For PM_{10}, SCREEN3 or ISCST3 is recommended.

6.4 Determining the Significance of Transportation Projects

Transportation projects are different from other projects in that their long-term operational significance can usually be determined by whether they are included in the applicable Transportation Improvement Plan (TIP). Since TIPs in nonattainment and maintenance areas must be in conformity with the local air quality plan, a project that is not included in the TIP, by definition, is considered to have a significant air quality impact. See Chapter 9 for a discussion of Transportation Conformity. Exceptions are made for most safety improvement, landscaping, and transit projects. For a comprehensive list of exceptions, consult the UC Davis Institute of Transportation Studies (ITS) Transportation Project-Level CO Protocol (1997). Like the CALINE4 dispersion model, the CO Protocol can also be downloaded from the CALTRANS website at www.dot.ca.gov.

If a transportation project is included in the applicable TIP, the project's operational impacts will usually not be considered significant unless the project has changed. If significant changes have been made to the project's scope, a more detailed analysis may need to be performed to determine whether emissions from the new project will be higher than those projected in the plan. There are a number of tools available for making this determination. These include the previously mentioned UC Davis Project Level CO Protocol, and emission factor dispersion models such as CT-EMFAC and CALINE4.

6.5 Mitigating Significant Impacts

6.5.1 Carbon Monoxide. Significant CO impacts can be mitigated to some extent by increasing traffic speeds through methods such as traffic light synchronization, improved intersection channelization, inclusion of left turn lanes, demand management strategies, or through site design measures which can considerably reduce the impacts of proximate CO through improved dispersion. Expansion of a roadway by adding additional through-lanes to increase speeds may not be a preferable mitigation measure, however, because the resulting increase in traffic volume may negate any reductions in CO gained from the speed increase.

6.5.2 PM_{10}. PM_{10} impacts from industrial operations can be reduced by installation of additional or more efficient control equipment, or by the use of cleaner fuels. PM_{10} emissions from transportation activities are typically from Diesel-fueled vehicles or equipment, and can be mitigated through replacement or retrofit with newer, cleaner vehicles or equipment, or by the use of cleaner fuels or fuel additives.

6.5.3 Nitrogen Dioxide. Nitrogen dioxide impacts can be mitigated by reducing the use of motor vehicles, controlling sources of industrial combustion, and taking steps to minimize energy use wherever possible.

6.5.4 Sulfur Dioxide. Mitigation measures for sulfur oxides include overall reduction of the use of high sulfur fuels. Using low sulfur reformulated diesel fuel for heavy-duty vehicles, or using natural gas vehicles as an alternative can do this. Conservation of energy is another mitigation measure that can help reduce concentrations of SO_2.

6.5.5 Other Measures. Many measures that are incorporated into projects to mitigate impacts of ROG or NOx can mitigate CO, PM_{10}, SO_2, or NO_2 as well. Below is a list of mitigation measures listed in other sections that can also reduce operation-related emissions of CO, PM_{10} and other pollutants:

- Reduce Employee Trips
- Maintain stationary and mobile equipment in proper running order
- Implement a vehicle reduction measure listed in Appendix E
- Phasing of the project with roadway improvements
- Installation of energy-efficient appliances or equipment

Chapter 7
Evaluation of Toxic Air Contaminants

7.1 Overview

Toxic air contaminants (TACs), or in federal parlance under the Clean Air Act, hazardous air pollutants (HAPs), are pollutants that may be expected to result in an increase in mortality or serious illness or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death.

TACs can be separated into carcinogens and noncarcinogens based on the nature of the physiological degradation associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts will not occur. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

TACs are emitted by a wide range of sources, from industrial plants to households. Since it is not practical to eliminate all TACs from our lives, these compounds are regulated through risk management programs. These programs are designed to ensure that the risk of adverse health effects from exposures to TACs is not significant.

7.2 Regulation of TACs

Toxic air contaminants are not considered criteria pollutants in that the federal and California Clean Air Acts do not address them specifically through the setting of National or State Ambient Air Quality Standards. Instead, EPA and CARB regulate HAPs and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology to limit emissions. In conjunction with District rules, they establish the regulatory framework for TACs.

7.2.1 Federal. As amended in 1990, the Clean Air Act contained a list of 189 HAPs designated by Congress. EPA's current list consists of 188 compounds (see EPA website at **www.epa.gov/ttn/atw/188polls.html**). The EPA has established National Emission Standards for Hazardous Air Pollutants (NESHAPs), as required by the federal Clean Air Act Amendments. These are technology-based source-specific regulations that limit allowable emissions of HAPs. See 40 CFR Parts 61 and 63.

7.2.2 State. California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB designates a substance as a TAC. To date, CARB has identified 21 TACs, and has also adopted EPA's list of

HAPs as TACs. Most recently, Diesel exhaust particulate was added to the CARB list of TACs. Table 7-1, below, lists TACs associated with common land use activities.

Table 7.1 Toxic Air Contaminants By Land Use

Land Use	Toxic Air Contaminant
Aerospace Manufacturing	Hexavalent Chromium
Autobody Shop	Benzene, Toluene, Xylene
Auto Machine Shop	Asbestos
Biomedical Laboratory	Benzene, Carbon Tetrachloride, Chloroform, Formaldehyde, Methylene Chloride
Chemical Manufacturing	Ethylene Dichloride, Asbestos
College/University	Cadmium, Hexavalent Chromium, Ethylene Oxide
Dry Cleaner	Perchloroethylene
Electrical Manufacturing	PCBs, Cadmium, Chromium, Nickel, Trichloroethylene, 1,4-Dioxane
Gasoline Station	Benzene, Methyl-tertiary butyl ether, Toluene, Xylene
Hospital	Dioxins, Dibenzofurans, Cadmium, Ethylene Oxide
Landfill	Benzene, Vinyl Chloride
Medical Equipment Sterilization	Ethylene Oxide
Petroleum Tank	Benzene
Printing Services	1,2,4-Tri-methylbenzene, Ethyl Benzene, Ethylene Glycol Monobutyl Ether, Methylene chloride, Propylene, Xylenes
Wastewater Treatment	Benzene, Carbon Tetrachloride, Ethylene Dichloride, Ethylene Dibromide, Chloroform, Perchloroethylene, Trichloroethylene

Once a TAC is identified, CARB's next step is to adopt an Airborne Toxics Control Measure for sources that emit designated TACs. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below the threshold. If there is no safe threshold, the measure must incorporate Best Available Control Technology for TACs ("T-BACT") to minimize emissions. All of the TACs identified by CARB to date have no safe threshold. CARB has established formal control measures for 11 TACs to date. See CARB regulations at 17 CCR secs. 93001, where the control measures are incorporated by reference.

The Hot Spots Act requires that existing facilities that emit toxic substances above specified levels:

- Prepare a toxic emissions inventory
- Prepare a risk assessment if emissions are significant
- Notify the public of significant risk levels
- Prepare and implement risk reduction measures

These requirements apply to facilities that: a) either manufacture, formulate, use, or release toxic substances and emit more than 10 tons per year of criteria pollutants; b) fall into facility

categories listed in Appendix E1 or E2 of the State's Emissions Inventory Criteria and Guidelines Regulation; or c) are listed on a District's toxic inventory list. This act is implemented in El Dorado County through criteria and guidelines incorporated into CARB regulations at 17 CCR sec. 93301. Persons interested in identifying facilities that emit TACs in El Dorado County should contact either the District or CARB.

7.2.3 El Dorado Air Pollution Control District. Air pollution control districts may adopt and enforce control measures adopted by CARB, to limit TACs locally. The District has adopted control measures for benzene emissions from retail gasoline dispensing (Rule IX, Section A) and for Hexavalent Chromium from Chrome Plating and Chromic Acid Anodizing Operations (Rule IX, Section B).

7.3 Asbestos

Asbestos is listed as a TAC by CARB and a HAP by EPA. It is of special concern in El Dorado County because it occurs naturally in surface deposits of several types of ultramafic minerals. Asbestos emissions can result from the sale or use of asbestos-containing materials, road surfacing with such materials, grading activities, and surface mining.

EPA has adopted a NESHAP for asbestos that sets forth emission standards for mills, roadways, manufacturing, demolition and renovation, spraying, fabricating, insulation materials, and waste disposal (40 CFR Part 61, Subpart M). Similarly, in 1990 CARB adopted an ATCM for asbestos-containing serpentine rock covering the use or sale of materials containing more than 5% asbestos. In 2000, CARB revised its ATCM to apply to the use or sale of materials containing more than 0.25% ultramafic rocks (17 CCR sec. 93106). In July 2001, CARB adopted another ATCM (17 CCR sec. 93105) limiting emissions from construction, grading, quarrying and surface mining in areas with ultramafic rock. Unless they are replaced by a District regulation, these ATCMs must be enforced by the District.

The District has not yet adopted any separate regulation governing asbestos. However, a county-wide ordinance was adopted on January 4, 2000 (Ordinance 4548, codified as Chapter 8.44 of the El Dorado County Ordinance Code) adopting the CARB asbestos content level as a "permissible asbestos content level." The ordinance requires compliance with this level in the use and sale of asbestos-containing materials within the county. For grading, excavation, and construction activities, the ordinance requires an Asbestos Hazard Dust Mitigation Plan in all areas of the county identified as potentially having asbestiform minerals; the mitigation measures include extensive wetting, covering, and other actions. A similar plan is required for surface mining activities in asbestiform deposits.

7.4 Siting Considerations

As discussed in Chapter 2, the siting of a project can largely influence whether it will result in significant air quality impacts. This is especially true with respect to TACs. A public agency should avoid siting a sensitive receptor, such as a school, medical facility, or elder care center near a source of toxic emissions, and vice-versa. The District can be contacted regarding the potential incompatibility of land uses that involve TACs.

The District maintains an inventory of all facilities that emit significant amounts of TACs. If a project involves purchasing a schoolsite or constructing a new elementary or secondary school, Public Resources Code § 21151.8 requires a lead agency to consult with the air district to identify facilities that emit hazardous air pollutants within 1/4 mile of the site. Similarly, under Health & Safety Code § 42301.6(a), if any new or modified source of TACs is located within 1,000 feet of a school, the District is required to send a notice of the proposed project to the parents of all students and to all residences within 1,000 feet of the source. The notice must include a description of the project and a description of the health risks posed by the project. In recognition of these provisions, under its qualitative criteria, the District will require a risk assessment if TACs are or will be emitted within ¼ mile of a school or proposed school site.

7.5 Criteria for Significance

If the lead agency determines that the project will emit a TAC, the Initial Study must assess the potential of those toxic emissions to adversely impact nearby populations. Impacts from TACs may be estimated by conducting a health risk assessment (HRA). The California Air Pollution Control Officers Association (CAPCOA) has developed TAC HRA guidelines to provide consistent, statewide procedures for preparing the health risk assessments. The CAPCOA Guidelines can be downloaded from CARB's website at http://www.arb.ca.gov/ab2588/riskassess.htm. The HRA procedure involves the use of an air quality model and a protocol approved by the District.

7.5.1 HRA Criteria. The District considers the health risk from TACs to be significant if either of the following two criteria is met:

1. the lifetime probability of contracting cancer is greater than one in one million (ten in one million if T-BACT is applied); or
2. the ground-level concentration of non-carcinogenic toxic air contaminants would result in a Hazard Index of greater than 1.

The Hazard Index is determined by dividing the estimated exposure level by the acute (short-term) or chronic (long-term) "reference exposure level" (REL). The exposure level is the hourly or annual average ground-level concentration of a TAC that is estimated to occur as a result of the proposed project. The REL is the dose at or below which no adverse health effects are anticipated. Generally, RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature with an added margin of safety for sensitive individuals.

Applicable RELs may be obtained from CARB or the Office of Environmental Health Hazard Assessment in CalEPA.

The HRA should include mobile source TACs as well as stationary source TACs. In particular, emissions of Diesel particulates from construction activities or project operation involving the use of Diesel-powered vehicles or equipment must be included in the HRA. The District should be consulted for the techniques to be used in estimating these emissions.

7.5.2. Compliance with Regulatory Requirements. In addition, the District will consider a project significant, even if the HRA does not exceed the significance criteria above, if the project does not comply with the applicable regulatory requirements. The applicable requirements for asbestos and non-asbestos sources are set forth below.

Asbestos. For both temporary construction activities and long-term facility operations, the use of materials containing asbestos and processes involving the use of asbestos must comply with the applicable EPA NESHAP for asbestos, the CARB ATCMs for asbestos, and Ordinance 4548 of El Dorado County. Where applicable, each of these control measures must be completely met; otherwise, the project will be deemed to have a significant impact on air quality.

Non-Asbestos TACs. For non-asbestos TACs, if the contaminant(s) in question, and the particular use(s) of each TAC are covered by an applicable NESHAP, a CARB ATCM, or a District regulation, complete compliance with all applicable control measures is required to render the air quality impact insignificant.

7.5.3 Screening Levels. Based on its experience with modeling results from various types of projects, the District has identified the following levels as conservative indicators that a project will not result in significant emissions of TACs:

- Development projects with Diesel truck traffic less than 10 trucks/day.
- Industrial projects that result in emissions of organic gases, particulates, NOx, or oxides of sulfur (SOx) below the applicability levels specified under the Toxic Hot Spots Act (AB 2588; see Health & Safety Code sec. 44322 and the applicable CARB regulations implementing that act [see 17 CCR sec. 93300.5 and guidelines incorporated therein]).
- Construction emissions of ROG and NOx that meet the screening criteria in Section 4.2.

The District may determine that these screening levels are not appropriate on a project-by-project basis; accordingly, project proponents or the Lead Agency should consult with the District prior to their application.

Chapter 8
Cumulative Air Quality Impacts

8.1 Cumulative Impacts and CEQA

Section 15064(i)(1) of the CEQA Guidelines lays out the procedure for consideration of cumulative impacts at the Initial Study stage, and provides:

> "When assessing whether a cumulative effect requires an EIR, the lead agency shall consider whether the cumulative impact [of a project] is significant and whether the effects of the project are cumulatively considerable. An EIR must be prepared if the cumulative impact may be significant and the project's incremental effect, though individually limited, is cumulatively considerable. "'Cumulatively considerable' means that the incremental effects of an individual project are considerable when viewed in connection with the effect of past projects, the effects of other current projects, and the effects of probable future projects [as defined in § 15130]."

The Guidelines specifically recognize that a project can be rendered less than cumulatively considerable, and thus not significant, through mitigation measures included in the project and described in a mitigated negative declaration. (See § 15064(i)(2).)

The Guidelines state further that the incremental contribution of a project will not be considered cumulatively considerable if the project "will comply with requirements in a previously approved plan or mitigation program," such as a formally adopted and enforceable air quality plan, that contains requirements that will avoid or substantially lessen the cumulative problem (Guidelines, §15064(i)(3). This is important because the District participates in a regional plan for attaining and maintaining the national and state ambient air quality standards for ozone that takes incremental emissions of ROG and NOx from economic growth into account.

The guidelines also clarify that incremental impacts that are so small as to be "de minimis" may be determined to be not cumulatively considerable and to not trigger the obligation to do an EIR. A de minimis contribution is one that leaves environmental conditions "essentially the same" whether or not the project is implemented. (Guidelines, § 15064(i)(4).)

Because mitigation can be so important in determining the outcome of the cumulative impacts analysis, the District recommends that lead agencies and project proponents contact the District as early as possible in the development process regarding cumulative impacts.

8.2 Significance Criteria

The District's primary criterion for determining whether a project has significant cumulative impacts is whether the project is consistent with an approved plan or mitigation program of District-wide or regional application in place for the pollutants emitted by the project. This criterion is applicable to both the construction and operation phases of a project.

8.2.1 ROG and NOx. The Sacramento Regional Ozone Air Quality Attainment Plan (AQAP) was developed for application in the Sacramento Region, including the Mountain Counties Air Basin portion of El Dorado County, to bring the region into attainment as required by the federal and California Clean Air Acts. The AQAP assumes annual increases in air pollutant emissions resulting from regional growth. However, the AQAP also assumes the incremental increase in emissions will be partially offset through the implementation of stationary, area, and indirect source control measures contained within the AQAP. These measures consist of the District's rules and regulations and other development- and transportation-related mitigation measures. If a project can demonstrate consistency with the AQAP for ROG and NOx emissions, it can be categorized as not having a significant cumulative air quality impact with respect to ozone.

Development projects in the Mountain Counties Air Basin portion of the county are considered consistent with the AQAP if:

1. the project does not require a change in the existing land use designation (e.g., a general plan amendment or rezone), and projected emissions of ROG and NOx from the proposed project are equal to or less than the emissions anticipated for the site if developed under the existing land use designation;
2. the project does not exceed the "project alone" significance criteria;
3. the lead agency for the project requires the project to implement any applicable emission reduction measures contained in and/or derived from the AQAP (see Appendix E); and
4. the project complies with all applicable district rules and regulations.

For projects in the Lake Tahoe Air Basin to be determined as not having a significant cumulative air quality impact, consistency with the applicable TRPA air quality plans and mitigation requirements must also be shown, as set forth in the TRPA Regional Plan for the Lake Tahoe Basin, the TRPA Regional Transportation Plan-Air Quality Plan for the Lake Tahoe Region, and TRPA ordinances relating to air quality.

8.2.2 Other Pollutants. For other pollutants such as CO, PM_{10}, SO_2, NO_2, and TACs, there is no applicable air quality plan containing growth elements. Accordingly, the District applies the following pollutant-specific criteria for determining the significance of cumulative impacts:

CO: CO is an attainment pollutant in El Dorado County, and local CO concentrations are expected to decline even further in the future as more stringent CO standards for motor vehicles take effect. The District does not consider CO to be an area-wide or regional pollutant that is likely to have cumulative effects. Accordingly, CO emissions for a project will ordinarily be considered not cumulatively significant as long as "project alone" emissions are not significant as determined under Chapters 4 and 6 of this Guide. However, should the District determine that the possibility exists for CO "hotspots" caused by the proposed project in conjunction with other nearby projects, the District may require modeling of combined CO emissions. For example, modeling will ordinarily be required if the proposed project and one or more other large projects jointly change traffic density levels to service level E or lower on the same roadway links or at the same intersection(s), or if a project will increase traffic on a road already at service level E or lower. Contiguous location of industrial CO sources would be another instance where the

District may require modeling of combined effects. If modeling shows a violation of an applicable AAQS for CO, further mitigation would have to be implemented to prevent the predicted violation in order for the project to be deemed not significant with respect to cumulative impacts.

PM_{10}, SO_2, and NO_2: Both the Mountain Counties and Lake Tahoe Air Basin portions of the county are nonattainment for the state 24-hour PM_{10} standard, which dictates the use of a relatively sensitive criterion for identifying cumulative effects on PM_{10} ambient concentrations. PM_{10} directly emitted from a project can have area-wide impacts and can be cumulatively significant even if not significant on a project-alone basis. The County is in attainment for the SO_2 and NO_2 ambient air quality standards, but SO_2 and NO_2 can also contribute to area-wide PM_{10} impacts through their transformation into sulfate and nitrate particulate aerosols. There is no approved regional plan for attainment of the PM_{10} standard, and there is no readily available model for predicting the combined ambient effects of directly emitted PM_{10}, SO_2, or NO_2 emissions from individual impacts. Accordingly, the District will apply an alternative "de minimis" criterion under § 15064(i)(4) of the CEQA Guidelines, as follows:

A project will be considered not significant for cumulative impacts of PM_{10}, SO_2, and/or NO_2 if the following conditions are met:

1. For projects that are principally industrial projects, or where the majority of the emissions of these pollutants is attributable to stationary sources of air pollution subject to District regulation:
    a. The project is not significant for "project alone" emissions of these pollutants;
    b. The project complies with all applicable rules and regulations of the District; and
    c. Project emissions of these pollutants are not projected to cause ambient concentrations that would exceed the applicable federal Prevention of Significant Deterioration (PSD) Class III increments (Class II increments in the Lake Tahoe Air Basin) as set forth in 40 CFR § 52.21(c), and as demonstrated through dispersion modeling approved by the District (e.g., the EPA SCREEN3 model).

    If the initial modeling results do not show compliance with the applicable PSD increments, additional mitigation may be undertaken.

2. For projects that are principally development projects, or where the majority of the emissions of these pollutants is attributable to motor vehicle sources:
    a. The project is not significant for "project alone" emissions of these pollutants;
    b. The project complies with all applicable rules and regulations of the District; and
    c. The project is not cumulatively significant for ROG, NOx, and CO based on the criteria set forth above.

The District will consider other reasonable approaches to examination of the cumulative impact of these pollutants on a case-by-case basis. Mixed used projects that are combined industrial and development projects should be analyzed by using the first approach for the industrial portion and the second approach for the development portion.

TACs: Emissions of toxic air contaminants are typically localized and not region-wide. Except in cases where there is information indicating the possible commingling of toxic pollutants from projects that are contiguous or nearby, the District considers implementation of the "project alone" mitigation requirements, and compliance with all applicable emission limits and mitigation measures required by EPA, CARB, District rules and regulations, and local ordinances, as set out in Chapter 7, sufficient for a finding of not significant for cumulative impacts of TACs. However, the District may require appropriate modeling and risk assessment for combined ambient concentrations of TACs where it determines there is a reasonable possibility of inter-project or area-wide toxic effects. For example, if two large developments are contiguous or nearby, and involve grading of ultramafic soils at about the same time, the District would typically require modeling of asbestos emissions; the same would apply to particulate emissions from nearby operations involving constant use of Diesel-powered vehicles or equipment (e.g., warehousing or vehicle fleet yards).

If the modeling shows that the combined concentration from multiple projects creates a composite cancer risk of more than one in one million (more than 10 in one million if T-BACT is applied), or a non-cancer hazard index greater than 1, then each project that contributes to this risk will be considered significant for cumulative impacts of TACs, except that in the event that the project-alone risk cancer risk is less than 1.0 in one million, and the non-cancer hazard index is less than 0.5, a project will be considered to be a de minimis contributor to the cumulative risk, and will be considered as not significant. In the event the above significance levels are exceeded, further mitigation may be able to reduce cumulative effects below the level of significance.

8.3 Estimating Cumulative Emissions

The following information must be provided to the lead agency and the District for an adequate analysis of cumulative impacts:[1]

1. Either one of the following two elements:
   a. A list of past, present, and reasonably anticipated future projects producing related or cumulative impacts, including those projects outside the control of the agency, or
   b. A summary of projections contained in an adopted general plan or related planning document that is designed to evaluate regional or area-wide conditions;
2. A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and
3. An analysis of the cumulative impacts of the relevant projects.

The following describes the District's recommended procedures for fulfilling these requirements.

[1] CEQA Guidelines § 15130

8.3.1 Ozone Precursors (ROG, NOx). The lead agency or project applicant should provide the analysis outlined in paragraphs A-D below to determine if the significance criteria listed above in section 8.2 will be exceeded.

A. General Plan Amendment/Rezone - The lead agency should determine if the project requires a general plan or zoning amendment. If the project requires an amendment, the URBEMIS emission estimate model or Table D-3 (Appendix D) should be used to estimate the project's transportation-related ROG and NOx emissions for both the existing and proposed general plan or zoning designations. A similar estimate of any ROG and NOx directly emitted from operations before and after the amendment should be made. If the combined transportation-related and direct emissions are estimated to be greater for the proposed land use designation, the project will have a significant cumulative air quality impact. Mitigation measures are provided in Chapter 5 and Appendix E to reduce this impact below the significance level. If on-site mitigation measures cannot reduce the emissions to less than significance, then off-site mitigation measures described below should be considered. If the project does not require a general plan or zoning amendment, continue to "B" below.

B. Project Alone - The URBEMIS emission estimate model or Table D-3 (Appendix D) should be used to estimate the project's long-term transportation-related operational emissions of ROG and NOx (see Chapter 5 for methodology). A similar estimate of any directly emitted ROG and NOx should be made. An individual project exceeding the project-alone significance threshold in Chapter 5 is considered cumulatively significant due to the existing nonattainment classification of the air basin. This means that even small amounts of air pollution will contribute to air quality degradation. Mitigation measures are provided in Chapter 5 and Appendix E to reduce this impact below the significance level. If on-site mitigation measures cannot reduce the emissions to less than significance, then off-site mitigation measures described in Appendix E should be considered. Credit may also be taken for mitigation measures implemented in regional programs by other agencies. If the project's estimated emissions are below the project-alone significance criteria, continue to "C" below.

C. All AQAP Control Measures Implemented; Compliance with All District Rules and Regulations Demonstrated - The lead agency should determine if the project is implementing all applicable emission control measures adopted in or derived from the AQAP. These measures are listed in Chapter 5 and Appendix E. (Projects in the Lake Tahoe Air Basin must also show implementation of all applicable TRPA control measures and mitigation.) If the measures are not part of the project description, the lead agency should require the project to amend its application or require compliance with the emission control measures as a condition of approval. If the lead agency does not require the project to implement feasible emission control measures, the project will result in a significant cumulative impact. A similar determination regarding compliance with all applicable District rules and regulations should be made. If the lead agency is requiring the project to implement all feasible emission control measures, and compliance with District rules and regulations can be demonstrated, continue to "D" below.

D. Lead Agency Determination - For projects in which the lead agency (e.g., school district, special district) is not the local governmental jurisdiction (i.e., city or county government), the lead agency should determine through a review of recently approved projects if the jurisdiction in which the project is located is implementing the emission control measures contained within

the AQAP. If the local jurisdiction is requiring projects to implement all feasible emission control measures, then the project will not result in significant cumulative air quality impacts.

8.3.2 Other Pollutants. For CO, PM_{10}, SO_2, NO_2, and TACs, the method for estimating emissions is expressed above in the statement of the applicable significance criteria. The District should be consulted if additional information is required.

8.4 Mitigation Recommendations

Chapter 5 and Appendix E describe the District's recommended feasible mitigation strategies for cumulative air quality impacts. These measures have been implemented by other projects within the Sacramento Region. A project applicant may propose different or additional measures that achieve the same emission reductions as those identified by the District, but in such case must receive the District's approval.

Chapter 9
Conformity

9.1 General Conformity

General conformity requirements were adopted by Congress as part of the Clean Air Act (CAA) Amendments in 1990, and were implemented by U.S. EPA regulations in 1993. (See Sec. 176 of the CAA (42 U.S.C. § 7506) and 40 CFR Part 93, Subpart B.) General conformity requires that all federal actions must "conform" with the State Implementation Plan (SIP) as approved or promulgated by EPA. The purpose of the general conformity program is to ensure that actions taken by the federal government do not undermine state or local efforts to achieve and maintain the national ambient air quality standards. Before a federal action is taken, it must be evaluated for conformity with the SIP. All "reasonably foreseeable" emissions predicted to result from the action are taken into consideration. These include direct and indirect emissions, and must be identified as to location and quantity. If it is found that the action would create emissions above *de minimis* threshold levels specified in EPA regulations (40 CFR § 93.153(b)), or if the activity is considered "regionally significant" because its emissions exceed 10% of an area's total emissions, the action cannot proceed unless mitigation measures are specified that would bring the project into conformance.

Since any project that is not in compliance with conformity requirements would clearly have the potential for causing a significant impact on air quality, it is appropriate to require compliance with those requirements before a Negative Declaration can be prepared under CEQA.

9.1.1 Application of the Conformity Rule. General conformity applies in both federal non-attainment and federal air quality maintenance areas. Within these areas, it applies to any "Federal action" not specifically exempted by the CAA or EPA regulations, i.e., any non-exempt activity by a federal governmental department, agency or instrumentality, or any activity that such an entity supports in any way, provides financial assistance for, or licenses, permits, or approves. This definition is broad enough to capture purely private projects subject only to local approval where a local agency with any kind of approval authority is the recipient of federal funding for any purpose. Emissions from construction activities are also included. General conformity does not apply to projects or actions that are covered by the Transportation Conformity rule, which is discussed below.

9.1.2 Compliance with the Conformity Rule. If a federal action falls under the general conformity rule, the federal agency responsible for the action is responsible for making the conformity determination. In some instances, a state will make the conformity determination under a delegation from a federal agency. Private developers are not responsible for making a conformity determination, but can be directly and seriously affected by a determination.

When an agency makes a conformity decision, it must provide opportunity for comment and review. This public participation requirement means that the agency must:

1. Make its draft conformity determination available for review, along with all supporting documents.
2. Advertise the draft determination in the area affected by the action and provide 30 days for written public comment.
3. Document its response to all comments and make both the comments and responses available to the public within 30 days of the final conformity decision.
4. Advertise a notice of the final conformity determination in the area affected by the action within 30 days of the final determination.

9.1.3 De Minimis Limits. EPA regulations (40 CFR § 153(b)(1)) exempt projects in nonattainment and maintenance areas from general conformity requirements if their projected emissions do not exceed specified *de minimis* levels. The only applicable level in El Dorado County, which is applicable only for the Mountain Counties Air Basin (western) portion of the county, is the limit for severe nonattainment areas for ozone: 25 tons/year of ROG or NOx. There are also certain exemptions based on project type or size (see 40 CFR § 153).

9.2 Transportation Conformity

Transportation conformity requirements were also added to the CAA in the 1990 amendments, and EPA adopted implementing regulations in 1997. See § 176 of the CAA (42 U.S.C. § 7506) and 40 CFR Part 93, Subpart A. Transportation conformity serves much the same purpose as general conformity: it ensures that transportation plans (TPs), transportation improvement programs (TIPs), and projects that are developed, funded, or approved by the United States Department of Transportation or that are recipients of funds under the Federal Transit Act or from the Federal Highway Administration, conform to the SIP as approved or promulgated by EPA. Federal transportation projects are also reviewed to ensure that they do not cause new air quality violations or impede an area's progress toward attainment of air quality standards. Currently, transportation conformity applies in nonattainment areas and maintenance areas.

Under transportation conformity, a determination of conformity with the applicable SIP must be made by the agency responsible for the project, such as the Metropolitan Planning Organization, the Council of Governments, or a federal agency. The agency making the determination is also responsible for all the requirements relating to public participation. Generally, a project will be considered conforming if it is in the TIP and the TIP is incorporated in the SIP. If an action is covered under transportation conformity, it does not need to be separately evaluated under general conformity.

When a transportation project is evaluated for conformity purposes, the evaluation deals only with the operational emissions associated with that project. Operational emissions are emissions generated after completion of the project. In the case of a new or expanded freeway, for instance, operational emissions are generated by the additional vehicles using the freeway. Emissions from the construction of a transportation project are not dealt with in a transportation conformity analysis, but must be separately evaluated under this Guide for CEQA purposes.

9.3 Caveat

Conformity has burgeoned from a relatively simple concept into a complex, technical regulatory program. Difficult questions can arise as to whether a project is subject to conformity and what agency is responsible for the conformity demonstration. The District has made compliance with federal conformity provisions a requirement for determining that a project will not have a significant impact on air quality under CEQA. Lead agencies and project proponents should seek expert advice on conformity requirements early in the CEQA process.

Appendix A
CEQA Guide Checklist and Flow Chart

This Checklist and Flow Chart are provided to assist Lead Agencies and project proponents in complying with the "El Dorado County Air Pollution Control District Guide for Determining the Significance of Air Quality Impacts," under the California Environmental Quality Act (CEQA). *It is provided for convenience and should not be used as a substitute for carefully reviewing and following the Guide itself.*

A. Overview – Under CEQA, if a proposed project is determined to have "significant" air quality impacts, a detailed Environmental Impact Report, or EIR, must be prepared to describe those impacts and suggest alternatives or mitigation. If the impacts are not significant a Negative Declaration can be prepared; or a Mitigated Negative Declaration can be prepared if significant impacts can be reduced or eliminated through mitigation. Project significance is determined through an Initial Study conducted early in the project approval process. For most projects, the District will be a commenting agency rather than the Lead Agency, but in either capacity the District will uniformly apply the significance criteria laid out in the Guide.

The Guide contains **quantitative criteria** for judging the air quality significance of a project, as follows:

- For emissions of **ROG and NOx**, a project is significant if it will result in construction or operation emissions greater than 82 lbs/day. The Guide contains detailed instructions for calculating ROG and NOx mass emissions for comparison against these criteria.

- For emissions of **PM_{10}, CO, SO_2, NO_2, and other pollutants**, a project is significant if construction or operation emissions will result in ambient pollutant concentrations in excess of the applicable national or state ambient air quality standard (AAQS). The Guide specifies how emissions of these pollutants are to be calculated and then used to determine resulting ambient concentrations for comparison against the AAQS. Special standards for ozone, CO, and visibility apply in the **Lake Tahoe Air Basin** portion of the county.

- If a project will result in emissions of **toxic air contaminants** (TACs), it will be considered significant if it causes a cancer risk greater than 1 in 1 million (10 in 1 million if best available control technology for toxics is used) or a non-cancer Hazard Index greater than 1. In addition, the project must demonstrate compliance with all applicable District, state, and U.S. EPA regulations governing toxic and hazardous emissions.

There are detailed steps specified in the Guide to aid in the calculation of project emissions and comparison against the significance criteria, as well as lists of mitigation steps that can be applied to render a project not significant. The Guide also specifies how **cumulative impacts** of a project are to be determined and evaluated for significance, and how emissions should be evaluated for significance against the following **qualitative criteria**:

- The significance criteria listed in **Appendix G** to the CEQA guidelines (14 CCR secs. 15000-15387).
- **Odors** that may cause a public nuisance.
- **Sensitive receptors**, such as hospitals, day care centers, and elder housing.
- Compliance with applicable **District rules and regulations**.
- Federal "**conformity**" requirements for both transportation and non-transportation type projects.

B. Checklist Steps – The District recommends that the following general sequence be used under its CEQA Guide.

PRELIMINARY STEPS

↳ Determine **preliminary project configuration**.

? **Consult** with the District.

? Determine the applicability of any **District rules and regulations**.
(Note: compliance with District rules and regulations will help reduce emissions but will not necessarily cause emissions to be insignificant under CEQA.

- Permit requirements. (See Figure 1.1 in Chapter 1of the Guide; refer to District Regulation V.)
- Prohibitory rules. (Refer to District Regulation II.)

? Undertake project **mitigation** based on consultation compliance with regulatory requirements

↳ Determine **proposed project configuration**.

CONSTRUCTION EMISSIONS

? Evaluate **construction emissions** as specified in Chapter 4 of the Guide.

- Conduct **project screening** to determine whether the project can be classified as less than significant for one or more pollutants without the need for detailed calculations or modeling. See Section 4.2.

- Where project screening does not apply, or if calculation of actual emissions is desired, follow the steps in Section 4.3 for completing **Table 4.10** to estimate emissions of ROG, NOx, $PM_{10,}$ and CO from the operation of construction vehicles and equipment, fugitive dust, asphalt paving, and architectural coating activities, and worker commute trips. For ROG and NOx, the estimated emissions can be compared directly against the 82 lbs/day significance criteria; for PM_{10} and CO, unless screening assumptions apply, estimated emissions must be converted to ambient concentrations through modeling or another method approved by the District, for comparison against the applicable AAQS.

- Evaluate emissions for any **toxic impacts** (see Chapter 7). Pay special attention to particulate emissions from Diesel engines and fugitive dust emissions in areas of the county with ultramafic (asbestos-containing) minerals.

- Evaluate emissions for **cumulative impacts** (see Chapter 8).

- Evaluate emissions against the following **qualitative criteria**: odors, sensitive receptors, compliance with District rules and regulations.

- If necessary, implement **mitigation** measures in Section 4.4 and re-calculate emissions using Table 4.13.

OPERATION EMISSIONS - ROG and NOx

? Evaluate **ROG and NOx emissions from project operation** as detailed in Chapter 5.

- Conduct **project screening** to determine whether the project can be classified as less than significant without the need for detailed calculations or modeling. See Section 5.2.

- Where project screening does not apply or where actual emissions calculation is desired, use Table 5.3 and the methodologies in Section 5.3 to sum together ROG and NOx emissions from stationary sources, motor vehicle operation and energy use, and subtract any deductions or credits to generate **net operation emissions**.

- **Compare** net operation emissions with the 82 lbs/day criteria.

- If appropriate, undertake **mitigation** measures to get emissions under the significance criteria, as explained in Section 5.4, using Table 5.5 for the calculations. Off-site mitigation may also be possible, as explained in Section 5.5.

OPERATION EMISSIONS – CO, PM_{10}, and Other Pollutants

? Evaluate **CO, PM_{10} and other emissions from project operation** as detailed in Chapter 6.

- Conduct **project screening** to determine whether the project can be classified as less than significant for one or more pollutants without the need for detailed calculations or modeling. See Section 6.3.1.

- Where project screening is not applicable, or where actual calculation of emissions is desired, determine **applicable AAQS** from Appendix B.

- Determine **background pollutant levels** from Figures 6.1 through 6.7 as explained in Section 6.3.3.

- Using the methods specified in Sections 6.3.2 through 6.3.5 and Appendix D, **determine ambient concentrations** resulting from operation emissions for each pollutant and combine with background levels, as shown in Table 6.2.

- If the projected combined pollutant concentrations exceed an AAQS, undertake **mitigation** per the instructions in Section 6.5

? Refer to Section 6.4 for special instructions regarding **transportation projects**.

OPERATION EMISSIONS - OTHER CRITERIA

? Evaluate any impacts on **visibility**, for comparison against the applicable visibility standards (see Appendix B and Section 6.3.2).

↳ Evaluate emissions for any **toxic impacts** (see Chapter 7). Pay special attention to any asbestos emissions and particulate emissions from Diesel engines.

↳ Evaluate emissions for **cumulative impacts** (see Chapter 8).

- ↳ Evaluate the project for compliance with EPA **conformity** regulations (see Chapter 9).

- ↳ Evaluate emissions under the **qualitative criteria**: odors, sensitive receptors, District rules and regulations.

- ↳ Undertake **mitigation** to reduce or eliminate any significant impacts under the applicable criteria for these other impacts.

? ? ?

See the attached **flow chart** for a graphic description of the process for evaluating projects for air quality impacts used in this Guide.

Appendix B
Air Quality Management and Ambient Air Quality Standards

B.1 Introduction

This appendix summarizes air quality management responsibilities of various federal, state, regional, and local government agencies (see Table B.1). In addition, this appendix includes a summary of the major federal and State laws, regulations, and programs that establish the legal framework for protecting and improving air quality in El Dorado County. Table B.2 shows the national and state ambient air quality standards

B.2 Air Quality Management

B.2.1. Agency Responsibilities. Table B.1, below, lists the principal governmental agencies that are responsible for air quality in El Dorado County, and briefly summarizes their major responsibilities.

Table B.1 Air Quality Management Regulatory Responsibilities

Govt. Level	Legislation	Implementing Agency	Responsibilities
Federal	Clean Air Act	U.S. Environmental Protection Agency	Enforce CAA, establish national ambient air quality standards, regulate major emission sources such as on- and off-road vehicles, power plants, industrial sources, hazardous pollutants
State	California Clean Air Act (H&S § 39600 et seq.) AB 1807, Air Toxics Contaminants Act	California EPA, Air Resources Board, Office of Environmental and Health Hazard Assessment	Implement CCAA, meet state requirements of CAA, establish state ambient air quality standards, set CA vehicle emission standards
Regional	California Health and Safety Code §39000 - §44474	El Dorado County APCD	Monitor air quality, design programs to attain and maintain state and federal ambient air quality standards, develop air quality rules that regulate point source, area source, and mobile source activity emissions, establish permitting requirements for stationary sources, enforce air quality rules through inspections, education, training, or fines.
Regional	Tahoe Regional Planning Compact, as amended	Tahoe Regional Planning Agency (TRPA)	Serve as the lead air quality planning agency and regional transportation planning agency for the Lake Tahoe area; approve development consistent with TRPA plans and ordinances.

Local	Local Ordinances, Air Quality Element of General Plan	Public Agencies including Local Governments and County Transportation Commissions	Control or mitigate air pollution through police powers and land use decision-making authority, General Plan air quality elements, congestion management program, local ordinances, administrative actions, CEQA review and mitigation monitoring

B.2.2 Federal Programs

The **federal Clean Air Act** of 1970 (CAA) required the U.S. EPA to establish national ambient air quality standards (NAAQS) to protect public health and welfare. EPA has adopted NAAQS for six pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate, and lead. These pollutants are commonly referred to as "criteria" pollutants because they are the most prevalent air pollutants known to be deleterious to human health and extensive health effects criteria documents have been prepared for each of these contaminants.

The CAA required states exceeding NAAQS to prepare State Implementation Plans (SIPs) showing how the standards would be met by December 1987. The CAA was amended in 1977, and again in 1990, to extend the deadline for compliance and require that revised SIPs be prepared. Sanctions were imposed for the failure of a state to submit and implement an acceptable plan, consisting of denial of federal highway funding and more stringent permit requirements for major stationary sources. The 1990 amendments established five categories of air pollution severity for ozone nonattainment areas (marginal, moderate, serious, severe, and extreme). The SIP requirements vary, depending on degree of nonattainment severity.

The "conformity" provisions of the Act are designed to ensure that federal agencies contribute to, instead of jeopardize, efforts to achieve the NAAQS. In November 1993, the U.S. EPA issued regulations governing general conformity for non-transportation-related federal actions, followed in 1997 by regulations governing conformity of transportation projects. Further details on the federal conformity program are provided in Chapter 9.

Also, the U.S. EPA has programs for identifying and regulating hazardous air pollutants (HAPs). The 1990 Clean Air Act Amendments directed EPA to set standards for HAPs and to require facilities to reduce emissions of controlled chemicals. The 1990 Amendments specified that 174 industrial sources be regulated. An industry is classified as a major source and must be regulated if it emits ten tons per year of any of the listed HAPs or a combination of 25 tons or more of all listed HAPs.

The **National Environmental Policy Act** (NEPA) requires that major projects conducted or approved by the federal government be subject to environmental assessments. Where the potential for significant adverse environmental impacts exists, an Environmental Impact Statement must be prepared and circulated to affected jurisdictions and interested public.

The **Transportation Equity Act for the 21st Century** (TEA-21) provides funds for transportation projects and activities that contribute to meeting air quality standards, including transit, pedestrian, and bicycle-oriented projects. Under TEA-21, the Congestion Management

and Air Quality Improvement Program (CMAQ) directs funds toward transportation projects that will contribute to the attainment of NAAQS for ozone and carbon monoxide. The funds are distributed based on population size and severity of a region's air pollution problem.

B.2.3 California Programs

The **California Clean Air Act** (CCAA) of 1988, as amended in 1992, requires air districts like the El Dorado County APCD to develop and implement plans to attain statewide ambient air quality standards established by the California Air Resources Board (CARB). In general, the district plans must be designed to achieve and maintain state ambient air quality standards through emission reductions from stationary and transportation sources by the "earliest practicable date," and must reduce excessive emissions of pollutants by five percent or more per year. The District and CARB are also directed to meet the state's obligations under the federal CAA.

Under the **California Motor Vehicle Emission Control Program**, implemented by CARB, new on- and off-road vehicles must meet stringent exhaust and evaporative emission standards. In general, California motor vehicle emission standards are more stringent than the federal standards; however, other states may voluntarily impose California standards. CARB regulations require manufacturers selling new vehicles in California to phase in "low emission" light- and medium-duty vehicles, including a specified number of "zero-emission" vehicles, beginning in 2003. When fully implemented, these regulations will reduce emissions from vehicles by over 99% compared to uncontrolled vehicles. CARB has also set requirements for the sale and distribution of low-emission gasoline and Diesel fuels, and implements a heavy-duty vehicle inspection program, which applies to Diesel-powered trucks and buses. In 2000, CARB declared Diesel particulate exhaust emissions a toxic air contaminant (TAC), thus triggering further emission control measures for Diesel vehicles.

The California Bureau of Automotive Repair administers the vehicle inspection and maintenance program (I/M or "Smog Check" Program), which requires in-use vehicles with excessive emissions to be repaired.

California Planning Law and Guidelines do not require an air quality element for general plans. However, the El Dorado County general plan, as part of its Public Health, Safety and Noise Element, does include specific air quality objectives. Among the objectives are reductions in the number of vehicle trips, clean fuels, expanded use of transit, project designs that minimize direct and indirect emissions, separation of pollution sources from sensitive receptors, reduced emissions from construction activities, and protection of vegetation. California requires that general plans be consistent with any air quality policies and programs established by local jurisdictions like the APCD. Local plans must also be consistent with regional air quality plans such as the Sacramento Area Regional Ozone Attainment Plan.

The **Sacramento Area Regional Ozone Attainment Plan** is a regional plan required by the federal government. It was prepared jointly by the air districts in the Sacramento area to address how the Sacramento Region will attain the NAAQS. The plan covers the Mountain Counties Air Basin of El Dorado County (i.e., the western slope of the Sierras), and El Dorado County is a participant in

the plan. The plan contains stationary source controls, motor vehicle emission controls, and transportation system improvement measures that would reduce the amount of air pollutants released into the atmosphere; with assistance from state programs implemented by CARB, the participating air districts must undertake emission control measures as needed to attain the NAAQS for ozone by 2005.

The **Tahoe Regional Planning Agency**, or TRPA, has adopted a Regional Plan that includes an Air Quality Element that focuses on achieving the national and state ambient air quality standards as well as special TRPA-adopted regional and subregional visibility standards, and the reduction of nitrate deposition from vehicle NOx emissions. TRPA has jurisdiction within the Lake Tahoe Air Basin portion of El Dorado County. TRPA's ordinances and Regional Transportation Plan contain specific measures designed to monitor and achieve the air quality objectives of its Regional Plan. The APCD's rules and regulations are also governing in the Lake Tahoe area.

Motor Vehicle Fees. Since 1988, California law (AB 2766, Sher) allows the district to impose a $4.00 surcharge fee on vehicles registered within its jurisdiction. These surcharge revenues are collected by the Department of Motor Vehicles and are allocated to programs that reduce air pollution from motor vehicle activity in the county.

B.3 Ambient Air Quality Standards

Table B.2, below, shows the national and state ambient air quality standards. As explained further in Chapter 3, the District uses the national and state ambient air quality standards as part of its objective or quantitative criteria for determining significance under CEQA for all pollutants other than reactive organic compounds (ROG) and oxides of nitrogen (NOx), i.e., a project that has emissions other than ROG or NOx that cause or contribute to a violation of any national or state ambient air quality standard is considered to have a "significant" air quality impact.

Table B.2 Ambient Air Quality Standards

Pollutant	Unit of Measure	California	National
Ozone	1-Hour 8-Hour	0.09 N/A	0.12 ppm 0.08 ppm
Carbon Monoxide	1-Hour 8-Hour	20.0 ppm 9.0 ppm	35.0 ppm 9.0 ppm
Carbon Monoxide (Lake Tahoe Air Basin)	8-Hour	6 ppm	N/A
Nitrogen Dioxide	1-Hour Annual	0.25 ppm N/A	N/A 0.053 ppm
Sulfur Dioxide	1-Hour 24-Hour Annual	0.25 ppm 0.04 ppm N/.A	N/A 0.14 ppm 0.030 ppm
Respirable Particulates (PM_{10})	24-Hour Annual Average[1]	50 µg/m^3 30 µg/m^3	150 µg/m^3 50 µg/m^3
Fine Particulate Matter ($_{PM2.5}$)	24-Hour Annual Average[1]	N/A N/A	65µg/m^3 15µg/m^3
Sulfates	24-Hour	25 µg/m^3	N/A
Lead	30-Day Average Calendar Quarter	1.5 µg/m^3 N/A	N/A 1.5 µg/m^3
Hydrogen Sulfide	1-Hour	0.03 ppm	N/A
Vinyl Chloride	24-Hour	0.010 ppm	N/A
Visibility Reducing Particles	1-Observation	Visibility >10 Miles (>30 miles for Lake Tahoe) w/ relative humidity <70%	N/A

[1] The state PM_{10} annual standard is for the geometric mean of all measurements. The national PM_{10} and $PM_{2.5}$ annual average standards are based upon the arithmetic mean of all measurements; ppm = parts per million. µg/m^3 = micrograms per cubic meter. The NAAQS shown serve as both primary (health-related) and secondary (welfare-related) standards, except that for SO_2 the standards shown are the primary NAAQS; there is also a separate secondary NAAQS for SO_2 of 0.5 ppm. Implementation of the 8-hr NAAQS for ozone and the NAAQS for fine particulate has delayed by litigation and is pending further implementation guidance from the federal court and EPA.
SOURCE: California Air Resources Board.

Appendix C-1
Construction Emission Factors and Dust Mitigation Measures

This appendix provides additional emission factors that can be used in estimating construction emissions and quantifying the benefits of mitigation measures.

C.1 Dust Emissions (PM_{10})

See the calculation methodology in Section 4.3.2 and Table 4.3 in Chapter 4.

C.2 Employee Trip Estimation

Trip estimation for construction employees is based upon the SCAQMD CEQA Planners Handbook, 1993.

$$Tr = ER_{on\text{-}site}\left[\frac{(GSF \times CV \times ER)}{100{,}000}\right]$$

Where:

GSF =	Gross Square Feet
CV (Construction Value) =	55.70 (Single Family) 58.73 (Multi-Family) 59.98 (Office/Emp)
ER (Employee Rate) =	9.2
$ER_{on\text{-}site}$ (On-site Construction = Employee Rate)	.392

C.3 Asphalt Paving

Asphalt paving emissions are estimated using the factors presented in Table C.1 and multiplying by the length of the roadway or number of square feet for parking structures.

Table C.1 Emission Factors–Paving

Pavement Type	Emission Factor
Road - Per Lane	3.8 lbs/mile
Road - Two-Lane	10.2 lbs/mile
Area (Parking, etc.)	0.000024 lbs/sf
Source: CARB, SMAQMD	

C.4 Stationary Equipment

Stationary equipment emissions for each individual pollutant can be estimated by:

$$EM = (EQ \times T_{(h)} \times HP_{(ave)} \times EF)$$

Where:

EM = Emissions
EQ = Number of Equipment
$T_{(h)}$ = Daily Hours of Use
$HP_{(ave)}$ = Average Horsepower
EF = Emissions Factor (see Table B.5)

Table C.2 Emission Factors–Stationary Equipment

Fuel Type	ROG (lbs)	NO_X (lbs)	PM_{10} (lbs)
Diesel	0.0025	0.0310	0.0020
Gasoline	0.0140	0.0114	0.0007
Source: SCAQMD			

C.5 Architectural Coatings

Architectural coatings can be estimated by the following formula:

$$EM = (CT_{(sqft)} \times CT_{(layers)} \times EF)$$

Where:

EM = Emissions
$CT_{(sqft)}$ = Number of Square Feet Coated
$CT_{(layers)}$ = Number of Coats
EF = Emissions Factor (see Table C.4)

Emission factors should accurately reflect the application method and the material that will be coated.

Table C.3 Emission Factors–Architectural Coatings

	Application Method	
Surface Type	Brush/Roller (lbs/sf)	Spray (lbs/sf)
Wood/Metal/Plasterboard	0.0134	0.0205
Concrete/Masonry	0.077	0.1184
Source: CARB, SMAQMD		

C.6 Fugitive Dust Mitigation Measures

The following tables C.4 and C.5 are taken from Rule 403 of the South Coast Air Quality Management District (SCAQMD) and contain mitigation measures that may be applied under the screening criteria in sec. 4.2 of Chapter 4 to reduce fugitive dust emissions from construction activities to a less-than-significant level.

Table C.4 Best Available Fugitive Dust Control Measures

Fugitive Dust Source Category	Control Actions
Earth-moving (except construction cutting and filling areas, and mining operations)	1a. Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the District; two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR 1a-1. For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving – construction fill areas	1b. Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the District; for areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM method 1557 or other equivalent method approved by the District, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content; two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.
Earth-moving – construction cut areas and mining operations	1c. Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining areas unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	2a/b. Apply dust suppression in a sufficient quantity and frequency to maintain a stabilized surface; any areas which cannot be stabilized, as evidenced by wind driven dust, must have an application of water at least twice per day to at least 80 percent of the unstabilized area.

Disturbed surface areas – completed grading areas	2c. Apply chemical stabilizers within 5 working days or grading completion; OR 2d. Take action 3a or 3c specified for inactive disturbed surface areas.
Inactive disturbed surface areas	3a. Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible due to excessive slope or other safety conditions; OR 3b. Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR 3c. Establish a vegetative ground cover within 21 days after active operations have ceased; ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR 3d. Utilize any combination of control actions 3a, 3b and 3c such that, in total, they apply to all inactive disturbed surface areas.
Unpaved roads	4a. Water all roads used for any vehicular traffic at least once per every two hours of active operations; OR 4b. Water all roads used for any vehicular traffic once daily and restrict vehicle speed to 15 mph; OR 4c. Apply chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	5a. Apply chemical stabilizers; OR 5b. Apply water to at least 80 percent of the surface areas of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR 5c. Install a three-sided enclosure with walls with no more than 50 percent porosity that extend, at a minimum, to the top of the pile.
Track-out control	6a. Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and width of at least 20 feet; OR 6b. Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.

All categories	7a. Any other control measures approved by the District.
Source: SCAQMD Rule 403, Tables 2 and 3.	

Table C.5 Best Available Fugitive Dust Control Measures for High Wind Conditions*

Fugitive Dust Source Category	Control Measures
Earth moving	1A. Cease all active operations, OR 2A. Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	0B. On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR 1B. Apply chemical stabilizers prior to a wind event; OR 2B. Apply water to all unstabilized disturbed areas 3 times per day; if there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR 3B. Take the actions specified in Table B.6, Item 3c; OR 4B. Utilize any combination of control actions specified in Table 1, Items 1B, 2B and 3B, such that, in total, they apply to all disturbed surfaced areas.
Unpaved roads	1C. Apply chemical stabilizers prior to a wind event; OR 2C. Apply water twice per hour during active operation; OR 3C. Stop all vehicular traffic.
Open storage piles	1D. Apply water twice per hour; OR 2D. Install temporary coverings.
Paved road track-out	1E. Cover all haul vehicles; OR 2E. Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for operation on both public and private roads.
All categories	1F. Any other control measures approved by the District.
* High wind conditions means when gusts exceed 25 mph. Source: SCAQMD Rule 403, Table 1.	

Appendix C-2
Road Construction Emission Model
User Instructions

The Roadway Construction Emissions Model, Version 2.1 is a Microsoft Excel© spreadsheet model that contains seven individual worksheets:

1. User Instructions
2. Emission estimates (results)
3. Data Entry
4. Appendix D worksheet
5. Appendix B worksheet
6. Emfac7f worksheet
7. Emfac7g worksheet

Each of the seven individual worksheets is explained briefly below. Of these seven worksheets, the user can only make changes to specific areas of the third worksheet: Data Entry. The following discussion describes each of the worksheets in the order listed above, except for the Data Entry worksheet, which is described last.

User Instruction Worksheet

The first worksheet contains user instructions that identify how to use the road construction emissions model. Those instructions are self-explanatory and are covered in more detail here.

Emission Estimates Worksheet

The emission estimates worksheet summarizes the results of the project being evaluated. The emission estimates worksheet cannot be edited directly. It can only be modified by entering or editing values on the data entry worksheet. Daily and total project emissions of ROG, CO, NOx, and PM_{10} are shown for each project phase. Both PM_{10} exhaust and fugitive dust emissions are also shown. Emissions in English and metric units are shown in separate tables. The primary assumptions used to estimate emissions are shown in the footnotes of each table.

Appendix D Worksheet

The Appendix D Worksheet is based on the California Air Resources Board's Off Road Model Appendix D report. Appendix D contains information on emission rates (grams per hp-hr) for various off-road engine sizes. Appendix D also contains information on engine emission deterioration rates, which are not included in the road construction emission estimates. Appendix D is linked to the Appendix B Worksheet (described below), which contains information of vehicle replacement rates. Those rates are used in Appendix D to estimate average vehicle emissions by vehicle year class.

Appendix B Worksheet

The Appendix B Worksheet is also based on the California Air Resources Board's Off Road Model report. Appendix B contains information on the average horsepower and useful life of a wide range of construction equipment. That information is linked to Appendix D, described above.

EMFAC7G Worksheet

The EMFAC7G worksheet contains emissions for two types of vehicles: light duty trucks and heavy-heavy duty diesel trucks. They are based on two separate runs of the California Air Resources Board's EMFAC7G emissions model. Each run is based on an average vehicle speed of 30 mph. Light duty truck emissions include running exhaust, tire and brake wear, start emissions, and evaporative emissions. Heavy-heavy duty truck emissions include running exhaust and tire and brake wear emissions.

EMFAC7F Worksheet

The EMFAC7F worksheet contains emissions for two types of vehicles: light duty trucks and heavy-heavy duty diesel trucks. They are based on two separate runs of the California Air Resources Board's EMFAC7F emissions model, version 1.1. Each run is based on an average vehicle speed of 30 mph. Light duty truck emissions include running exhaust, including running evaporative emissions. Diurnal and multi-day evaporative emissions are not included in the EMFAC7G emission rates. Heavy-heavy duty truck emissions include running exhaust.

Data Entry Worksheet

The data entry worksheet represents the only one of the seven worksheets that can be directly modified by the user. To enter or modify project-specific data, the user must go to the data entry worksheet. Prior to beginning a new project, the user is encouraged to hit the button (found at column h, row 9) that clears all previously entered data input and user overrides. The first user inputs are shaded in Figure C-2.1. These represent the required data fields that must be modified by the user for the model to generate default values for the project.

The required fields are:

Project Name - User identifies a name for the project.

Construction Start Year - The construction start year must be between year 2000 and 2010.

Project Type - The model has three different default parameters for three different project types: new road construction, road widening, and bridge or overpass construction.

Project length - The number of months required for the project to be completed. For projects with construction scheduled to last more than 12 months, the model adjusts vehicle emissions based on the years in which construction would occur.
Predominate Soil/Site Type - The model allows the user to select one of three soil/site types. By selecting one of these soil types, the model allocates differing percentages of time to construction phases.

On-Road Emission Factors - The emission factors needed to calculate worker commute emissions. EMFAC7F is a vehicle emissions model that was in use in California during the mid 1990's. Many of the existing state implementation plans are based on EMFAC7F. EMFAC7F was superseded by EMFAC7G in the late 1990's. Most recently, EMFAC2000 has been released by the California Air Resources Board. This vehicle emissions model, along with the MOBILE model, will be incorporated into the road construction model in future updates.

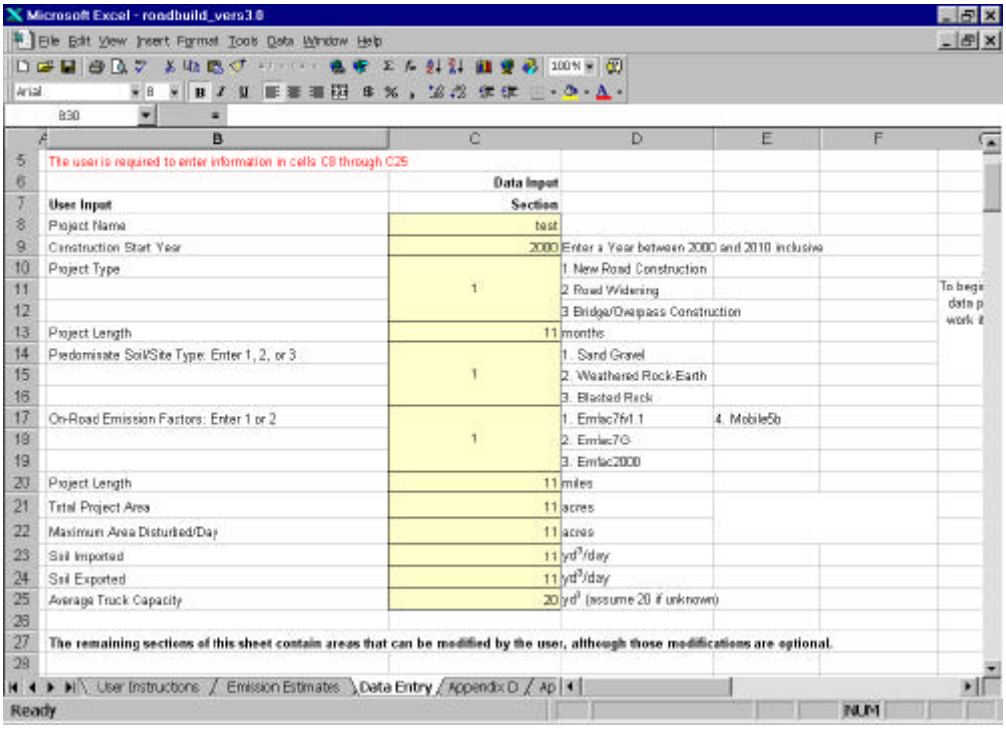
Project length/Total project area - Project length identifies the linear distance of the project, while project area represents the project square footage or acreage.

Maximum area disturbed per day - The maximum area disturbed per day is used by the model to estimate the total fugitive PM_{10} emissions that will be generated by the project.

Soil Imported/Soil Exported/Average Truck Capacity - If soil must be imported or exported from the project site, the user must enter the project-specific information here. Average truck capacity is used by the model to calculate the daily number of truck trips required for soil transport.

When all the required data are entered, the model automatically calculates the optional fields, which include, but are not limited to, the length of each construction phase, the area disturbed by construction, and the types of construction equipment that will be used.

Figure C-2.1. Data Input



Appendix D
Vehicle Trip and Emission Calculations

D.1 Vehicle Trip Calculations

Use the following table to determine the number of daily vehicle trips generated by a project.

Table D.1 Estimating Vehicular Trips

Land Use(s)	Size	Trip Rate[1]	Daily Vehicle Trips
Total Daily Vehicle Trips			
[1] Refer to Table D-2 for appropriate daily average trip rates.			

- Itemize each land use associated with a project in the first column.
- List the size of each land use.
  Note: Typically, residential projects are listed by number of dwelling units, while non-residential projects are reported by gross square footage, expressed as 1000s of square feet. For example, a 50,000 square foot project would be recorded in the table above as 50.
- Transfer the appropriate trip generation rates for each land use from Table D.2.
  Note: If additional trip generation rates are needed, refer to the Institute of Transportation Engineers (ITE) *Trip Generation Handbook – 6th Edition.*
- Multiply the size of each land use by its trip generation rate to determine the number of daily vehicle trips generated by each land use.
- Add trip totals for each land use to determine a project's total daily vehicle trips.

D.2 Vehicle Emission Calculations

Table D.2 Trip Generation Rates for Various Land Uses

LAND USE	UNIT OF MEASURE	TRIP RATE	LAND USE	UNIT OF MEASURE	TRIP RATE
Port and Terminal			**Office**		
Aviation Airport	Av. Flts/day	1.98	General Office	1000 GSF	15.00*
Truck Terminal	Acre	62.48	Corp. Headquarters Bldg.	1000 GSF	6.27
Industrial			Medical Office Bldg.	1000 GSF	25.91
Light Industrial	1000 GSF	5.26	Office Park	1000 GSF	8.50
Industrial Park	1000 GSF	5.44	Research Center	1000 GSF	5.93
Manufacturing	1000 GSF	3.05	Business Park	1000 GSF	10.89
Warehousing	1000 GSF	3.77	**Medical**		
Mini Warehouse	1000 GSF	2.45	Hospital	1000 GSF	15.25
Residential			**Retail**		
Single Family D.U.	DU	9.53	Building & Lumber Store	1000 GSF	28.80
Apartment	DU	6.29	Special Retail Center	1000 GLA	37.97
Res. Condominium	DU	5.69	Discount Store	1000 GSF	70.56
Mobile Home Park	DU	4.77	Hardware/Paint Store	1000 GSF	58.23
Planned Unit Dev.	DU	6.96	Garden Center	1000 GSF	44.51
Lodging			Shopping Center	1000 GLA	82.00*
Hotel	Room	8.93	Quality Restaurant	1000 GSF	92.55
Motel	Room	5.63	High-Turnover Restaurant	1000 GSF	158.37
Recreational			Fast Food w/ Drive-Thru	1000 GSF	623.19
Golf Course	Acre Acre	8.18	Fast Food w/o Drive-Thru	1000 GSF	778.18
Racquet Club	1000 GSF	17.14	New Cars Sales	1000 GSF	38.72
Institutional			Supermarket	1000 GSF	172.02
Elementary School	1000 GSF	10.72	Convenience Market (24 hr)	1000 GSF	758.79
High School	1000 GSF	10.90	Furniture Store	1000 GSF	4.67
Church	1000 GSF	13.28	**Services**		
Day Care Center	1000 GSF	58.33	Walk-In Bank	1000 GSF	109.44
Library	1000 GSF	39.75	Drive-In Bank	1000 GSF	201.56

GSF = Gross Square Feet; GLA = Gross Leasable Area; D.U. = Dwelling Unit
Note: Trip Rate based on a daily average calculated over one week.
Source: Institute of Transportation Engineers. Trip Generation – 6th Edition, 1997

Use Table D.3, below, to calculate long-term vehicular emissions of a project or short-term construction employee trip emissions. Calculate emissions for the year closest to the build-out year of the project. Larger, phased projects may require multiple calculations. Complete Table D.3 for each year of analysis.

Table D.3 Vehicle Emissions Calculation

Year of Analysis _____ Total Daily Vehicle Trips (Table D.1) _____	Emissions (Pounds/Day)			
	ROG	NO_X	PM_{10}	CO
Total Vehicular Emissions				

- Enter the year of analysis (the build-out year of the project or phase of larger projects).
- Transfer the total daily vehicle trips from Table D.1 (or from Table 4.7 in Chapter 4: *Construction Worker Trip Generation).*
- Use Table D.4 to estimate the amount of emissions generated by daily trips (use the corresponding year of analysis). (Rows from emission tables can be transferred to rows of Table D.1.)
- Add pollutant values for each column as necessary to determine total vehicular emissions. Transfer vehicular emission totals to line two of Table 10: Long-Term Emissions. If estimating Phase II Construction employee trip emissions, transfer totals to line one of Table 5: Short Term Phase II Emissions.

Table D.4 Lookup Table for Construction Worker Trip Emissions (Lbs.)
Years 2000, 2005, 2010, 2015

	Year 2000				Year 2005			
Trips	ROG	NOx	PM_{10}	CO	ROG	NOx	PM_{10}	CO
1	0.04	0.04	0.001	0.38	0.03	0.02	0.001	0.21
10	0.44	0.35	0.012	3.78	0.26	0.19	0.012	2.10
100	4.38	3.55	0.116	37.79	2.56	1.93	0.117	20.96
1000	43.82	35.47	1.164	377.88	25.62	19.29	1.173	209.56
10000	438.21	354.67	11.640	3778.84	256.23	192.91	11.727	2095.57
	Year 2010				Year 2015			
Trips	ROG	NOx	PM_{10}	CO	ROG	NOx	PM_{10}	CO
1	0.02	0.01	0.001	0.12	0.01	0.01	0.001	0.08
10	0.16	0.11	0.011	1.25	0.10	0.07	0.012	0.75
100	1.59	1.13	0.113	12.46	1.03	0.66	0.119	7.55
1000	15.85	11.25	1.125	124.62	10.31	6.64	1.191	75.49
10000	158.53	112.50	11.250	1246.23	103.07	66.42	11.910	754.92

Source: California Air Resources Board, EMFAC2000, version 2.02.
Runs performed for El Dorado County, Mountain Counties Air Basin, using weighted fleet mix of light-duty autos, light-duty trucks, and medium-duty vehicles, annual average emission rates, and a10-mile one-way trip.
Use linear interpolation or extrapolation if actual number of trips is different from numbers shown. Use linear interpolation for intervening years.

Appendix E
Operation Emissions Mitigation

E.1 Introduction

The mitigation measures listed in Table E.1 include estimates of their ability to reduce vehicle trips and/or emissions. Incorporate as many feasible mitigation measures into the project as possible in order to substantially lessen or avoid significant air quality impacts. The emission reduction factors are additive and can be combined without limitation. Use Table E.1 to calculate the project's operation emission reduction factor. The emission reduction factors in Table E.2 are percents. For example, an emission reduction factor of 1.0 means that the measure would result in a 1.0% reduction in project emissions.

Table E-1 Operation Emissions Reduction

Mitigation Measures		Emission Reduction Factor
Measure Number	Implementing Mechanism (Condition of Approval, etc.)	
	Total Trip Reduction Factor (%)	

- List each mitigation measure included in the project by mitigation measure number. Specify the mechanism or process by which the measure will be implemented. Enter the corresponding emission reduction factor for each mitigation measure.
- Enter the sum of all emission reduction factors in the last row of Table E-1.
- Transfer the total emission reduction factor to line two of Table 5.4 in Chapter 5 for each pollutant.

Table E-2 Mitigation Measures

No.	Description	Development Type	Emission Reduction Factor
Bicycle/Pedestrian/Transit			
1	Non-residential projects provide bicycle lockers and/or racks	Commercial	0.5
3	Non-residential projects provide personal showers and lockers	Commercial	0.5
4	Bicycle storage (Class I) at apartment complexes or condos without garages	Residential	0.5
5	Entire project is located within ½ mile of an existing Class I or Class II bike lane and provides a comparable bikeway connection to that existing facility	Residential Commercial Mixed	1.0
6	The project provides for major pedestrian facilities and improvements such as overpasses and wider sidewalks	Residential Commercial Mixed	1.0
7	Bus service provides headways of 15 minutes or less for stops within ¼ mile; project provides essential bus stop improvements (i.e., shelters, route, information, benches, and lighting).	Commercial	1.0
9	High density residential, mixed, or retail/commercial uses within ¼ mile of existing transit, linking with activity centers and other planned infrastructure.	Residential Commercial Mixed	2.0 for light rail, 1.0 for bus only
Parking			
11	Employee and/or customer paid parking system (no validations)	Commercial	3.0
12	Provide minimum amount of parking required.	Commercial Mixed	0.5
13	Provide parking reduction: Office 25%, Medical office 8%, Commercial 5%, Industrial 10%. Additional 10-20% if located along transit station (special review of parking is required).	Commercial Mixed	2.5
14	Provide grass paving or reflective surface for unshaded parking lot areas, driveways, or fire lanes that reduce standard paving by 10% or more.	Residential Commercial Mixed	0.5
15	Increase parking lot shading by 20% over code.	Residential Commercial Mixed	1.0
16	Provide electric vehicle charging facilities	Residential Commercial Mixed	1.0
21	Provide a parking lot design that includes clearly	Commercial	0.5

	marked and shaded pedestrian pathways between transit facilities and building entrances		
Commercial Building Design			
23	Office floor area ratio is 0.75 or greater within ¼ mile of an existing transit stop.	Commercial Mixed	2.5 for light rail, 1.5 for bus only
24	Setback distance is minimized between development and existing transit, bicycle, or pedestrian corridor.	Commercial Mixed	1.0
25	Setback distance is minimized between development and neighboring properties.	Commercial Mixed	0.5
Residential Development			
26	Average residence density 7 d.u. per acre or greater.	Residential	1.5, 3.0, 4.5
27	Multiple and direct street routing (grid style)	Residential Commercial Mixed	2.5
28	Granny Flats – Have ancillary "granny units" (requires Special Development Permit but no Accessory Structure Use Permit)	Residential	1.0
Mixed Use			
29	Development of projects predominantly characterized by properties on which various uses, such as office, commercial, institutional, and residential, are combined in a single building or on a single site. A "single site" may include contiguous properties.	Mixed	3.0
32	Separate, safe, and convenient bicycle and pedestrian paths connecting residential, commercial, and office uses.	Residential Commercial Mixed	2.0
33	The project provides a development pattern that eliminates physical barriers such as walls, berms, landscaping, and slopes between residential and non-residential uses that impede bicycle or pedestrian circulation.	C, M	1.0
Building Component Measures			
41	Install only natural gas fireplaces	Residential	1.0
42	Install Energy Star or ground source heat pumps.	Residential Commercial Mixed	0.5
43	Install ozone destruction catalyst on air conditioning systems in consultation with El Dorado APCD	Residential Commercial Mixed	2.5
44	Install Energy Star labeled roof materials.	Commercial	0.5
47	Install roof photovoltaic energy systems as a standard feature on new homes.	Residential	2.5

48	Exceed Title 24 energy standards for cooling energy by 25% or comply with SMUD Advantage (Tier II) energy standards.	Residential	0.5
49	Exceed Title 24 energy standards for cooling energy by 50%, or comply with SMUD Advantage Plus (Tier III) or EPA/DOE Energy Star Home energy standards.	Residential	1.0
50	Orient 75 or more percent of homes and/or buildings to face either north or south (within 30 degrees of N/S), and include shading master plan.	Residential	0.5
TDM and Miscellaneous Measures			
51	Include permanent TMA membership and funding requirement. Funding to be provided by Community Facilities District or County Service Area or other non-revocable funding mechanism.	Residential Commercial Mixed	2.5
59	Make physical development consistent with requirements for neighborhood electric vehicles.	Residential	1.5
63	Implement Clean Air Business Practices such as using low-emission delivery vehicles, contract with alternative-fuel waste hauling companies, etc., in consultation with El Dorado APCD.	Commercial	TBD
64	Provide electric shuttle to transit stops.	Residential Commercial Mixed	2.0
65	Provide a complimentary cordless electric lawnmower to each residential buyer.	Residential	2.0
67	Transit pass subsidy (100%) and/or commute alternative allowance.	Commercial	1.5
Innovative Strategies			
99	Other proposed strategies in consultation with El Dorado APCD	Residential Commercial Mixed	TBD

Note: "TBD" means the emission reduction factor must be developed in consultation with the District.

Appendix F
Glossary

Ambient (Air)	Any unconfined portion of the atmosphere; the outside air. For the purpose of evaluating project air quality impacts, ambient air includes any location to which the general public has access. Employees of the project developer are not considered to be part of the general public; however, residents, tenants, employees of tenants, visitors, and customers are considered to be part of the general public.
Ambient Air Quality Standard	The national ambient air quality standards (NAAQS) and the California ambient air quality standards (California AAQS) define the levels of various pollutants above which unacceptable health effects may occur.
Ancillary Services	Any retail or commercial goods or services that provide auxiliary or supplemental service to an employee or group of employees that would typically be utilized during midday and end-of-day errands.
Area Source	Those sources that individually emit relatively small quantities of air pollutants. This includes small items such as home heaters and consumer products.
BACT	Best Available Control Technology is applicable to certain stationary sources of air pollution regulated by the district. BACT is defined as the most stringent emissions control which, for a given class of source, has been 1) achieved in practice; 2) identified in a state implementation plan; or 3) found by the District to be technologically achievable and cost-effective.
CALINE	The Caline model, developed by Caltrans, calculates ambient concentrations of pollutants from vehicle traffic on a roadway segment, intersection, or parking lot.
CARB	The California Air Resources Board is the state agency with overall responsibility for achieving and maintaining healthy air quality.
Carbon Monoxide (CO)	Carbon Monoxide is an odorless, colorless, toxic gas, and is the product of incomplete combustion.
Class II Bike Lane	A lane within a street or roadway designed for the one-way use of bicycles. It is an on-street facility with signs, striped land markings, and pavement legends.

Discretionary Project	A project that is subject to a decision by a governmental agency regarding whether and how to carry out or approve a project.
EMFAC	CARB's on-road motor vehicle emissions model which estimates the amounts and types of pollutants emitted from on-road vehicles in California.
Emission Reduction	Credits issued for the reduction of actual emissions from an emission unit; credits registered with the District in accordance with the requirements of El Dorado County APCD Rule 524.
EPA	The U.S. Environmental Protection Agency is the agency designated by Congress to protect air quality on a national basis.
Floor Area Ratio (FAR)	Floor Area Ratio is the gross floor area permitted on a site divided by the total net area of the site, expressed in decimals to one or two places.
General Conformity	Federal regulatory program designed to ensure that federal actions are consistent with local Air Quality plans. Regions must show conformity or risk losing federal transportation funding.
Indirect Source	A project that attracts or generates vehicle activity that in turn generates air pollutants. Examples include office buildings, shopping centers, and airports.
Isopleth	A line on a map connecting points at which a given variable has a specified constant value.
Micron	A measure of air quality for a particular pollutant. A micron is equal to a millionth of a meter.
NOx	Nitrogen Oxides. Nitrogen dioxide, a toxic reddish-brown gas, and nitric oxide, a colorless gas, are the primary ingredients of nitrogen oxides. Nitrogen oxides are produced by the combustion of fuel, such as the burning of gasoline in automobile engines.
PM_{10}	PM_{10} is small suspended particulate matter, 10 microns or less in diameter, which can enter the lungs. The major components of PM_{10} are dust particles, nitrates, and sulfates. PM_{10} is directly emitted into the atmosphere as a by-product of fuel combustion, abrasion, or through wind erosion and unpaved roads.
$PM_{2.5}$	"Fine" particulate matter; typically associated with adverse health effects. EPA recently established a new NAAQS for $PM_{2.5}$, and

	following delay from litigation, is expected to begin soon to define what states must do to implement the standard.
Point Source	Point Source is a term used to designate a sizeable stationary emission source at a specific location.
ROG	Reactive Organic Gases are a species of organic gas that undergoes photochemical reactions.
Sensitive Receptor	People, or facilities that generally house people (schools, hospitals, residences, etc.), that may experience adverse effects from unhealthful concentrations of air pollutants.
Stationary Source	A non-mobile source that emits air pollutants. Examples include industrial boilers, power plants, and refineries.
T-BACT	The most effective emission limitation or control technique that has been achieved in practice for a category or class of source; or any other emissions limitation or control technique found by the Executive Officer of the CARB or APCO of the local district to be technologically feasible for the category or class of source.
Threshold	The maximum amount of pollutant a project can generate without being considered significant.
Toxic Air Contaminant (TAC)	An airborne chemical waste that can cause long-term health effects such as cancer, birth defects, or genetic damage.
Transportation Conformity	A federal rule that ensures that federal transportation projects conform to the local air quality plan.
Trip	A single or one-direction vehicle movement with either the origin or the destination (exiting or entering) inside a study site.
URBEMIS	A model designed to estimate air emissions from land use development projects. The model includes emissions from the construction of the project as well as area sources and mobile sources generated by a project.
VMT	Vehicle Miles Traveled are the total miles traveled by all vehicles in a particular geographic area, often measured over a 24-hour period.