AIR QUALITY ANALYSIS

Interstate 5 North Coast Corridor Project

SAN DIEGO COUNTY, CALIFORNIA
DISTRICT 11-SD-5 (PM R28.4/R55.4)
EA 235800 (P ID 11-000-0159)

AUGUST 2007

AIR QUALITY ANALYSIS
FOR THE
I-5 NORTH COAST PROJECT

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Errata Sheet:

Air Quality Analysis for the I-5 North Coast Project (August 2007)

The project description was revised to state that the painted buffer separation between the general purpose lanes and the HOV/Managed Lanes would be up to five (5) feet.

This minor change in the project description is consistent with the analysis contained in this technical study.

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CHAPTER 1.0
INTRODUCTION

1.1 INTRODUCTION

The California Department of Transportation (Department) is proposing to construct High Occupancy Vehicle (HOV) lanes in each direction on a total of 27 miles of Interstate 5 (I-5) between the city of San Diego and the city of Oceanside. An alternative to the project, known as the I-5 North Coast Project, would also include either 1 or 2 General Purpose (GP) lanes in each direction on I-5 from La Jolla Village Drive to Harbor Drive. All proposed alternatives of the project would include construction of Direct Access Ramps (DARs) to the HOV lanes, the addition of auxiliary lanes, and the widening of bridges and overcrossings on the project route. Figure 1 depicts the project area in a regional context and Figures 2a, 2b, 2c, 2d, and 2e depict the project location.

The purpose of this air quality analysis is to describe the existing air quality in the project area, identify potential air quality impacts of the proposed project, and demonstrate conformity of the project to the State Implementation Plan (SIP), as required by the federal Clean Air Act. This report also identifies measures to mitigate or minimize pollutant emissions that could occur during project construction.

1.2 SUMMARY

The project site is located in the San Diego Air Basin (SDAB), which currently meets the federal standards for all criteria pollutants, except ozone (O_3), and state standards for all criteria pollutants, except O_3, particulate matter sized 2.5 microns or less ($PM_{2.5}$), and particulate matter sized 10 microns or less (PM_{10}). San Diego County completed 3 years within the federal 1-hour O_3 standard on November 15, 2001, becoming eligible for redesignation as an attainment area. Formal redesignation by the U.S. Environmental Protection Agency (USEPA) as an O_3 attainment area occurred on July 28, 2003, and a maintenance plan was approved. On April 15, 2004, the USEPA issued the designations for the 8-hour O_3 standard, and the SDAB is classified as “basic” nonattainment. Basic is the least severe of the six degrees of O_3 nonattainment (USEPA 2007a). The SDAB also falls under a federal “maintenance plan” for carbon monoxide (CO) following a 1998 redesignation as a CO attainment area. The SDAB is currently classified as a state “serious” O_3 nonattainment area and a state nonattainment area for $PM_{2.5}$ and PM_{10}.

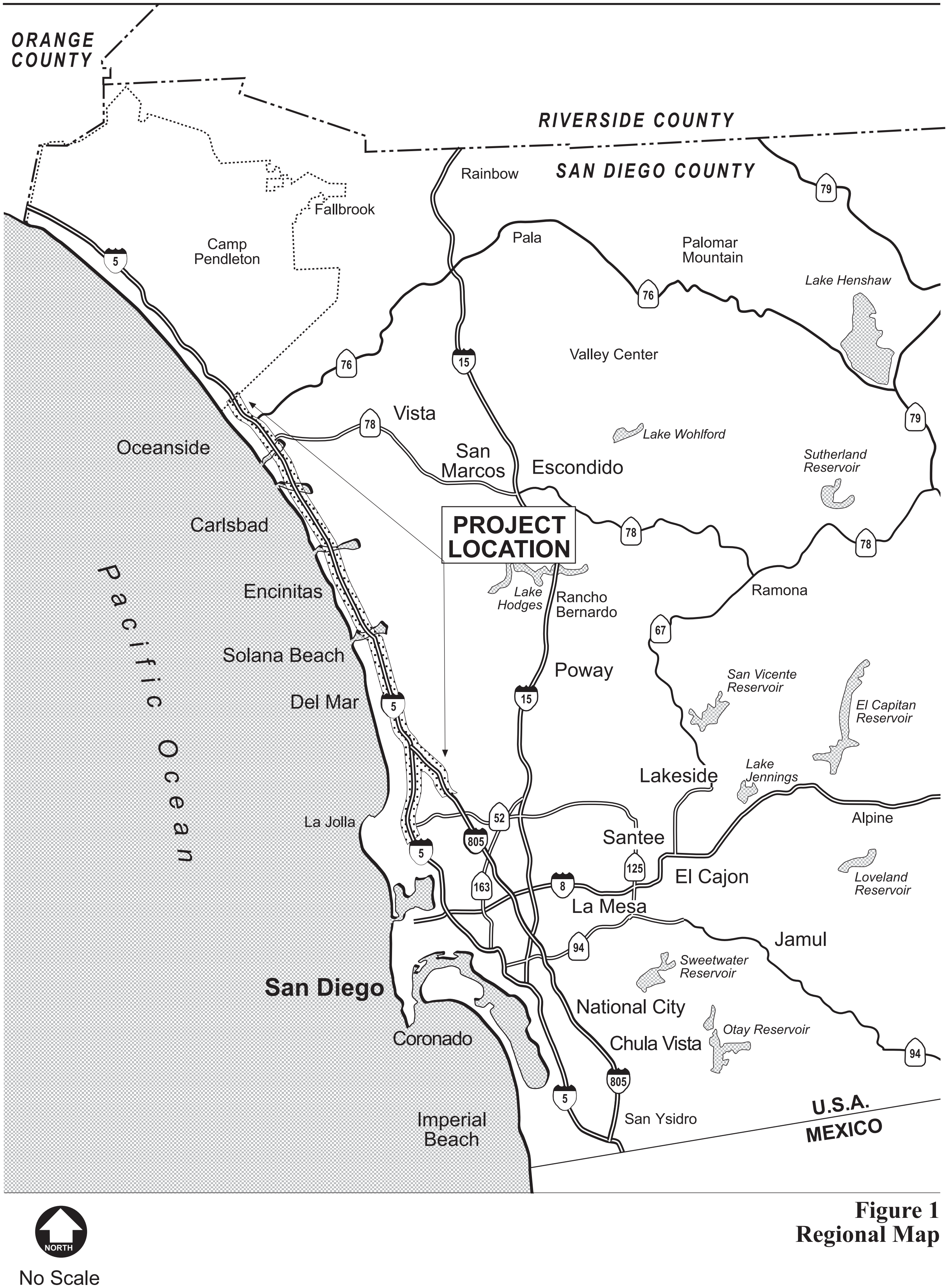

Figure 1
Regional Map

No Scale

Figure 2a
Project Location Map

No Scale

Figure 2b
Project Location Map

Figure 2c
Project Location Map

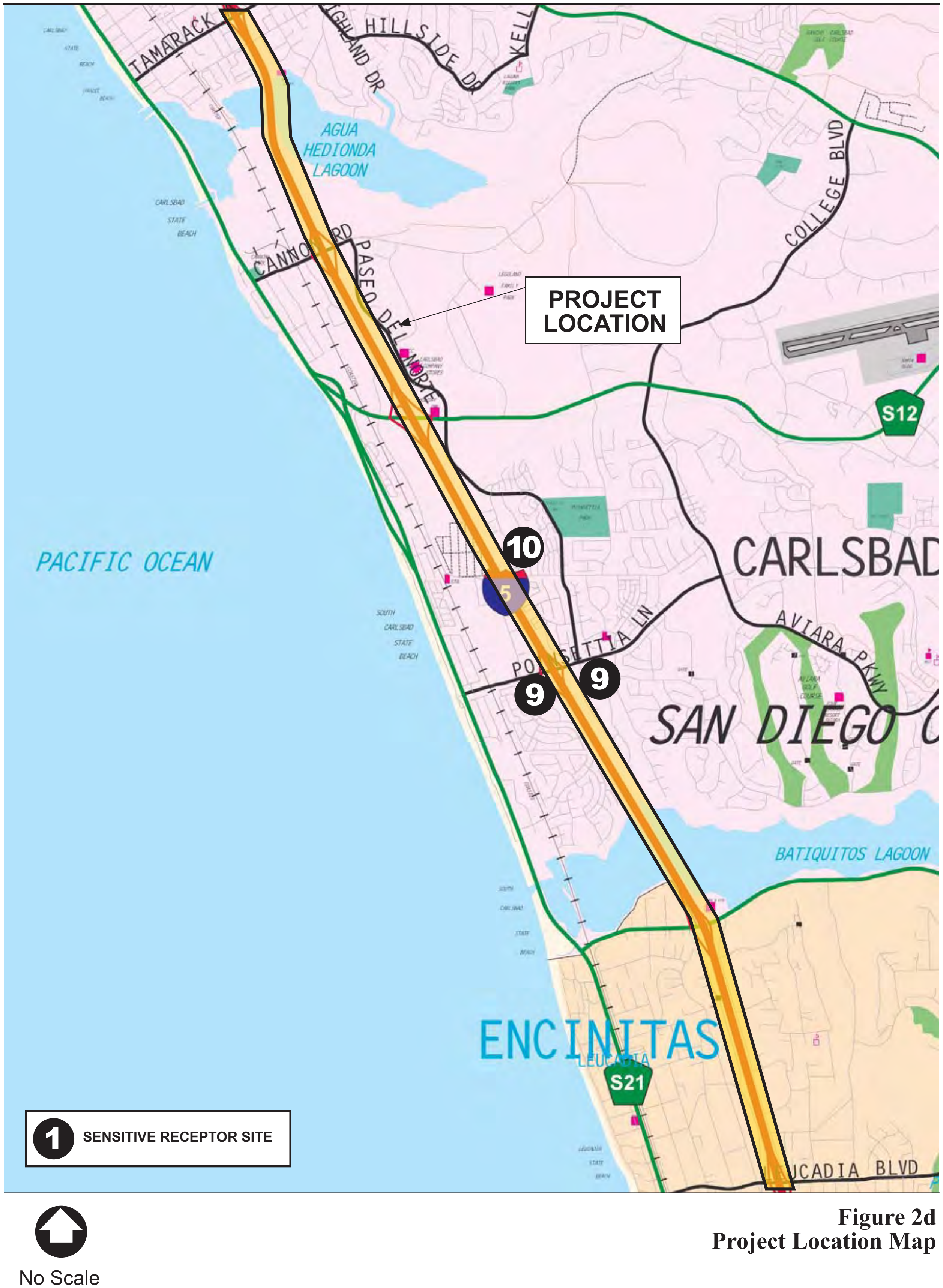

Figure 2d
Project Location Map

No Scale

Figure 2e
Project Location Map

The Clean Air Act requires a demonstration that federal actions conform to the SIP and similar approved plans in areas that are designated as nonattainment or have maintenance plans for criteria pollutants. Transportation measures, such as the proposed action, are analyzed for conformity as part of regional transportation plans (RTPs) and regional transportation improvement programs (RTIPs). Table 1 shows the status of the SIP in San Diego.

Table 1
Status of State Implementation Plan in San Diego

Pollutants	Status
Ozone (O_3)	In July 1997, the U.S. Environmental Protection Agency (USEPA) established a new federal 8-hour standard for ozone of 0.085 parts per million. USEPA designated 15 areas in California that violate the federal 8-hour ozone standard on April 15, 2004. Each nonattainment area's classification and attainment deadline is based on the severity of its ozone problem. San Diego's nonattainment areas deadline is 2009-2014.
Carbon Monoxide (CO)	On April 26, 1996, the California Air Resources Board (CARB) approved the "Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas" as part of the SIP for carbon monoxide. USEPA approved this revision on June 1, 1998, and redesignated San Diego to attainment. On October 22, 1998, CARB revised the State Implementation Plan (SIP) to incorporate the effects of the recent Board action to remove the wintertime oxygen requirement for gasoline in certain areas. On July 22, 2004, CARB approved an update to the SIP that shows how the 10 areas will maintain the standard through 2018, revises emission estimates, and establishes new on-road motor vehicle emission budgets for transportation conformity purposes.

Source: CARB 2007a

The metropolitan planning organization responsible for the preparation of RTPs and the associated air quality analyses is the San Diego Association of Governments (SANDAG). The proposed project is included in the current 2030 Revenue Constrained RTP (SANDAG 2006) and 2006 RTIP (SANDAG 2007), which have been found in conformance with the Clean Air Act. The U.S. Department of Transportation (USDOT) made a finding of conformity for the 2006 RTIP and a conformity redetermination for the 2030 RTP, 2006 Update (USDOT 2006). Therefore, the proposed project would conform with the SIP, and there would be no regional air quality impact.

Potential local air quality impact, which could result if the project were to cause severe congestion, will be analyzed as a subsequent subtask, following completion of the analysis of future traffic impact.

The proposed project would involve major construction. A discussion of construction emissions, potential impacts, and measures to avoid or minimize the impacts is included in this analysis. Recommended pollution abatement measures are included in the analysis. All Department standard specifications for construction mitigation, including measures in the SIP, air district rules, will be implemented.

1.3 PROJECT DESCRIPTION

Four build alternatives and one no-build alternative are under consideration. Common features to all four build alternatives include the construction of DARs at Voigt Drive, Manchester Avenue, Cannon Road, and Oceanside Boulevard. Auxiliary lanes would also be constructed in various locations along the corridor to facilitate traffic entering and exiting main travel lanes along the freeway. Freeway overcrossings and undercrossings would be widened. Reconfiguration of various interchanges to improve vehicular, pedestrian, and bicycle circulation would also occur. Bridges would be widened across the lagoons, and several bridges would also be lengthened. Other features, such as soundwalls, retaining walls, concrete barriers, guard rails/end treatments, crash cushions, bridge rails, drainage improvements, and signage, would also be installed at specific locations along the corridor. These alternatives are further described below.

Alternative 1 – 10 + 4 with Buffer

- Construct 4 HOV lanes on I-5 from south of San Elijo Lagoon in Encinitas to State Route 78 (SR 78) in Oceanside. Two HOV lanes would operate in each direction and would be separated from the GP lanes by a 1- to 4-foot buffer.

- Construct 4 HOV lanes on I-5 from SR 78 north to Harbor Drive/Vandegrift Boulevard in Oceanside. Two HOV lanes would operate in each direction and would be separated from GP lanes by a 1- to 4-foot buffer.

- Construct 2 HOV lanes on I-5 from Interstate 805 (I-805) in San Diego to south of San Elijo Lagoon in Encinitas. Two HOV lanes would operate in each direction and would be separated from GP lanes by striping from I-805 to north of Del Mar Heights Road. Two HOV lanes would operate in each direction and would be separated by a 3-foot buffer from north of Del Mar Heights Road to San Elijo Lagoon.

- Construct 2 HOV lanes on I-5 from north of La Jolla Village Drive to south of Sorrento Valley Road in San Diego. One HOV lane would operate in each direction and would be separated from GP lanes by striping.

- Construct a 2-lane HOV viaduct on I-5 from south of Sorrento Valley Road to I-805 in San Diego. One HOV lane would operate in each direction.

- Construct 2 GP lanes on I-5 from south of Via de la Valle in San Diego to SR 78 in Oceanside.

- Construct DARs on I-5 at four locations: Voigt Drive, north of Manchester Avenue, north of Cannon Road, and north of Oceanside Boulevard.

- Construct northbound and southbound auxiliary lanes in various locations.

Alternative 2 – 10 + 4 with Barrier

- The 10+4 "barrier" alternative proposes the same features as the 10+4 "buffer" alternative with the exception of a fixed concrete barrier in lieu of the buffer. Shoulders would also be provided adjacent to either side of the concrete barrier.

Alternative 3 – 8 + 4 with Buffer

- Construct 4 HOV lanes on I-5 from south of San Elijo Lagoon in Encinitas to SR 78 in Oceanside. Two HOV lanes would operate in each direction and would be separated from GP lanes by a 1- to 4-foot buffer.

- Construct 4 HOV lanes on I-5 from SR 78 to north of Harbor Drive/Vandegrift Boulevard in Oceanside. Two HOV lanes would operate in each direction and would be separated from GP lanes by a 1- to 4-foot buffer.

- Construct 2 HOV lanes on I-5 from I-805 in San Diego to south of San Elijo Lagoon. Two HOV lanes would operate in each direction and would be separated from GP lanes by striping from I-805 to north of Del Mar Heights Road. Two HOV lanes would operate in each direction and are separated from GP lanes by a 1- to 4-foot buffer from north of Del Mar Heights Road to San Elijo Lagoon.

- Construct 2 HOV lanes on I-5 from north of La Jolla Village Drive to south of Sorrento Valley Road in San Diego. One HOV lane would operate in each direction and would be separated from GP lanes by striping.

- Construct a 2-lane HOV viaduct on I-5 from south of Sorrento Valley Road to I-805. One HOV lane would operate in each direction.

- Construct DARs on I-5 at Voigt Drive, north of Manchester Avenue, north of Cannon Road, and north of Oceanside Boulevard.

- Construct northbound and southbound auxiliary lanes in various locations.

Alternative 4 – 8 + 4 with Barrier

- The 8+4 "barrier" alternative would function similarly to the 8+4 "buffer" alternative but would have a fixed concrete barrier in lieu of the buffer. Shoulders would be provided to either side of the concrete barrier.

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CHAPTER 2.0
AIR POLLUTANTS

“Air Pollution” is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. Individual air pollutants may adversely affect human or animal health, reduce visibility, damage property, and reduce the productivity or vigor of crops and natural vegetation.

Six air pollutants have been identified by the USEPA as being of concern nationwide: CO; O_3; nitrogen dioxide (NO_2); sulfur dioxide (SO_2); lead (Pb), and particulate matter (PM), which is subdivided into two classes based on particle size. These pollutants are collectively referred to as criteria pollutants. The sources of these pollutants, their effects on human health and the nation’s welfare, and their final deposition in the atmosphere vary considerably.

In the San Diego area, ambient concentrations of CO, O_3, and Pb are primarily influenced by motor vehicle activity. Emissions of sulfur oxides (SO_X) are associated mainly with various stationary sources. Emissions of nitrogen oxides (NO_X) and PM come from both mobile and stationary sources.

2.1 CARBON MONOXIDE (CO)

CO is a colorless and odorless gas that, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Relatively high concentrations are typically found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under the severest meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Overall, CO emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973. CO concentrations are typically higher in winter. As a result, California has required the use of oxygenated gasoline in the winter months to reduce CO emissions.

2.2 OZONE (O_3)

O_3 is the principal component of smog and is formed in the atmosphere through a series of reactions involving reactive organic gases (ROG) and NO_X in the presence of sunlight. ROG and NO_X are called precursors of O_3. NO_X includes various combinations of nitrogen and oxygen, including nitrogen oxide (NO), NO_2, NO_3, etc. O_3 is a principal cause of lung and eye irritation in the urban environment. Significant O_3 concentrations are normally produced only in the summer, when atmospheric inversions are greatest and temperatures are high. ROG and NO_X emissions are both considered critical in O_3 formation. Control strategies for O_3 have focused on reducing emissions from vehicles, industrial processes using solvents and coatings, and consumer products.

2.3 NITROGEN DIOXIDE (NO_2)

NO_2 is a product of combustion and is generated in vehicles and in stationary sources such as power plants and boilers. NO_2 can cause lung damage. As noted above, NO_2 is part of the NO_X family and is a principal contributor to O_3 and smog.

2.4 SULFUR DIOXIDE (SO_2)

SO_2 is a combustion product, with the primary source being power plants and heavy industries that use coal or oil as fuel. SO_2 is also a product of diesel engine combustion. The health effects of SO_2 include lung disease and breathing problems for asthmatics. SO_2 in the atmosphere contributes to the formation of acid rain. In the San Diego Air Basin (SDAB), there is relatively little use of coal and oil; therefore, SO_2 is of lesser concern than in many other parts of the country.

2.5 LEAD (Pb)

Pb is a stable compound that persists and accumulates both in the environment and in animals. Previously, the Pb used in gasoline anti-knock additives represented a major source of Pb emissions to the atmosphere. The USEPA began working to reduce Pb emissions soon after its inception, issuing the first reduction standards in l973, which called for a gradual phase-down of Pb to one-tenth of a gram per gallon by l986. The average Pb content in gasoline in 1973 was 2 to 3 grams per gallon or about 200,000 tons of Pb a year. In 1975, passenger cars and light trucks were manufactured with a more elaborate emission control system, which included a catalytic converter that required lead-free fuel. In l995 leaded fuel accounted for only 0.6 percent of total gasoline sales and less than 2,000 tons of Pb per year. Effective January 1, 1996, the Clean Air Act banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in on-road vehicles (USEPA 1996). Pb emissions have significantly decreased due to the near elimination of the use of leaded gasoline.

2.6 PARTICULATE MATTER (PM)

PM is a complex mixture of extremely small particles and liquid droplets. PM is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. Natural sources of particulates include windblown dust and ocean spray.

The size of PM is directly linked to the potential for causing health problems. The USEPA is concerned about particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. Health studies have shown a significant association between exposure to PM and premature death. Other important effects include aggravation of respiratory and cardiovascular disease, lung disease, decreased lung function, asthma attacks, and certain cardiovascular problems such as heart attacks and irregular heartbeat (USEPA 2007a). Individuals particularly sensitive to fine particle exposure include older adults, people with heart and lung disease, and children. The USEPA groups PM into two categories, $PM_{2.5}$ andPM_{10}, as described below.

Fine Particulate Matter ($PM_{2.5}$)

Fine particles, such as those found in smoke and haze, are 2.5 micrometers in diameter and smaller ($PM_{2.5}$). Sources of fine particles include all types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes. $PM_{2.5}$ is the major cause of reduced visibility (haze) in California. Control of $PM_{2.5}$ is primarily achieved through the regulation of emission sources, such as the USEPA's Clean Air Interstate Rule and Clean Air Visibility Rule for stationary sources; the 2004 Clean Air Nonroad Diesel Rule, the Tier 2 Vehicle Emission Standards, and Gasoline Sulfur Program; or the California Air Resources Board (CARB) Goods Movement reduction plan.

Inhalable Particulate Matter (PM_{10})

Inhalable particles (PM_{10}) include both fine and coarse dust particles; the fine particles are $PM_{2.5}$ as described above. Coarse particles, such as those found near roadways and dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter. Sources of coarse particles include crushing or grinding operations, and dust from paved or unpaved roads. The health effects of PM_{10} are similar to $PM_{2.5}$. Control of PM_{10} is primarily achieved through the control of dust at construction and industrial sites, the cleaning of paved roads, and the wetting or paving of frequently used unpaved roads.

The criteria pollutants that are most important for this air quality impact analysis are those that can be traced principally to motor vehicles and to earth-moving activities. Of these pollutants, CO, ROG, NO_X, and PM_{10} are evaluated on a regional or "mesoscale" basis. CO is often analyzed on a localized or "microscale" basis in cases of congested traffic conditions. Although PM_{10} has very localized effects, there is no USEPA-approved methodology to evaluate microscale impacts of PM_{10}. Methods for analysis of $PM_{2.5}$ are anticipated within the next few years, as implementation of the new standard progresses.

2.7 DIESEL EXHAUST PARTICULATE

In 1999, the CARB identified particulate emissions from diesel-fueled engines as a Toxic Air Contaminant (TAC). Once a substance is identified as a TAC, the CARB is required by law to determine if there is a need for further control. This is referred to as risk management (CARB 2001). The process of further studies is ongoing at the CARB, with committees meeting to analyze both stationary and mobile diesel engine sources, as well as many other aspects of the problem. On September 28, 2000, the CARB approved the *Proposed Diesel Risk Reduction Plan and the Proposed Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines*. CARB programs in progress relating to truck emissions are included in the following paragraphs. There are other programs for risk reduction for off-road diesel engines.

In February 2001, the USEPA issued new rules requiring cleaner diesel fuels in 2006 and beyond. However, since 1993 California's regulations have required cleaner diesel fuel than the federal requirements. The 1993 federal regulations reduced particulate emissions by 5 percent, while the California regulations reduced particulate emissions by 25 percent.

The control of emissions from mobile sources is a statewide responsibility of the CARB that has not been delegated to the local air districts. However, the San Diego Air Pollution Control District (SDAPCD) is participating in the administration programs to reduce diesel emissions, principally by procurement and use of replacement vehicles powered by natural gas.

No standards exist for quantitative impact analysis for diesel particulates. Some air districts have issued preliminary project guidance for projects with large or concentrated numbers of trucks, such as warehouses and distribution facilities.

2.8 ASBESTOS

The Clean Air Act requires the USEPA to develop and enforce regulations to protect the general public from exposure to airborne contaminants that are known to be hazardous to human health. In accordance with Clean Air Act Section 112, the USEPA established National Emissions Standards for Hazardous Air Pollutants (NESHAP) to protect the public. Asbestos was one of the first hazardous air pollutants regulated under this section. On March 31, 1971, the USEPA identified asbestos as a hazardous pollutant, and on April 6, 1973, first promulgated the asbestos NESHAP in 40 CFR 61. In 1990, a revised NESHAP regulation was promulgated by the USEPA.

The asbestos NESHAP regulations protect the public by minimizing the release of asbestos fibers during activities involving the processing, handling, and disposal of asbestos-containing material. Accordingly, the asbestos NESHAP specifies work practices to be followed during demolitions and renovations of all structures, installations, and buildings (excluding residential buildings that have four or fewer dwelling units). In addition, the regulations require the project applicant to notify applicable state and local agencies and/or USEPA regional offices before all demolitions or before construction that contains a certain threshold amount of asbestos.

Naturally Occurring Asbestos (NOA) -bearing Serpentine

Serpentine is a mineral commonly found in seismically active regions of California, usually in association with ultramafic rocks and along associated faults. Certain types of serpentine occur naturally in a fibrous form known generically as asbestos. Asbestos is a known carcinogen and inhalation of asbestos may result in the development of lung cancer or mesothelioma. The CARB has regulated the amount of asbestos in crushed serpentinite used in surfacing applications, such as for gravel on unpaved roads, since 1990. In 1998, new concerns were raised about health hazards from activities that disturb asbestos-bearing rocks and soil. In response, the CARB revised their asbestos limit for crushed serpentines and ultramafic rock in surfacing applications from 5 percent to less than 0.25 percent, and adopted a new rule requiring best practices dust control measures for activities that disturb rock and soil containing NOA (CDC 2000a).

According to the report *A General Location Guide for Ultramafic Rocks in California-Area Likely to Contain Naturally Occurring Asbestos* (CDC 2000b), the coastal portion of San Diego County NOA is not typically found in the geological formations present on the proposed project site (CDC 2000a, b). Thus, hazardous exposure to asbestos-containing serpentine materials would not be a concern with the proposed project.

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CHAPTER 3.0
APPLICABLE STANDARDS

3.1 FEDERAL AND STATE STANDARDS

The Clean Air Act (42 USC §§ 7401-7671q) requires the adoption of National Ambient Air Quality Standards (NAAQS) to protect the public health and welfare from the effects of air pollution. The NAAQS have been updated as needed. Current standards are set for SO_2, CO, NO_2, O_3, PM_{10}, $PM_{2.5}$, and Pb.[1] The CARB has established the California Ambient Air Quality Standard (CAAQS), which are generally more restrictive than the NAAQS. Federal and state standards are shown in Table 2.

3.2 REGIONAL AUTHORITY

In San Diego County, the SDAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies. Included in the SDAPCD's tasks are monitoring of air pollution, preparation of the SIP for the SDAB, and promulgation of Rules and Regulations. The SIP includes strategies and tactics to be used to attain the federal O_3 standard in the county. The SIP elements are taken from the Regional Air Quality Strategy, the SDAPCD plan for attaining the state O_3 standard. The state standard for O_3 is more stringent than the federal standard. The Rules and Regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts.

The SDAPCD does not have quantitative emissions limits for construction activities, nor for long-term emissions that may result from increased vehicle use.

One SDAPCD rule is noted with respect to the proposed project:

- SDAPCD Rule 51, Nuisance, prohibits emissions that cause injury, detriment, nuisance, or annoyance to the public.

[1] The standards for $PM_{2.5}$ and 8-hour O_3 were published in 1997. Subsequent litigation delayed implementation, although 8-hour O_3 averages are being calculated and $PM_{2.5}$ monitoring networks are in place and growing. A federal appeals court decision on March 26, 2002, appears to have removed the last hurdles to implementation by the USEPA.

Table 2
National and California Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3]	**Secondary[4]**	**Concentration[5]**
Ozone (O_3)[6]	1-Hour	-	Same as Primary Standard	0.09 ppm (180 $\mu g/m^3$)
	8-Hour	0.08 ppm (157 $\mu g/m^3$)		0.070 ppm (137 $\mu g/m^3$) [9]
Carbon Monoxide (CO)	8-Hour	9 ppm (10 mg/m^3)	None	9.0 ppm (10 mg/m^3)
	1-Hour	35 ppm (40 mg/m^3)		20 ppm (23 mg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 $\mu g/m^3$)	Same as Primary Standard	0.030 ppm (56 $\mu g/m^3$)[10]
	1-Hour	-		0.18 ppm (338$\mu g/m^3$)[10]
Sulfur Dioxide (SO_2)	Annual Average	0.03 ppm (80 $\mu g/m^3$)	-	-
	24-Hour	0.14 ppm (365 $\mu g/m^3$)	-	0.04 ppm (105 $\mu g/m^3$)
	3-Hour	-	0.5 ppm (1300 $\mu g/m^3$)	-
	1-Hour	-	-	0.25 ppm (655 $\mu g/m^3$)
Suspended Particulate Matter (PM_{10})[7]	24-Hour	150 $\mu g/m^3$	Same as Primary Standard	50 $\mu g/m^3$
	Annual Arithmetic Mean	Revoked		20 $\mu g/m^3$
Fine Particulate Matter ($PM_{2.5}$)[8]	24-Hour	35 $\mu g/m^3$	Same as Primary Standard	-
	Annual Arithmetic Mean	15 $\mu g/m^3$		12 $\mu g/m^3$
Lead (Pb)	30-Day Average	-	-	1.5 $\mu g/m^3$
	Calendar Quarter	1.5 $\mu g/m^3$	Same as Primary Standard	-
Hydrogen Sulfide (H_2S)	1-Hour	No Federal Standards		0.03 ppm (42 $\mu g/m^3$)
Sulfates (SO_4)	24-Hour			25 $\mu g/m^3$
Visibility Reducing Particles	8-Hour (10 am to 6 pm, Pacific Standard Time)			In sufficient amount to produce an extinction coefficient of 0.23 per km due to particles when the relative humidity is less than 70 percent.
Vinyl chloride[9]	24 Hour			0.01 ppm (26 $\mu g/m^3$)

1 NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the USEPA for further clarification and current federal policies.

2 California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

3 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

4 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

5 Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

6 On June 15, 2005 the 1-hour ozone standard was revoked for all areas except the 8-hour ozone nonattainment Early Action Compact Areas (those areas do not yet have an effective date for their 8-hour designations). Additional information on federal ozone standards is available at http://www.epa.gov/oar/oaqps/greenbk/index.html.

7 Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the USEPA revoked the annual PM_{10} standard on December 17, 2006.

8 Effective, December 17, 2006, the USEPA lowered the $PM_{2.5}$ 24-hour standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$.

9 The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

10 The nitrogen dioxide ambient air quality standard was amended on February 22, 2007, to lower the 1-hr standard to 0.18 ppm and establish a new annual standard of 0.030 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter
Source: USEPA 2007b; CARB 2007b.

The project is required to comply with this rule, and conformance will be incorporated into project specifications and procedures.

3.3 CONFORMITY OF FEDERAL ACTIONS

Section 176(c) of the Clean Air Act requires

> No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan after it has been approved ...
>
> Conformity to an implementation plan means
>
> (A) conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and
>
> (B) that such activities will not
>
> (i) cause or contribute to any new violation of any standard in any area;
> (ii) increase the frequency or severity of any existing violation of any standard in any area; or
> (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.
>
> The determination of conformity shall be based on the most recent estimates of emissions, and such estimates shall be determined from the most recent population, employment, travel and congestion estimates as determined by the metropolitan planning organization or other agency authorized to make such estimates.

In November 1993, the USDOT and USEPA developed guidance for determining conformity of transportation plans, programs, and projects. This guidance is denoted as the Transportation Conformity Rule (40 CFR §§ 51.390-464 and 40 CFR §§ 93.100-136).

The metropolitan planning organization responsible for the preparation of RTPs and the associated air quality analyses is SANDAG. The most current approved versions of the plans are the 2030 Revenue Constrained RTP: 2006 Update (SANDAG 2006) (2030 RTP – 2006 Update) and 2006 RTIP, as amended (SANDAG 2007). The USDOT made a finding of conformity for the 2006 RTIP and a conformity redetermination for the 2030 RTP – 2006 Update on October 6, 2006. The project is identified in the 2006 RTIP in Chapter 3, on page 26, as Interstate 5 – HOV Managed Lanes (MPO ID: CAL09) with the following description: "From San Diego to Oceanside – construct HOV/Managed Lanes" (SANDAG 2007). The 2006 RTIP was approved on October 2, 2006, by the USDOT and has been amended six times since this approval. Table 3 below provides a summary of the amendment date and the federal and state approval dates. This project is included in Amendment 2, which revised project funding. Federal Regional Surface Transportation Program (RSTP) funds were added. None of the other amendments modified the project, CAL09, as described in the 2006 RTIP. A detailed discussion of the project as described in the 2030 RTP – 2006 Update and the 2006 RTIP is provided in Chapter 5.0.

Table 3
RTIP Conformity Dates

Amendment Number and Date	Reviewing Agency	Approval Date
Amendment No. 1 October 27, 2006	Department	November 9, 2006
	USDOT	December 1, 2006
Amendment No. 2 January 19, 2007	Department	February 8, 2007
	USDOT	March 2, 2007
Amendment No. 3 March 23, 2007	Department	April 17, 2007
	USDOT	May 3, 2007
Amendment No. 4 April 20, 2007	Department	April 27, 2007
	USDOT	May 9, 2007
Amendment No. 5 May 4, 2007	Department	May 14, 2007
	USDOT	June 5, 2007
Amendment No. 6 July 20, 2007	Department	July 25, 2007
	USDOT	Pending

Source: SANDAG 2007

CHAPTER 4.0
EXISTING CONDITIONS

4.1 ENVIRONMENTAL SETTING, CLIMATE AND METEOROLOGY

The project is located in the SDAB, which is coincident with San Diego County. The climate of San Diego County is characterized by warm, dry summers and mild, wet winters. One of the main determinants of the climatology is a semipermanent high-pressure area (the Pacific High) in the eastern Pacific Ocean. In the summer, this pressure center is located well to the north, causing storm tracks to be directed north of California. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the region, causing widespread precipitation. In San Diego County, the months of heaviest precipitation are November through April, averaging about 9 to 14 inches annually. The mean temperature is 62.2 degrees Fahrenheit (°F) and the mean maximum and mean minimum temperatures are 75.7°F and 48.5°F, respectively.

The Pacific High also influences the wind patterns of California. The predominant wind directions are westerly and west-southwesterly during all four seasons, and the average annual wind speed is 5.6 miles per hour (mph).

A common atmospheric condition known as a temperature inversion affects air quality in San Diego. During an inversion, air temperatures get warmer rather than cooler with increasing height. Subsidence inversions occur during the warmer months (May through October) as descending air associated with the Pacific High comes into contact with cooler marine air. The boundary between the layers of air represents a temperature inversion that traps pollutants below it. The inversion layer is approximately 2,000 feet above mean sea level (AMSL) during the months of May through October. However, during the remaining months (November through April), the temperature inversion is approximately 3,000 feet AMSL. Inversion layers are important elements of local air quality because they inhibit the dispersion of pollutants, thus resulting in a temporary degradation of air quality.

4.2 REGIONAL AND LOCAL AIR QUALITY

Specific geographic areas are classified as either "attainment" or "nonattainment" areas for each pollutant based on the comparison of measured data with federal and state standards. If an area is redesignated from nonattainment to attainment, the Clean Air Act requires a revision to the SIP, called a maintenance plan, to demonstrate how the air quality standard will be maintained for at least 10 years. The Transportation Conformity Rule, 51 CFR 390-464, classifies an area required to develop a maintenance plan as a maintenance area.

The SDAB currently meets the federal standards for all criteria pollutants except O_3 and meets state standards for all criteria pollutants except O_3, $PM_{2.5}$, and PM_{10}. San Diego County completed 3 years within the federal 1-hour O_3 standard on November 15, 2001, becoming eligible for redesignation as an attainment area. Formal redesignation by the USEPA as an O_3 attainment area occurred on July 28, 2003, and a maintenance plan was approved. On April 15, 2004, the USEPA issued the initial designations for the 8-hour O_3 standard, and the SDAB is classified as "basic" nonattainment (USEPA 2007c). Basic is the least severe of the six degrees of O_3 nonattainment. The SDAPCD must submit an air quality plan to the USEPA in 2007; the plan must demonstrate how the 8-hour O_3 standard will be attained by 2009 (SDAPCD 2004). The SIP was approved by the CARB on May 24, 2007, and forwarded to the USEPA. The SDAB currently falls under a federal "maintenance plan" for CO, following a 1998 redesignation as a CO attainment area.

The SDAB is currently classified as a state "serious" O_3 nonattainment area and a state nonattainment area for $PM_{2.5}$ and PM_{10} (CARB 2006).

Ambient air pollutant concentrations in the SDAB are measured at 10 air quality monitoring stations operated by the SDAPCD. The SDAPCD air quality monitoring station that represents the project area, climate, and topography in the SDAB is the Del Mar-Mira Costa College monitoring station, located at 215 Ninth Street, Del Mar, approximately 0.5 mile east of I-5 in Del Mar. The station monitors O_3. As this station only records O_3, information from the 12th Avenue monitoring station was used because it is the nearest station that monitors the other pollutants. The 12th Avenue monitoring station was used because it is the nearest station that monitors all of the following pollutants: CO, SO_2, NO_2, O_3, PM_{10}, and $PM_{2.5}$. The 12st Avenue monitoring station was moved to 1110A Beardsley Street, San Diego, in July 2005. Thus, 2006 data were taken from the Beardsley Street monitoring station. Table 4 summarizes the excesses of standards and the highest pollutant levels recorded at this station for the years 2004 to 2006.

Table 4
Ambient Air Quality Summary

Pollutant Standards	2004	2005	2006
Ozone (O_3) Del Mar-Mira Costa College			
Maximum 1-hour concentration (ppm)	0.129	0.082	0.086
Maximum 8-hour concentration (ppm)	0.095	0.070	0.074
Number of Days Standard Exceeded			
NAAQS 1-hour (>0.12 ppm)	1	0	0
CAAQS 1-hour (>0.09 ppm)	3	0	0
NAAQS 8-hour (>0.08 ppm)	3	0	0
Carbon Monoxide (CO) San Diego-12th Avenue			
Maximum 8-hour concentration (ppm)	4.04	4.71	3.27
Maximum 1-hour concentration (ppm)	6.3	5.3	5.3
Number of Days Standard Exceeded			
NAAQS 8-hour (≥9 ppm)	0	0	0
CAAQS 8-hour (≥9.0 ppm)	0	0	0
NAAQS 1-hour (≥35 ppm)	0	0	0
CAAQS 1-hour (≥20 ppm)	0	0	0
Particulate Matter (PM_{10})[a] San Diego-12th Avenue			
National maximum 24-hour concentration (μg/m^3)	68.0	76.0	71.0
National second highest 24-hour concentration (μg/m^3)	65.0	48.0	69.0
State maximum 24-hour concentration (μg/m^3)	71.0	79.0	74.0
State second highest 24-hour concentration (μg/m^3)	68.0	49.0	71.0
National[b] annual average concentration (μg/m^3)	33.2	21.2	33.6
State[c] annual average concentration (μg/m^3)	34.5	*	34.4
Number of Days Standard Exceeded			
NAAQS 24-hour (>150 μg/m^3)[d]	0	0	0
CAAQS 24-hour (>50 μg/m^3)[d]	9	1	64.5
Particulate Matter ($PM_{2.5}$) San Diego-12th Avenue			
Maximum 24-hour concentration (μg/m^3)	42.9	32.3	63.3
Second highest 24-hour concentration (μg/m^3)	42.3	28.6	47.7
National[b] annual average concentration (μg/m^3)	13.8	*	13.1
State[c] annual average concentration (μg/m^3)	*	*	13.1
Number of Days Standard Exceeded			
NAAQS 24-hour (>65 μg/m^3)	0	2	0
Nitrogen Dioxide (NO_X) San Diego-12th Avenue			
Maximum 1-hour concentration (ppm)	0.094	0.091	0.094
Annual Average (ppm)	0.020	*	0.021
Number of Days Standard Exceeded			
CAAQS 1-hour	0	0	0
Sulfur Dioxide (SO_X) San Diego-12th Avenue			
Maximum 24-hour concentration (ppm)	0.008	0.007	0.009
Annual Average (ppm)	0.004	0.002	0.004
Number of Days Standard Exceeded			
NAAQS 24-hour	0	0	0
CAAQS 24-hour	0	0	0

Notes:
* There were insufficient (or no) data available to determine the value.
[a] Measurements usually collected every 6 days.
[b] National annual average based on arithmetic mean.
[c] State annual average based on geometric mean.
[d] Based on an estimate of how many days concentrations would have been greater than the standard.
Sources: CARB 2007d; SDAPCD 2007

4.3 ROADWAYS AND TRAFFIC

The primary roadway of concern would be I-5. I-5, within the project alignment, is an eight-lane freeway, with four lanes in the northbound direction and four lanes in the southbound direction. I-5 is divided into 16 segments within the project area by the Department's Traffic and Vehicle Data Systems Unit, which conducts traffic counts with California on all interstate freeways and state routes. The annual average daily traffic (AADT) for each segment ranges from 130,000 vehicles, at Palomar Airport Road, to 267,000 vehicles, at Del Mar Heights Road (Department 2007).

CHAPTER 5.0
FUTURE AIR QUALITY AND IMPACTS

5.1 OPERATIONS EMISSIONS

Regional Air Quality

As previously indicated, the I-5 North Coast Project is included in SANDAG's 2030 RTP – 2006 Update and 2006 RTIP, as amended. The project is identified in the 2006 RTIP in Chapter 3, on page 26, as the Interstate 5 – HOV Managed Lanes (MPO ID: CAL09) with the following description: "From San Diego to Oceanside – construct HOV/Managed Lanes" (SANDAG 2007). The 2006 RTIP was approved on October 6, 2006, by the USDOT and has been amended six times since this approval. Table 3 of this report provides a summary of the amendment date and the federal and state approval dates. This project is included in Amendment 2, which revised project funding. Federal RSTP funds were added. None of the amendments modified the project, CAL09, as described in the 2006 RTIP.

On February 24, 2006, the SANDAG Board adopted the 2030 Revenue Constrained RTP: 2006 Update and its air quality conformity. The USDOT issued its conformity finding on March 29, 2006. On August 4, 2006, the SANDAG Board adopted the 2006 RTIP. On October 6, 2006, the USDOT made a finding of conformity for the 2006 RTIP and a conformity redetermination for the 2030 RTP – 2006 Update.

The proposed alternatives are included under three scenarios in Appendix A, The Plans, of the 2030 RTP. Appendix A of the 2030 RTP contains the projects included in the air quality analysis (SANDAG 2004). In Table A.1, on page 171, the project is included as part of a project to improve I-5, between SR 56 and Vandegrift Boulevard, from 8 GP lanes to 8 GP lanes with 4 managed lanes. Managed lanes include HOV lanes and Value Pricing lanes (SANDAG 2004). In Table A.5, on page 181, the project is included as parts of two projects, with the first improving I-5, between SR 56 and Leucadia Boulevard, from 8 GP lanes to 10 GP lanes with 4 managed lanes, and the second improving I-5, between Leucadia Boulevard and Vandegrift Boulevard, from 8 GP lanes to 8 GP lanes with 4 managed lanes (SANDAG 2004). In Table A.10, the project is included as portions of two projects, with the first improving I-5, between SR 56 and Palomar Airport Road, from 8 GP lanes to 10 GP lanes with 4 managed lanes, and the second improving I-5, between Palomar Airport Road and SR 76, from 8 GP lanes to 8 GP lanes with 4 managed lanes (SANDAG 2004).

As shown, the proposed project is included in SANDAG's 2006 RTIP, as amended, and SANDAG's 2030 RTP – 2006 Update. Both of these documents and the related conformity determinations have been approved by the USDOT. Further, the design and scope of the project are consistent with the design concept and scope of the project in the latest Metropolitan Planning Organization (MPO) transportation plan and program that has conformity determination by Federal Highway Administration (FHWA) and Federal Transportation Administration. Therefore, the proposed project conforms to the regional air quality plans. As such, no additional transportation conformity analysis is needed unless the scope of the project changes significantly.

<u>Local Air Quality</u>

Carbon Monoxide

The Transportation Conformity Rules require a statement that

> federal projects must not cause or contribute to any new localized CO violations or increase the frequency or severity of any existing CO violations in CO nonattainment and maintenance areas.

The CO portion of the requirement applies to the proposed project because the SDAB is a federal CO maintenance area. The air quality analyses of projects included in the RTP and RTIP do not include the analyses of local CO impacts; these must be addressed on a project level.

Procedures and guidelines for use in evaluating the potential local level CO impacts of a project are contained in Transportation Project-Level Carbon Monoxide Protocol (the Protocol) (UCD ITS 1997). The Protocol provides a methodology for determining the level of analysis, if any, required on a project. On April 1, 2003, the USEPA approved EMFAC 2002 for use in the State of California (USEPA 2003). Since June 30, 2003, the Department, through a notice on its website, has required the use of EMFAC 2002 for use in all CO Hot Spot Analysis in new projects, which require their approval (Department 2003). The guidelines comply with the Clean Air Act, federal and state conformity rules, the National Environmental Policy Act (NEPA), and the California Environmental Quality Act.

The SDAB was redesignated as a CO attainment area subsequent to the passage of the 1990 Clean Air Act amendments. Continued attainment has been verified with the SDAPCD. In areas meeting those conditions, in accordance with the Protocol, only projects that are likely to worsen air quality necessitate further analysis. Projects that worsen air quality are defined as those that substantially increase the percentage of vehicles in cold start mode, defined as an increase in the number of vehicles operating in cold start mode of 2 percent or more; those that substantially increase traffic volumes, defined as an increase in volume in excess of 5 percent; and those that worsen traffic flow, defined for intersections as increasing average delay at signalized intersections operating at level of service (LOS) E or F.

These criteria were evaluated for all intersections within the I-5 North Coast Project area. Based on this evaluation, three intersections were chosen that represent, from an air quality standpoint, the highest potential locations for adverse concentrations of CO: Palomar Airport Road and I-5 access ramps, Genesee Avenue and I-5 access ramps, and Del Mar Heights Road and I-5 access ramps. In consultation with the Department, it has been determined that these intersections have the highest volumes, with poor traffic flow, and the greatest potential delay time during peak traffic commuting hours. Table 5 provides a summary of the intersection operation for each of these intersections. According to the traffic information provided by the Department, while some other intersections in the area may also be operating at LOS E or F, they would operate more efficiently than the selected intersections with the proposed project than without, i.e., less delay time at intersections, which would represent a decrease in the potential for harmful build-up of CO at project intersections.

Table 5
Intersection Operation Summary

Intersection	Existing				2030 No Build				2030 10+4 w/ DAR				2015 10+4 w/ DAR			
	AM		PM		AM		PM		AM		PM		AM		PM	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
I-5 SB ramps / Palomar Airport Road	C	27.3	B	10.9	F	84.4	F	95.2	C	21.3	B	18.1	B	19.1	B	15.9
I-5 NB ramps / Palomar Airport Road	E	68.2	D	50.3	F	98.5	F	233.9	F	99.5	F	269.9	F	85.2	F	210.3
I-5 SB ramps / Genesee Ave	F	81.9	E	58.4	F	112.4	F	227.5	F	99.3	F	219.9	F	87.5	E	70.0
I-5 NB ramps / Genesee Ave	F	135.5	E	65.0	F	140.1	F	153.2	F	214.3	F	127.5	D	40.0	F	97.7
I-5 SB ramps / Del Mar Heights Road	B	10.9	B	15.4	B	15.4	B	13.3	B	13.0	B	12.4	B	16.6	B	11.1
I-5 NB ramps / Del Mar Heights Road	C	31.3	D	41.8	E	72.0	E	74.3	E	70.9	F	83.8	E	56.1	E	63.9

Note: delay in units of seconds
Source: Wilson and Company; Technical Report No. 6 (March, 2007)

The proposed project would not generate traffic but would accommodate future traffic volumes by providing increased efficiency via expanded capacity. Therefore, it may be presumed that the project would not measurably increase traffic volume or the percentage of vehicles in cold start mode. Thus, the number of vehicles operating in cold start mode and the potential increase in traffic volumes were not considered further in this analysis.

In addition to intersection operations, traffic volumes, and cold start modes, air pollutant impacts are related directly to the location of sensitive receptors relative to the subject intersection. The nearest sensitive receptors to the intersections of Palomar Airport Road and I-5 access ramps, Genesee Avenue and I-5 access ramps, and Del Mar Heights Road and I-5 access ramps are people walking along sidewalks in the project area. For purposes of this analysis, the receptors are located on the sidewalks. The nearest residential receptors are located approximately 130 feet southwest of the intersection of Del Mar Heights Road and I-5. No existing residential sensitive receptors are located nearer than 300 feet of the intersection of Genesee Avenue and I-5 or Palomar Airport Road and I-5.

As required by the CO Protocol, a detailed CO Concentration Analysis was conducted for the intersections of Palomar Airport Road and I-5 access ramps, Genesee Avenue and I-5 access ramps, and Del Mar Heights Road and I-5 access ramps for the existing (2005) condition; the 10+4 with direct access ramps Alternative for 2015 and 2030; and the 2030 No Build Alternative. CO impacts were modeled under worst-case wind angle conditions at 5 feet from the roadway edge as public sidewalks occur along all existing roadways, and concentrations at these locations would represent the greatest concentrations of CO due to limited dispersion area. Several other assumptions were developed to perform the CO screening analysis, which include:

- I-5 access ramp cruise speeds at the intersections are 25 mph.
- Cruise speeds for all west to east vehicles are 40 mph.
- I-5 access ramps experience 50 to 70 percent of the red light time depending on time of day and the intersection.
- Roadway geometrics for I-5 access ramps and all west to east roadways under all alternatives are based on project alternatives described in Technical Report #6, Freeway Interchanges Operations Report (Department 2007).
- The ambient 1-hour CO concentration is 5.3 parts per million (ppm), which is the highest concentration at the Beardsley Street Air Quality Monitoring Station for 2006.

- The mean low temperature is 44°F, which occurs in January in the County of San Diego.
- The mixing height for winter in the project area is 1,000 feet.
- The elevation of the alignment is approximately 62 feet AMSL at Palomar Airport Road, 245 feet AMSL at Del Mar Heights Road, and 250 feet AMSL at Genesee Avenue.

Based on these assumptions and the traffic volumes provided by the Department, the CO analysis did indicate that the proposed project future traffic conditions would slightly increase CO levels at nearby sensitive receptors or areas immediately adjacent to the intersections. CO concentration levels due to the proposed project are presented in Table 5, and CO analysis calculations are provided in Appendix A.

As indicated in Table 6, the federal and state 1-hour CO standards are 35 ppm and 20 ppm, respectively; the federal 8-hour standard is 9 ppm and the state standard is 9.0 ppm. As shown in Table 6, the proposed project's future traffic conditions would not lead to any exceedances of these thresholds during the AM or PM peak periods at any of the analyzed intersections. All other intersections in the project area are predicted to experience less delay time and improved operating conditions. Therefore, the proposed project would not result in or contribute to any significant local air quality impacts due to future operations.

$PM_{2.5}$ and PM_{10}

$PM_{2.5}$ and PM_{10} hot spot analysis is required by the USEPA Transportation Conformity Rule (40 CFR 93.116 and 40 CFR 93.123) in order to determine project-level Conformity in $PM_{2.5}$ or PM_{10} nonattainment or maintenance areas.

As previously stated in Section 3.3, the SDAB is not federally designated as a $PM_{2.5}$ or PM_{10} nonattainment or maintenance area; thus, the project does not require a $PM_{2.5}$ or PM_{10} conformity analysis.

Table 6
Estimated CO Concentrations
(ppm)

Intersection	Existing		2030 No Build		2015 10+4 w/ DAR		2030 10+4 w/ DAR	
	AM	PM	AM	PM	AM	PM	AM	PM
1-Hour CO Concentrations								
Palomar Airport Road and I-5 access ramps	11.1	10.8	6.6	7.0	7.7	8.2	6.6	7.1
Genesee Avenue and I-5 access ramps	12.1	13.2	6.5	6.7	7.3	7.0	6.5	6.7
Del Mar Heights Road and I-5 access ramps	10.2	11.3	6.7	6.8	7.5	7.9	6.4	6.8
Federal standard	35							
State standard	20							
8-Hour Concentrations								
Palomar Airport Road and I-5 access ramps	7.8	7.6	4.6	4.9	5.4	5.7	4.6	5.0
Genesee Avenue and I-5 access ramps	7.8	8.7	4.6	4.7	5.1	4.9	4.6	4.7
Del Mar Heights Road and I-5 access ramps	7.1	7.9	4.7	4.8	5.3	5.5	4.5	4.8
Federal standard	9							
State standard	9.0							

Notes:
Ambient 1-hour concentrations are based on maximum CO levels for the Beardsley Street Monitoring Station.
Eight-hour concentrations are estimated from 1-hour concentrations using an urban location persistence factor of 0.7.

Mobile Source Air Toxics

The following discussion is based on the FHWA Memorandum, Subject: INFORMATION: Interim Guidance on Air Toxic Analysis in NEPA Documents, dated February 3, 2006. The purpose of the guidance is to advise when and how to analyze Mobile Source Air Toxics (MSATs) in the NEPA process for highways. This guidance is interim, because MSAT science is still evolving. As the science progresses, the FHWA will update the guidance.

The USEPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The USEPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act.

In its rule, the USEPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, the FHWA projects that even with a 64 percent increase in vehicle miles traveled, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent and will reduce on-highway diesel PM emissions by 87 percent.

As a result, the USEPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of Clean Air Act Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary 6 MSATs.

Unavailable Information for Project-Specific MSAT Impact Analysis

This air quality analysis includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with implementation of the proposed project. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information.

Unavailable or Incomplete Information

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling to estimate ambient concentrations resulting from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

- **Emissions.** The USEPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE 6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE 6.2 is a trip-based model; emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE 6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE 6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects and cannot adequately capture emissions effects of smaller projects.[2] For PM, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE 6.2 for both PM and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, the USEPA has identified problems with MOBILE 6.2 as an obstacle to quantitative analysis.

  These deficiencies compromise the capability of MOBILE 6.2 to estimate MSAT emissions. MOBILE 6.2 is an adequate tool for projecting emissions trends and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

- **Dispersion.** The tools to predict how MSATs disperse are also limited. The USEPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more

[2] For purposes of MSAT discussion, smaller projects are those with average daily traffic volumes of less than 140,000.

than a decade ago for the purpose of predicting episodic concentrations of CO to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The National Cooperative Highway Research Program is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, the FHWA is also faced with a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

- **Exposure Levels and Health Effects.** Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, there are various studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of USEPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

The USEPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The USEPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from the USEPA's IRIS database and represents its most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.

- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.

- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.

- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.

- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- **Diesel exhaust** is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

- **Diesel exhaust** also represents chronic respiratory effects, possibly the primary noncancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a nonprofit organization funded by the USEPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes—particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based Upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from the proposed project and MSAT concentrations or exposures created by the project emissions cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

The impact evaluation below provides a qualitative assessment of MSAT emissions and acknowledges that the proposed project may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain. Because of this uncertainty, the health effects from these emissions cannot be estimated.

Evaluation of Project MSAT Potential

The FHWA has developed a tiered approach for analyzing MSATs in NEPA documents. Depending on the specific project circumstances, the FHWA has identified three levels of analysis:

- No analysis for projects with no potential for meaningful MSAT effects, Category 1;

- Qualitative analysis for projects with low potential MSAT effects, Category 2; or

- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects, Category 3.

Category 1 includes projects that:

- qualify as a categorical exclusion under 23 CFR 771.117(c);
- are exempt under the Clean Air Act conformity rule under 40 CFR 93.126; or
- have no meaningful impacts on traffic volumes or vehicle mix.

The proposed I-5 North Coast Project does not meet the Category 1 requirements.

Category 2 projects includes those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase emissions. Category 2 projects include a broad range of projects and most highway projects will fall into this category. Any projects not meeting the threshold criteria for Category 3 projects, described in the following discussion and not meeting the criteria for Category 1 projects, should be considered Category 2 projects. Examples of these types of projects are minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street or where design year traffic is not projected to meet or exceed 140,000 to 150,000 AADT.

Category 3 is intended for projects that have the potential for meaningful differences among project alternatives. Category 3 projects should be more rigorously assessed for impacts. The assessment would include a quantitative analysis that would attempt to measure the level of emissions for the six priority MSATs for each alternative, to use as a basis of comparison. This analysis should also address the potential for cumulative impacts, where appropriate, based on local conditions. A project that would have higher potential for MSAT effects, i.e., Category 3, is a project that would:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location; or

- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT volume is projected to be in the range of 140,000 to 150,000, or greater, by the design year;

And also:

- Be proposed to be located in proximity to populated areas, or in rural areas, in proximity to concentrations of vulnerable populations (i.e., schools, nursing homes, hospitals).

The maximum design year (2030) AADT volume for I-5 between Vandegrift Boulevard/Harbor Drive and Genesee Avenue without the project would range between 196,000 AADT and 409,000 AADT (Wilson 2006). While new capacity would be facilitated with the same portion of the I-5 North Coast Project, the estimated maximum design year (2030) AADT volume between 196,000 and 409,000 vehicles would exceed the FHWA threshold of 140,000 AADT as the minimum volume for higher potential Category 3 MSAT effects (FHWA 2006). Therefore, the project would be considered a Category 3 project with a high potential for MSAT effects. The proposed project is a Category 3 project, that is, a quantitative analysis may be required to differentiate which alternative would have a higher potential MSAT effect.

Evaluation of Project MSAT Impacts

This is provided separately in the Mobile Source Air Toxics Analysis report by Caltrans District 11.

5.2 CONSTRUCTION IMPACTS

The principal criteria pollutants emitted during construction would be PM_{10} and $PM_{2.5}$. The source of the pollutants would be fugitive[3] dust created during clearing, grubbing, excavation, and grading; demolition of structures and pavement; vehicle travel on paved and unpaved roads; and material blown from unprotected graded areas, stockpiles, and haul trucks. Generally, the distance that particles drift from their source depends on their size, emission height, and wind speed. About 50 percent of fugitive dust is made up of relatively large particles, greater than 100 microns in diameter. These particles are responsible for the reduced visibility often associated with construction, as well as the nuisance caused by the deposition of dust on vehicles, and in exterior areas used by people for recreation and business. Given their relatively large size, these

[3] “Fugitive” is a term used in air quality analysis to denote emission sources that are not confined to stacks, vents, or similar paths.

particles tend to settle within 20 to 30 feet of their source. Small particles, less than 100 microns in diameter, can travel nearly 330 feet before settling to the ground, depending on wind speed. These smaller particles also contribute to visibility and nuisance impacts, and include PM_{10} and $PM_{2.5}$, which are potential health hazards.

A secondary source of pollutants during construction would be the engine exhaust from construction equipment. The principal pollutants of concern would be NO_X, ROG, and volatile organic compounds (VOC) emissions that would contribute to the formation of O_3, which is a regional nonattainment pollutant.

Potential construction air quality impacts would result from construction activities associated with segment widening and mainline bridge construction, and overcrossing/undercrossing construction. For the purpose of this construction analysis, modeling was based on two scenarios: (1) one included widening and modification of a mainline bridge, which would be similar to what would be required for an overcrossing/undercrossing; and (2) one included widening of a 1.3-mile-long roadway segment from 8 lanes to 15 lanes (8 GP, 3 auxiliary, and 4 HOV lanes). The use of barriers or buffers in the final design would have little or no effect on anticipated construction emissions. A detailed inventory of construction equipment used for the proposed project was not available due to the early stage of design; therefore, this analysis is based on default construction equipment assumptions developed for the Road Construction Model from other road construction and improvement projects.

Construction emissions for the 8+4 and 10+4 scenarios are estimated by using the Road Construction Model, version 5.1. 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 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.

The mainline bridge scenario was based on a 10+4 alternative, which consisted of adding new roads to the existing 8-lane bridge by adding 4 HOV lanes (2 in each direction) and adding 2 auxiliary lanes (1 in each direction). Construction activity associated with the mainline bridge widening and improvement scenario would be similar to the construction requirements anticipated for an overcrossing/undercrossing widening and improvement. This mainline bridge scenario is based on the bridge over the Agua Hedionda Lagoon and represents a conservative estimate of the construction requirements for other bridges and overcrossings/undercrossings in the project area. Construction was assumed to begin in mid-2006 and would last for 1 year. The construction model assumes an 8-hour workday. The project length was estimated at 191 feet with a width of 165 feet. The total project area for the bridge is 4.3 acres and 1 acre is the maximum area disturbed per day. The 4.3-acre area includes the bridge, abutments, and associated roadway improvements. No soil import or export was assumed.

The roadway widening was also based on a 10+4 alternative, which consists of adding new roadway lanes to the existing 8-lane freeway by adding 4 HOV lanes (2 in each direction) and adding 1 auxiliary lane in the northbound direction and 2 auxiliary lanes in the southbound direction. As this scenario includes 15 lanes, it represents the greatest increase in roadway within the proposed project; thus, this analysis represents a conservative estimate for other roadway widening segments in the project. Construction was assumed to begin December 2008 and all phases would require less than 3 years to complete. The construction model assumes an 8-hour workday. The total project area for the road widening is 28 acres and 4.6 acres is the maximum area disturbed per day. Based on similar roadway-widening project, it was assumed that 4,000 cubic yards per day of base material would be imported.

Typically, there are four activities associated with road construction: (1) grubbing/land clearing, (2) grading/excavation, (3) drainage/utilities/sub-grade, and (4) paving. The road construction model was used to estimate construction-related ROG, VOC, NO_X, and PM_{10} emissions and the results for the mainline bridge scenario are shown in Table 7 and the results for the roadway-widening scenario in Table 8. Details of the construction-related emission calculations are included as Appendix B.

Table 7
Construction Emission Estimates for the Mainline Bridge (tons/year)

Construction Phase	VOC	NO_X	CO	PM_{10}
Grubbing/Land Clearing	0.1	0.6	0.7	0.3
Grading/Excavation	1.2	9.6	11.2	1.8
Drainage/Utilities/Sub-Grade	0.4	2.0	2.3	1.0
Paving	0.1	0.4	0.7	0.0
Total of Construction Phases	1.8	12.6	14.9	3.1
De Minimis Limit	100	100	100	100

Source: Road Construction Model Version 5.1
Note: PM_{10} estimates assume 50% control of fugitive dust from watering and associated dust control measures.

Table 8
Construction Emission Estimates for the Roadway-Widening (tons/year)

Construction Phase	VOC	NO_X	CO	PM_{10}
Grubbing/Land Clearing	0.1	0.5	0.6	0.1
Grading/Excavation	1.2	2.5	3.0	0.4
Drainage/Utilities/Sub-Grade	0.4	1.8	2.0	0.3
Paving	0.1	0.3	0.4	0.0
Total of Construction Phases	1.8	5.1	6.0	0.8
De Minimis Limit	100	100	100	100

Source: Road Construction Model Version 5.1
Note: PM_{10} estimates assume 50% control of fugitive dust from watering and associated dust control measures.

Construction emissions are assessed against the general conformity *de minimis* emission limits used to determine conformity with existing air quality plans. The *de minimis* limit for CO in an area under a maintenance plan is 100 tons per year. The *de minimis* limits for Basic O_3 (8-hour) nonattainment are 100 tons per year for both NO_X and VOC. The federal *de minimis* limit for PM_{10} nonattainment is 100 tons per year. Although the SDAB is not a federal nonattainment area for PM_{10}, it is a state nonattainment area. Therefore, use of this limit would represent a conservative threshold.

As shown in Tables 7 and 8, construction-related emissions for a both scenarios would be below the *de minimis* limits. Table 9 shows the total construction-related emissions for the roadway widening and mainline bridge constructed simultaneously would be below the *de minimis* limits. Approximately 6.6 miles of road and bridge construction could work simultaneously in the region before exceeding the *de minimis* limit. Constructing 6.6 miles of bridges and roadway widening represents a conservative estimate. It is highly unlikely that 6.6 miles of construction would occur because of road closure affecting daily traffic on I-5. Therefore, construction activities limited to approximately 6.6 miles of construction of roadway widening and bridge working simultaneously in the region would not have a significant impact on air quality.

While no significant construction-related impacts to air quality have been identified, it is recommended that the proposed project implement the following measures to control dust and comply with SDAPCD Rule 51 and California Specification Section 10: Dust Control (Department 1999):

Table 9
Total Construction Emission Estimates for the Roadway-Widening and Mainline Bridge (tons/year)

Construction Phase	VOC	NO_X	CO	PM_{10}
Grubbing/Land Clearing	0.2	1.1	1.3	0.4
Grading/Excavation	1.7	12.1	14.2	2.2
Drainage/Utilities/Sub-Grade	0.7	3.8	4.3	1.3
Paving	0.1	0.7	1.1	0.1
Total of Construction Phases	2.7	17.7	20.9	4.0
De Minimis Limit	100	100	100	100

Source: Road Construction Model Version 5.1
Note: PM_{10} estimates assume 50% control of fugitive dust from watering and associated dust control measures.

SDAPCD Rule 51

- Minimize land disturbance.
- Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas.
- Suspend grading and earth moving when wind gusts exceed 25 mph unless the soil is wet enough to prevent dust plumes.
- Cover trucks when hauling loose material.
- Stabilize the surface of materials stockpiles if not removed immediately.
- Limit vehicular paths on unpaved surfaces and stabilize any temporary roads.
- Minimize unnecessary vehicular and machinery activities.
- Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway.
- Revegetate disturbed land, including vehicular paths created during construction to avoid future off-road vehicular activities.
- Locate construction equipment and truck staging and maintenance areas as far as feasible and nominally downwind of schools, active recreation areas, and other areas of high population density.

Diesel Particulate Emissions

Diesel particulate emissions are of concern, as described in Section 2.7 of this report. While there is no formal guidance for impact analysis, potential adverse impacts would be increased if construction equipment and truck staging areas were to be located near schools, active recreation areas, or areas of higher population density. Thus, a measure to reduce this potential impact has been identified in Chapter 6.0.

5.3 CUMULATIVE IMPACTS

The analysis of project impacts to regional air quality, as performed by SANDAG and the SDAPCD in conjunction with the 2030 RTP – 2006 Update and 2006 RTIP as amended process, is a cumulative analysis. The proposed project would conform to the conformity analyses for the 2030 RTP – 2006 Update (SANDAG 2006) and 2006 RTIP, as amended (SANDAG 2007), which are long-range planning documents that include roadway projects throughout the region. Therefore the project would not result in a cumulative impact to air quality.

CHAPTER 6.0
POLLUTION ABATEMENT MEASURES

It is recommended that the following measures be incorporated into the project to minimize the emission of fugitive dust, PM_{10}, and $PM_{2.5}$:

<u>SDAPCD Rule 51</u>

- Minimize land disturbance.
- Use watering trucks to minimize dust; watering should be sufficient to confine dust plumes to the project work areas.
- Suspend grading and earth moving when wind gusts exceed 25 mph unless the soil is wet enough to prevent dust plumes.
- Cover trucks when hauling dirt.
- Stabilize the surface of dirt piles if not removed immediately.
- Limit vehicular paths on unpaved surfaces and stabilize any temporary roads.
- Minimize unnecessary vehicular and machinery activities.
- Sweep paved streets at least once per day where there is evidence of dirt that has been carried on to the roadway.
- Revegetate disturbed land, including vehicular paths created during construction to avoid future off-road vehicular activities.
- Remove unused material.

It is recommended that the following measure be incorporated into the project to minimize exposure to diesel particulate emissions.

Caltrans Specification Section 10: Dust Control

- Locate construction equipment and truck staging and maintenance areas as far as feasible and nominally downwind of schools, active recreation areas, and other areas of high population density.

CHAPTER 7.0
REFERENCES

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APPENDIX A

CALINE4 MODEL OUTPUT SHEETS

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT:

I. SITE VARIABLES

U= .5 M/S   Z0= 100. CM   ALT= 0. (FT)
BRG= WORST CASE   VD= .0 CM/S
CLAS= 7 (G)   VS= .0 CM/S
MIXH= 1000. M   AMB= 5.0 PPM
SIGTH= 5. DEGREES   TEMP= 44.0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	1600	12.5	.0	44.0
B. Link_9	*****	*****	*****	*****	AG	1600	12.5	.0	44.0
C. Link_10	*****	*****	*****	*****	AG	1100	7.1	.0	44.0
D. Link_11	*****	*****	*****	*****	AG	1100	7.1	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	1986	11.1	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	2312	5.1	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	2272	5.3	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	3446	5.6	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	2300	12.7	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	2300	12.7	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	752	6.9	.0	56.0
L. Link_23	*****	*****	*****	*****	AG	1062	5.1	.0	56.0
M. Link_25	*****	*****	*****	*****	AG	280	5.1	.0	44.0
N. Link_26	*****	*****	*****	*****	AG	280	5.1	.0	44.0
O. Link_18	*****	*****	*****	*****	AG	326	5.9	.0	44.0
P. Link_19	*****	*****	*****	*****	AG	326	5.9	.0	44.0
Q. Link_28	*****	*****	*****	*****	AG	2272	10.2	.0	56.0
R. Link_29	*****	*****	*****	*****	AG	2312	9.4	.0	56.0

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT:

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	74.	9.0	.0	.0	.0	.0	.0	.2	.0	.2
2. Rcpt_2	324.	9.1	.0	.0	.0	.0	.0	.0	.7	.0
3. Rcpt_3	73.	11.1	.0	.0	.0	.0	.0	.2	.1	.3
4. Rcpt_4	60.	8.2	.2	.0	.0	.0	.6	.3	1.1	.1
5. Rcpt_5	331.	9.6	1.3	.9	.0	.7	.0	.4	.0	.0
6. Rcpt_6	254.	9.9	.0	.0	.0	.4	.0	.1	.1	.2
7. Rcpt_7	172.	9.1	1.2	.0	.3	.5	1.3	.0	.0	.0
8. Rcpt_8	76.	9.8	1.3	.0	.0	.0	2.8	.0	.0	.6

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT:

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.0	.0	1.0	2.3
2. Rcpt_2	.0	2.5	.0	.0	.0	.0	.0	.0	.0	.8
3. Rcpt_3	.0	1.9	.0	.0	.0	.0	.0	.0	.9	2.5
4. Rcpt_4	.0	.0	.0	.0	.1	.0	.0	.0	.6	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	1.4	.0
6. Rcpt_6	.0	.3	.0	.0	.0	.0	.0	.0	2.9	.7
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.7	.0
8. Rcpt_8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	0. (FT)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	5.3 PPM		
SIGTH=	5. DEGREES	TEMP=	44.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	1250	11.7	.0	44.0
B. Link_9	*****	*****	*****	*****	AG	1250	11.7	.0	44.0
C. Link_10	*****	*****	*****	*****	AG	1800	7.1	.0	44.0
D. Link_11	*****	*****	*****	*****	AG	1800	7.1	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	2573	12.7	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	1346	5.1	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	1785	5.2	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	2462	5.1	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	1250	10.6	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	1250	10.6	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	1235	7.3	.0	56.0
L. Link_23	*****	*****	*****	*****	AG	1156	5.1	.0	56.0
M. Link_25	*****	*****	*****	*****	AG	340	5.1	.0	44.0
N. Link_26	*****	*****	*****	*****	AG	340	5.1	.0	44.0
O. Link_18	*****	*****	*****	*****	AG	1350	5.9	.0	44.0
P. Link_19	*****	*****	*****	*****	AG	1350	5.9	.0	44.0
Q. Link_28	*****	*****	*****	*****	AG	1785	10.2	.0	56.0
R. Link_29	*****	*****	*****	*****	AG	2696	9.4	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	75.	9.3	.0	.0	.0	.2	.0	.0	.0	.1
2. Rcpt_2	60.	8.5	.1	.0	.0	.0	1.0	.2	1.0	.1
3. Rcpt_3	73.	10.4	.0	.0	.0	.1	.0	.1	.0	.2
4. Rcpt_4	60.	8.4	.1	.0	.0	.0	.8	.2	.9	.0
5. Rcpt_5	332.	9.3	1.0	.6	.0	1.1	.0	.2	.0	.0
6. Rcpt_6	254.	9.7	.0	.0	.0	.6	.0	.0	.1	.1
7. Rcpt_7	170.	10.0	.8	.0	.4	.9	1.9	.0	.0	.0
8. Rcpt_8	75.	10.8	1.0	.0	.0	.0	4.2	.0	.0	.4

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.0	.0	.9	2.7
2. Rcpt_2	.0	.0	.0	.0	.0	.0	.0	.0	.8	.0
3. Rcpt_3	.0	.9	.0	.0	.0	.0	.0	.0	.8	2.9
4. Rcpt_4	.0	.0	.2	.0	.2	.0	.0	.0	.5	.1
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	1.1	.0
6. Rcpt_6	.0	.2	.0	.0	.0	.0	.0	.0	2.3	.8
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.5	.0
8. Rcpt_8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

```
     U=    .5 M/S            Z0= 100. CM           ALT=     0. (FT)
   BRG= WORST CASE           VD=    .0 CM/S
  CLAS=     7 (G)            VS=    .0 CM/S
  MIXH= 1000. M             AMB=   5.3 PPM
 SIGTH=    5. DEGREES      TEMP= 44.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	1251	3.2	.0	44.0
B. Link_9	*****	*****	*****	*****	AG	1251	3.2	.0	44.0
C. Link_10	*****	*****	*****	*****	AG	2118	5.1	.0	44.0
D. Link_11	*****	*****	*****	*****	AG	2118	5.1	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	2022	2.5	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	2002	2.5	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	1770	2.4	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	2889	2.5	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	2619	5.1	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	2619	5.1	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	819	3.2	.0	56.0
L. Link_23	*****	*****	*****	*****	AG	1085	2.4	.0	56.0
M. Link_25	*****	*****	*****	*****	AG	289	2.4	.0	44.0
N. Link_26	*****	*****	*****	*****	AG	289	2.4	.0	44.0
O. Link_18	*****	*****	*****	*****	AG	0	.0	.0	44.0
P. Link_19	*****	*****	*****	*****	AG	0	.0	.0	44.0
Q. Link_28	*****	*****	*****	*****	AG	1770	3.8	.0	56.0
R. Link_29	*****	*****	*****	*****	AG	2002	3.4	.0	56.0

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	325.	7.1	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	324.	6.9	.0	.0	.0	.0	.0	.0	.3	.0
3. Rcpt_3	72.	7.6	.0	.0	.0	.1	.0	.1	.0	.1
4. Rcpt_4	358.	6.7	.0	.0	.0	.0	.0	.0	.0	.0
5. Rcpt_5	332.	7.2	.3	.2	.0	.9	.0	.2	.0	.0
6. Rcpt_6	254.	7.3	.0	.0	.0	.5	.0	.0	.0	.0
7. Rcpt_7	168.	7.2	.2	.0	.3	.9	.3	.0	.0	.0
8. Rcpt_8	143.	6.7	.0	.0	.0	.8	.0	.3	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R
1. Rcpt_1	*	.0	1.8	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	*	.0	1.1	.0	.0	.0	.0	.0	.0	.0	.3
3. Rcpt_3	*	.0	.9	.0	.0	.0	.0	.0	.0	.3	.8
4. Rcpt_4	*	.4	.6	.2	.1	.0	.0	.0	.0	.0	.0
5. Rcpt_5	*	.0	.0	.0	.0	.0	.0	.0	.0	.4	.0
6. Rcpt_6	*	.0	.1	.0	.0	.0	.0	.0	.0	.9	.2
7. Rcpt_7	*	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
8. Rcpt_8	*	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0

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          CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
                   JUNE 1989 VERSION
                   PAGE   1

              JOB: C:\Documents and Settings\MadduxB\My Doc
              RUN: CALINE4 RUN      (WORST CASE ANGLE)
        POLLUTANT: Carbon Monoxide


  I.  SITE VARIABLES

       U=    .5 M/S             Z0= 100. CM            ALT=     0. (FT)
     BRG= WORST CASE            VD=   .0 CM/S
    CLAS=     7 (G)             VS=   .0 CM/S
    MIXH= 1000. M              AMB=  5.3 PPM
   SIGTH=    5. DEGREES       TEMP= 44.0 DEGREE (C)


 II.  LINK VARIABLES

      LINK      *  LINK COORDINATES (FT)  *             EF     H     W
   DESCRIPTION  *   X1    Y1    X2    Y2  * TYPE  VPH  (G/MI)  (FT)  (FT)
----------------*-------------------------*------------------------------
A. Link_8       * ***** ***** ***** ***** *  AG   2252   3.4     .0  44.0
B. Link_9       * ***** ***** ***** ***** *  AG   2252   3.4     .0  44.0
C. Link_10      * ***** ***** ***** ***** *  AG   2211   5.1     .0  44.0
D. Link_11      * ***** ***** ***** ***** *  AG   2211   5.1     .0  44.0
E. Link_13      * ***** ***** ***** ***** *  AG   3570   5.1     .0  56.0
F. Link_14      * ***** ***** ***** ***** *  AG   2288   2.5     .0  56.0
G. Link_15      * ***** ***** ***** ***** *  AG   1822   2.4     .0  56.0
H. Link_16      * ***** ***** ***** ***** *  AG   2731   2.5     .0  56.0
I. Link_17      * ***** ***** ***** ***** *  AG   1719   3.8     .0  44.0
J. Link_20      * ***** ***** ***** ***** *  AG   1719   3.8     .0  44.0
K. Link_21      * ***** ***** ***** ***** *  AG   1450   3.3     .0  56.0
L. Link_23      * ***** ***** ***** ***** *  AG   2010   2.4     .0  56.0
M. Link_25      * ***** ***** ***** ***** *  AG    362   2.4     .0  44.0
N. Link_26      * ***** ***** ***** ***** *  AG    362   2.4     .0  44.0
O. Link_18      * ***** ***** ***** ***** *  AG      0    .0     .0  44.0
P. Link_19      * ***** ***** ***** ***** *  AG      0    .0     .0  44.0
Q. Link_28      * ***** ***** ***** ***** *  AG   1822   3.8     .0  56.0
R. Link_29      * ***** ***** ***** ***** *  AG   2288   3.6     .0  56.0
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CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	72.	6.9	.0	.0	.0	.1	.0	.2	.0	.2
2. Rcpt_2	60.	6.8	.0	.0	.0	.0	.5	.1	.5	.0
3. Rcpt_3	71.	7.4	.0	.0	.0	.0	.1	.2	.0	.2
4. Rcpt_4	60.	6.8	.0	.0	.0	.0	.4	.2	.4	.0
5. Rcpt_5	332.	7.6	.5	.3	.0	1.0	.0	.2	.0	.0
6. Rcpt_6	253.	7.3	.0	.0	.0	.5	.0	.0	.0	.0
7. Rcpt_7	168.	8.2	.4	.0	.3	.9	1.1	.0	.0	.0
8. Rcpt_8	75.	8.2	.5	.0	.0	.0	2.2	.0	.0	.2

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.0	.0	.2	.8
2. Rcpt_2	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0
3. Rcpt_3	.0	.4	.0	.0	.0	.0	.0	.0	.2	.9
4. Rcpt_4	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	.4	.0
6. Rcpt_6	.0	.0	.0	.0	.0	.0	.0	.0	.9	.3
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
8. Rcpt_8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

```
    U=    .5 M/S            Z0= 100. CM            ALT=     0. (FT)
  BRG= WORST CASE           VD=    .0 CM/S
 CLAS=     7 (G)            VS=    .0 CM/S
 MIXH= 1000. M             AMB=   5.3 PPM
SIGTH=    5. DEGREES      TEMP=  44.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	1400	1.6	.0	44.0
B. Link_9	*****	*****	*****	*****	AG	1400	1.6	.0	44.0
C. Link_10	*****	*****	*****	*****	AG	2290	2.3	.0	44.0
D. Link_11	*****	*****	*****	*****	AG	2290	2.3	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	3650	2.1	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	2250	1.2	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	2410	1.3	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	4020	1.3	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	2700	2.3	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	2700	2.3	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	810	1.5	.0	56.0
L. Link_23	*****	*****	*****	*****	AG	1400	1.2	.0	56.0
M. Link_25	*****	*****	*****	*****	AG	350	1.2	.0	44.0
N. Link_26	*****	*****	*****	*****	AG	350	1.2	.0	44.0
O. Link_18	*****	*****	*****	*****	AG	0	.0	.0	44.0
P. Link_19	*****	*****	*****	*****	AG	0	.0	.0	44.0
Q. Link_28	*****	*****	*****	*****	AG	2410	2.0	.0	56.0
R. Link_29	*****	*****	*****	*****	AG	2250	1.9	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	74.	6.2	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	60.	6.1	.0	.0	.0	.0	.2	.0	.3	.0
3. Rcpt_3	72.	6.6	.0	.0	.0	.0	.0	.0	.0	.0
4. Rcpt_4	61.	6.1	.0	.0	.0	.0	.2	.0	.3	.0
5. Rcpt_5	53.	6.5	.0	.0	.0	.3	.3	.0	.0	.6
6. Rcpt_6	254.	6.5	.0	.0	.0	.2	.0	.0	.0	.0
7. Rcpt_7	168.	6.6	.1	.0	.2	.4	.5	.0	.0	.0
8. Rcpt_8	76.	6.5	.1	.0	.0	.0	.9	.0	.0	.2

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

	CONC/LINK (PPM)									
RECEPTOR	I	J	K	L	M	N	O	P	Q	R
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.0	.0	.2	.5
2. Rcpt_2	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
3. Rcpt_3	.0	.4	.0	.0	.0	.0	.0	.0	.2	.5
4. Rcpt_4	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	.0	.0	.0	.0	.0	.0	.0	.0	.6	.1
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0
8. Rcpt_8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= 5.3 PPM	
SIGTH= 5. DEGREES	TEMP= 44.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	2440	1.6	.0	44.0
B. Link_9	*****	*****	*****	*****	AG	2440	1.6	.0	44.0
C. Link_10	*****	*****	*****	*****	AG	2200	2.3	.0	44.0
D. Link_11	*****	*****	*****	*****	AG	2200	2.3	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	5080	2.3	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	2980	1.2	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	2380	1.3	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	3590	1.3	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	1750	2.1	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	1750	2.1	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	1430	1.6	.0	56.0
L. Link_23	*****	*****	*****	*****	AG	1330	1.2	.0	56.0
M. Link_25	*****	*****	*****	*****	AG	450	1.2	.0	44.0
N. Link_26	*****	*****	*****	*****	AG	450	1.2	.0	44.0
O. Link_18	*****	*****	*****	*****	AG	0	.0	.0	44.0
P. Link_19	*****	*****	*****	*****	AG	0	.0	.0	44.0
Q. Link_28	*****	*****	*****	*****	AG	2380	2.0	.0	56.0
R. Link_29	*****	*****	*****	*****	AG	2980	1.9	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	74.	6.3	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	60.	6.2	.0	.0	.0	.0	.3	.0	.3	.0
3. Rcpt_3	72.	6.6	.0	.0	.0	.0	.0	.0	.0	.0
4. Rcpt_4	60.	6.2	.0	.0	.0	.0	.2	.0	.3	.0
5. Rcpt_5	52.	6.5	.0	.0	.0	.3	.4	.0	.0	.5
6. Rcpt_6	254.	6.5	.0	.0	.0	.2	.0	.0	.0	.0
7. Rcpt_7	168.	6.9	.2	.0	.1	.4	.7	.0	.0	.0
8. Rcpt_8	75.	7.0	.3	.0	.0	.0	1.3	.0	.0	.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.0	.0	.2	.6
2. Rcpt_2	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
3. Rcpt_3	.0	.2	.0	.0	.0	.0	.0	.0	.2	.6
4. Rcpt_4	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	.0	.0	.0	.0	.0	.0	.0	.0	.6	.2
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0
8. Rcpt_8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= 5.3 PPM	
SIGTH= 5. DEGREES	TEMP= 44.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	1750	1.6	.0	44.0
B. Link_9	*****	*****	*****	*****	AG	1750	1.6	.0	44.0
C. Link_10	*****	*****	*****	*****	AG	2300	2.3	.0	44.0
D. Link_11	*****	*****	*****	*****	AG	2300	2.3	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	3850	2.1	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	2800	1.2	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	2440	1.3	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	4040	1.3	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	2900	2.3	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	2900	2.3	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	840	1.5	.0	56.0
L. Link_23	*****	*****	*****	*****	AG	1500	1.2	.0	56.0
M. Link_25	*****	*****	*****	*****	AG	400	1.2	.0	44.0
N. Link_26	*****	*****	*****	*****	AG	400	1.2	.0	44.0
O. Link_18	*****	*****	*****	*****	AG	0	.0	.0	44.0
P. Link_19	*****	*****	*****	*****	AG	0	.0	.0	44.0
Q. Link_28	*****	*****	*****	*****	AG	2440	2.0	.0	56.0
R. Link_29	*****	*****	*****	*****	AG	2800	1.2	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	325.	6.2	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	60.	6.2	.0	.0	.0	.0	.2	.0	.3	.0
3. Rcpt_3	72.	6.5	.0	.0	.0	.0	.0	.0	.0	.0
4. Rcpt_4	61.	6.1	.0	.0	.0	.0	.2	.0	.3	.0
5. Rcpt_5	53.	6.5	.0	.0	.0	.3	.3	.0	.0	.6
6. Rcpt_6	254.	6.5	.0	.0	.0	.2	.0	.0	.0	.0
7. Rcpt_7	168.	6.6	.1	.0	.2	.4	.5	.0	.0	.0
8. Rcpt_8	76.	6.6	.2	.0	.0	.0	.9	.0	.0	.2

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R
1. Rcpt_1	.0	.8	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
3. Rcpt_3	.0	.4	.0	.0	.0	.0	.0	.0	.2	.4
4. Rcpt_4	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	.0	.0	.0	.0	.0	.0	.0	.0	.6	.1
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0
8. Rcpt_8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= 5.3 PPM	
SIGTH= 5. DEGREES	TEMP= 44.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	2520	1.6	.0	44.0
B. Link_9	*****	*****	*****	*****	AG	2520	1.6	.0	44.0
C. Link_10	*****	*****	*****	*****	AG	2400	2.3	.0	44.0
D. Link_11	*****	*****	*****	*****	AG	2400	2.3	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	5250	2.3	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	3200	1.3	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	2520	1.2	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	3820	1.3	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	1900	2.1	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	1900	2.1	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	1600	1.6	.0	56.0
L. Link_23	*****	*****	*****	*****	AG	2780	1.6	.0	56.0
M. Link_25	*****	*****	*****	*****	AG	500	1.2	.0	44.0
N. Link_26	*****	*****	*****	*****	AG	500	1.2	.0	44.0
O. Link_18	*****	*****	*****	*****	AG	0	.0	.0	44.0
P. Link_19	*****	*****	*****	*****	AG	0	.0	.0	44.0
Q. Link_28	*****	*****	*****	*****	AG	2520	2.0	.0	56.0
R. Link_29	*****	*****	*****	*****	AG	3200	1.8	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	73.	6.3	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	60.	6.2	.0	.0	.0	.0	.3	.0	.3	.0
3. Rcpt_3	72.	6.6	.0	.0	.0	.0	.0	.0	.0	.0
4. Rcpt_4	60.	6.2	.0	.0	.0	.0	.2	.0	.3	.0
5. Rcpt_5	52.	6.6	.0	.0	.0	.3	.5	.0	.0	.6
6. Rcpt_6	253.	6.6	.0	.0	.0	.3	.0	.0	.0	.0
7. Rcpt_7	168.	6.9	.2	.0	.2	.4	.7	.0	.0	.0
8. Rcpt_8	75.	7.1	.3	.0	.0	.0	1.4	.0	.0	.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: C:\Documents and Settings\MadduxB\My Doc
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.0	.0	.2	.6
2. Rcpt_2	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
3. Rcpt_3	.0	.3	.0	.0	.0	.0	.0	.0	.2	.6
4. Rcpt_4	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	.0	.0	.0	.0	.0	.0	.0	.0	.6	.2
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0
8. Rcpt_8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Del Mar Heights Ex AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	245. (FT)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	5.0 PPM		
SIGTH=	5. DEGREES	TEMP=	44.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	1038	7.1	.0	44.0
B. Link_10	*****	*****	*****	*****	AG	1200	12.7	.0	44.0
C. Link_11	*****	*****	*****	*****	AG	1200	12.7	.0	44.0
D. Link_12	*****	*****	*****	*****	AG	1200	12.7	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	1857	7.3	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	1857	7.3	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	1765	5.7	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	2321	9.4	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	1000	12.7	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	1000	12.7	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	1642	10.2	.0	56.0
L. Link_22	*****	*****	*****	*****	AG	1642	10.2	.0	56.0
M. Link_23	*****	*****	*****	*****	AG	1204	5.5	.0	56.0
N. Link_24	*****	*****	*****	*****	AG	1204	5.5	.0	56.0
O. Link_25	*****	*****	*****	*****	AG	629	7.3	.0	44.0
P. Link_26	*****	*****	*****	*****	AG	629	7.3	.0	44.0
Q. Link_18	*****	*****	*****	*****	AG	901	7.3	.0	44.0
R. Link_19	*****	*****	*****	*****	AG	901	7.3	.0	44.0
S. Link_28	*****	*****	*****	*****	AG	1765	10.2	.0	56.0
T. Link_29	*****	*****	*****	*****	AG	1857	10.2	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Del Mar Heights Ex AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	73.	8.8	.0	.0	.0	.1	.0	.4	.0	.5
2. Rcpt_2	60.	7.9	.0	.0	.0	.0	.4	.3	1.1	.2
3. Rcpt_3	72.	9.9	.0	.0	.0	.1	.0	.3	.0	.5
4. Rcpt_4	59.	8.5	.0	.0	.0	.0	.3	.5	1.0	.0
5. Rcpt_5	55.	9.7	.0	.0	.2	1.0	.5	.0	.0	2.9
6. Rcpt_6	254.	9.7	.0	.0	.0	.8	.0	.2	.1	.2
7. Rcpt_7	240.	8.9	.4	.0	.0	.0	.0	1.8	.2	.0
8. Rcpt_8	239.	8.3	.0	.0	.0	.0	.0	1.6	.3	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: Del Mar Heights Ex AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.7	2.0
2. Rcpt_2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.8	.0
3. Rcpt_3	.0	.8	.0	.0	.0	.0	.0	.0	.0	.0	.7	2.2
4. Rcpt_4	.0	.0	.0	.6	.0	.0	.4	.0	.0	.0	.4	.1
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	2.3	.7
7. Rcpt_7	.0	.0	.1	.4	.0	.0	.0	.0	.0	.0	.0	.6
8. Rcpt_8	.0	.0	.1	.4	.0	.0	.0	.0	.0	.0	.0	.7

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Del Mar Heights Ex PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 245. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 305. M	AMB= 5.3 PPM	
SIGTH= 5. DEGREES	TEMP= 44.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	1642	7.1	.0	44.0
B. Link_10	*****	*****	*****	*****	AG	1241	12.7	.0	44.0
C. Link_11	*****	*****	*****	*****	AG	1241	12.7	.0	44.0
D. Link_12	*****	*****	*****	*****	AG	1241	12.7	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	2175	7.3	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	1910	7.3	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	1892	5.7	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	2148	9.4	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	980	12.7	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	980	12.7	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	1682	10.2	.0	56.0
L. Link_22	*****	*****	*****	*****	AG	1682	10.2	.0	56.0
M. Link_23	*****	*****	*****	*****	AG	1196	5.5	.0	56.0
N. Link_24	*****	*****	*****	*****	AG	1196	5.5	.0	56.0
O. Link_25	*****	*****	*****	*****	AG	539	7.3	.0	44.0
P. Link_26	*****	*****	*****	*****	AG	539	7.3	.0	44.0
Q. Link_18	*****	*****	*****	*****	AG	945	7.3	.0	44.0
R. Link_19	*****	*****	*****	*****	AG	945	7.3	.0	44.0
S. Link_28	*****	*****	*****	*****	AG	1892	10.2	.0	56.0
T. Link_29	*****	*****	*****	*****	AG	1910	10.2	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Del Mar Heights Ex PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	73.	9.2	.0	.0	.0	.1	.0	.4	.0	.4
2. Rcpt_2	60.	8.4	.0	.0	.0	.0	.5	.3	1.1	.2
3. Rcpt_3	72.	10.2	.0	.0	.0	.1	.0	.3	.0	.5
4. Rcpt_4	59.	9.0	.1	.0	.0	.0	.4	.5	1.1	.0
5. Rcpt_5	55.	9.9	.0	.0	.3	1.0	.6	.0	.0	2.7
6. Rcpt_6	254.	10.2	.0	.0	.0	.8	.0	.2	.1	.2
7. Rcpt_7	240.	9.5	.6	.0	.0	.0	.0	1.9	.2	.0
8. Rcpt_8	77.	9.2	.8	.0	.0	.0	1.7	.4	.0	.9

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: Del Mar Heights Ex PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
							CONC/LINK (PPM)						
1. Rcpt_1	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.8	2.0
2. Rcpt_2	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.8	.0
3. Rcpt_3	*	.0	.8	.0	.0	.0	.0	.0	.0	.0	.0	.7	2.3
4. Rcpt_4	*	.0	.0	.0	.7	.0	.0	.4	.0	.0	.0	.4	.1
5. Rcpt_5	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	*	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	2.5	.7
7. Rcpt_7	*	.0	.0	.1	.4	.0	.0	.0	.0	.0	.0	.0	.6
8. Rcpt_8	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Del Mar Heights 2015WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	245. (FT)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	5.0 PPM		
SIGTH=	5. DEGREES	TEMP=	44.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	476	3.2	.0	44.0
B. Link_10	*****	*****	*****	*****	AG	1551	4.5	.0	44.0
C. Link_11	*****	*****	*****	*****	AG	1551	4.5	.0	44.0
D. Link_12	*****	*****	*****	*****	AG	1551	4.5	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	744	4.1	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	1540	2.4	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	1260	2.6	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	1490	2.4	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	1965	4.3	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	1965	4.3	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	696	4.3	.0	56.0
L. Link_22	*****	*****	*****	*****	AG	696	4.3	.0	56.0
M. Link_23	*****	*****	*****	*****	AG	1275	2.6	.0	56.0
N. Link_24	*****	*****	*****	*****	AG	1275	2.6	.0	56.0
O. Link_25	*****	*****	*****	*****	AG	615	2.6	.0	44.0
P. Link_26	*****	*****	*****	*****	AG	615	2.6	.0	44.0
Q. Link_18	*****	*****	*****	*****	AG	495	3.3	.0	44.0
R. Link_19	*****	*****	*****	*****	AG	495	3.3	.0	44.0
S. Link_28	*****	*****	*****	*****	AG	1260	3.6	.0	56.0
T. Link_29	*****	*****	*****	*****	AG	1540	4.7	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Del Mar Heights 2015WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	198.	6.2	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	324.	6.2	.0	.0	.0	.0	.0	.0	.2	.0
3. Rcpt_3	73.	6.9	.0	.0	.0	.0	.0	.0	.0	.0
4. Rcpt_4	358.	6.2	.0	.0	.0	.0	.0	.0	.0	.0
5. Rcpt_5	55.	6.2	.0	.0	.1	.5	.1	.0	.0	.5
6. Rcpt_6	253.	6.5	.0	.0	.0	.4	.0	.0	.0	.0
7. Rcpt_7	240.	6.1	.0	.0	.0	.0	.0	.5	.0	.0
8. Rcpt_8	240.	6.0	.0	.0	.0	.0	.0	.4	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Del Mar Heights 2015WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Rcpt_1	.0	.7	.0	.1	.1	.0	.0	.0	.0	.0	.0	.2
2. Rcpt_2	.0	.8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.3
3. Rcpt_3	.0	.6	.0	.0	.0	.0	.0	.0	.0	.0	.2	.9
4. Rcpt_4	.3	.4	.0	.2	.1	.0	.1	.0	.0	.0	.0	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.6	.3
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2
8. Rcpt_8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.3

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Del Mar Heights 2015WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 245. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 305. M	AMB= 5.3 PPM	
SIGTH= 5. DEGREES	TEMP= 44.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	1350	4.7	.0	44.0
B. Link_10	*****	*****	*****	*****	AG	519	4.5	.0	44.0
C. Link_11	*****	*****	*****	*****	AG	519	4.5	.0	44.0
D. Link_12	*****	*****	*****	*****	AG	519	4.5	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	1125	4.1	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	1190	2.4	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	1355	2.6	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	1428	2.4	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	780	4.3	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	780	4.3	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	1350	4.7	.0	56.0
L. Link_22	*****	*****	*****	*****	AG	1350	4.7	.0	56.0
M. Link_23	*****	*****	*****	*****	AG	1230	2.6	.0	56.0
N. Link_24	*****	*****	*****	*****	AG	1230	2.6	.0	56.0
O. Link_25	*****	*****	*****	*****	AG	575	3.3	.0	44.0
P. Link_26	*****	*****	*****	*****	AG	575	3.3	.0	44.0
Q. Link_18	*****	*****	*****	*****	AG	525	3.3	.0	44.0
R. Link_19	*****	*****	*****	*****	AG	525	3.3	.0	44.0
S. Link_28	*****	*****	*****	*****	AG	1355	3.6	.0	56.0
T. Link_29	*****	*****	*****	*****	AG	1190	4.1	.0	56.0

JOB: Del Mar Heights 2015WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	73.	6.3	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	253.	6.4	.0	.0	.0	.0	.0	.0	.0	.0
3. Rcpt_3	72.	6.6	.0	.0	.0	.0	.0	.0	.0	.0
4. Rcpt_4	58.	6.5	.0	.0	.0	.0	.0	.1	.4	.0
5. Rcpt_5	323.	6.5	.8	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	313.	6.8	1.0	.0	.0	.1	.1	.0	.0	.2
7. Rcpt_7	240.	6.6	.4	.0	.0	.0	.0	.4	.0	.0
8. Rcpt_8	75.	6.5	.4	.0	.0	.0	.6	.0	.0	.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: Del Mar Heights 2015WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	*	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Rcpt_1	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.5
2. Rcpt_2	*	.0	.0	.0	.8	.0	.0	.1	.0	.0	.0	.0	.0
3. Rcpt_3	*	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.2	.6
4. Rcpt_4	*	.0	.0	.0	.3	.0	.0	.2	.0	.0	.0	.0	.0
5. Rcpt_5	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0
6. Rcpt_6	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. Rcpt_7	*	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.2
8. Rcpt_8	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Del Mar Heights 2030WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S
BRG= WORST CASE
CLAS= 7 (G)
MIXH= 1000. M
SIGTH= 5. DEGREES

Z0= 100. CM
VD= .0 CM/S
VS= .0 CM/S
AMB= 5.0 PPM
TEMP= 44.0 DEGREE (C)

ALT= 245. (FT)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	800	1.6	.0	44.0
B. Link_10	*****	*****	*****	*****	AG	990	2.1	.0	44.0
C. Link_11	*****	*****	*****	*****	AG	990	2.1	.0	44.0
D. Link_12	*****	*****	*****	*****	AG	990	2.1	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	2060	1.9	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	2060	1.2	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	2190	1.7	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	2500	1.3	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	990	2.1	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	990	2.1	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	2190	2.1	.0	56.0
L. Link_22	*****	*****	*****	*****	AG	2190	2.1	.0	56.0
M. Link_23	*****	*****	*****	*****	AG	2060	1.3	.0	56.0
N. Link_24	*****	*****	*****	*****	AG	2060	1.3	.0	56.0
O. Link_25	*****	*****	*****	*****	AG	990	1.6	.0	44.0
P. Link_26	*****	*****	*****	*****	AG	990	1.6	.0	44.0
Q. Link_18	*****	*****	*****	*****	AG	800	1.6	.0	44.0
R. Link_19	*****	*****	*****	*****	AG	800	1.6	.0	44.0
S. Link_28	*****	*****	*****	*****	AG	2190	2.1	.0	56.0
T. Link_29	*****	*****	*****	*****	AG	2060	2.1	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Del Mar Heights 2030WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	74.	5.8	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	60.	5.8	.0	.0	.0	.0	.1	.0	.4	.0
3. Rcpt_3	73.	6.0	.0	.0	.0	.0	.0	.0	.0	.0
4. Rcpt_4	59.	6.0	.0	.0	.0	.0	.0	.0	.4	.0
5. Rcpt_5	253.	5.9	.0	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	252.	6.1	.0	.0	.0	.1	.0	.0	.0	.0
7. Rcpt_7	239.	5.8	.0	.0	.0	.0	.0	.4	.1	.0
8. Rcpt_8	239.	5.8	.0	.0	.0	.0	.0	.3	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: Del Mar Heights 2030WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.5
2. Rcpt_2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
3. Rcpt_3	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.2	.5
4. Rcpt_4	.0	.0	.0	.2	.0	.0	.1	.0	.0	.0	.0	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.6	.1
6. Rcpt_6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.6	.1
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
8. Rcpt_8	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.2

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Del Mar Heights 2030WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S — Z0= 100. CM — ALT= 245. (FT)
BRG= WORST CASE — VD= .0 CM/S
CLAS= 7 (G) — VS= .0 CM/S
MIXH= 305. M — AMB= 5.3 PPM
SIGTH= 5. DEGREES — TEMP= 44.0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_8	*****	*****	*****	*****	AG	850	1.6	.0	44.0
B. Link_10	*****	*****	*****	*****	AG	930	2.1	.0	44.0
C. Link_11	*****	*****	*****	*****	AG	930	2.1	.0	44.0
D. Link_12	*****	*****	*****	*****	AG	930	2.1	.0	44.0
E. Link_13	*****	*****	*****	*****	AG	1990	2.1	.0	56.0
F. Link_14	*****	*****	*****	*****	AG	1990	1.3	.0	56.0
G. Link_15	*****	*****	*****	*****	AG	2240	1.3	.0	56.0
H. Link_16	*****	*****	*****	*****	AG	2400	1.3	.0	56.0
I. Link_17	*****	*****	*****	*****	AG	930	1.8	.0	44.0
J. Link_20	*****	*****	*****	*****	AG	930	1.8	.0	44.0
K. Link_21	*****	*****	*****	*****	AG	2240	2.0	.0	56.0
L. Link_22	*****	*****	*****	*****	AG	2240	2.0	.0	56.0
M. Link_23	*****	*****	*****	*****	AG	2060	1.2	.0	56.0
N. Link_24	*****	*****	*****	*****	AG	2060	1.2	.0	56.0
O. Link_25	*****	*****	*****	*****	AG	930	1.6	.0	44.0
P. Link_26	*****	*****	*****	*****	AG	930	1.6	.0	44.0
Q. Link_18	*****	*****	*****	*****	AG	850	1.6	.0	44.0
R. Link_19	*****	*****	*****	*****	AG	850	1.6	.0	44.0
S. Link_28	*****	*****	*****	*****	AG	2240	1.7	.0	56.0
T. Link_29	*****	*****	*****	*****	AG	1990	1.9	.0	56.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Del Mar Heights 2030WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0
7. Rcpt_7	******	******	6.0
8. Rcpt_8	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	73.	6.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	253.	6.1	.0	.0	.0	.0	.0	.0	.0	.0
3. Rcpt_3	72.	6.2	.0	.0	.0	.0	.0	.0	.0	.0
4. Rcpt_4	59.	6.2	.0	.0	.0	.0	.0	.0	.3	.0
5. Rcpt_5	253.	6.1	.0	.0	.0	.0	.0	.0	.0	.0
6. Rcpt_6	252.	6.2	.0	.0	.0	.0	.0	.0	.0	.0
7. Rcpt_7	240.	6.1	.0	.0	.0	.0	.0	.3	.0	.0
8. Rcpt_8	239.	6.0	.0	.0	.0	.0	.0	.3	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 3

JOB: Del Mar Heights 2030WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.4
2. Rcpt_2	.0	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0
3. Rcpt_3	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.1	.4
4. Rcpt_4	.0	.0	.0	.2	.0	.0	.1	.0	.0	.0	.0	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.5	.1
6. Rcpt_6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.5	.1
7. Rcpt_7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
8. Rcpt_8	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Genesee Ave 2005 AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

```
      U=    .5 M/S             Z0= 100. CM            ALT=     0. (FT)
    BRG= WORST CASE            VD=   .0 CM/S
   CLAS=     7 (G)             VS=   .0 CM/S
   MIXH= 1000. M              AMB=  5.0 PPM
  SIGTH=    5. DEGREES       TEMP= 44.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_28	*****	*****	*****	*****	AG	1200	7.1	.0	44.0
B. Link_30	*****	*****	*****	*****	AG	1200	7.1	.0	44.0
C. Link_31	*****	*****	*****	*****	AG	1200	7.1	.0	44.0
D. Link_33	*****	*****	*****	*****	AG	200	7.1	.0	34.0
E. Link_34	*****	*****	*****	*****	AG	1210	7.1	.0	44.0
F. Link_35	*****	*****	*****	*****	AG	1210	7.1	.0	44.0
G. Link_37	*****	*****	*****	*****	AG	2250	12.7	.0	34.0
H. Link_39	*****	*****	*****	*****	AG	2240	12.7	.0	44.0
I. Link_40	*****	*****	*****	*****	AG	0	.0	.0	34.0
J. Link_41	*****	*****	*****	*****	AG	0	.0	.0	34.0
K. Link_43	*****	*****	*****	*****	AG	0	.0	.0	34.0
L. Link_44	*****	*****	*****	*****	AG	1300	8.7	.0	44.0
M. Link_45	*****	*****	*****	*****	AG	1300	8.7	.0	44.0
N. Link_46	*****	*****	*****	*****	AG	1580	5.1	.0	44.0
O. Link_47	*****	*****	*****	*****	AG	1580	11.7	.0	44.0
P. Link_48	*****	*****	*****	*****	AG	1657	5.1	.0	44.0
Q. Link_49	*****	*****	*****	*****	AG	1317	8.7	.0	44.0
R. Link_50	*****	*****	*****	*****	AG	2370	5.5	.0	44.0
S. Link_51	*****	*****	*****	*****	AG	2370	10.6	.0	44.0
T. Link_52	*****	*****	*****	*****	AG	3130	5.9	.0	44.0

JOB: Genesee Ave 2005 AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	118.	8.2	.0	.0	.0	.0	.0	.0	.3	.6
2. Rcpt_2	102.	10.0	.7	.0	.0	.0	.0	.0	.0	.0
3. Rcpt_3	292.	12.1	.0	.0	.0	.0	.0	.0	1.9	.3
4. Rcpt_4	208.	10.7	.0	.0	.0	.0	.4	.0	4.1	.0
5. Rcpt_5	193.	9.8	.0	.0	.0	.0	.0	.0	3.2	.0
6. Rcpt_6	293.	10.2	.0	.0	.0	.0	.0	.0	.0	.3

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Rcpt_1	.0	.0	.0	.0	.0	.2	.5	.0	.0	.1	1.3	.1
2. Rcpt_2	.0	.0	.0	.0	1.7	.3	.3	.2	.3	.3	.8	.1
3. Rcpt_3	.0	.0	.0	.0	.2	.2	2.8	.0	.0	.2	.9	.6
4. Rcpt_4	.0	.0	.0	.0	.0	.0	.0	.4	.8	.0	.0	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.7	.0	.0	.8	.0	.0
6. Rcpt_6	.0	.0	.0	.0	.1	.3	2.8	.0	.0	.1	1.0	.6

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Genesee Ave 2005 PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= 5.0 PPM	
SIGTH= 5. DEGREES	TEMP= 44.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_28	*****	*****	*****	*****	AG	2200	7.3	.0	44.0
B. Link_30	*****	*****	*****	*****	AG	2200	7.3	.0	44.0
C. Link_31	*****	*****	*****	*****	AG	2200	7.3	.0	44.0
D. Link_33	*****	*****	*****	*****	AG	200	7.3	.0	34.0
E. Link_34	*****	*****	*****	*****	AG	1100	10.6	.0	44.0
F. Link_35	*****	*****	*****	*****	AG	1100	10.6	.0	44.0
G. Link_37	*****	*****	*****	*****	AG	1100	10.6	.0	34.0
H. Link_39	*****	*****	*****	*****	AG	1029	12.7	.0	44.0
I. Link_40	*****	*****	*****	*****	AG	0	.0	.0	34.0
J. Link_41	*****	*****	*****	*****	AG	0	.0	.0	34.0
K. Link_43	*****	*****	*****	*****	AG	0	.0	.0	34.0
L. Link_44	*****	*****	*****	*****	AG	2711	12.5	.0	44.0
M. Link_45	*****	*****	*****	*****	AG	2711	12.5	.0	44.0
N. Link_46	*****	*****	*****	*****	AG	1766	5.1	.0	44.0
O. Link_47	*****	*****	*****	*****	AG	1766	9.4	.0	44.0
P. Link_48	*****	*****	*****	*****	AG	1392	5.1	.0	44.0
Q. Link_49	*****	*****	*****	*****	AG	2112	9.4	.0	44.0
R. Link_50	*****	*****	*****	*****	AG	1746	5.1	.0	44.0
S. Link_51	*****	*****	*****	*****	AG	1764	8.7	.0	44.0
T. Link_52	*****	*****	*****	*****	AG	1510	5.1	.0	44.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Genesee Ave 2005 PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	156.	7.9	.5	.4	.3	.0	.0	.0	.0	.0
2. Rcpt_2	102.	13.2	1.2	.0	.0	.0	.1	.0	.0	.0
3. Rcpt_3	290.	10.5	.0	.0	.0	.0	.0	.0	.8	.0
4. Rcpt_4	208.	9.2	.0	.0	.0	.0	.5	.0	2.0	.0
5. Rcpt_5	108.	8.7	.0	.0	.0	.0	.8	.0	.0	.0
6. Rcpt_6	291.	9.5	.0	.0	.0	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Rcpt_1	.0	.0	.0	.0	1.3	.0	.0	.0	.0	.0	.0	.4
2. Rcpt_2	.0	.0	.0	.0	4.7	.3	.2	.2	.5	.3	.6	.0
3. Rcpt_3	.0	.0	.0	.1	.8	.4	2.4	.0	.0	.0	.4	.3
4. Rcpt_4	.0	.0	.0	.0	.0	.0	.0	.3	1.4	.0	.0	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.4	2.4	.0	.0	.0
6. Rcpt_6	.0	.0	.0	.1	.8	.4	2.3	.0	.0	.0	.5	.3

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Genesee Ave 2015 WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

```
      U=    .5 M/S            Z0= 100. CM            ALT=     0. (FT)
    BRG= WORST CASE           VD=    .0 CM/S
   CLAS=     7 (G)            VS=    .0 CM/S
   MIXH= 1000. M             AMB=  5.0 PPM
  SIGTH=     5. DEGREES     TEMP= 44.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_28	*****	*****	*****	*****	AG	1969	2.4	.0	44.0
B. Link_30	*****	*****	*****	*****	AG	2169	2.4	.0	44.0
C. Link_31	*****	*****	*****	*****	AG	2169	2.4	.0	44.0
D. Link_33	*****	*****	*****	*****	AG	200	2.4	.0	34.0
E. Link_34	*****	*****	*****	*****	AG	1757	3.2	.0	44.0
F. Link_35	*****	*****	*****	*****	AG	1757	3.2	.0	44.0
G. Link_37	*****	*****	*****	*****	AG	1551	5.0	.0	34.0
H. Link_39	*****	*****	*****	*****	AG	1965	5.1	.0	44.0
I. Link_40	*****	*****	*****	*****	AG	0	.0	.0	34.0
J. Link_41	*****	*****	*****	*****	AG	0	.0	.0	34.0
K. Link_43	*****	*****	*****	*****	AG	0	.0	.0	34.0
L. Link_44	*****	*****	*****	*****	AG	696	3.2	.0	44.0
M. Link_45	*****	*****	*****	*****	AG	696	3.2	.0	44.0
N. Link_46	*****	*****	*****	*****	AG	1590	2.4	.0	44.0
O. Link_47	*****	*****	*****	*****	AG	1590	4.1	.0	44.0
P. Link_48	*****	*****	*****	*****	AG	1410	2.4	.0	44.0
Q. Link_49	*****	*****	*****	*****	AG	744	4.1	.0	44.0
R. Link_50	*****	*****	*****	*****	AG	1590	2.4	.0	44.0
S. Link_51	*****	*****	*****	*****	AG	1590	3.8	.0	44.0
T. Link_52	*****	*****	*****	*****	AG	1940	2.4	.0	44.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Genesee Ave 2015 WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	117.	6.0	.0	.0	.0	.0	.0	.0	.0	.2
2. Rcpt_2	103.	6.6	.4	.0	.0	.0	.0	.0	.0	.0
3. Rcpt_3	292.	7.3	.0	.0	.0	.0	.0	.0	.5	.0
4. Rcpt_4	208.	6.8	.0	.0	.0	.0	.2	.0	1.2	.0
5. Rcpt_5	189.	6.5	.0	.0	.0	.0	.2	.0	.8	.0
6. Rcpt_6	293.	6.7	.0	.0	.0	.0	.0	.0	.0	.1

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Rcpt_1	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0	.3	.0
2. Rcpt_2	.0	.0	.0	.0	.3	.2	.1	.0	.0	.1	.2	.0
3. Rcpt_3	.0	.0	.0	.0	.0	.1	1.0	.0	.0	.0	.2	.2
4. Rcpt_4	.0	.0	.0	.0	.0	.0	.0	.1	.2	.0	.0	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.3	.0	.0	.2	.0	.0
6. Rcpt_6	.0	.0	.0	.0	.0	.1	1.0	.0	.0	.0	.3	.2

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Genesee Ave 2015 WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

```
      U=    .5 M/S            Z0= 100. CM           ALT=     0. (FT)
    BRG= WORST CASE           VD=   .0 CM/S
   CLAS=     7 (G)            VS=   .0 CM/S
   MIXH= 1000. M             AMB=  5.0 PPM
  SIGTH=    5. DEGREES      TEMP= 44.0 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_28	*****	*****	*****	*****	AG	1210	2.4	.0	44.0
B. Link_30	*****	*****	*****	*****	AG	1410	2.4	.0	44.0
C. Link_31	*****	*****	*****	*****	AG	1410	2.4	.0	44.0
D. Link_33	*****	*****	*****	*****	AG	200	2.4	.0	34.0
E. Link_34	*****	*****	*****	*****	AG	1757	3.2	.0	44.0
F. Link_35	*****	*****	*****	*****	AG	1757	3.2	.0	44.0
G. Link_37	*****	*****	*****	*****	AG	519	4.1	.0	34.0
H. Link_39	*****	*****	*****	*****	AG	780	4.5	.0	44.0
I. Link_40	*****	*****	*****	*****	AG	0	.0	.0	34.0
J. Link_41	*****	*****	*****	*****	AG	0	.0	.0	34.0
K. Link_43	*****	*****	*****	*****	AG	0	.0	.0	34.0
L. Link_44	*****	*****	*****	*****	AG	1350	3.3	.0	44.0
M. Link_45	*****	*****	*****	*****	AG	1350	3.3	.0	44.0
N. Link_46	*****	*****	*****	*****	AG	2411	2.4	.0	44.0
O. Link_47	*****	*****	*****	*****	AG	2411	3.2	.0	44.0
P. Link_48	*****	*****	*****	*****	AG	1471	2.4	.0	44.0
Q. Link_49	*****	*****	*****	*****	AG	1125	4.1	.0	44.0
R. Link_50	*****	*****	*****	*****	AG	1530	2.4	.0	44.0
S. Link_51	*****	*****	*****	*****	AG	1530	3.2	.0	44.0
T. Link_52	*****	*****	*****	*****	AG	1530	2.4	.0	44.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Genesee Ave 2015 WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	118.	5.8	.0	.0	.0	.0	.0	.0	.0	.0
2. Rcpt_2	103.	6.8	.2	.0	.0	.0	.0	.0	.0	.0
3. Rcpt_3	291.	7.0	.0	.0	.0	.0	.0	.0	.1	.0
4. Rcpt_4	276.	6.4	.0	.0	.0	.0	.4	.0	.0	.0
5. Rcpt_5	109.	6.2	.0	.0	.0	.0	.4	.0	.0	.0
6. Rcpt_6	293.	6.8	.0	.0	.0	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Rcpt_1	.0	.0	.0	.0	.0	.1	.2	.0	.0	.0	.3	.0
2. Rcpt_2	.0	.0	.0	.0	.7	.2	.1	.0	.1	.1	.1	.0
3. Rcpt_3	.0	.0	.0	.0	.1	.2	1.1	.0	.0	.0	.2	.2
4. Rcpt_4	.0	.0	.0	.0	.0	.2	.1	.0	.0	.4	.0	.0
5. Rcpt_5	.0	.0	.0	.0	.0	.0	.0	.2	.6	.0	.0	.0
6. Rcpt_6	.0	.0	.0	.0	.0	.2	1.1	.0	.0	.0	.2	.2

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Genesee Ave 2030 WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= 5.0 PPM	
SIGTH= 5. DEGREES	TEMP= 44.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_28	*****	*****	*****	*****	AG	2800	2.2	.0	44.0
B. Link_30	*****	*****	*****	*****	AG	3000	2.2	.0	44.0
C. Link_31	*****	*****	*****	*****	AG	3000	2.2	.0	44.0
D. Link_33	*****	*****	*****	*****	AG	200	2.2	.0	34.0
E. Link_34	*****	*****	*****	*****	AG	2430	1.6	.0	44.0
F. Link_35	*****	*****	*****	*****	AG	2430	1.6	.0	44.0
G. Link_37	*****	*****	*****	*****	AG	2560	2.3	.0	34.0
H. Link_39	*****	*****	*****	*****	AG	3050	2.3	.0	44.0
I. Link_44	*****	*****	*****	*****	AG	2310	1.6	.0	44.0
J. Link_45	*****	*****	*****	*****	AG	2310	1.6	.0	44.0
K. Link_46	*****	*****	*****	*****	AG	2520	1.2	.0	44.0
L. Link_47	*****	*****	*****	*****	AG	2520	1.8	.0	44.0
M. Link_48	*****	*****	*****	*****	AG	1950	1.2	.0	44.0
N. Link_49	*****	*****	*****	*****	AG	2680	1.2	.0	44.0
O. Link_50	*****	*****	*****	*****	AG	2680	1.2	.0	44.0
P. Link_51	*****	*****	*****	*****	AG	2680	1.6	.0	44.0
Q. Link_52	*****	*****	*****	*****	AG	2680	1.2	.0	44.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Genesee Ave 2030 WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	156.	5.7	.2	.2	.0	.0	.0	.0	.0	.0
2. Rcpt_2	102.	6.5	.4	.0	.0	.0	.0	.0	.0	.0
3. Rcpt_3	291.	6.5	.0	.0	.0	.0	.0	.0	.4	.0
4. Rcpt_4	208.	6.3	.0	.0	.0	.0	.2	.0	.8	.0
5. Rcpt_5	188.	6.1	.0	.0	.0	.0	.1	.0	.6	.0
6. Rcpt_6	293.	6.1	.0	.0	.0	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q
1. Rcpt_1	.0	.1	.0	.0	.0	.0	.0	.0	.2
2. Rcpt_2	.0	.5	.0	.0	.0	.0	.0	.1	.0
3. Rcpt_3	.0	.0	.0	.6	.0	.0	.0	.1	.1
4. Rcpt_4	.0	.0	.0	.0	.0	.2	.0	.0	.0
5. Rcpt_5	.0	.0	.0	.2	.0	.0	.2	.0	.0
6. Rcpt_6	.0	.0	.0	.6	.0	.0	.0	.2	.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Genesee Ave 2030 WOP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= 5.0 PPM	
SIGTH= 5. DEGREES	TEMP= 44.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_28	*****	*****	*****	*****	AG	2520	1.6	.0	44.0
B. Link_30	*****	*****	*****	*****	AG	2720	1.6	.0	44.0
C. Link_31	*****	*****	*****	*****	AG	2720	1.6	.0	44.0
D. Link_33	*****	*****	*****	*****	AG	200	*****	.0	34.0
E. Link_34	*****	*****	*****	*****	AG	2300	1.6	.0	44.0
F. Link_35	*****	*****	*****	*****	AG	2300	1.6	.0	44.0
G. Link_37	*****	*****	*****	*****	AG	1240	2.1	.0	34.0
H. Link_39	*****	*****	*****	*****	AG	1950	2.3	.0	44.0
I. Link_44	*****	*****	*****	*****	AG	3370	2.3	.0	44.0
J. Link_45	*****	*****	*****	*****	AG	3370	2.3	.0	44.0
K. Link_46	*****	*****	*****	*****	AG	2740	1.2	.0	44.0
L. Link_47	*****	*****	*****	*****	AG	2740	1.9	.0	44.0
M. Link_48	*****	*****	*****	*****	AG	1980	1.2	.0	44.0
N. Link_49	*****	*****	*****	*****	AG	2670	1.9	.0	44.0
O. Link_50	*****	*****	*****	*****	AG	2370	1.2	.0	44.0
P. Link_51	*****	*****	*****	*****	AG	2370	1.8	.0	44.0
Q. Link_52	*****	*****	*****	*****	AG	2230	1.2	.0	44.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Genesee Ave 2030 WOP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	143.	15.8	.0	.0	.0	10.3	.0	.0	.0	.0
2. Rcpt_2	107.	13.9	.4	.0	.0	7.6	.0	.0	.0	.0
3. Rcpt_3	285.	11.7	.0	.0	.0	5.9	.0	.0	.2	.0
4. Rcpt_4	276.	11.7	.0	.0	.0	5.7	.2	.0	.0	.0
5. Rcpt_5	275.	11.8	.0	.0	.0	6.0	.0	.0	.0	.0
6. Rcpt_6	286.	11.7	.0	.0	.0	6.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q
1. Rcpt_1	.0	.3	.0	.0	.0	.0	.0	.0	.2
2. Rcpt_2	.0	.6	.1	.0	.0	.0	.0	.0	.0
3. Rcpt_3	.0	.1	.0	.4	.0	.0	.0	.0	.0
4. Rcpt_4	.0	.0	.1	.0	.0	.0	.3	.0	.0
5. Rcpt_5	.0	.0	.1	.0	.0	.0	.3	.0	.0
6. Rcpt_6	.0	.2	.0	.3	.0	.0	.0	.0	.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Genesee Ave 2030 WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S	Z0= 100. CM	ALT= 0. (FT)
BRG= WORST CASE	VD= .0 CM/S	
CLAS= 7 (G)	VS= .0 CM/S	
MIXH= 1000. M	AMB= 5.0 PPM	
SIGTH= 5. DEGREES	TEMP= 44.0 DEGREE (C)	

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_28	*****	*****	*****	*****	AG	2800	2.2	.0	44.0
B. Link_30	*****	*****	*****	*****	AG	3000	2.2	.0	44.0
C. Link_31	*****	*****	*****	*****	AG	3000	2.2	.0	44.0
D. Link_33	*****	*****	*****	*****	AG	200	2.2	.0	34.0
E. Link_34	*****	*****	*****	*****	AG	2430	1.6	.0	44.0
F. Link_35	*****	*****	*****	*****	AG	2430	1.6	.0	44.0
G. Link_37	*****	*****	*****	*****	AG	2560	2.3	.0	34.0
H. Link_39	*****	*****	*****	*****	AG	3050	2.3	.0	44.0
I. Link_44	*****	*****	*****	*****	AG	2310	1.6	.0	44.0
J. Link_45	*****	*****	*****	*****	AG	2310	1.6	.0	44.0
K. Link_46	*****	*****	*****	*****	AG	2520	1.2	.0	44.0
L. Link_47	*****	*****	*****	*****	AG	2520	1.8	.0	44.0
M. Link_48	*****	*****	*****	*****	AG	1950	1.2	.0	44.0
N. Link_49	*****	*****	*****	*****	AG	2680	1.2	.0	44.0
O. Link_50	*****	*****	*****	*****	AG	2680	1.2	.0	44.0
P. Link_51	*****	*****	*****	*****	AG	2680	1.6	.0	44.0
Q. Link_52	*****	*****	*****	*****	AG	2680	1.2	.0	44.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Genesee Ave 2030 WP AM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	156.	5.7	.2	.2	.0	.0	.0	.0	.0	.0
2. Rcpt_2	102.	6.5	.4	.0	.0	.0	.0	.0	.0	.0
3. Rcpt_3	291.	6.5	.0	.0	.0	.0	.0	.0	.4	.0
4. Rcpt_4	208.	6.3	.0	.0	.0	.0	.2	.0	.8	.0
5. Rcpt_5	188.	6.1	.0	.0	.0	.0	.1	.0	.6	.0
6. Rcpt_6	293.	6.1	.0	.0	.0	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q
1. Rcpt_1	.0	.1	.0	.0	.0	.0	.0	.0	.2
2. Rcpt_2	.0	.5	.0	.0	.0	.0	.0	.1	.0
3. Rcpt_3	.0	.0	.0	.6	.0	.0	.0	.1	.1
4. Rcpt_4	.0	.0	.0	.0	.0	.2	.0	.0	.0
5. Rcpt_5	.0	.0	.0	.2	.0	.0	.2	.0	.0
6. Rcpt_6	.0	.0	.0	.6	.0	.0	.0	.2	.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Genesee Ave 2030 WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	.5 M/S	Z0=	100. CM	ALT=	0. (FT)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	1000. M	AMB=	5.0 PPM		
SIGTH=	5. DEGREES	TEMP=	44.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (FT) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Link_28	*****	*****	*****	*****	AG	2470	2.2	.0	44.0
B. Link_30	*****	*****	*****	*****	AG	2670	2.2	.0	44.0
C. Link_31	*****	*****	*****	*****	AG	2670	2.2	.0	44.0
D. Link_33	*****	*****	*****	*****	AG	200	2.2	.0	34.0
E. Link_34	*****	*****	*****	*****	AG	2430	1.6	.0	44.0
F. Link_35	*****	*****	*****	*****	AG	2430	1.6	.0	44.0
G. Link_37	*****	*****	*****	*****	AG	1170	2.0	.0	34.0
H. Link_39	*****	*****	*****	*****	AG	3000	2.3	.0	44.0
I. Link_44	*****	*****	*****	*****	AG	3335	1.6	.0	44.0
J. Link_45	*****	*****	*****	*****	AG	3335	1.6	.0	44.0
K. Link_46	*****	*****	*****	*****	AG	2770	1.2	.0	44.0
L. Link_47	*****	*****	*****	*****	AG	2770	1.8	.0	44.0
M. Link_48	*****	*****	*****	*****	AG	2035	1.2	.0	44.0
N. Link_49	*****	*****	*****	*****	AG	2650	1.2	.0	44.0
O. Link_50	*****	*****	*****	*****	AG	2120	1.2	.0	44.0
P. Link_51	*****	*****	*****	*****	AG	2120	1.6	.0	44.0
Q. Link_52	*****	*****	*****	*****	AG	2120	1.2	.0	44.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION

JOB: Genesee Ave 2030 WP PM
RUN: CALINE4 RUN (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (FT) X	Y	Z
1. Rcpt_1	******	******	6.0
2. Rcpt_2	******	******	6.0
3. Rcpt_3	******	******	6.0
4. Rcpt_4	******	******	6.0
5. Rcpt_5	******	******	6.0
6. Rcpt_6	******	******	6.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Rcpt_1	156.	5.7	.2	.1	.0	.0	.0	.0	.0	.0
2. Rcpt_2	102.	6.7	.4	.0	.0	.0	.0	.0	.0	.0
3. Rcpt_3	291.	6.4	.0	.0	.0	.0	.0	.0	.2	.0
4. Rcpt_4	278.	6.0	.0	.0	.0	.0	.3	.0	.0	.0
5. Rcpt_5	110.	5.8	.0	.0	.0	.0	.3	.0	.0	.0
6. Rcpt_6	293.	6.2	.0	.0	.0	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q
1. Rcpt_1	.0	.2	.0	.0	.0	.0	.0	.0	.1
2. Rcpt_2	.0	.7	.0	.0	.0	.0	.0	.1	.0
3. Rcpt_3	.0	.0	.0	.7	.0	.0	.0	.1	.1
4. Rcpt_4	.0	.0	.0	.0	.0	.0	.3	.0	.0
5. Rcpt_5	.0	.0	.0	.0	.1	.4	.0	.0	.0
6. Rcpt_6	.0	.0	.0	.7	.0	.0	.0	.1	.1

APPENDIX B

CONSTRUCTION-RELATED EMISSIONS ESTIMATES

Road Construction Emissions Model, Version 5.1

Emission Estimates for -> Road Widening

Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	
Grubbing/Land Clearing	9	45	54	26	3	23	
Grading/Excavation	21	162	189	30	7	23	
Drainage/Utilities/Sub-Grade	10	51	57	26	3	23	
Paving	5	23	34	2	2	0	
Maximum (pounds/day)	21	162	189	30	7	23	
Total (tons/construction project)	2	13	14	3	1	3	<-tons

Notes:

Project Start Year ->	2006
Project Length (months) ->	12
Total Project Area (acres) ->	28
Maximum Area Disturbed/Day (acres) ->	5
Total Soil Imported/Exported (yd^3/day)->	4000

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

Emission Estimates for -> Road Widening

Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	
Grubbing/Land Clearing	4	21	24	12	1	10	
Grading/Excavation	9	73	86	14	3	10	
Drainage/Utilities/Sub-Grade	5	23	26	12	2	10	
Paving	2	10	16	1	1	0	
Maximum (kilograms/day)	9	73	86	14	3	10	
Total (megagrams/construction project)	2	12	13	3	1	2	<-megagrams

Notes:

Project Start Year ->	2006
Project Length (months) ->	12
Total Project Area (hectares) ->	11
Maximum Area Disturbed/Day (hectares) ->	2
Total Soil Imported/Exported (meters^3/day)->	3058

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

Road Construction Emissions Model

Version 5.1

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C28.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

Input Type		
Project Name	Road Widening	
Construction Start Year	2006	Enter a Year between 2000 and 2010 inclusive
Project Type	2	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	12	months
Predominate Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
On-Road Emission Factors: Enter 1, 2, or 3	4	1. Emfac7fv1.1 2. Emfac7G 3. Emfac2001 4. Emfac2002
Project Length	1.3	miles
Total Project Area	28	acres
Maximum Area Disturbed/Day	4.6	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	4000	yd^3/day
Soil Exported	0	yd^3/day
Average Truck Capacity	20	yd^3 (assume 20 if unknown)

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C37 through C40.

Construction Periods	User Override of Construction Months	Program Calculated Months	2000	%	2001	%	2002
Grubbing/Land Clearing		1.2	0.00	0.00	0.00	0.00	0.00
Grading/Excavation		5.4	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade		3.6	0.00	0.00	0.00	0.00	0.00
Paving		1.8	0.00	0.00	0.00	0.00	0.00
Totals	0	12					

Hauling emission default values can be overridden in cells C48 through C50.

Soil Hauling Emissions	User Override of Soil Hauling Defaults	Default Values		
User Input				
Miles/round trip		30		
Round trips/day		200		
Vehicle miles traveled/day (calculated)	0	6000		
Hauling Emissions	**ROG**	**NOx**	**CO**	**PM10**
Emission rate (grams/mile)	0.85	10.00	8.59	0.30
Pounds per day	11.3	132.1	113.6	4.0
Tons per contruction period	0.67	7.85	6.74	0.24

Worker commute default values can be overridden in cells C62 through C67.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values		
Miles/ one-way trip		20		
One-way trips/day		2		
No. of employees: Grubbing/Land Clearing		6		
No. of employees: Grading/Excavation		8		
No. of employees: Drainage/Utilities/Sub-Grade		8		
No. of employees: Paving		8		
	ROG	**NOx**	**CO**	**PM10**
Emission rate (grams/mile)	0.36	0.67	7.41	0.04
Emission rate (grams/trip)	1.86	0.82	18.48	0.02
Pounds per day - Grubbing/Land Clearing	0.2	0.3	3.8	0.0
Tons per const. Period - Grub/Land Clear	0.0	0.0	0.0	0.0
Pounds per day - Grading/Excavation	0.3	0.5	5.4	0.0
Tons per const. Period - Grading/Excavation	0.0	0.0	0.3	0.0
Pounds per day - Drainage/Utilities/Sub-Grade	0.3	0.5	5.4	0.0
Tons per const. Period - Drain/Util/Sub-Grade	0.0	0.0	0.2	0.0
Pounds per day - Paving	0.3	0.5	5.4	0.0
Tons per const. Period - Paving	0.0	0.0	0.1	0.0
tons per construction period	0.0	0.1	0.7	0.0

Water truck default values can be overriden in cells C87 through C89 and E87 through E89.

Water Truck Emissions	Number of Water Trucks	Program Estimate of Number of Water Trucks	User Override of Water Truck Miles Traveled	Default Values Miles Traveled/Day	
Grubbing/Land Clearing - Exhaust		1		40	40
Grading/Excavation - Exhaust		1		40	40
Drainage/Utilities/Subgrade		1		40	40
	ROG	**NOx**	**CO**	**PM10**	
Emission rate (grams/mile)	0.85	10.00	8.59	0.30	
Pounds per day - Grubbing/Land Clearing	0.1	0.9	0.8	0.0	
Tons per const. Period - Grub/Land Clear	0.00	0.01	0.01	0.00	
Pound per day - Grading/Excavation	0.1	0.9	0.8	0.0	
Tons per const. Period - Grading/Excavation	0.00	0.05	0.04	0.00	
Pound per day - Drainage/Utilities/Subgrade	0.1	0.9	0.8	0.0	
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.03	0.03	0.00	

Fugitive dust default values can be overridden in cells C104 and C105.

Fugitive PM10 Dust	User Override of Max Acreage/Day	Default Maximum Acreage/Day	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing		4.6	23.0	0.3
Fugitive Dust - Grading/Excavation		4.6	23.0	1.4
Fugitive Dust - Drainage/Utilities/Subgrade		5	23.0	0.9

Off road equipment default number of vehicles can be overridden in cells B115 through B224.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
	1	Dozer	3.60	17.81	25.91	1.30
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
	1	Scrapper	3.63	18.83	20.34	1.05
	3	Signal Boards	1.70	4.27	6.31	0.61
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	8.9	40.9	52.6	3.0
		tons per period	0.1	0.5	0.7	0.0

Grading/Excavation

Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
	1	Excavator	1.84	9.44	9.04	0.47
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
	1	Grader	1.20	5.29	11.11	0.59
	1	Loaders, Rubber Tired	0.92	4.17	8.33	0.43
		Off-Highway Trucks	0.00	0.00	0.00	0.00
	0	Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
	1	Scrapper	3.63	18.83	20.34	1.05
	3	Signal Boards	1.70	4.27	6.31	0.61
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		max pounds per day	9.3	42.0	55.1	3.2
		tons per period	0.6	2.5	3.3	0.2

Drainage/Utilities/Subgrade

Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
	1	Compactor	2.08	12.77	11.46	0.62
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
	1	Grader	1.20	5.29	11.11	0.59
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
	1	Scrapper	3.63	18.83	20.34	1.05
	3	Signal Boards	1.70	4.27	6.31	0.61
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
	1	Trenchers	0.99	3.59	6.36	0.52
		max pounds per day	9.6	44.8	55.6	3.4
		tons per period	0.4	1.8	2.2	0.1

Paving Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
	1	Pavers	0.93	4.21	8.41	0.44
	1	Paving Equipment	0.82	3.52	8.48	0.44
	2	Rollers	1.17	5.31	10.62	0.55
		Scrapper	0.00	0.00	0.00	0.00
	3	Signal Boards	1.70	4.27	6.31	0.61
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	4.6	17.3	33.8	2.0
		tons per period	0.1	0.3	0.7	0.0
Total Emissions (tons per construction period)			1.1	5.1	6.8	0.4

0

Equipment default values for horsepower, load factor, and hours/day can be overridden in cells C235 through C256, E235 through E256, and G235 through G256.

Equipment		Default Values Horsepower		Default Values Load Factor		Default Values Hours/day
Bore/Drill Rigs		218		0.75		8
Concrete/Industrial Saws		84		0.73		8
Cranes		190		0.43		8
Crawler Tractors		143		0.575		8
Crushing/Proc. Equipment		154		0.78		8
Excavators		180		0.58		8
Graders		174		0.575		8
Off-Highway Tractors		255		0.41		8
Off-Highway Trucks		417		0.49		8
Other Construction Equipment		190		0.62		8
Pavers		132		0.59		8
Paving Equipment		111		0.53		8
Rollers		114		0.43		8
Rough Terrain Forklifts		94		0.475		8
Rubber Tired Dozers		352		0.59		8
Rubber Tired Loaders		165		0.465		8
Scrapers		313		0.66		8
Signal Boards		25		0.82		8
Skid Steer Loaders		62		0.515		8
Surfacing Equipment		437		0.49		8
Tractors/Loaders/Backhoes		79		0.465		8
Trenchers		82		0.695		8

Default load factors from SCAQMD CEQA Handbook, 1993.

Default horsepower values from Appendix B, California Air Resources Board's Offroad Model (see also Appendix B of this spreadsheet).

Signal board horsepower based on: U.S. EPA, 1998. Final Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines (EPA420-R-98-016).

0 0

END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 5.1

Emission Estimates for -> Bridge

Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	
Grubbing/Land Clearing	7	39	47	7	2	5	
Grading/Excavation	8	42	50	7	3	5	
Drainage/Utilities/Sub-Grade	8	45	51	7	3	5	
Paving	3	13	23	1	1	0	
Maximum (pounds/day)	8	45	51	7	3	5	
Total (tons/construction project)	1	5	6	1	0	1	<-tons

Notes:		
	Project Start Year ->	2006
	Project Length (months) ->	12
	Total Project Area (acres) ->	4
	Maximum Area Disturbed/Day (acres) ->	1
	Total Soil Imported/Exported (yd^3/day)->	0

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

Emission Estimates for -> Bridge

Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	
Grubbing/Land Clearing	3	18	22	3	1	2	
Grading/Excavation	4	19	23	3	1	2	
Drainage/Utilities/Sub-Grade	4	20	23	3	1	2	
Paving	1	6	10	1	1	0	
Maximum (kilograms/day)	4	20	23	3	1	2	
Total (megagrams/construction project)	1	4	6	1	0	0	<-megagrams

Notes:		
	Project Start Year ->	2006
	Project Length (months) ->	12
	Total Project Area (hectares) ->	2
	Maximum Area Disturbed/Day (hectares) ->	0
	Total Soil Imported/Exported ($meters^3$/day)->	0

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

Road Construction Emissions Model **Version 5.1**

Data Entry Worksheet

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C28.

Input Type		
Project Name	Bridge	
Construction Start Year	2006	Enter a Year between 2000 and 2010 inclusive
Project Type	3	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	12	months
Predominate Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
On-Road Emission Factors: Enter 1, 2, or 3	4	1. Emfac7fv1.1 4. Emfac2002 2. Emfac7G 3. Emfac2001
Project Length	0.036	miles
Total Project Area	4.3	acres
Maximum Area Disturbed/Day	0.9	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	0	yd^3/day
Soil Exported	0	yd^3/day
Average Truck Capacity	20	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C37 through C40.

Construction Periods	User Override of Construction Months	Program Calculated Months	2000	%	2001	%	2002
Grubbing/Land Clearing		1.2	0.00	0.00	0.00	0.00	0.00
Grading/Excavation		5.4	0.00	0.00	0.00	0.00	0.00
Drainage/Utilities/Sub-Grade		3.6	0.00	0.00	0.00	0.00	0.00
Paving		1.8	0.00	0.00	0.00	0.00	0.00
Totals	0	12					

Hauling emission default values can be overridden in cells C48 through C50.

Soil Hauling Emissions	User Override of Soil Hauling Defaults	Default Values		
User Input				
Miles/round trip		30		
Round trips/day		0		
Vehicle miles traveled/day (calculated)	0	0		
Hauling Emissions	**ROG**	**NOx**	**CO**	**PM10**
Emission rate (grams/mile)	0.85	10.00	8.59	0.30
Pounds per day	0.0	0.0	0.0	0.0
Tons per contruction period	0.00	0.00	0.00	0.00

Worker commute default values can be overridden in cells C62 through C67.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values		
Miles/ one-way trip		20		
One-way trips/day		2		
No. of employees: Grubbing/Land Clearing		3		
No. of employees: Grading/Excavation		5		
No. of employees: Drainage/Utilities/Sub-Grade		5		
No. of employees: Paving		4		
	ROG	**NOx**	**CO**	**PM10**
Emission rate (grams/mile)	0.36	0.67	7.41	0.04
Emission rate (grams/trip)	1.86	0.82	18.48	0.02
Pounds per day - Grubbing/Land Clearing	0.1	0.2	1.7	0.0
Tons per const. Period - Grub/Land Clear	0.0	0.0	0.0	0.0
Pounds per day - Grading/Excavation	0.2	0.3	3.3	0.0
Tons per const. Period - Grading/Excavation	0.0	0.0	0.2	0.0
Pounds per day - Drainage/Utilities/Sub-Grade	0.2	0.3	3.3	0.0
Tons per const. Period - Drain/Util/Sub-Grade	0.0	0.0	0.1	0.0
Pounds per day - Paving	0.1	0.2	2.5	0.0
Tons per const. Period - Paving	0.0	0.0	0.0	0.0
tons per construction period	0.0	0.0	0.4	0.0

Water truck default values can be overriden in cells C87 through C89 and E87 through E89.

Water Truck Emissions	Number of Water Trucks	Program Estimate of Number of Water Trucks	User Override of Water Truck Miles Traveled	Default Values Miles Traveled/Day	
Grubbing/Land Clearing - Exhaust		1		40	40
Grading/Excavation - Exhaust		1		40	40
Drainage/Utilities/Subgrade		1		40	40
	ROG	**NOx**	**CO**	**PM10**	
Emission rate (grams/mile)	0.85	10.00	8.59	0.30	
Pounds per day - Grubbing/Land Clearing	0.1	0.9	0.8	0.0	
Tons per const. Period - Grub/Land Clear	0.00	0.01	0.01	0.00	
Pound per day - Grading/Excavation	0.1	0.9	0.8	0.0	
Tons per const. Period - Grading/Excavation	0.00	0.05	0.04	0.00	
Pound per day - Drainage/Utilities/Subgrade	0.1	0.9	0.8	0.0	
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.03	0.03	0.00	

Fugitive dust default values can be overridden in cells C104 and C105.

Fugitive PM10 Dust	User Override of Max Acreage/Day	Default Maximum Acreage/Day	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing		0.9	4.5	0.1
Fugitive Dust - Grading/Excavation		0.9	4.5	0.3
Fugitive Dust - Drainage/Utilities/Subgrade		1	4.5	0.2

Off road equipment default number of vehicles can be overridden in cells B115 through B224.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
	1	Dozer	3.60	17.81	25.91	1.30
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
	1	Scrapper	3.63	18.83	20.34	1.05
	0	Signal Boards	0.05	0.12	0.17	0.02
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	7.3	36.8	46.4	2.4
		tons per period	0.1	0.5	0.6	0.0

Grading/Excavation

Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
	0	Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
	1	Excavator	1.84	9.44	9.04	0.47
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
	1	Grader	1.20	5.29	11.11	0.59
	1	Loaders, Rubber Tired	0.92	4.17	8.33	0.43
		Off-Highway Trucks	0.00	0.00	0.00	0.00
	0	Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
	1	Scrapper	3.63	18.83	20.34	1.05
	0	Signal Boards	0.05	0.12	0.17	0.02
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		max pounds per day	7.6	37.8	49.0	2.6
		tons per period	0.5	2.2	2.9	0.2

Drainage/Utilities/Subgrade

Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
	1	Compactor	2.08	12.77	11.46	0.62
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
	1	Grader	1.20	5.29	11.11	0.59
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
	1	Scrapper	3.63	18.83	20.34	1.05
	0	Signal Boards	0.05	0.12	0.17	0.02
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
	1	Trenchers	0.99	3.59	6.36	0.52
		max pounds per day	7.9	40.6	49.5	2.8
		tons per period	0.3	1.6	2.0	0.1

Paving	Number of Vehicles		ROG	CO	NOx	PM10
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
	1	Pavers	0.93	4.21	8.41	0.44
	1	Paving Equipment	0.82	3.52	8.48	0.44
	1	Rollers	0.59	2.65	5.31	0.28
		Scrapper	0.00	0.00	0.00	0.00
	0	Signal Boards	0.05	0.12	0.17	0.02
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	2.4	10.5	22.4	1.2
		tons per period	0.0	0.2	0.4	0.0
Total Emissions (tons per construction period)			0.9	4.5	5.9	0.3

0

Equipment default values for horsepower, load factor, and hours/day can be overridden in cells C235 through C256, E235 through E256, and G235 through G256.

		Default Values		Default Values		Default Values
Equipment		Horsepower		Load Factor		Hours/day
Bore/Drill Rigs		218		0.75		8
Concrete/Industrial Saws		84		0.73		8
Cranes		190		0.43		8
Crawler Tractors		143		0.575		8
Crushing/Proc. Equipment		154		0.78		8
Excavators		180		0.58		8
Graders		174		0.575		8
Off-Highway Tractors		255		0.41		8
Off-Highway Trucks		417		0.49		8
Other Construction Equipment		190		0.62		8
Pavers		132		0.59		8
Paving Equipment		111		0.53		8
Rollers		114		0.43		8
Rough Terrain Forklifts		94		0.475		8
Rubber Tired Dozers		352		0.59		8
Rubber Tired Loaders		165		0.465		8
Scrapers		313		0.66		8
Signal Boards		25		0.82		8
Skid Steer Loaders		62		0.515		8
Surfacing Equipment		437		0.49		8
Tractors/Loaders/Backhoes		79		0.465		8
Trenchers		82		0.695		8

Default load factors from SCAQMD CEQA Handbook, 1993.

Default horsepower values from Appendix B, California Air Resources Board's Offroad Model (see also Appendix B of this spreadsheet).

Signal board horsepower based on: U.S. EPA, 1998. Final Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines (EPA420-R-98-016).

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END OF DATA ENTRY SHEET