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# Rancho Palma

**MOBILE SOURCE AIR TOXIC HEALTH RISK ASSESSMENT  
CITY OF SAN BERNARDINO**

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## **LIST OF ABBREVIATED TERMS**

(1)	Reference
AADT	Annual Average Daily Traffic Volumes
ARB	Air Resources Board
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CO	Carbon Monoxide
CPF	Cancer Potency Factor
EPA	Environmental Protection Agency
HRA	Health Risk Assessment
LDA	Light Duty Auto
LDT	Light Duty Truck
LHD	Light Heavy Duty
MCY	Motorcycle
MDV	Medium Duty Vehicle
NO <sub>2</sub>	Nitrogen Dioxide
OBUS	Other Bus
PM <sub>10</sub>	Particulate Matter 10 microns in diameter or less
PM <sub>2.5</sub>	Particulate Matter 2.5 microns in diameter or less
PPM	Parts per Million
Project	Rancho Palma
PVMRM	Plume Volume Molar Ratio Methods
REL	Reference Exposure Level
RME	Reasonable Maximum Exposure
SBUS	School Bus
SCAQMD	South Coast Air Quality management District
TACs	Toxic Air Contaminants
TOP	The Ontario Plan
UBUS	Urban Bus
URF	Unit Risk Factor
UTM	Universal Traverse Mercator

# 1 INTRODUCTION

In 2005, the California Air Resources Board (ARB) promulgated an advisory recommendation to avoid setting sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles per day or rural roads with 50,000 vehicles per day. According to the ARB, the increased cancer risk is 300 to 1,700 per million within this domain. The strongest association of traffic related emissions with adverse health outcomes was seen within 300 feet of roadways with high truck densities. Notwithstanding, the ARB notes that a site specific analysis would be required to determine the actual risk near a particular land use and should consider factors such as prevailing wind direction, local topography and climate.

Additionally, the California Code of Regulations, Title 14, Section 15126.2(a) recommends that significant environmental effects of a project be assessed when a project brings development and people into an affected area (1). For the proposed project, adjoining freeway emissions are a potential concern and relevant thresholds and standards exist to determine the impact of vehicular emissions on an exposed population. As such, a health risk assessment was prepared to assess the impact of these emissions on individuals residing at the proposed project site.

In consideration of the above referenced requirement, the assessment and dispersion modeling methodologies used in the preparation of this report were composed of all relevant and appropriate procedures presented by the U.S. Environmental Protection Agency, California Environmental Protection Agency and South Coast Air Quality Management District (SCAQMD). The methodologies and assumptions offered under this regulatory guidance were used to ensure that the assessment effectively quantified residential exposures associated with the generation of contaminant emissions from adjacent mobile source activity.

This report summarizes the protocol used to evaluate contaminant exposures and presents the results of the health risk assessment (HRA) prepared by Urban Crossroads, Inc., for the proposed Rancho Palma project (referred to as "Project").

## 1.1 SITE LOCATION

The proposed Rancho Palma Project is located northeast of West Little League Drive and northwest of Palm Avenue in the City of San Bernardino, as shown on Exhibit 1-A. The Interstate 215 (I-215) Freeway right-of-way is located approximately 75 feet south of the Project site. Existing residential land uses in the Project study area are located north of the Project site on Irvington Avenue, Chestnut Avenue, and Loreda Street. The Guhin and Verdemon Parks are located west and north of the Project site, respectively. North of the Project site are the Cesar E. Chavez Middle School on Magnolia Avenue, and the Little League Baseball Western Region Headquarters on North Little League Drive. The existing commercial retail Palm Travel Center is located south of the Project site on West Little League Drive.

## 1.2 PROJECT DESCRIPTION

The Project is proposed to include the development of up to 120 single-family detached residential dwelling units and 98,000 square feet of commercial retail use, as shown on Exhibit 1-B. For the purposes of this analysis, potential impacts have been assessed for two development phases. The two phases and their anticipated opening years are as follows:

- Phase 1 (2018) – 120 single family detached residential dwelling units (Western Half);
- Phase 2 (2019) – 98,000 square feet of commercial retail use (Eastern Half).

Additionally, as part of the project design, the Project applicant has agreed to implement the following:

1. All single-family units within the project site shall include the installation and maintenance of air filtration systems with efficiencies equal to or exceeding a Minimum Efficiency Reporting Value (MERV) 14 as defined by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 52.2 (2)<sup>1</sup>.

## 1.3 SUMMARY OF FINDINGS

For carcinogenic exposures, the summation of risk for the maximum exposed residential receptor totaled 8.91E-06 (8.91 in one million) for the 30 year and 2.67E-06 (2.67 in one million) for the 9 year exposure scenarios. In comparison to the threshold level of 10 in one million, carcinogenic risks will not exceed the applicable thresholds for both the 30 and 9 year exposure scenario. Therefore, carcinogenic exposures are calculated to be within acceptable limits and are less than significant.

For chronic noncarcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for both the 30 year and 9 year exposure scenarios. For acute exposures, the hazard indices for the identified averaging times did not exceed unity. Therefore, noncarcinogenic hazards are calculated to be within acceptable limits and a less than significant impact would occur.

For the maximum exposed residential receptor, results of the analysis predicted freeway emissions will produce PM<sub>10</sub> concentrations of 0.74 µg/m<sup>3</sup> and 0.49 µg/m<sup>3</sup> for the 24-hour and annual averaging times. These values will not exceed the SCAQMD significance thresholds of 2.5 µg/m<sup>3</sup> and 1.0 µg/m<sup>3</sup>, respectively.

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<sup>1</sup> The use of MERV filtration systems to reduce DPM and particulates has been successfully implemented by several lead agencies, including, but not limited to: City of Los Angeles, City of Claremont, City of Irvine, City of Glendale, City of Berkeley, City of Oakland, and the Los Angeles Unified School District (LAUSD).

The average particle size efficiency (PSE) removal based on ASHRAE Standard 52.2 for MERV 14 is approximately 75% for 0.3 to 1.0 µg/m<sup>3</sup>(DPM) and 90% for 1.0 to 10 µg/m<sup>3</sup>(PM<sub>10</sub> and PM<sub>2.5</sub>) (2).

**EXHIBIT 1-A: LOCATION MAP**



**LEGEND:**



EXHIBIT 1-B: SITE PLAN



For PM<sub>2.5</sub>, a maximum 24-hour average concentration of 0.245 µg/m<sup>3</sup> was predicted. This value also will not exceed the identified significance threshold of 2.5 µg/m<sup>3</sup>.

The maximum modeled 1-hour average concentration for CO of 0.22 parts per million (ppm) (255.84 µg/m<sup>3</sup>), when added to an existing background concentration of 4.0 ppm, would equal a total Project concentration of 4.22 ppm. This would not cause an exceedance of the California Ambient Air Quality Standards (CAAQS) of 20 ppm. For the 8-hour averaging time, the maximum predicted concentration of 0.18 ppm (207.64 µg/m<sup>3</sup>), when added to an existing background level of 2.4 ppm, would equal a total Project concentration of 2.58 ppm. This would not cause an exceedance of the CAAQS of 9 ppm.

For NO<sub>2</sub>, a maximum one hour concentration of 0.023 ppm (44.01 µg/m<sup>3</sup>) was predicted. This concentration, when added to a background concentration of 0.073 ppm, would equal a total Project concentration of 0.096 ppm. This would not cause an exceedance of the CAAQS of 0.18 ppm.

As noted, short duration (i.e., 1 and 8-hour) exposures associated with both toxic and criteria pollutants are within acceptable limits. As such, less than significant impacts are anticipated to residents who access and utilize outdoor amenities.

#### **1.4 MITIGATION MEASURES**

No significant impacts would occur, thus no mitigation is required.

## 2 SOURCE IDENTIFICATION

The California Department of Transportation (Caltrans), Traffic and Vehicle Data Systems Unit collects and maintains traffic volume counts for vehicles traversing the California state highway system. Discrete data sets are available for main highway segments and adjoining freeway ramp volumes. Table 2-1 presents the annual average daily traffic volumes (AADT) for the roadway segments considered in the assessment. Data for mainline AADTs on Route 215 was obtained from the Project’s Traffic Study for Year 2035 conditions. Data for the northbound and southbound on/off ramps along Palm Avenue were obtained from the Caltrans Traffic and Vehicle Data Systems Unit (3).

**TABLE 2-1 FREEWAY TRAFFIC VOLUMES**

Roadway Segment	Annual Average Daily Traffic (AADT)
I-215 Freeway	81,160
NB On / Pine Avenue	6,700
NB Off / Pine Avenue	5,500
SB On / Pine Avenue	5,500
SB Off / Pine Avenue	6,700

### 3 SOURCE CHARACTERIZATION

In urban communities, vehicle emissions contribute significantly to localized concentrations of air contaminants. Typically, emissions generated from these sources are characterized by vehicle mix, the rate pollutants are generated during the course of travel and the number of vehicles traversing the roadway network.

Currently, emission factors are generated from a series of computer based programs to produce a composite emission rate for vehicles traveling at various speeds within a defined geographical area or along a discrete roadway segment. To account for the emission standards imposed on the California fleet, the ARB has developed the EMFAC2014 emission factor model. EMFAC2014 was utilized to identify pollutant emission rates for total organic gases (TOG), diesel particulates, particulates (PM10 and PM2.5), carbon monoxide (CO) and nitrogen oxide (NOx) compounds (4). To produce a representative vehicle fleet distribution, the assessment utilized ARB's San Bernardino County population estimates for the 2020 calendar year as a conservative measure. This approach provides an estimate of vehicle mix associated with operational profiles at the link or intersection level. Table 3-1 lists the identified fleet mix considered in the assessment.

Based upon the freeway traffic volumes and population profiles noted above, discrete traffic counts were identified for each roadway segment. Diesel vehicles account for 5.12 percent of the on-road mobile fleet. For chronic (long term) and acute (e.g., 1-hour) exposures, AADT values were averaged to produce representative hourly traffic volumes. Table 3-2 presents the hourly traffic volumes considered in the assessment.

TABLE 3-1: VEHICLE FLEET MIX PROFILE

Vehicle class	San Bernardino County		
	Fuel	Population	Percent
LDA	Diesel	3406	0.14
LDA	Gas	1066571	45.06
LDT1	Diesel	218	0.01
LDT1	Gas	168279	7.11
LDT2	Diesel	211	0.01
LDT2	Gas	420165	17.75
LHD1	Diesel	37466	1.58
LHD1	Gas	63985	2.70
LHD2	Diesel	11287	0.48
LHD2	Gas	5472	0.23
MCY	Gas	43045	1.82
MDV	Diesel	384	0.02
MDV	Gas	453630	19.17
MH	Diesel	7800	0.33
MH	Gas	31534	1.33
T6	Diesel	13217	0.56
T6	Gas	3297	0.14
T7	Diesel	32892	1.38
T7	Gas	402	0.02
OBUS	Diesel	525	0.02
OBUS	Gas	808	0.03
SBUS	Diesel	981	0.04
SBUS	Gas	515	0.02
UBUS	Diesel	504	0.02
UBUS	Gas	459	0.02

Note: Vehicle category descriptions can be found on the California Air Resources Board website at <http://www.arb.ca.gov/msei/modeling.htm>.

**TABLE 3-2: HOURLY FREEWAY TRAFFIC VOLUMES**

Roadway Segment	Average Traffic Volume		
	All	Gas	Diesel
Route 215 NB	1,690.8	1,604.3	86.5
Route 215 SB	1,690.8	1,604.3	86.5
NB On / Palm Avenue	279.2	264.9	14.3
NB Off / Palm Avenue	229.2	217.4	11.7
SB On / Palm Avenue	229.2	217.4	11.7
SB Off / Palm Avenue	279.2	264.9	14.3

Posted route speeds were assumed for vehicles traversing the main highway link (Route 215). Emissions associated with acceleration and deceleration (i.e., on/off ramps) were based upon vehicle speeds of 45 and 5 miles per hour, respectively. These values were subsequently adjusted utilizing the modal algorithms presented in the California Line Source Dispersion Model (5).

For particulates (PM10 and PM2.5), emissions were quantified through the reentrainment of paved roadway dust. The predictive emission equation developed by the U.S. Environmental Protection Agency (AP-42, Section 13.2.1) was utilized to generate particulate source strength (6). To account for the mass rate of emissions entrained from the roadway surface, the contribution from exhaust, break and tire wear were added to the AP-42 emission factor equation.

A list of compounds associated with mobile source emissions is presented in Table 3-3. Appendix 3.1 presents the on-road emission rate calculation worksheets for the freeway segments considered in the assessment.

**TABLE 3-3: COMPOUNDS EMITTED FROM ON ROAD MOBILE SOURCE ACTIVITY**

Source	Pollutant
State Route 215	Benzene Formaldehyde 1,3-Butadiene Acetaldehyde Acrolein Diesel Particulates Reentrained Particulates (PM10, PM2.5) Carbon Monoxide Nitrogen Dioxide

## 4 EXPOSURE QUANTIFICATION

In order to assess the impact of emitted compounds on individuals who reside at the proposed apartment complex, air quality modeling utilizing the AMS/EPA Regulatory Model AERMOD was performed to assess the downwind extent of mobile source emissions located within a ¼ mile radius of the project site. AERMOD's air dispersion algorithms are based upon a planetary boundary layer turbulence structure and scaling concepts, including the treatment of surface and elevated sources in simple and complex terrain.

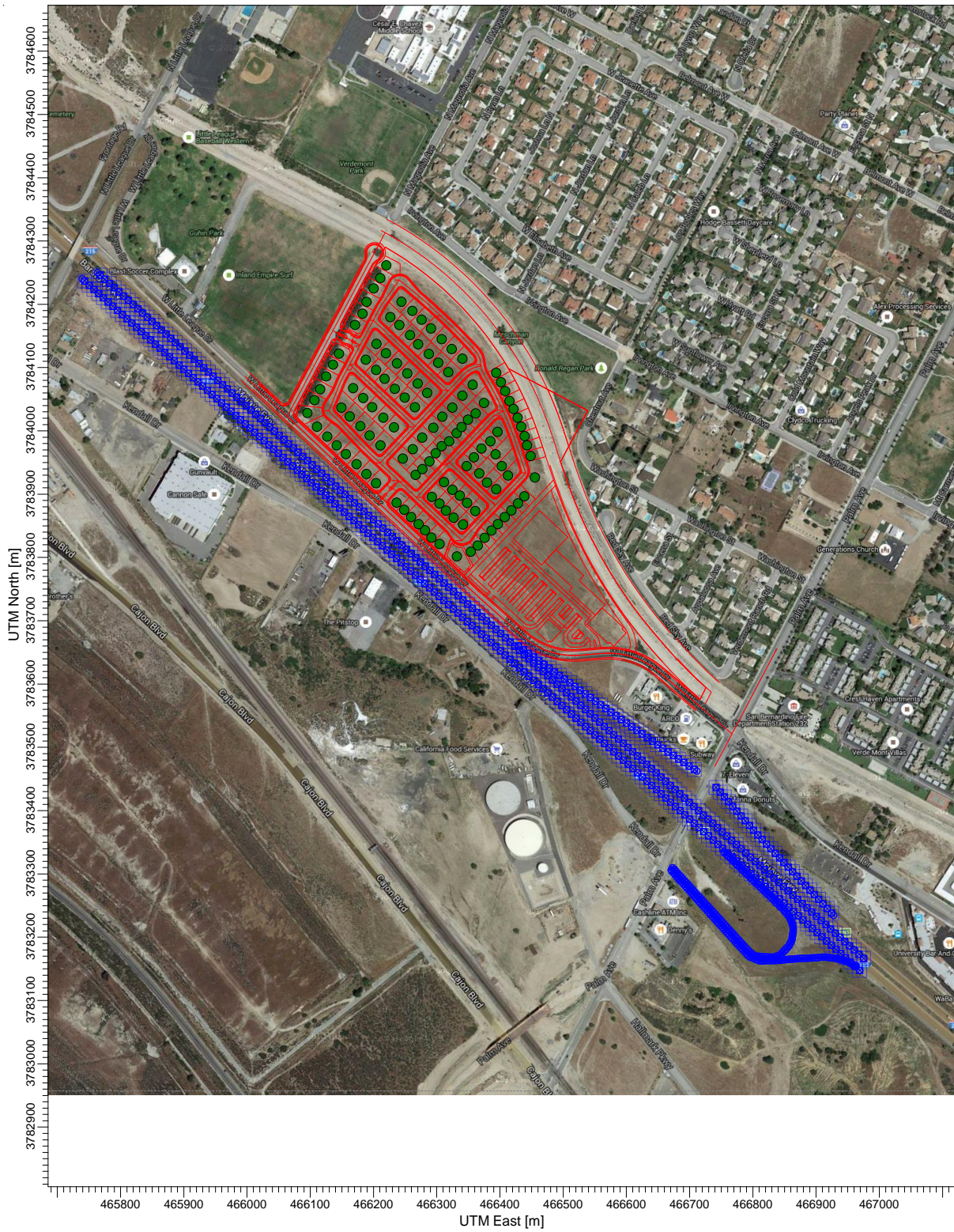
The model offers additional flexibility by allowing the user to assign initial vertical and lateral dispersion parameters for sources representative of a localized mobile fleet. For this assessment, the volume source algorithm was utilized to model the emissions generated from on-road mobile source activity. Although the freeway is located predominantly below grade, the assessment followed guidance promulgated by the U.S. Environmental Protection Agency (U.S. EPA, 2009) whereby the model was programmed to assume flat, level terrain (7). This was done to avoid underestimating pollutant concentrations for conditions involving low-level, non-buoyant sources in up-sloping terrain. Notwithstanding, to account for the discrepancy in terrain elevation, vertical ( $\sigma_z$ ) dispersion parameters were developed for each source location by approximating mixing zone residence time and quantifying the initial vertical term as performed in the California Line Source Dispersion Model Caline3 (5). The horizontal ( $\sigma_y$ ) parameters were generated by dividing the source separation distance by a standard deviation of 2.15. It should be noted that Caline3 was not used for dispersion modeling calculations, rather Caline3 modeling guidance was used for determining initial vertical mixing parameters which were input into AERMOD.

Air dispersion models require additional input parameters including pollutant emission data and local meteorology. Due to their sensitivity to individual meteorological parameters such as wind speed and direction, the U.S. Environmental Protection Agency recommends that meteorological data used as input into dispersion models be selected on the basis of relative spatial and temporal conditions that exist in the area of concern. In response to this recommendation, the nearest meteorological data available from the SCAQMD San Bernardino station (Source Receptor Area 34), which is located approximately 9 miles southeast of the project site, was used to represent local weather conditions and prevailing winds. Five years (2008-2012) of available AERMOD meteorological data was utilized in the modeling.

The modeling analysis also considered the spatial distribution of mobile source activity traversing the freeway in relation to the proposed site. To accommodate a Cartesian grid format, direction dependent calculations were obtained by identifying the universal transverse mercator (UTM) coordinates for each volume source location. On-site receptors were placed to provide coverage across the identified project boundary. A graphical representation of the source-receptor grid network is presented in Exhibit 4-A.

Air dispersion model input/output files are summarized in Appendix 3.3.

EXHIBIT 4-A: SOURCE RECEPTOR GRID NETWORK





## 5 RISK CHARACTERIZATION

### 5.1 CARCINOGENIC CHEMICAL RISK

Carcinogenic compounds are not considered to have threshold levels (i.e., dose levels below which there are no risks). Any exposure, therefore, will have some associated risk. As a result, the State of California has established a threshold of one in one hundred thousand (or ten in one million) ( $1.0E-05$ ) as a level posing no significant risk for exposures to carcinogens regulated under the Safe Drinking Water and Toxic Enforcement Act (Proposition 65). This threshold is also consistent with the maximum incremental cancer risk established by the SCAQMD for projects prepared under the auspices of the California Environmental Quality Act (CEQA). The SCAQMD *CEQA Air Quality Handbook* (1993) states that emissions of toxic air contaminants (TACs) are considered significant if a health risk assessment shows an increased risk of greater than ten in one million (8).

Health risks associated with exposure to carcinogenic compounds can be defined in terms of the probability of developing cancer as a result of exposure to a chemical at a given concentration. Under a deterministic approach (i.e., point estimate methodology), the cancer risk probability is determined by multiplying the chemical's annual concentration by its unit risk factor (URF). The URF is a measure of the carcinogenic potential of a chemical when a dose is received through the inhalation pathway. It represents an upper bound estimate of the probability of contracting cancer as a result of continuous exposure to an ambient concentration of one microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ ) over a 70 year lifetime. The URFs utilized in the assessment and corresponding cancer potency factor were obtained from the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values* (9).

To effectively quantify dose, the procedure requires the incorporation of several discrete exposure variates. Once determined, contaminant dose is multiplied by the cancer potency factor (CPF) in units of inverse dose expressed in milligrams per kilogram per day ( $\text{mg}/\text{kg}/\text{day}$ )-1 to derive the cancer risk estimate. Therefore, to assess exposures associated with the proposed residential population, the following dose algorithm was utilized.

$$CDI = (C_{air} \times EF \times ED \times IR) / (BW \times AT)$$

Where:

CDI = chronic daily intake (mg/kg/day)

C<sub>air</sub> = concentration of contaminant in air (mg/m<sup>3</sup>)

EF = exposure frequency (days/year)

ED = exposure duration (years)

IR = inhalation rate (m<sup>3</sup>/day)

BW = body weight (kg)

AT = averaging time (days)

To represent residential exposures, the assessment employed the U.S. Environmental Protection Agency's guidance to develop viable dose estimates based on reasonable maximum exposures (RME). Specifically, activity patterns for population mobility recommended by the U.S. Environmental Protection Agency and presented in the Exposure Factors Handbook were utilized. As a result, lifetime risk values for residents were adjusted to account for an exposure duration of 350 days per year for 30 years (i.e., 95th percentile). A 9 year exposure duration was additionally assessed to identify risk estimates associated with the average time individuals are reported to reside at a given residence. These values are consistent with the California Environmental Quality Act which considers the evaluation of environmental effects of proposed projects in a manner that reflects both reasonable and feasible assumptions. For body weight and inhalation, the assessment employed average adult values of 70 kilograms and 20 cubic meters per day, respectively.

Appendix 3.2, Tables A1 and A2, columns f-g, present the URF's and corresponding cancer potency factors for carcinogens considered in the assessment. The cancer risk attributed to each compound and summation of those risks are presented in column h.

For carcinogenic exposures, the summation of risk for the maximum exposed residential receptor totaled 8.91E-06 (8.91 in one million) for the 30 year and 2.67E-06 (2.67 in one million) for the 9 year exposure scenarios. In comparison to the threshold level of ten in one million, carcinogenic risks will not exceed the applicable thresholds for both the 30 and 9 year exposure scenario. Therefore, carcinogenic exposures were predicted to be within acceptable limits and are less than significant.

## 5.2 NON-CARCINOGENIC HAZARDS

An evaluation of the potential noncancer effects of contaminant exposures was also conducted. Under the point estimate approach, adverse health effects are evaluated by comparing the concentration of each compound with the appropriate Reference Exposure Level (REL). Available REL's presented in the *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values were considered in the assessment.*

To quantify noncarcinogenic impacts, the hazard index approach was used. The hazard index assumes that subthreshold exposures adversely affect a specific organ or organ system (i.e., toxicological endpoint). For each discrete pollutant exposure, target organs presented in regulatory guidance were utilized.

To calculate the hazard index, the pollutant concentration or dose is divided by the appropriate toxicity value. For compounds affecting the same toxicological endpoint, this ratio is summed. Where the total equals or exceeds one (i.e., unity), a health hazard is presumed to exist. For chronic exposures, REL's were converted to units expressed in mg/kg/day to accommodate the above referenced intake algorithm. To assess acute noncancer impacts, the maximum pollutant concentration is divided by the REL for the corresponding averaging time (e.g., 1-hour). No exposure adjustments are considered for short duration exposures.

Appendix 3.2, Tables A1 and A2, columns i-j, present the REL's and corresponding reference dose values used in the evaluation of chronic noncarcinogenic exposures. The noncancer hazard quotient for identified compounds generated from each source and a summation for each toxicological endpoint are presented in columns k-r. Tables A3 through A4, column e present the REL's for the assessment of acute exposures. Columns f-m identify each compound's hazard quotient and corresponding index for each endpoint.

For chronic noncarcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for both the 30 year and 9 year exposure scenarios. For acute exposures, the hazard indices for the identified averaging times did not exceed unity. Therefore, acute and chronic non-carcinogenic hazards were predicted to be within acceptable limits and are less than significant.

### **5.3 CRITERIA POLLUTANT EXPOSURES**

The State of California has promulgated strict ambient air quality standards for various pollutants. These standards were established to safeguard the public's health and welfare with specific emphasis on protecting those individuals susceptible to respiratory distress, such as asthmatics, the young, the elderly and those with existing conditions which may be affected by increased pollutant concentrations. However, recent research has shown that unhealthful respiratory responses occur with exposures to pollutants at levels that only marginally exceed clean air standards. Table 5-1 presents the CAAQS for the criteria pollutants considered in the assessment.

**TABLE 5-1: CALIFORNIA AMBIENT AIR QUALITY STANDARDS**

Pollutant	Standard	Health Effects
Particulates (PM10)	>50 µg/m <sup>3</sup> (24 hr avg.) >20 µg/m <sup>3</sup> (Annual)	1) Excess deaths from short-term exposures and the exacerbation of symptoms in sensitive individuals with respiratory disease. 2) Excess seasonal declines in pulmonary function especially in children.
Particulates (PM2.5)	>12 µg/m <sup>3</sup> (Annual)	1) Excess deaths and illness from long-term exposures and the exacerbation of symptoms in sensitive individuals with respiratory and cardio pulmonary disease.
Carbon Monoxide (CO)	>9.0 ppm (8 hr avg.) >20.0 ppm (1 hr avg.)	1) Aggravation of angina pectoris and other aspects of coronary heart disease. 2) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease. 3) Impairment of central nervous system functions. 4) Possible increased risk to fetuses.
Nitrogen Dioxide (NO <sub>2</sub> )	>0.18 ppm (1 hr avg.)	1) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups. 2) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes.

Abbreviations: ppm: parts per million; µg/m<sup>3</sup>: micrograms per cubic meter.

Source: California Code of Regulations, Title 17, Section 70200.

Pollutant emissions are considered to have a significant effect on the environment if they result in concentrations that create either a violation of an ambient air quality standard, contribute to an existing air quality violation or expose sensitive receptors to substantive pollutant concentrations. Should ambient air quality already exceed existing standards, the SCAQMD has established significance criteria for selected compounds to account for the continued degradation of local air quality. Background concentrations are based upon the highest observed value for the most recent three year period.

For PM<sub>10</sub> emissions, background concentrations representative of the project area exceed the CAAQS for the 24-hour and annual averaging times. As a result, a significant impact is achieved when pollutant concentrations produce a measurable change over existing background levels. Although background concentrations exceed the CAAQS annual averaging time for fine particulates, no measurable change criteria currently exists. As a result, the SCAQMD significance threshold of 2.5 µg/m<sup>3</sup> for the 24-hour averaging time is used to assess PM<sub>2.5</sub> impacts.

For the CO 1 and 8-hour averaging times and NO<sub>2</sub> 1-hour averaging time, background concentrations are below the current air quality standards. As such, significance is achieved when pollutant concentrations add to existing levels and create an exceedance of the CAAQS. Table 5-2 shows the pollutant concentrations collected at the nearest available monitoring sites to the Project for the last three years of available data. The nearest long-term air quality monitoring site in relation to the project for Particulate Matter ≤ 10 Microns (PM<sub>10</sub>), Particulate

Matter  $\leq$  2.5 Microns (PM<sub>2.5</sub>), Carbon Monoxide (CO), and Nitrogen Dioxide (NO<sub>2</sub>) is carried out by the South Coast Air Quality Management District (SCAQMD) at the Central San Bernardino Valley 2 monitoring station, located approximately 9 miles southeast of the Project site in the City of San Bernardino (SRA 34) (10). Table 5-2 outlines the relevant significance thresholds considered to affect local air quality.

**TABLE 5-2: SAN BERNARDINO MONITORING SUMMARY (SRA 34)**

Pollutant/ Averaging Time	Year			
	2012	2013	2014	Maximum
Particulates (PM <sub>10</sub> ) 24-Hour	53	102	136	136
Particulates (PM <sub>2.5</sub> ) 24-Hour	34.8	55.3	73.9	73.9
Carbon Monoxide (CO) 1-Hour	--	--	4.0	4.0
8-Hour	1.7	1.7	2.4	2.4
Nitrogen Dioxide (NO <sub>2</sub> ) 1-Hour	0.067	0.072	0.073	0.073

Note: PM<sub>10</sub> concentrations are expressed in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). All others are expressed in parts per million (ppm).  
Source: U.S Environmental Protection Agency and California Air Resources Board.

**TABLE 5-3: SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS**

Pollutant	Averaging Time	Pollutant Concentration
Particulates (PM10) Particulates (PM2.5)	24-Hours	2.5 µg/m <sup>3</sup> (operation)
Particulates (PM10)	Annual	1.0 µg/m <sup>3</sup>
Carbon Monoxide (CO)	1/8-Hours	SCAQMD is in attainment; impacts are significant if they cause or contribute to an exceedance of the following attainment standards 20 ppm (1-hour) and 9 ppm (8-hour).
Nitrogen Dioxide (NO <sub>2</sub> )	1-Hour	SCAQMD is in attainment; impacts are significant if they cause or contribute to an exceedance of the following attainment standard 0.18 ppm.

Abbreviations: ppm: parts per million; µg/m<sup>3</sup>: micrograms per cubic meter

Source: South Coast Air Quality Management District.

For the maximum exposed residential receptor, results of the analysis predicted freeway emissions will produce PM10 concentrations of 0.74 µg/m<sup>3</sup> and 0.49 µg/m<sup>3</sup> for the 24-hour and annual averaging times. These values will not exceed the SCAQMD significance thresholds of 2.5 µg/m<sup>3</sup> and 1.0 µg/m<sup>3</sup>, respectively.

For PM2.5, a maximum 24-hour average concentration of 0.245 µg/m<sup>3</sup> was predicted. This value also will not exceed the identified significance threshold of 2.5 µg/m<sup>3</sup>.

The maximum modeled 1-hour average concentration for CO of 0.22 parts per million (ppm) (255.84 µg/m<sup>3</sup>), when added to an existing background concentration of 4.0 ppm, would equal a total Project concentration of 4.22 ppm. This would not cause an exceedance of the California Ambient Air Quality Standards (CAAQS) of 20 ppm. For the 8-hour averaging time, the maximum predicted concentration of 0.18 ppm (207.64 µg/m<sup>3</sup>), when added to an existing background level of 2.4 ppm, would equal a total Project concentration of 2.58 ppm. This would not cause an exceedance of the CAAQS of 9 ppm.

For NO<sub>2</sub>, a maximum one hour concentration of 0.023 ppm (44.01 µg/m<sup>3</sup>) was predicted. This concentration, when added to a background concentration of 0.073 ppm, would equal a total Project concentration of 0.096 ppm. This would not cause an exceedance of the CAAQS of 0.18 ppm.

## 6 CONCLUSION

For carcinogenic exposures, the summation of risk for the maximum exposed residential receptor totaled 8.91E-06 (8.91 in one million) for the 30 year and 2.67E-06 (2.67 in one million) for the 9 year exposure scenarios. In comparison to the threshold level of 10 in one million, carcinogenic risks will not exceed the applicable thresholds for both the 30 and 9 year exposure scenario. Therefore, carcinogenic exposures are calculated to be within acceptable limits and are less than significant.

For chronic noncarcinogenic effects, the hazard index identified for each toxicological endpoint totaled less than one for both the 30 year and 9 year exposure scenarios. For acute exposures, the hazard indices for the identified averaging times did not exceed unity. Therefore, noncarcinogenic hazards are calculated to be within acceptable limits and a less than significant impact would occur.

For the maximum exposed residential receptor, results of the analysis predicted freeway emissions will produce PM10 concentrations of 0.74  $\mu\text{g}/\text{m}^3$  and 0.49  $\mu\text{g}/\text{m}^3$  for the 24-hour and annual averaging times. These values will not exceed the SCAQMD significance thresholds of 2.5  $\mu\text{g}/\text{m}^3$  and 1.0  $\mu\text{g}/\text{m}^3$ , respectively.

For PM2.5, a maximum 24-hour average concentration of 0.245  $\mu\text{g}/\text{m}^3$  was predicted. This value also will not exceed the identified significance threshold of 2.5  $\mu\text{g}/\text{m}^3$ .

The maximum modeled 1-hour average concentration for CO of 0.22 parts per million (ppm) (255.84  $\mu\text{g}/\text{m}^3$ ), when added to an existing background concentration of 4.0 ppm, would equal a total Project concentration of 4.22 ppm. This would not cause an exceedance of the California Ambient Air Quality Standards (CAAQS) of 20 ppm. For the 8-hour averaging time, the maximum predicted concentration of 0.18 ppm (207.64  $\mu\text{g}/\text{m}^3$ ), when added to an existing background level of 2.4 ppm, would equal a total Project concentration of 2.58 ppm. This would not cause an exceedance of the CAAQS of 9 ppm.

For NO<sub>2</sub>, a maximum one hour concentration of 0.023 ppm (44.01  $\mu\text{g}/\text{m}^3$ ) was predicted. This concentration, when added to a background concentration of 0.073 ppm, would equal a total Project concentration of 0.096 ppm. This would not cause an exceedance of the CAAQS of 0.18 ppm.

As noted, short duration (i.e., 1 and 8-hour) exposures associated with both toxic and criteria pollutants are within acceptable limits. As such, less than significant impacts are anticipated to residents who access and utilize outdoor amenities.

## 7 REFERENCES

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2. **American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.** *Method of Testing General Ventilation Air Cleaning Devices for Removal by Particle Size.* 1999. ANSI/ASHRAE Standard 52.2.
3. **California Department of Transportation.** Traffic and Vehicle Data Systems Unit. [Online] 2013. [http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/..](http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/)
4. —. EMFAC Software. [Online] <http://www.dot.ca.gov/hq/env/air/pages/emfac.htm>.
5. —. *Caline3 - A Versatile Dispersion Model for Predicting Air Pollutant Levels Near Highways and Arterial Streets.* s.l. : Office of Transportation Laboratory, 1979.
6. **U.S. Environmental Protection Agency.** 13.2.1 Paved Roads. [Online] <http://www.epa.gov/ttnchie1/ap42/ch13/final/c13s0201.pdf>.
7. **United States Environmental Protection Agency.** *AERMOD Implementation Guide.* s.l. : Office of Air Quality Planning and Standards, 2009.
8. **South Coast Air Quality Management District.** *Air Quality Handbook.* 1993.
9. **California Air Resources Board.** Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values. [Online] <http://www.arb.ca.gov/toxics/healthval/contable/pdf>.
10. **South Coast Air Quality Management District.** *Air Quality Reporting.* [pdf] Diamond Bar : Sierra Wade Associates, 1999.



## 8 CERTIFICATION

The contents of this air study report represent an accurate depiction of the environmental impacts associated with the proposed Rancho Palma Project. The information contained in this health risk assessment is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 660-1994 ext. 217.

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### EDUCATION

Master of Science in Environmental Studies  
California State University, Fullerton • May, 2010

Bachelor of Arts in Environmental Analysis and Design  
University of California, Irvine • June, 2006

### PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners  
AWMA – Air and Waste Management Association  
ASTM – American Society for Testing and Materials

### PROFESSIONAL CERTIFICATIONS

Environmental Site Assessment – American Society for Testing and Materials • June, 2013  
Planned Communities and Urban Infill – Urban Land Institute • June, 2011  
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008  
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007  
AB2588 Regulatory Standards – Trinity Consultants • November, 2006  
Air Dispersion Modeling – Lakes Environmental • June, 2006

**APPENDIX 3.1:**  
**EMISSION RATE CALCULATION WORKSHEETS**

### Running Rate Emission Summary

Criteria	5 mph	45 mph	65 mph
CO	3.281	1.043	2.087
NOx	0.861	0.586	0.831
PM10	0.046	0.0136	0.0162
PM2.5	0.042	0.0037	0.0149
TOG GAS	0.402	0.102	0.174
TOG DSL	1.565	0.141	0.111
DSL Particulate	0.096	0.045	0.068

### TW/BW Emission Summary

	TW	BW	Total
PM10	0.045	0.040	0.085
PM2.5	0.002	0.017	0.019

EMFAC2011 Worksheet  
(5 mph)

EMFAC2011 Emission Rates  
Region Type: County  
Region: San Bernardino  
Calendar Year: 2020  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
**Pollutant Classification: Criteria**

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	CO_RUNEX (gms/mile)	CO_RUNEX AVE (gms/mile)	NOX_RUNEX (gms/mile)	NOx_RUNEX AVE (gms/mile)	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)	PM10_PMTW (gms/mile)	PM10_PMTW_AVE (gms/mile)	PM10_PMBW (gms/mile)	PM10_PMBW_AVE (gms/mile)
San Bernardino	2020	Annual	LDA	DSL	Aggregated	5	1869.620736	0.0013	1.63396101	0.00208793	0.140868014	0.00018001	0.01104466	0.00001411	0.01104466	0.00001411	0.036749816	0.000046960
San Bernardino	2020	Annual	LDA	GAS	Aggregated	5	676311.8832	0.4622	0.388885075	0.17975830	0.512631562	0.23695889	0.038178762	0.01764776	0.038178762	0.01764776	0.036749814	0.016987240
San Bernardino	2020	Annual	LDT1	DSL	Aggregated	5	134.88275	0.0001	4.147266451	0.00038233	0.402782346	0.00003713	0.018724347	0.00000173	0.018724347	0.00000173	0.036749816	0.000003388
San Bernardino	2020	Annual	LDT1	GAS	Aggregated	5	101185.5326	0.0692	0.594299612	0.04110026	0.601790533	0.04161831	0.07806097	0.00539850	0.07806097	0.00539850	0.036749814	0.002541524
San Bernardino	2020	Annual	LDT2	DSL	Aggregated	5	121.25939	0.0001	2.211657599	0.00018330	0.235659558	0.00001953	0.011471137	0.00000095	0.011471137	0.00000095	0.036749815	0.000003046
San Bernardino	2020	Annual	LDT2	GAS	Aggregated	5	247137.3591	0.1689	0.433088895	0.07315367	0.606343189	0.10241830	0.042878954	0.00724275	0.042878954	0.00724275	0.036749815	0.006207464
San Bernardino	2020	Annual	LHD1	DSL	Aggregated	5	25208.75828	0.0172	4.043867813	0.06967373	0.253930123	0.00437508	0.004900165	0.00008443	0.004900165	0.00008443	0.076439597	0.001317014
San Bernardino	2020	Annual	LHD1	GAS	Aggregated	5	47538.03319	0.0325	3.037043237	0.09867630	3.720863867	0.12089425	0.083639947	0.00271754	0.083639947	0.00271754	0.036749816	0.001194035
San Bernardino	2020	Annual	LHD2	DSL	Aggregated	5	7609.175113	0.0052	2.238986332	0.01164420	0.200781511	0.00104420	0.003441808	0.00001790	0.003441808	0.00001790	0.089179536	0.000463792
San Bernardino	2020	Annual	LHD2	GAS	Aggregated	5	4498.996026	0.0031	2.961705373	0.00910706	3.605873878	0.01108784	0.082409487	0.00025340	0.082409487	0.00025340	0.036749815	0.000113003
San Bernardino	2020	Annual	MCY	GAS	Aggregated	5	41584.70141	0.0284	24.71769052	0.70252556	1.217078548	0.03459178	0.000596026	0.00001694	0.000596026	0.00001694	0.036749449	0.001044492
San Bernardino	2020	Annual	MDV	DSL	Aggregated	5	218.195775	0.0001	3.5644918	0.00053158	0.416308819	0.00006208	0.012602552	0.00000188	0.012602552	0.00000188	0.036749814	0.000005481
San Bernardino	2020	Annual	MDV	GAS	Aggregated	5	252358.7351	0.1725	0.392360143	0.06767432	0.469452337	0.08097119	0.046592791	0.00803633	0.046592791	0.00803633	0.036749815	0.006338612
San Bernardino	2020	Annual	MH	DSL	Aggregated	5	2431.280612	0.0017	7.010467968	0.01164938	0.362017351	0.00060157	0.00584485	0.00000971	0.00584485	0.00000971	0.130339314	0.000216586
San Bernardino	2020	Annual	MH	GAS	Aggregated	5	13561.73574	0.0093	2.313226809	0.02144145	15.32431539	0.14204208	0.374920201	0.00347516	0.374920201	0.00347516	0.036749815	0.000340636
San Bernardino	2020	Annual	T6	DSL	Aggregated	5	13162.03774	0.0090	7.304080554	0.06570665	0.456791649	0.00410924	0.002824517	0.00002541	0.003151388	0.00002835	0.130339319	0.001172517
San Bernardino	2020	Annual	T6	GAS	Aggregated	5	2552.247931	0.0017	2.121127043	0.00370007	6.125609563	0.01068545	0.079685969	0.00013900	0.060595317	0.00010570	0.036749815	0.000064106
San Bernardino	2020	Annual	T7	DSL	Aggregated	5	22269.12415	0.0152	123.4525507	1.87898736	3.425343758	0.05213483	0.015225889	0.00023174	0.0017506	0.00002664	0.061135219	0.000930489
San Bernardino	2020	Annual	T7	GAS	Aggregated	5	294.2198155	0.0002	6.116524961	0.00122998	13.53777275	0.00272232	0.231236538	0.00004650	0.096286237	0.00001936	0.036749815	0.000007390
San Bernardino	2020	Annual	OBUS	DSL	Aggregated	5	440.6269497	0.0003	8.419834014	0.00253568	0.609099752	0.00018343	0.003511388	0.00000095	0.002824517	0.00000085	0.130339319	0.000039252
San Bernardino	2020	Annual	OBUS	GAS	Aggregated	5	733.2853002	0.0005	3.475365508	0.00174178	10.41358567	0.00521908	0.060595317	0.00003037	0.079685969	0.00003994	0.036749814	0.000018418
San Bernardino	2020	Annual	SBUS	DSL	Aggregated	5	1058.466563	0.0007	33.83143174	0.02447475	1.179168555	0.00085305	0.0017506	0.00000127	0.015225889	0.00001101	0.744796108	0.000538809
San Bernardino	2020	Annual	SBUS	GAS	Aggregated	5	203.1956088	0.0001	1.990490103	0.00027644	25.25098266	0.00350682	0.096286237	0.00001337	0.231236538	0.00003211	0.036749815	0.000005104
San Bernardino	2020	Annual	UBUS	DSL	Aggregated	5	350.6148485	0.0002	45.76174481	0.01096613	3.318322148	0.00079519	0.006761242	0.00000162	0.006761242	0.00000162	0.841815676	0.000201729
San Bernardino	2020	Annual	UBUS	GAS	Aggregated	5	284.0042077	0.0002	8.092312554	0.00157079	21.1801737	0.00411126	0.546961623	0.00010617	0.546961623	0.00010617	0.036749814	0.000007133
							1463118.0	1.0		3.281		0.861		0.046		0.045		0.040

EMFAC2011 Emission Rates  
Region Type: County  
Region: San Bernardino  
Calendar Year: 2020  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
**Pollutant Classification: TOG GAS**

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Bernardino	2020	Annual	LDA	GAS	Aggregated	5	676311.8832	0.4872	0.167092348	0.0814
San Bernardino	2020	Annual	LDT1	GAS	Aggregated	5	101185.5326	0.0729	0.385938988	0.0281
San Bernardino	2020	Annual	LDT2	GAS	Aggregated	5	247137.3591	0.1780	0.225519997	0.0401
San Bernardino	2020	Annual	LHD1	GAS	Aggregated	5	47538.03319	0.0342	0.409134136	0.0140
San Bernardino	2020	Annual	LHD2	GAS	Aggregated	5	4498.996026	0.0032	0.218395607	0.0007
San Bernardino	2020	Annual	MCY	GAS	Aggregated	5	41584.70141	0.0300	5.195983468	0.1556
San Bernardino	2020	Annual	MDV	GAS	Aggregated	5	252358.7351	0.1818	0.402124252	0.0731
San Bernardino	2020	Annual	MH	GAS	Aggregated	5	13561.73574	0.0098	0.436966581	0.0043
San Bernardino	2020	Annual	T6	GAS	Aggregated	5	2552.247931	0.0018	0.651191243	0.0012
San Bernardino	2020	Annual	T7	GAS	Aggregated	5	294.2198155	0.0002	4.027191561	0.0009
San Bernardino	2020	Annual	OBUS	GAS	Aggregated	5	733.2853002	0.0005	0.74171332	0.0004
San Bernardino	2020	Annual	SBUS	GAS	Aggregated	5	203.1956088	0.0001	4.000791991	0.0006
San Bernardino	2020	Annual	UBUS	GAS	Aggregated	5	284.0042077	0.0002	6.225860968	0.0013
							1388243.9	1.0		0.402

EMFAC2011 Worksheet  
(5 mph)

PM2_5_RUNEX (gms/mile)	PM2_5_RUNEX_AVE (gms/mile)	PM2_5_PMTW (gms/mile)	PM2_5_PMTW_AVE (gms/mile)	PM2_5_PMBW (gms/mile)	PM2_5_PMBW_AVE (gms/mile)
0.010244376	0.000013091	0.00199999	0.000002556	0.01574992	0.000020126
0.035124462	0.016235937	0.00199999	0.000924476	0.01574992	0.007280245
0.017367232	0.000001601	0.00199999	0.000000184	0.01574992	0.000001452
0.071816096	0.004966619	0.00199999	0.000138314	0.015749919	0.001089225
0.010640254	0.000000882	0.00199999	0.000000166	0.015749919	0.000001305
0.03944864	0.006663326	0.00199999	0.000337821	0.01574992	0.002660342
0.004541286	0.000078244	0.002999984	0.000051688	0.032759827	0.000564435
0.076948752	0.002500135	0.00199999	0.000064981	0.01574992	0.000511729
0.00318979	0.000016589	0.002999985	0.000015602	0.038219796	0.000198768
0.075816729	0.000233132	0.00199999	0.000006150	0.01574992	0.000048430
0.000509313	0.000014476	0.001999975	0.000056843	0.015749763	0.000447639
0.011670213	0.000001740	0.00199999	0.000000298	0.015749919	0.000002349
0.04286537	0.007393423	0.00199999	0.000344958	0.01574992	0.002716548
0.005406602	0.000008984	0.002999985	0.000004985	0.055859693	0.000092823
0.344926595	0.003197147	0.00199999	0.000018538	0.01574992	0.000145987
0.002905428	0.000026137	0.002999984	0.000026988	0.055859708	0.000502507
0.055747691	0.000097246	0.00199999	0.000003489	0.01574992	0.000027474
0.00161348	0.000024558	0.00891184	0.000135641	0.026200808	0.000398785
0.088583338	0.000017813	0.00199999	0.000000402	0.01574992	0.000003167
0.002620686	0.000000789	0.002999984	0.000000903	0.055859708	0.000016822
0.073311092	0.000036742	0.00199999	0.000001002	0.01574992	0.000007894
0.013930387	0.000010078	0.002999984	0.000002170	0.319198332	0.000230918
0.212737615	0.000029545	0.00199999	0.000000278	0.01574992	0.000002187
0.006273318	0.000001503	0.00199999	0.000000479	0.360778114	0.000086455
0.503204718	0.000097677	0.00199999	0.000000388	0.01574992	0.000003057

0.042

0.002

0.017

EMFAC2011 Worksheet  
(5 mph)

EMFAC2011 Emission Rates  
Region Type: County  
Region: San Bernardino  
Calendar Year: 2020  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
Pollutant Classification: TOG DSL

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Bernardino	2020	Annual	LDA	DSL	Aggregated	5	1869.620736	0.0250	0.062086656	0.0016
San Bernardino	2020	Annual	LDT1	DSL	Aggregated	5	134.88275	0.0018	0.11263324	0.0002
San Bernardino	2020	Annual	LDT2	DSL	Aggregated	5	121.25939	0.0016	0.071426065	0.0001
San Bernardino	2020	Annual	LHD1	DSL	Aggregated	5	25208.75828	0.3367	0.424307731	0.1429
San Bernardino	2020	Annual	LHD2	DSL	Aggregated	5	7609.175113	0.1016	0.404215752	0.0411
San Bernardino	2020	Annual	MDV	DSL	Aggregated	5	218.195775	0.0029	0.068432198	0.0002
San Bernardino	2020	Annual	MH	DSL	Aggregated	5	2431.280612	0.0325	1.628510671	0.0529
San Bernardino	2020	Annual	T6	DSL	Aggregated	5	13162.03774	0.1758	1.371146941	0.2410
San Bernardino	2020	Annual	T7	DSL	Aggregated	5	22269.12415	0.2974	3.511421562	1.0444
San Bernardino	2020	Annual	OBUS	DSL	Aggregated	5	440.6269497	0.0059	2.08523457	0.0123
San Bernardino	2020	Annual	SBUS	DSL	Aggregated	5	1058.466563	0.0141	1.490976176	0.0211
San Bernardino	2020	Annual	UBUS	DSL	Aggregated	5	350.6148485	0.0047	1.628105228	0.0076
							74874.0	1.0		1.565

EMFAC2011 Emission Rates  
Region Type: County  
Region: San Bernardino  
Calendar Year: 2020  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
Pollutant Classification: DSL Particulate

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
San Bernardino	2020	Annual	LDA	DSL	Aggregated	5	1869.620736	0.0250	0.038178762	0.0010
San Bernardino	2020	Annual	LDT1	DSL	Aggregated	5	134.88275	0.0018	0.07806097	0.0001
San Bernardino	2020	Annual	LDT2	DSL	Aggregated	5	121.25939	0.0016	0.042878954	0.0001
San Bernardino	2020	Annual	LHD1	DSL	Aggregated	5	25208.75828	0.3367	0.083639947	0.0282
San Bernardino	2020	Annual	LHD2	DSL	Aggregated	5	7609.175113	0.1016	0.082409487	0.0084
San Bernardino	2020	Annual	MDV	DSL	Aggregated	5	218.195775	0.0029	0.046592791	0.0001
San Bernardino	2020	Annual	MH	DSL	Aggregated	5	2431.280612	0.0325	0.374920201	0.0122
San Bernardino	2020	Annual	T6	DSL	Aggregated	5	13162.03774	0.1758	0.060595317	0.0107
San Bernardino	2020	Annual	T7	DSL	Aggregated	5	22269.12415	0.2974	0.096286237	0.0286
San Bernardino	2020	Annual	OBUS	DSL	Aggregated	5	440.6269497	0.0059	0.079685969	0.0005
San Bernardino	2020	Annual	SBUS	DSL	Aggregated	5	1058.466563	0.0141	0.231236538	0.0033
San Bernardino	2020	Annual	UBUS	DSL	Aggregated	5	350.6148485	0.0047	0.546961623	0.0026
							74874.0	1.0		0.096

EMFAC2011 Worksheet  
(45 mph)

EMFAC2014 Emission Rates  
 Region Type: County  
 Region: San Bernardino  
 Calendar Year: 2035  
 Season: Annual  
 Vehicle Classification: EMFAC2007 Categories  
**Pollutant Classification: Criteria**

Region	CalYr	Season	Veh_Class	Fuel	MdYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	CO_RUNEX (gms/mile)	CO_RUNEX AVE (gms/mile)	NOX_RUNEX (gms/mile)	NOx_RUNEX AVE (gms/mile)	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)	PM10_PMTW (gms/mile)	PM10_PMTW_AVE (gms/mile)	PM10_PMBW (gms/mile)	PM10_PMBW_AVE (gms/mile)
San Bernardino	2020	Annual	LDA	DSL	Aggregated	45	1869.620736	0.0013	0.921828856	0.00117794	0.087074161	0.00011127	0.001262268	0.00000161	0.007999959	0.00001022	0.036749816	0.000046960
San Bernardino	2020	Annual	LDA	GAS	Aggregated	45	676311.8832	0.4622	0.115377461	0.05333210	0.361944334	0.16730521	0.011625019	0.00537355	0.007999958	0.00369790	0.036749814	0.016987240
San Bernardino	2020	Annual	LDT1	DSL	Aggregated	45	134.88275	0.0001	2.068756635	0.00019072	0.226901345	0.00002092	0.0022862	0.00000021	0.007999959	0.00000074	0.036749816	0.000003388
San Bernardino	2020	Annual	LDT1	GAS	Aggregated	45	101185.5326	0.0692	0.15549935	0.01075394	0.419358847	0.02900180	0.022418609	0.00155041	0.007999958	0.00055326	0.036749814	0.002541524
San Bernardino	2020	Annual	LDT2	DSL	Aggregated	45	121.25939	0.0001	1.237830563	0.00010259	0.143103183	0.00001186	0.001327091	0.00000011	0.007999958	0.00000066	0.036749815	0.000003046
San Bernardino	2020	Annual	LDT2	GAS	Aggregated	45	247137.3591	0.1689	0.128875744	0.02176859	0.426292545	0.07200569	0.012875683	0.00217485	0.007999959	0.00135128	0.036749815	0.006207464
San Bernardino	2020	Annual	LHD1	DSL	Aggregated	45	25208.75828	0.0172	0.746641247	0.01286424	0.355948871	0.00613281	0.000570528	0.00000983	0.011999938	0.00020675	0.076439597	0.001317014
San Bernardino	2020	Annual	LHD1	GAS	Aggregated	45	47538.03319	0.0325	0.577367617	0.01875920	2.182284813	0.07090442	0.023619181	0.00076741	0.007999959	0.00025993	0.036749816	0.001194035
San Bernardino	2020	Annual	LHD2	DSL	Aggregated	45	7609.175113	0.0052	0.405914875	0.00211102	0.278031286	0.00144595	0.00039618	0.00000206	0.011999938	0.00006241	0.089179536	0.000463792
San Bernardino	2020	Annual	LHD2	GAS	Aggregated	45	4498.996026	0.0031	0.563322937	0.00173218	2.120150433	0.00651933	0.023204363	0.00007135	0.007999958	0.00002460	0.036749815	0.000113003
San Bernardino	2020	Annual	MCY	GAS	Aggregated	45	41584.70141	0.0284	18.39039261	0.52269127	1.204186906	0.03422537	0.000257839	0.00000733	0.007999990	0.00022737	0.036749449	0.001044492
San Bernardino	2020	Annual	MDV	DSL	Aggregated	45	218.195775	0.0001	1.864349682	0.00027803	0.246416505	0.00003675	0.001481296	0.00000022	0.007999958	0.00000119	0.036749814	0.000005481
San Bernardino	2020	Annual	MDV	GAS	Aggregated	45	252358.7351	0.1725	0.116543802	0.02010149	0.340006474	0.05864435	0.013940236	0.00224044	0.007999959	0.00137983	0.036749815	0.006338612
San Bernardino	2020	Annual	MH	DSL	Aggregated	45	2431.280612	0.0017	1.285959692	0.00213689	0.504735318	0.00083872	0.000676112	0.00000112	0.011999938	0.00001994	0.130339314	0.000216586
San Bernardino	2020	Annual	MH	GAS	Aggregated	45	13561.73574	0.0093	0.481349224	0.00446166	5.288217442	0.04901683	0.114836794	0.00106443	0.007999959	0.00007415	0.036749815	0.000340636
San Bernardino	2020	Annual	T6	DSL	Aggregated	45	13162.03774	0.0090	1.347820765	0.01212484	0.638784328	0.00574643	0.000361429	0.00000325	0.011999937	0.00010795	0.130339319	0.001172517
San Bernardino	2020	Annual	T6	GAS	Aggregated	45	2552.247931	0.0017	0.369016784	0.00064371	1.709663757	0.00298232	0.046649404	0.00008137	0.007999958	0.00001396	0.036749815	0.000064106
San Bernardino	2020	Annual	T7	DSL	Aggregated	45	22269.12415	0.0152	23.03673273	0.35062645	4.836708593	0.07361625	0.000208182	0.00000317	0.035647358	0.00054256	0.061135219	0.000930498
San Bernardino	2020	Annual	T7	GAS	Aggregated	45	294.2198155	0.0002	1.026901467	0.00020650	3.453354339	0.00069444	0.071482606	0.00001437	0.007999959	0.00000161	0.036749815	0.000007390
San Bernardino	2020	Annual	OBUS	DSL	Aggregated	45	440.6269497	0.0003	1.636602001	0.00049287	0.895534223	0.00026970	0.000323669	0.00000010	0.011999937	0.00000361	0.130339319	0.000039252
San Bernardino	2020	Annual	OBUS	GAS	Aggregated	45	733.2853002	0.0005	0.583243457	0.00029231	2.899219974	0.00145303	0.053442892	0.00002678	0.007999958	0.00000401	0.036749814	0.000018418
San Bernardino	2020	Annual	SBUS	DSL	Aggregated	45	1058.466563	0.0007	6.074050753	0.00439416	1.635001719	0.00118281	0.001757574	0.00000127	0.011999937	0.00000868	0.744796108	0.000538809
San Bernardino	2020	Annual	SBUS	GAS	Aggregated	45	203.1956088	0.0001	0.333878476	0.00004637	7.785200907	0.00108120	0.041981967	0.00000583	0.007999959	0.00000111	0.036749815	0.000005104
San Bernardino	2020	Annual	UBUS	DSL	Aggregated	45	350.6148485	0.0002	8.230311465	0.00197227	4.579895617	0.00109751	0.000780472	0.00000019	0.007999959	0.00000192	0.841815676	0.000201729
San Bernardino	2020	Annual	UBUS	GAS	Aggregated	45	284.0042077	0.0002	1.08427816	0.00021047	9.600504008	0.00186354	0.115584714	0.00002244	0.007999959	0.00000155	0.036749814	0.000007133
							1463118.0	1.0		1.043		0.586		0.014		0.009		0.040

EMFAC2014 Emission Rates  
 Region Type: County  
 Region: San Bernardino  
 Calendar Year: 2020  
 Season: Annual  
 Vehicle Classification: EMFAC2007 Categories  
**Pollutant Classification: TOG GAS**

Region	CalYr	Season	Veh_Class	Fuel	MdYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Bernardino	2020	Annual	LDA	GAS	Aggregated	45	676311.8832	0.4872	0.023113453	0.0113
San Bernardino	2020	Annual	LDT1	GAS	Aggregated	45	101185.5326	0.0729	0.060483214	0.0044
San Bernardino	2020	Annual	LDT2	GAS	Aggregated	45	247137.3591	0.1780	0.031631187	0.0056
San Bernardino	2020	Annual	LHD1	GAS	Aggregated	45	47538.03319	0.0342	0.048831832	0.0017
San Bernardino	2020	Annual	LHD2	GAS	Aggregated	45	4498.996026	0.0032	0.025511203	0.0001
San Bernardino	2020	Annual	MCY	GAS	Aggregated	45	41584.70141	0.0300	2.245962604	0.0673
San Bernardino	2020	Annual	MDV	GAS	Aggregated	45	252358.7351	0.1818	0.056574401	0.0103
San Bernardino	2020	Annual	MH	GAS	Aggregated	45	13561.73574	0.0098	0.052103505	0.0005
San Bernardino	2020	Annual	T6	GAS	Aggregated	45	2552.247931	0.0018	0.078085336	0.0001
San Bernardino	2020	Annual	T7	GAS	Aggregated	45	294.2198155	0.0002	0.490255904	0.0001
San Bernardino	2020	Annual	OBUS	GAS	Aggregated	45	733.2853002	0.0005	0.09243675	0.0000
San Bernardino	2020	Annual	SBUS	GAS	Aggregated	45	203.1956088	0.0001	0.460384873	0.0001
San Bernardino	2020	Annual	UBUS	GAS	Aggregated	45	284.0042077	0.0002	0.718671481	0.0001
							1388243.9	1.0		0.102

EMFAC2011 Worksheet  
(45 mph)

PM2_5_RUNEX (gms/mile)	PM2_5_RUNEX_AVE (gms/mile)	PM2_5_PMTW (gms/mile)	PM2_5_PMTW_AVE (gms/mile)	PM2_5_PMBW (gms/mile)	PM2_5_PMBW_AVE (gms/mile)
0.016332504	0.000020870	0.001170302	0.000001495	0.01574992	0.000020126
0.001137142	0.000525633	0.010695017	0.004943667	0.01574992	0.007280245
0.031351655	0.000002890	0.002119904	0.000000195	0.01574992	0.000001452
0.00250246	0.000173064	0.020625122	0.001426381	0.015749919	0.001089225
0.016195212	0.000001342	0.001230587	0.000000102	0.015749919	0.000001305
0.001255286	0.000212032	0.011845629	0.002000862	0.01574992	0.002660342
0.025065852	0.000431872	0.000528732	0.000009110	0.032759827	0.000564435
0.000719021	0.000023362	0.021729646	0.000706016	0.01574992	0.000511729
0.024566565	0.000127762	0.000367153	0.000001909	0.038219796	0.000198768
0.000548529	0.000001687	0.021348014	0.000065644	0.01574992	0.000048430
0.000290481	0.000008256	0.000216682	0.000006159	0.015749763	0.000447639
0.016981342	0.000002532	0.001369439	0.000000204	0.015749919	0.000002349
0.001415741	0.000244187	0.012825018	0.002212060	0.01574992	0.002716548
0.122649701	0.000203808	0.000625423	0.000001039	0.055859693	0.000092823
0.001000658	0.000009275	0.105649855	0.000979275	0.01574992	0.000145987
0.067421206	0.000606513	0.000333334	0.000002999	0.055859708	0.000502507
0.000549445	0.000000958	0.042917451	0.000074865	0.01574992	0.000027474
0.065611216	0.000998624	0.000191491	0.000002915	0.026200808	0.000398785
0.000268292	0.000000054	0.065763997	0.000013225	0.01574992	0.000003167
0.050953073	0.000015345	0.000300312	0.000000090	0.055859708	0.000016822
0.000429135	0.000000215	0.049167461	0.000024642	0.01574992	0.000007894
0.0708501	0.000051255	0.00160803	0.000001163	0.319198332	0.000230918
0.002807845	0.000000390	0.038623161	0.000005364	0.01574992	0.000002187
0.118820438	0.000028474	0.00072415	0.000000174	0.360778114	0.000086455
0.000809755	0.000000157	0.10633794	0.000020641	0.01574992	0.000003057

0.004

0.013

0.017



EMFAC2011 Worksheet  
(45 mph)

EMFAC2014 Emission Rates  
Region Type: County  
Region: San Bernardino  
Calendar Year: 2020  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
Pollutant Classification: TOG DSL

Region	CalYr	Season	Veh_Class	Fuel	MdYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Bernardino	2020	Annual	LDA	DSL	Aggregated	45	1869.620736	0.0250	0.019303434	0.0005
San Bernardino	2020	Annual	LDT1	DSL	Aggregated	45	134.88275	0.0018	0.033242291	0.0001
San Bernardino	2020	Annual	LDT2	DSL	Aggregated	45	121.25939	0.0016	0.022148574	0.0000
San Bernardino	2020	Annual	LHD1	DSL	Aggregated	45	25208.75828	0.3367	0.120201444	0.0405
San Bernardino	2020	Annual	LHD2	DSL	Aggregated	45	7609.175113	0.1016	0.114665332	0.0117
San Bernardino	2020	Annual	MDV	DSL	Aggregated	45	218.195775	0.0029	0.020980501	0.0001
San Bernardino	2020	Annual	MH	DSL	Aggregated	45	2431.280612	0.0325	0.117188054	0.0038
San Bernardino	2020	Annual	T6	DSL	Aggregated	45	13162.03774	0.1758	0.088869793	0.0156
San Bernardino	2020	Annual	T7	DSL	Aggregated	45	22269.12415	0.2974	0.219844534	0.0654
San Bernardino	2020	Annual	OBUS	DSL	Aggregated	45	440.6269497	0.0059	0.130236831	0.0008
San Bernardino	2020	Annual	SBUS	DSL	Aggregated	45	1058.466563	0.0141	0.082014067	0.0012
San Bernardino	2020	Annual	UBUS	DSL	Aggregated	45	350.6148485	0.0047	0.344053536	0.0016
							74874.0	1.0	0.141	

EMFAC2011 Emission Rates  
Region Type: County  
Region: Los Angeles  
Calendar Year: 2020  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
Pollutant Classification: DSL Particulate

Region	CalYr	Season	Veh_Class	Fuel	MdYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
San Bernardino	2020	Annual	LDA	DSL	Aggregated	45	1869.620736	0.0250	0.011625019	0.0003
San Bernardino	2020	Annual	LDT1	DSL	Aggregated	45	134.88275	0.0018	0.022418609	0.0000
San Bernardino	2020	Annual	LDT2	DSL	Aggregated	45	121.25939	0.0016	0.012875683	0.0000
San Bernardino	2020	Annual	LHD1	DSL	Aggregated	45	25208.75828	0.3367	0.023619181	0.0080
San Bernardino	2020	Annual	LHD2	DSL	Aggregated	45	7609.175113	0.1016	0.023204363	0.0024
San Bernardino	2020	Annual	MDV	DSL	Aggregated	45	218.195775	0.0029	0.013940236	0.0000
San Bernardino	2020	Annual	MH	DSL	Aggregated	45	2431.280612	0.0325	0.114836794	0.0037
San Bernardino	2020	Annual	T6	DSL	Aggregated	45	13162.03774	0.1758	0.046649404	0.0082
San Bernardino	2020	Annual	T7	DSL	Aggregated	45	22269.12415	0.2974	0.071482606	0.0213
San Bernardino	2020	Annual	OBUS	DSL	Aggregated	45	440.6269497	0.0059	0.053442892	0.0003
San Bernardino	2020	Annual	SBUS	DSL	Aggregated	45	1058.466563	0.0141	0.041981697	0.0006
San Bernardino	2020	Annual	UBUS	DSL	Aggregated	45	350.6148485	0.0047	0.115584714	0.0005
							74874.0	1.0	0.045	

EMFAC2011 Worksheet  
(65 mph)

EMFAC2014 Emission Rates  
Region Type: County  
Region: San Bernardino  
Calendar Year: 2035  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
Pollutant Classification: Criteria

Region	CalYr	Season	Veh_Class	Fuel	MdYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	CO_RUNEX (gms/mile)	CO_RUNEX AVE (gms/mile)	NOX_RUNEX (gms/mile)	NOx_RUNEX AVE (gms/mile)	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)	PM10_PMTW (gms/mile)	PM10_PMTW_AVE (gms/mile)	PM10_PMBW (gms/mile)	PM10_PMBW_AVE (gms/mile)
San Bernardino	2020	Annual	LDA	DSL	Aggregated	65	1869.620736	0.0013	0.764460782	0.00097685	0.097752632	0.00012491	0.001503326	0.00000192	0.007999959	0.00001022	0.036749816	0.000046960
San Bernardino	2020	Annual	LDA	GAS	Aggregated	65	676311.8832	0.4622	0.111485359	0.05153301	0.512970524	0.23711558	0.014105454	0.00652011	0.007999958	0.00369790	0.036749814	0.016987240
San Bernardino	2020	Annual	LDT1	DSL	Aggregated	65	134.88275	0.0001	1.811137148	0.00016697	0.277437956	0.00002558	0.002594155	0.00000024	0.007999959	0.00000074	0.036749816	0.000003388
San Bernardino	2020	Annual	LDT1	GAS	Aggregated	65	101185.5326	0.0692	0.157035343	0.01086017	0.60426731	0.04178960	0.022667247	0.00156761	0.007999958	0.00055326	0.036749814	0.002541524
San Bernardino	2020	Annual	LDT2	DSL	Aggregated	65	121.25939	0.0001	1.032292388	0.00008555	0.163702699	0.00001357	0.001577982	0.00000013	0.007999958	0.00000066	0.036749815	0.000003046
San Bernardino	2020	Annual	LDT2	GAS	Aggregated	65	247137.3591	0.1689	0.125130496	0.02113597	0.611322621	0.10325938	0.014892763	0.00251556	0.007999959	0.00135128	0.036749815	0.006207464
San Bernardino	2020	Annual	LHD1	DSL	Aggregated	65	25208.75828	0.0172	1.153558895	0.01987522	0.454090339	0.00782374	0.000485869	0.00000837	0.011999938	0.00020675	0.076439597	0.001317014
San Bernardino	2020	Annual	LHD1	GAS	Aggregated	65	47538.03319	0.0325	0.684734408	0.02224764	3.73471767	0.12134437	0.020103767	0.00065319	0.007999959	0.00025993	0.036749816	0.001194035
San Bernardino	2020	Annual	LHD2	DSL	Aggregated	65	7609.175113	0.0052	0.583157589	0.00303280	0.341892693	0.00177807	0.00032074	0.00000167	0.011999938	0.00006241	0.089179536	0.000463792
San Bernardino	2020	Annual	LHD2	GAS	Aggregated	65	4498.996026	0.0031	0.668196265	0.00205466	3.637013722	0.01118359	0.019688201	0.00006054	0.007999958	0.00002460	0.036749815	0.000113003
San Bernardino	2020	Annual	MCY	GAS	Aggregated	65	41584.70141	0.0284	45.29614725	1.28740593	1.432809754	0.04072328	0.000509717	0.00001449	0.007999990	0.00022737	0.036749449	0.001044492
San Bernardino	2020	Annual	MDV	DSL	Aggregated	65	218.195775	0.0001	1.637886818	0.00024426	0.287565122	0.00004288	0.001750635	0.00000026	0.007999958	0.00000119	0.036749815	0.000005481
San Bernardino	2020	Annual	MDV	GAS	Aggregated	65	252358.7351	0.1725	0.112780501	0.01945239	0.476653363	0.08221322	0.016091928	0.002277554	0.007999959	0.00137983	0.036749815	0.006338612
San Bernardino	2020	Annual	MH	DSL	Aggregated	65	2431.280612	0.0017	1.931297234	0.00320926	0.629599312	0.00104621	0.000560265	0.00000093	0.011999938	0.00001994	0.130339314	0.000216586
San Bernardino	2020	Annual	MH	GAS	Aggregated	65	13561.73574	0.0093	0.558658766	0.00517824	5.46604918	0.05066517	0.194533363	0.00180314	0.007999959	0.00007415	0.036749815	0.000340636
San Bernardino	2020	Annual	T6	DSL	Aggregated	65	13162.03774	0.0090	2.157120294	0.01940520	0.840811646	0.00756384	0.000284721	0.00000256	0.011999937	0.00010795	0.130339319	0.001172517
San Bernardino	2020	Annual	T6	GAS	Aggregated	65	2552.247931	0.0017	0.459980697	0.00080239	1.744981304	0.00304393	0.081568658	0.00014229	0.007999958	0.00001396	0.036749815	0.000064106
San Bernardino	2020	Annual	T7	DSL	Aggregated	65	22269.12415	0.0152	40.27681409	0.61302601	6.93568869	0.10556340	0.000208944	0.00000318	0.035647358	0.00054256	0.061135219	0.000930490
San Bernardino	2020	Annual	T7	GAS	Aggregated	65	294.2198155	0.0002	1.197931196	0.0024089	2.928589087	0.00058891	0.118199792	0.00002377	0.007999959	0.00000161	0.036749815	0.000007390
San Bernardino	2020	Annual	OBUS	DSL	Aggregated	65	440.6269497	0.0003	3.165180599	0.00095321	1.402331065	0.00042232	0.000255655	0.00000008	0.011999937	0.00000361	0.130339319	0.000039252
San Bernardino	2020	Annual	OBUS	GAS	Aggregated	65	733.2853002	0.0005	0.771613891	0.00038672	2.92924836	0.00146808	0.095234979	0.00004773	0.007999958	0.00000401	0.036749814	0.000018418
San Bernardino	2020	Annual	SBUS	DSL	Aggregated	65	1058.466563	0.0007	0.387821666	0.00028056	9.216658156	0.093800279	0.00066763	0.00006786	0.011999937	0.00000868	0.744796108	0.000538809
San Bernardino	2020	Annual	SBUS	GAS	Aggregated	65	203.1956088	0.0001	14.98778965	0.00208148	2.732707072	0.00037951	0.002615772	0.00000036	0.007999959	0.00000111	0.036749815	0.000005104
San Bernardino	2020	Annual	UBUS	DSL	Aggregated	65	350.6148485	0.0002	1.598535747	0.00038307	19.95699044	0.00478240	0.138271145	0.00003313	0.007999959	0.00000192	0.841815676	0.000201729
San Bernardino	2020	Annual	UBUS	GAS	Aggregated	65	284.0042077	0.0002	12.11229066	0.00235110	4.637540536	0.00090019	0.001149511	0.00000022	0.007999959	0.00000155	0.036749814	0.000007133
							1463118.0	1.0	2.087		0.831		0.016		0.009		0.040	

EMFAC2014 Emission Rates  
Region Type: County  
Region: San Bernardino  
Calendar Year: 2020  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
Pollutant Classification: TOG GAS

Region	CalYr	Season	Veh_Class	Fuel	MdYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Bernardino	2020	Annual	LDA	GAS	Aggregated	65	676311.8832	0.4872	0.027974072	0.0136
San Bernardino	2020	Annual	LDT1	GAS	Aggregated	65	101185.5326	0.0729	0.068968526	0.0050
San Bernardino	2020	Annual	LDT2	GAS	Aggregated	65	247137.3591	0.1780	0.037801757	0.0067
San Bernardino	2020	Annual	LHD1	GAS	Aggregated	65	47538.03319	0.0342	0.044548697	0.0015
San Bernardino	2020	Annual	LHD2	GAS	Aggregated	65	4498.996026	0.0032	0.021455767	0.0001
San Bernardino	2020	Annual	MCY	GAS	Aggregated	65	41584.70141	0.0300	4.457312071	0.1335
San Bernardino	2020	Annual	MDV	GAS	Aggregated	65	252358.7351	0.1818	0.06744117	0.0123
San Bernardino	2020	Annual	MH	GAS	Aggregated	65	13561.73574	0.0098	0.04728973	0.0005
San Bernardino	2020	Annual	T6	GAS	Aggregated	65	2552.247931	0.0018	0.076336641	0.0001
San Bernardino	2020	Annual	T7	GAS	Aggregated	65	294.2198155	0.0002	0.537683627	0.0001
San Bernardino	2020	Annual	OBUS	GAS	Aggregated	65	733.2853002	0.0005	0.102337721	0.0001
San Bernardino	2020	Annual	SBUS	GAS	Aggregated	65	203.1956088	0.0001	0.551016239	0.0001
San Bernardino	2020	Annual	UBUS	GAS	Aggregated	65	284.0042077	0.0002	0.684932336	0.0001
							1388243.9	1.0	0.174	

EMFAC2011 Worksheet  
(65 mph)

PM2_5_RUNEX (gms/mile)	PM2_5_RUNEX_AVE (gms/mile)	PM2_5_PMTW (gms/mile)	PM2_5_PMTW_AVE (gms/mile)	PM2_5_PMBW (gms/mile)	PM2_5_PMBW_AVE (gms/mile)
0.001393915	0.000001781	0.00199999	0.000002556	0.01574992	0.000020126
0.012977018	0.005998499	0.00199999	0.000924476	0.01574992	0.007280245
0.002405176	0.000000222	0.00199999	0.000000184	0.01574992	0.000001452
0.020853868	0.001442201	0.00199999	0.000138314	0.015749919	0.001089225
0.001463103	0.000000121	0.00199999	0.000000166	0.015749919	0.000001305
0.013701343	0.002314313	0.00199999	0.000337821	0.01574992	0.002660342
0.000450236	0.000007757	0.002999984	0.000051688	0.032759827	0.000564435
0.018495464	0.000600934	0.00199999	0.000064981	0.01574992	0.000511729
0.000297166	0.000001545	0.002999985	0.000015602	0.038219796	0.000198768
0.018113146	0.000055697	0.00199999	0.000006150	0.01574992	0.000048430
0.000427943	0.000012163	0.001999975	0.000056843	0.015749763	0.000447639
0.001617638	0.000000241	0.00199999	0.000000298	0.015749919	0.000002349
0.014804574	0.002553494	0.00199999	0.000344958	0.01574992	0.002716548
0.000518283	0.000000861	0.002999985	0.000004985	0.055859693	0.000092823
0.178970687	0.001658891	0.00199999	0.000018538	0.01574992	0.000145987
0.000263177	0.000002368	0.002999984	0.000026988	0.055859708	0.000502507
0.075043165	0.000130905	0.00199999	0.000003489	0.01574992	0.000027474
0.000189865	0.000002890	0.00891184	0.000135641	0.026200808	0.000398785
0.108743809	0.000021867	0.00199999	0.000000402	0.01574992	0.000003167
0.000237205	0.000000071	0.002999984	0.000000903	0.055859708	0.000016822
0.08761618	0.000043911	0.00199999	0.000001002	0.01574992	0.000007894
0.086296256	0.000062429	0.002999984	0.000002170	0.319198332	0.000230918
0.002310707	0.000000321	0.00199999	0.000000278	0.01574992	0.000002187
0.127209456	0.000030484	0.00199999	0.000000479	0.360778114	0.000086455
0.001016797	0.000000197	0.00199999	0.000000388	0.01574992	0.000003057

0.015

0.002

0.017

EMFAC2011 Worksheet  
(65 mph)

EMFAC2014 Emission Rates  
Region Type: County  
Region: San Bernardino  
Calendar Year: 2020  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
Pollutant Classification: TOG DSL

Region	CalYr	Season	Veh_Class	Fuel	MdYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	TOG_RUNEX (gms/mile)	TOG_RUNEX AVE (gms/mile)
San Bernardino	2020	Annual	LDA	DSL	Aggregated	65	1869.620736	0.0250	0.024486683	0.0006
San Bernardino	2020	Annual	LDT1	DSL	Aggregated	65	134.88275	0.0018	0.036594277	0.0001
San Bernardino	2020	Annual	LDT2	DSL	Aggregated	65	121.25939	0.0016	0.027791025	0.0000
San Bernardino	2020	Annual	LHD1	DSL	Aggregated	65	25208.75828	0.3367	0.102642865	0.0346
San Bernardino	2020	Annual	LHD2	DSL	Aggregated	65	7609.175113	0.1016	0.098020018	0.0100
San Bernardino	2020	Annual	MDV	DSL	Aggregated	65	218.195775	0.0029	0.025950939	0.0001
San Bernardino	2020	Annual	MH	DSL	Aggregated	65	2431.280612	0.0325	0.134756161	0.0044
San Bernardino	2020	Annual	T6	DSL	Aggregated	65	13162.03774	0.1758	0.068702917	0.0121
San Bernardino	2020	Annual	T7	DSL	Aggregated	65	22269.12415	0.2974	0.156820887	0.0466
San Bernardino	2020	Annual	OBUS	DSL	Aggregated	65	440.6269497	0.0059	0.106983824	0.0006
San Bernardino	2020	Annual	SBUS	DSL	Aggregated	65	1058.466563	0.0141	0.093800279	0.0013
San Bernardino	2020	Annual	UBUS	DSL	Aggregated	65	350.6148485	0.0047	0.138271145	0.0006
							74874.0	1.0		0.111

EMFAC2011 Emission Rates  
Region Type: County  
Region: San Bernardino  
Calendar Year: 2020  
Season: Annual  
Vehicle Classification: EMFAC2007 Categories  
Pollutant Classification: DSL Particulate

Region	CalYr	Season	Veh_Class	Fuel	MdYr	Speed (miles/hr)	Population (vehicles)	Wt Frac	PM10_RUNEX (gms/mile)	PM10_RUNEX AVE (gms/mile)
San Bernardino	2020	Annual	LDA	DSL	Aggregated	65	1869.620736	0.0250	0.014105454	0.0004
San Bernardino	2020	Annual	LDT1	DSL	Aggregated	65	134.88275	0.0018	0.022667247	0.0000
San Bernardino	2020	Annual	LDT2	DSL	Aggregated	65	121.25939	0.0016	0.014892763	0.0000
San Bernardino	2020	Annual	LHD1	DSL	Aggregated	65	25208.75828	0.3367	0.020103767	0.0068
San Bernardino	2020	Annual	LHD2	DSL	Aggregated	65	7609.175113	0.1016	0.019688201	0.0020
San Bernardino	2020	Annual	MDV	DSL	Aggregated	65	218.195775	0.0029	0.016091928	0.0000
San Bernardino	2020	Annual	MH	DSL	Aggregated	65	2431.280612	0.0325	0.194533363	0.0063
San Bernardino	2020	Annual	T6	DSL	Aggregated	65	13162.03774	0.1758	0.081568658	0.0143
San Bernardino	2020	Annual	T7	DSL	Aggregated	65	22269.12415	0.2974	0.118199792	0.0352
San Bernardino	2020	Annual	OBUS	DSL	Aggregated	65	440.6269497	0.0059	0.095234979	0.0006
San Bernardino	2020	Annual	SBUS	DSL	Aggregated	65	1058.466563	0.0141	0.093800279	0.0013
San Bernardino	2020	Annual	UBUS	DSL	Aggregated	65	350.6148485	0.0047	0.138271145	0.0006
							74874.0	1.0		0.068

## Emission Factor Rate Adjustment Worksheet

### CO Emissions

Acceleration / On-Ramp (15 - 45 mph)

$$Emfac (gr/mi) = (emfac \text{ at average link speed} \times 16/60) \times (0.027) \times (exp (.098 \times \text{acceleration speed product})) \times (60 \text{ min/hr}) / (\text{average link speed})$$

emfac at link speed	2.073
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	4.931
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Deceleration / Off-Ramp

$$Emfac (gr/mi) = (emfac \text{ at idle speed} * 1.5)$$

emfac at idle speed (gr/mi)	4.186
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Emfac (gr/mi)	6.279
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### NOX Emissions

Acceleration / On-Ramp (15 - 45 mph)

$$Emfac (gr/mi) = (emfac \text{ at average link speed} \times 16/60) \times (0.027) \times (exp (.098 \times \text{acceleration speed product})) \times (60 \text{ min/hr}) / (\text{average link speed})$$

emfac at link speed	0.396
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.942
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Deceleration / Off-Ramp

$$Emfac (gr/mi) = (emfac \text{ at idle speed} * 1.5)$$

emfac at idle speed (gr/mi)	0.812
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Emfac (gr/mi)	1.218
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## Emission Factor Rate Adjustment Worksheet

### PM10 Emissions

Acceleration / On-Ramp (15 - 45 mph)

$$Emfac (gr/mi) = (emfac \text{ at average link speed} \times 16/60) \times (0.027) \times (exp (.098 \times \text{acceleration speed product})) \times (60 \text{ min/hr}) / (\text{average link speed})$$

emfac at link speed	0.004
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.010
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Deceleration / Off-Ramp

$$Emfac (gr/mi) = (emfac \text{ at idle speed} * 1.5)$$

emfac at idle speed (gr/mi)	0.018
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Emfac (gr/mi)	0.027
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### PM2.5 Emissions

Acceleration / On-Ramp (15 - 45 mph)

$$Emfac (gr/mi) = (emfac \text{ at average link speed} \times 16/60) \times (0.027) \times (exp (.098 \times \text{acceleration speed product})) \times (60 \text{ min/hr}) / (\text{average link speed})$$

emfac at link speed	0.0037
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.009
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Deceleration / Off-Ramp

$$Emfac (gr/mi) = (emfac \text{ at idle speed} * 1.5)$$

emfac at idle speed (gr/mi)	0.016
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Emfac (gr/mi)	0.024
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## Emission Factor Rate Adjustment Worksheet

### TOG GAS Emissions

Acceleration / On-Ramp (15 - 45 mph)

$$Emfac (gr/mi) = (emfac \text{ at average link speed} \times 16/60) \times (0.027) \times (exp (.098 \times \text{acceleration speed product})) \times (60 \text{ min/hr}) / (\text{average link speed})$$

emfac at link speed	0.119
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.283
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Deceleration / Off-Ramp

$$Emfac (gr/mi) = (emfac \text{ at idle speed} * 1.5)$$

emfac at idle speed (gr/mi)	0.505
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Emfac (gr/mi)	0.758
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### TOG DSL Emissions

Acceleration / On-Ramp (15 - 45 mph)

$$Emfac (gr/mi) = (emfac \text{ at average link speed} \times 16/60) \times (0.027) \times (exp (.098 \times \text{acceleration speed product})) \times (60 \text{ min/hr}) / (\text{average link speed})$$

emfac at link speed	0.154
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi)	0.366
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Deceleration / Off-Ramp

$$Emfac (gr/mi) = (emfac \text{ at idle speed} * 1.5)$$

emfac at idle speed (gr/mi)	1.646
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## Emission Factor Rate Adjustment Worksheet

Emfac (gr/mi) 2.469

### DSL Particulate Emissions

Acceleration / On-Ramp (15 - 45 mph)

*Emfac (gr/mi) = (emfac at average link speed x 16/60) x (0.027) x (exp (.098 x acceleration speed product)) x (60 min/hr) / (average link speed)*

emfac at link speed	0.045
speed (mph)	45.0
acceleration time (sec)	18.0
acceleration rate (mph/sec)	2.50

Emfac (gr/mi) 0.107

Deceleration / Off-Ramp

*Emfac (gr/mi) = (emfac at idle speed \* 1.5)*

emfac at idle speed (gr/mi)	0.096
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Emfac (gr/mi) 0.144

Source: California Department of Transportation, 1989. Division of New Technology and Research. Caline4 – A Dispersion Model for Predicting Air Pollution Concentrations Near Roadways (Revised). FHWA/CA/TL-84/15.



## Emission Factor Profile Worksheet Chronic Exposure

TOG -Toxic Emissions

Gasoline/Toxic Fractions/Hot Stabilized Exhaust

Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
2004	0.028414	0.021422	0.006603	0.005511	0.001533
2005	0.028205	0.021200	0.006551	0.005450	0.001520
2006	0.027938	0.021000	0.006483	0.005350	0.001510
2007	0.027660	0.020700	0.006410	0.005250	0.001490
2008	0.027338	0.020300	0.006326	0.005120	0.001470
2009	0.026849	0.019800	0.006190	0.004870	0.001450
2010	0.026521	0.019400	0.006105	0.004750	0.001430
2011	0.026521	0.019400	0.006105	0.004750	0.001430
2012	0.025656	0.018500	0.005873	0.004370	0.001380
2013	0.025656	0.018500	0.005873	0.004370	0.001380
2014	0.025656	0.018500	0.005873	0.004370	0.001380
2015	0.024349	0.017100	0.005530	0.003850	0.001310
2016	0.024349	0.017100	0.005530	0.003850	0.001310
2017	0.024349	0.017100	0.005530	0.003850	0.001310
2018	0.022182	0.014700	0.004944	0.002860	0.001190
2019	0.022182	0.014700	0.004944	0.002860	0.001130
2020	0.021079	0.013600	0.004659	0.002450	0.001130
2021	0.021079	0.013600	0.004659	0.002450	0.001130
2022	0.021079	0.013600	0.004659	0.002450	0.001130
2023	0.021079	0.013600	0.004659	0.002450	0.001130
2024	0.021079	0.013600	0.004659	0.002450	0.001130
2025	0.021079	0.013600	0.004659	0.002450	0.001130
2026	0.021079	0.013600	0.004659	0.002450	0.001130
2027	0.021079	0.013600	0.004659	0.002450	0.001130
2028	0.021079	0.013600	0.004659	0.002450	0.001130
2029	0.021079	0.013600	0.004659	0.002450	0.001130
2030	0.021079	0.013600	0.004659	0.002450	0.001130

Analysis Year					
2017	0.024349	0.017100	0.005530	0.003850	0.001310

TOG Emission Rate - gr/mi  
Speed (MPH)

Acceleration      **0.283**  
Deceleration      **0.758**  
65                      **0.198**

Toxic Emission Rate - gr/mi  
Speed (MPH)

Acceleration      0.014755  
Deceleration      0.039522  
65                      0.010324

Weight Fraction / Speciation

Benzene                      0.467  
Formaldehyde              0.328  
1,3-Butadiene              0.106  
Acetaldehyde              0.074  
Acrolein                      0.025

## Emission Factor Profile Worksheet Chronic Exposure

Diesel Particulate Emissions - PM10

PM10 Emission Rate - gr/mi	Acceleration	0.126
Speed (MPH)	Deceleration	0.203
	65	0.080

Source: TOG/toxic fractions from UC Davis-Caltrans Air Quality Project, *Estimating Mobile Source Air Toxic Emissions: A Step-by-Step Project Analysis Methodology*. Task Order No. 61.

## Emission Factor Profile Worksheet Acute Exposure

TOG -Toxic Emissions

Gasoline/Toxic Fractions/Hot Stabilized Exhaust

Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
2004	0.028414	0.021422	0.006603	0.005511	0.001533
2005	0.028205	0.021200	0.006551	0.005450	0.001520
2006	0.027938	0.021000	0.006483	0.005350	0.001510
2007	0.027660	0.020700	0.006410	0.005250	0.001490
2008	0.027338	0.020300	0.006326	0.005120	0.001470
2009	0.026849	0.019800	0.006190	0.004870	0.001450
2010	0.026521	0.019400	0.006105	0.004750	0.001430
2011	0.026521	0.019400	0.006105	0.004750	0.001430
2012	0.025656	0.018500	0.005873	0.004370	0.001380
2013	0.025656	0.018500	0.005873	0.004370	0.001380
2014	0.025656	0.018500	0.005873	0.004370	0.001380
2015	0.024349	0.017100	0.005530	0.003850	0.001310
2016	0.024349	0.017100	0.005530	0.003850	0.001310
2017	0.024349	0.017100	0.005530	0.003850	0.001310
2018	0.022182	0.014700	0.004944	0.002860	0.001190
2019	0.022182	0.014700	0.004944	0.002860	0.001130
2020	0.021079	0.013600	0.004659	0.002450	0.001130
2021	0.021079	0.013600	0.004659	0.002450	0.001130
2022	0.021079	0.013600	0.004659	0.002450	0.001130
2023	0.021079	0.013600	0.004659	0.002450	0.001130
2024	0.021079	0.013600	0.004659	0.002450	0.001130
2025	0.021079	0.013600	0.004659	0.002450	0.001130
2026	0.021079	0.013600	0.004659	0.002450	0.001130
2027	0.021079	0.013600	0.004659	0.002450	0.001130
2028	0.021079	0.013600	0.004659	0.002450	0.001130
2029	0.021079	0.013600	0.004659	0.002450	0.001130
2030	0.021079	0.013600	0.004659	0.002450	0.001130

Analysis Year					
2017	0.024349	0.017100	0.005530	0.003850	0.001310

TOG Emission Rate - gr/mi  
Speed (MPH)

Acceleration            **0.283**  
Deceleration            **0.758**  
65                            **0.198**

Toxic Emission Rate - gr/mi  
Speed (MPH)

Acceleration            0.014755  
Deceleration            0.039522  
65                            0.010324

Weight Fraction / Speciation

Benzene                            0.467  
Formaldehyde                    0.328  
1,3-Butadiene                    0.106  
Acetaldehyde                    0.074  
Acrolein                            0.025

# Emission Factor Profile Worksheet

## Acute Exposure

TOG -Toxic Emissions

Diesel/Toxic Fractions/Hot Stabilized Exhaust

Year	Benzene	Formaldehyde	1,3-Butadiene	Acetaldehyde	Acrolein
2004	0.020009	0.147133	0.001900	0.073526	0
2005	0.020009	0.147133	0.001900	0.073526	0
2006	0.020009	0.147133	0.001900	0.073526	0
2007	0.020009	0.147133	0.001900	0.073526	0
2008	0.020009	0.147133	0.001900	0.073526	0
2009	0.020009	0.147133	0.001900	0.073526	0
2010	0.020009	0.147133	0.001900	0.073526	0
2011	0.020009	0.147133	0.001900	0.073526	0
2012	0.020009	0.147133	0.001900	0.073526	0
2013	0.020009	0.147133	0.001900	0.073526	0
2014	0.020009	0.147133	0.001900	0.073526	0
2015	0.020009	0.147133	0.001900	0.073526	0
2016	0.020009	0.147133	0.001900	0.073526	0
2017	0.020009	0.147133	0.001900	0.073526	0
2018	0.020009	0.147133	0.001900	0.073526	0
2019	0.020009	0.147133	0.001900	0.073526	0
2020	0.020009	0.147133	0.001900	0.073526	0
2021	0.020009	0.147133	0.001900	0.073526	0
2022	0.020009	0.147133	0.001900	0.073526	0
2023	0.020009	0.147133	0.001900	0.073526	0
2024	0.020009	0.147133	0.001900	0.073526	0
2025	0.020009	0.147133	0.001900	0.073526	0
2026	0.020009	0.147133	0.001900	0.073526	0
2027	0.020009	0.147133	0.001900	0.073526	0
2028	0.020009	0.147133	0.001900	0.073526	0
2029	0.020009	0.147133	0.001900	0.073526	0
2030	0.020009	0.147133	0.001900	0.073526	0

Analysis Year

2017	0.020009	0.147133	0.001900	0.073526	0
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TOG Emission Rate - gr/mi

Speed (MPH)

Acceleration           0.366  
 Deceleration           2.469  
 65                         0.131

Toxic Emission Rate - gr/mi

Speed (MPH)

Acceleration           0.088780  
 Deceleration           0.598900  
 65                         0.031776

Weight Fraction / Speciation

Benzene                     0.082  
 Formaldehyde             0.607  
 1,3-Butadiene            0.008  
 Acetaldehyde             0.303  
 Acrolein                   0.000

On-Road Mobile Sources  
Emission Rate Computation

**I-215 NB (Sources \_\_ to \_\_)**

**CO Emissions**

Number of Sources	163
Link Length (meters)	1632.0
Volume/Baseline (VPH)	1690.8
Pollutant Mass Emission Rate (gr/mi)	2.869

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	1.36648
Pollutant Emission Rate (gr/sec/source)	8.38E-03

**I-215 SB (Sources \_\_ to \_\_)**

**CO Emissions**

Number of Sources	165
Link Length (meters)	1647.8
Volume/Baseline (VPH)	1690.8
Pollutant Mass Emission Rate (gr/mi)	2.869

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	1.37971
Pollutant Emission Rate (gr/sec/source)	8.36E-03

**NB ON / Palm Avenue (Sources \_\_ to \_\_)**

**CO Emissions**

Number of Sources	35
Link Length (meters)	347.6
Volume/Baseline (VPH)	279.2
Pollutant Mass Emission Rate (gr/mi)	4.931

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.08260
Pollutant Emission Rate (gr/sec/source)	2.36E-03

**NB OFF / Palm Avenue (Sources \_\_ to \_\_)**

**CO Emissions**

Number of Sources	28
Link Length (meters)	277.8
Volume/Baseline (VPH)	229.2
Pollutant Mass Emission Rate (gr/mi)	6.279

On-Road Mobile Sources  
Emission Rate Computation

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.06901
Pollutant Emission Rate (gr/sec/source)	2.46E-03

**SB ON /Palm Avenue (Sources \_\_ to \_\_)**

**CO Emissions**

Number of Sources	90
Link Length (meters)	360.5
Volume/Baseline (VPH)	229.2
Pollutant Mass Emission Rate (gr/mi)	4.931

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.07033
Pollutant Emission Rate (gr/sec/source)	7.81E-04

**SB OFF / Palm Avenue (Sources \_\_ to \_\_)**

**CO Emissions**

Number of Sources	112
Link Length (meters)	447.2
Volume/Baseline (VPH)	279.2
Pollutant Mass Emission Rate (gr/mi)	4.931

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.10627
Pollutant Emission Rate (gr/sec/source)	9.49E-04

On-Road Mobile Sources  
Emission Rate Computation

**I-215 NB (Sources \_\_ to \_\_)**

**NOx Emissions**

Number of Sources	163
Link Length (meters)	1632.0
Volume/Baseline (VPH)	1690.8
Pollutant Mass Emission Rate (gr/mi)	0.488

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.23243
Pollutant Emission Rate (gr/sec/source)	1.43E-03

**I-215 SB (Sources \_\_ to \_\_)**

**NOx Emissions**

Number of Sources	165
Link Length (meters)	1647.8
Volume/Baseline (VPH)	1690.8
Pollutant Mass Emission Rate (gr/mi)	0.488

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.23468
Pollutant Emission Rate (gr/sec/source)	1.42E-03

**NB ON / Palm Avenue (Sources \_\_ to \_\_)**

**NOx Emissions**

Number of Sources	35
Link Length (meters)	347.6
Volume/Baseline (VPH)	279.2
Pollutant Mass Emission Rate (gr/mi)	0.942

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.01578
Pollutant Emission Rate (gr/sec/source)	4.51E-04

**NB OFF / Palm Avenue (Sources \_\_ to \_\_)**

**NOx Emissions**

Number of Sources	28
Link Length (meters)	277.8
Volume/Baseline (VPH)	229.2
Pollutant Mass Emission Rate (gr/mi)	1.218

On-Road Mobile Sources  
Emission Rate Computation

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.01339
Pollutant Emission Rate (gr/sec/source)	4.78E-04

**SB ON /Palm Avenue (Sources \_\_ to \_\_)**

**NOx Emissions**

Number of Sources	90
Link Length (meters)	360.5
Volume/Baseline (VPH)	229.2
Pollutant Mass Emission Rate (gr/mi)	0.942

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.01343
Pollutant Emission Rate (gr/sec/source)	1.49E-04

**SB ON / Palm Avenue (Sources \_\_ to \_\_)**

**NOx Emissions**

Number of Sources	112
Link Length (meters)	447.2
Volume/Baseline (VPH)	279.2
Pollutant Mass Emission Rate (gr/mi)	0.942

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.02030
Pollutant Emission Rate (gr/sec/source)	1.81E-04



On-Road Mobile Sources  
Emission Rate Computation

**I-215 NB (Sources \_\_ to \_\_ )**

**PM2.5 Emissions**

Number of Sources	163
Link Length (meters)	1632.0
Volume/Baseline (VPH)	1690.8
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.005
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.044

*Route 60 WB (Sources \_\_ to \_\_ )*

$$Emission\ Rate\ (gr/sec) = ((Road\ Surface\ Silt\ Loading)^{0.91} \times (Gross\ Vehicle\ Weight)^{1.02}) + (Emfac2011\ Emissions) \\ \times (Volume/Baseline) / (1609.3\ m/mile) \times (3600\ sec/hr) \times (Link\ Length)$$

PM2.5 Reentrainment Emission Rate (gr/sec)	0.020853
PM2.5 Reentrainment Emission Rate (gr/sec/source)	1.28E-04

**I-215 SB (Sources \_\_ to \_\_ )**

**PM2.5 Emissions**

Number of Sources	165
Link Length (meters)	1647.8
Volume/Baseline (VPH)	1690.8
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.005
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.044

*For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x*

$$(Road\ Surface\ Silt\ Loading)^{0.91} \times (Gross\ Vehicle\ Weight)^{1.02}) + (Emfac2011\ Emissions)$$

*Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)*

PM2.5 Reentrainment Emission Rate (gr/sec)	0.021055
PM2.5 Reentrainment Emission Rate (gr/sec/source)	1.28E-04

**NB ON / Palm Avenue (Sources \_\_ to \_\_)**

**PM2.5 Emissions**

Number of Sources	35
Link Length (meters)	347.6
Volume/Baseline (VPH)	279.2
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02

**On-Road Mobile Sources  
Emission Rate Computation**

Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.009
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.048

*For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)<sup>0.91</sup> x (Gross Vehicle Weight)<sup>1.02</sup> ) + (Emfac2011 Emissions)*  
*Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)*

PM2.5 Reentrainment Emission Rate (gr/sec)	0.000797
PM2.5 Reentrainment Emission Rate (gr/sec/source)	2.28E-05

**NB OFF / Palm Avenue (Sources \_\_ to \_\_)**

**PM2.5 Emissions**

Number of Sources	28
Link Length (meters)	277.8
Volume/Baseline (VPH)	229.2
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.024
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.063

*For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)<sup>0.91</sup> x (Gross Vehicle Weight)<sup>1.02</sup> ) + (Emfac2011 Emissions)*  
*Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)*

PM2.5 Reentrainment Emission Rate (gr/sec)	0.000688
PM2.5 Reentrainment Emission Rate (gr/sec/source)	2.46E-05

**SB ON / Pine Avenue (Sources \_\_ to \_\_)**

**PM2.5 Emissions**

Number of Sources	90
Link Length (meters)	360.5
Volume/Baseline (VPH)	229.2
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.009
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.048

*For PM2.5 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)<sup>0.91</sup> x (Gross Vehicle Weight)<sup>1.02</sup> ) + (Emfac2011 Emissions)*

**On-Road Mobile Sources  
Emission Rate Computation**

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

PM2.5 Reentrainment Emission Rate (gr/sec)	0.000679
PM2.5 Reentrainment Emission Rate (gr/sec/source)	7.54E-06

**SB OFF / Pine Avenue (Sources \_\_ to \_\_)**

**PM2.5 Emissions**

Number of Sources	112
Link Length (meters)	447.2
Volume/Baseline (VPH)	279.2
Particle Size Multiplier (g/mi)	0.25
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.009
Emfac2011 Emissions TW/BW (g/mi)	0.019
PM2.5 Reentrainment Mass Emission Rate (gr/mi)	0.048

$$For\ PM2.5\ Reentrainment:\ Mass\ Emission\ Rate\ (gr/mile) = ((Particulate\ PM10\ Base\ Emission\ Factor) \times (Road\ Surface\ Silt\ Loading)^{0.91} \times (Gross\ Vehicle\ Weight)^{1.02}) + (Emfac2011\ Emissions)$$

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

PM2.5 Reentrainment Emission Rate (gr/sec)	0.001025
PM2.5 Reentrainment Emission Rate (gr/sec/source)	9.16E-06

On-Road Mobile Sources  
Emission Rate Computation

**I-215 NB (Sources \_\_ to \_\_ )**

**PM10 Emissions**

Number of Sources	163
Link Length (meters)	1632.0
Volume/Baseline (VPH)	1690.8
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.006
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.132

*Route 60 WB (Sources \_\_ to \_\_ )*

$$(Road\ Surface\ Silt\ Loading)^{0.91} \times (Gross\ Vehicle\ Weight)^{1.02} + (Emfac2011\ Emissions)$$

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate \times Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

PM10 Reentrainment Emission Rate (gr/sec)	0.062837
PM10 Reentrainment Emission Rate (gr/sec/source)	3.86E-04

**I-215 SB (Sources \_\_ to \_\_ )**

**PM10 Emissions**

Number of Sources	165
Link Length (meters)	1647.8
Volume/Baseline (VPH)	1690.8
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.006
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.132

*For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x*

$$(Road\ Surface\ Silt\ Loading)^{0.91} \times (Gross\ Vehicle\ Weight)^{1.02} + (Emfac2011\ Emissions)$$

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate \times Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

PM10 Reentrainment Emission Rate (gr/sec)	0.063446
PM10 Reentrainment Emission Rate (gr/sec/source)	3.85E-04

**NB ON / Palm Avenue (Sources \_\_ to \_\_)**

**PM10 Emissions**

Number of Sources	35
Link Length (meters)	347.6
Volume/Baseline (VPH)	279.2
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02

**On-Road Mobile Sources  
Emission Rate Computation**

Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.010
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.136

*For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)<sup>0.91</sup> x (Gross Vehicle Weight)<sup>1.02</sup> ) + (Emfac2011 Emissions)*  
*Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)*

PM10 Reentrainment Emission Rate (gr/sec)	0.002284
PM10 Reentrainment Emission Rate (gr/sec/source)	6.52E-05

**NB OFF / Palm Avenue (Sources \_\_ to \_\_)**

**PM10 Emissions**

Number of Sources	28
Link Length (meters)	277.8
Volume/Baseline (VPH)	229.2
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.027
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.153

*For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)<sup>0.91</sup> x (Gross Vehicle Weight)<sup>1.02</sup> ) + (Emfac2011 Emissions)*  
*Emission Rate (gr/sec) = ((Mass Emission Rate x Volume/Baseline)/(1609.3 m/mile) x (3600 sec/hr)) x (Link Length)*

PM10 Reentrainment Emission Rate (gr/sec)	0.001685
PM10 Reentrainment Emission Rate (gr/sec/source)	6.02E-05

**SB ON / Pine Avenue (Sources \_\_ to \_\_)**

**PM10 Emissions**

Number of Sources	90
Link Length (meters)	360.5
Volume/Baseline (VPH)	229.2
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.010
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.136

*For PM10 Reentrainment: Mass Emission Rate (gr/mile) = ((Particulate PM10 Base Emission Factor) x (Road Surface Silt Loading)<sup>0.91</sup> x (Gross Vehicle Weight)<sup>1.02</sup> ) + (Emfac2011 Emissions)*

**On-Road Mobile Sources  
Emission Rate Computation**

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

PM10 Reentrainment Emission Rate (gr/sec)	0.001944
PM10 Reentrainment Emission Rate (gr/sec/source)	2.16E-05

**SB OFF / Pine Avenue (Sources \_\_ to \_\_)**

**PM10 Emissions**

Number of Sources	112
Link Length (meters)	447.2
Volume/Baseline (VPH)	279.2
Particle Size Multiplier (g/mi)	1.0
Road Surface Silt Loading (g/m2)	0.02
Average Vehicle Weight (tons)	2.7
Emfac2011 Emissions Run (g/mi)	0.010
Emfac2011 Emissions TW/BW (g/mi)	0.048
PM10 Reentrainment Mass Emission Rate (gr/mi)	0.136

$$For\ PM10\ Reentrainment:\ Mass\ Emission\ Rate\ (gr/mile) = ((Particulate\ PM10\ Base\ Emission\ Factor) \times (Road\ Surface\ Silt\ Loading)^{0.91} \times (Gross\ Vehicle\ Weight)^{1.02}) + (Emfac2011\ Emissions)$$

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

PM10 Reentrainment Emission Rate (gr/sec)	0.002938
PM10 Reentrainment Emission Rate (gr/sec/source)	2.62E-05

On-Road Mobile Sources  
Emission Rate Computation

**I-215 NB (Sources \_\_ to \_\_)**

**TOG DSL Emissions**

Number of Sources	163
Link Length (meters)	1632.0
Volume/Baseline (VPH)	86.5
Pollutant Mass Emission Rate (gr/mi)	0.031776

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00077
Pollutant Emission Rate (gr/sec/source)	4.75E-06

**I-215 SB (Sources \_\_ to \_\_)**

**TOG DSL Emissions**

Number of Sources	165
Link Length (meters)	1647.8
Volume/Baseline (VPH)	86.5
Pollutant Mass Emission Rate (gr/mi)	0.031776

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00078
Pollutant Emission Rate (gr/sec/source)	4.74E-06

**NB ON / Palm Avenue (Sources \_\_ to \_\_)**

**TOG DSL Emissions**

Number of Sources	35
Link Length (meters)	347.6
Volume/Baseline (VPH)	14.3
Pollutant Mass Emission Rate (gr/mi)	0.088780

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00008
Pollutant Emission Rate (gr/sec/source)	2.18E-06

**NB OFF / Palm Avenue (Sources \_\_ to \_\_)**

**TOG DSL Emissions**

Number of Sources	28
Link Length (meters)	277.8
Volume/Baseline (VPH)	11.7
Pollutant Mass Emission Rate (gr/mi)	0.598900

On-Road Mobile Sources  
Emission Rate Computation

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00034
Pollutant Emission Rate (gr/sec/source)	1.20E-05

**SB ON /Palm Avenue (Sources \_\_ to \_\_)**

**TOG DSL Emissions**

Number of Sources	90
Link Length (meters)	360.5
Volume/Baseline (VPH)	11.7
Pollutant Mass Emission Rate (gr/mi)	0.088780

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00006
Pollutant Emission Rate (gr/sec/source)	7.18E-07

**SB ON / Palm Avenue (Sources \_\_ to \_\_)**

**TOG DSL Emissions**

Number of Sources	112
Link Length (meters)	447.2
Volume/Baseline (VPH)	14.3
Pollutant Mass Emission Rate (gr/mi)	0.088780

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00010
Pollutant Emission Rate (gr/sec/source)	8.75E-07



On-Road Mobile Sources  
Emission Rate Computation

**I-215 NB (Sources \_\_ to \_\_)**

**TOG GAS Emissions**

Number of Sources	163
Link Length (meters)	1632.0
Volume/Baseline (VPH)	1604.3
Pollutant Mass Emission Rate (gr/mi)	0.010324

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00467
Pollutant Emission Rate (gr/sec/source)	2.86E-05

**I-215 SB (Sources \_\_ to \_\_)**

**TOG GAS Emissions**

Number of Sources	165
Link Length (meters)	1647.8
Volume/Baseline (VPH)	1604.3
Pollutant Mass Emission Rate (gr/mi)	0.010324

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00471
Pollutant Emission Rate (gr/sec/source)	2.86E-05

**NB ON / Palm Avenue (Sources \_\_ to \_\_)**

**TOG GAS Emissions**

Number of Sources	35
Link Length (meters)	347.6
Volume/Baseline (VPH)	264.9
Pollutant Mass Emission Rate (gr/mi)	0.014755

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00023
Pollutant Emission Rate (gr/sec/source)	6.70E-06

**NB OFF / Palm Avenue (Sources \_\_ to \_\_)**

**TOG GAS Emissions**

Number of Sources	28
Link Length (meters)	277.8
Volume/Baseline (VPH)	217.4
Pollutant Mass Emission Rate (gr/mi)	0.039522

On-Road Mobile Sources  
Emission Rate Computation

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00041
Pollutant Emission Rate (gr/sec/source)	1.47E-05

**SB ON /Palm Avenue (Sources \_\_ to \_\_)**

**TOG GAS Emissions**

Number of Sources	90
Link Length (meters)	360.5
Volume/Baseline (VPH)	217.4
Pollutant Mass Emission Rate (gr/mi)	0.014755

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00020
Pollutant Emission Rate (gr/sec/source)	2.22E-06

**SB OFF / Palm Avenue (Sources \_\_ to \_\_)**

**TOG GAS Emissions**

Number of Sources	112
Link Length (meters)	447.2
Volume/Baseline (VPH)	264.9
Pollutant Mass Emission Rate (gr/mi)	0.014755

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00030
Pollutant Emission Rate (gr/sec/source)	2.69E-06

On-Road Mobile Sources  
Emission Rate Computation

**I-215 NB (Sources \_\_ to \_\_)**

**DSL Particulate Emissions**

Number of Sources	163
Link Length (meters)	1632.0
Volume/Baseline (VPH)	86.5
Pollutant Mass Emission Rate (gr/mi)	0.068

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00166
Pollutant Emission Rate (gr/sec/source)	1.02E-05

**I-215 SB (Sources \_\_ to \_\_)**

**DSL Particulate Emissions**

Number of Sources	165
Link Length (meters)	1647.8
Volume/Baseline (VPH)	86.5
Pollutant Mass Emission Rate (gr/mi)	0.068

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00167
Pollutant Emission Rate (gr/sec/source)	1.01E-05

**NB ON / Palm Avenue (Sources \_\_ to \_\_)**

**DSL Particulate Emissions**

Number of Sources	35
Link Length (meters)	347.6
Volume/Baseline (VPH)	14.3
Pollutant Mass Emission Rate (gr/mi)	0.107

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00009
Pollutant Emission Rate (gr/sec/source)	2.62E-06

**NB OFF / Palm Avenue (Sources \_\_ to \_\_)**

**DSL Particulate Emissions**

Number of Sources	28
Link Length (meters)	277.8
Volume/Baseline (VPH)	11.7
Pollutant Mass Emission Rate (gr/mi)	0.144

On-Road Mobile Sources  
Emission Rate Computation

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00008
Pollutant Emission Rate (gr/sec/source)	2.89E-06

**SB ON /Palm Avenue (Sources \_\_ to \_\_)**

**DSL Particulate Emissions**

Number of Sources	90
Link Length (meters)	360.5
Volume/Baseline (VPH)	11.7
Pollutant Mass Emission Rate (gr/mi)	0.107

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00008
Pollutant Emission Rate (gr/sec/source)	8.66E-07

**SB ON / Palm Avenue (Sources \_\_ to \_\_)**

**DSL Particulate Emissions**

Number of Sources	112
Link Length (meters)	447.2
Volume/Baseline (VPH)	14.3
Pollutant Mass Emission Rate (gr/mi)	0.144

$$Emission\ Rate\ (gr/sec) = ((Mass\ Emission\ Rate\ x\ Volume/Baseline)/(1609.3\ m/mile) \times (3600\ sec/hr)) \times (Link\ Length)$$

Pollutant Emission Rate (gr/sec)	0.00016
Pollutant Emission Rate (gr/sec/source)	1.42E-06

All  
DSL

1463118.0
74874.0

Diesel Fleet Mix (weight fraction)

0.0512
--------

Link Counts	Sources	AADT	VPH all	VPH gas	VPH diesel
MAIN NB		40580	1690.8	1604.3	86.5
MAIN SB		40580	1690.8	1604.3	86.5
NB ON / PALM		6700	279.2	264.9	14.3
NB OFF / PALM		5500	229.2	217.4	11.7
SB ON / PALM		5500	229.2	217.4	11.7
SB OFF / PALM		6700	279.2	264.9	14.3

**APPENDIX 3.2:**  
**RISK CALCULATION WORKSHEETS**

**Table A1**  
**Quantification of Carcinogenic Risks and Noncarcinogenic Hazards**  
**Residential Exposure Scenario (30 Year)**

Source (a)	Concentration		Weight Fraction (d)	Contaminant (e)	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
	(ug/m3) (b)	(mg/m3) (c)			URF (ug/m3) (f)	CPF (mg/kg/day) (g)	RISK (h)	REL (ug/m3) (i)	RfD (mg/kg/day) (j)	RESP (k)	CNS/PNS (l)	CV/BL (m)	IMMUN (n)	KIDN (o)	GI/LV (p)	REPRO (q)	EYES (r)
	Freeway	0.36546			3.7E-04	4.60E-01	Benzene	2.9E-05	1.0E-01	2.0E-06	6.0E+01	1.7E-02		2.7E-03	2.7E-03		
			3.32E-01	Formaldehyde	6.0E-06	2.1E-02	3.0E-07	9.0E+00	2.6E-03	1.3E-02							
			1.05E-01	1,3-Butadiene	1.7E-04	6.0E-01	2.7E-06	2.0E+01	5.7E-03							1.8E-03	
			7.80E-02	Acetaldehyde	2.7E-06	1.0E-02	3.3E-08	1.4E+02	4.0E-02	2.0E-04							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	2.5E-02							
	0.03157	3.2E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	3.9E-06	5.0E+00	1.4E-03	6.1E-03							
Total							8.91E-06			4.4E-02	2.7E-03	2.7E-03	0.0E+00	0.0E+00	0.0E+00	4.5E-03	0.0E+00

\* Key to Toxicological Endpoints

RESP            Respiratory System  
CNS/PNS        Central/Peripheral Nervous System  
CV/BL          Cardiovascular/Blood System  
IMMUN         Immune System  
KIDN            Kidney  
GI/LV          Gastrointestinal System/Liver  
REPRO         Reproductive System (e.g., teratogenic and developmental effects)  
EYES            Eye irritation and/or other effects

Note:            Exposure factors used to calculate contaminant intake

exposure frequency (days/year)            350  
exposure duration (years)                    30  
inhalation rate (m3/day)                      20  
average body weight (kg)                    70  
averaging time<sub>(cancer)</sub> (days)                25550  
averaging time<sub>(noncancer)</sub> (days)            10950

**Table A2**  
**Quantification of Carcinogenic Risks and Noncarcinogenic Hazards**  
**Residential Exposure Scenario (9 Year)**

Source (a)	Concentration		Weight Fraction (d)	Contaminant (e)	Carcinogenic Risk			Noncarcinogenic Hazards / Toxicological Endpoints*									
	(ug/m3) (b)	(mg/m3) (c)			URF (ug/m3) (f)	CPF (mg/kg/day) (g)	RISK (h)	REL (ug/m3) (i)	RfD (mg/kg/day) (j)	RESP (k)	CNS/PNS (l)	CV/BL (m)	IMMUN (n)	KIDN (o)	GI/LV (p)	REPRO (q)	EYES (r)
	Freeway	0.36546			3.7E-04	4.60E-01	Benzene	2.9E-05	1.0E-01	6.0E-07	6.0E+01	1.7E-02		2.7E-03	2.7E-03		
			3.32E-01	Formaldehyde	6.0E-06	2.1E-02	9.0E-08	9.0E+00	2.6E-03	1.3E-02							
			1.05E-01	1,3-Butadiene	1.7E-04	6.0E-01	8.0E-07	2.0E+01	5.7E-03							1.8E-03	
			7.80E-02	Acetaldehyde	2.7E-06	1.0E-02	1.0E-08	1.4E+02	4.0E-02	2.0E-04							
			2.50E-02	Acrolein				3.5E-01	1.0E-04	2.5E-02							
	0.03157	3.2E-05	1.00E+00	Diesel Particulates	3.0E-04	1.1E+00	1.2E-06	5.0E+00	1.4E-03	6.1E-03							
Total							2.67E-06			4.4E-02	2.7E-03	2.7E-03	0.0E+00	0.0E+00	0.0E+00	4.5E-03	0.0E+00

\* Key to Toxicological Endpoints

RESP            Respiratory System  
CNS/PNS        Central/Peripheral Nervous System  
CV/BL          Cardiovascular/Blood System  
IMMUN         Immune System  
KIDN            Kidney  
GI/LV          Gastrointestinal System/Liver  
REPRO         Reproductive System (e.g., teratogenic and developmental effects)  
EYES            Eye irritation and/or other effects

Note:            Exposure factors used to calculate contaminant intake

exposure frequency (days/year)            350  
exposure duration (years)                    9  
inhalation rate (m3/day)                      20  
average body weight (kg)                      70  
averaging time<sub>(cancer)</sub> (days)                25550  
averaging time<sub>(noncancer)</sub> (days)            3285



**Table A3**  
**Quantification of Noncarcinogenic Acute Hazards**  
**1-Hour Exposure / Average Traffic Scenario**

Source (a)	Concentration (ug/m3) (b)	Weight Fraction (c)	Contaminant (d)	Noncarcinogenic Hazards / Toxicological Endpoints*								
				REL (ug/m3) (e)	RESP (f)	CNS/PNS (g)	CV/BL (h)	IMMUN (i)	KIDN (j)	GI/LV (k)	REPRO (l)	EYES (m)
Freeway TOG	1.06000	4.60E-01	Benzene	1.3E+03			3.8E-04	3.8E-04			3.8E-04	
			Formaldehyde	5.5E+01							6.4E-03	
			Acetaldehyde	4.7E+02	1.8E-04						1.8E-04	
Freeway Diesel/TOG	0.18014	8.20E-02	Acrolein	2.5E+00	1.1E-02							1.1E-02
			Benzene	1.3E+03			1.1E-05	1.1E-05			1.1E-05	
			Formaldehyde	5.5E+01							2.0E-03	
		3.03E-01	Acetaldehyde	4.7E+02	1.2E-04							1.2E-04
Total					1.1E-02	0.0E+00	3.9E-04	3.9E-04	0.0E+00	0.0E+00	3.9E-04	1.9E-02

\* Key to Toxicological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

**Table A4**  
**Quantification of Noncarcinogenic Acute Hazards**  
**8-Hour Exposure / Average Traffic Scenario**

Source (a)	Concentration (ug/m3) (b)	Weight Fraction (c)	Contaminant (d)	Noncarcinogenic Hazards / Toxicological Endpoints*									
				REL (ug/m3) (e)	RESP (f)	CNS/PNS (g)	CV/BL (h)	IMMUN (i)	KIDN (j)	GI/LV (k)	REPRO (l)	EYES (m)	
Freeway TOG	0.63600	3.32E-01	Formaldehyde	9.0E+00	2.3E-02								
		7.80E-02	Acetaldehyde	3.0E+02	1.7E-04								
		2.50E-02	Acrolein	7.0E-01	2.3E-02								
Freeway Diesel/TOG	0.10350	6.07E-01	Formaldehyde	9.0E+00	7.0E-03								
		3.03E-01	Acetaldehyde	3.0E+02	1.0E-04								
Total				5.3E-02	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

\* Key to Toxicological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System (e.g., teratogenic and developmental effects)
EYES	Eye irritation and/or other effects

**APPENDIX 3.3:**

**AERMOD MODEL OUTPUT SUMMARY FILE**

\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\DPM\DPM.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 12:24:18

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\*\*MODELOPTs: RegDEFAULT CONC ELEV DRYDPLT WETDPLT URBAN

\*\*\* MODEL SETUP OPTIONS

SUMMARY \*\*\*

-----  
-----

\*\*Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --

\*\*NO GAS DEPOSITION Data Provided.

\*\*PARTICLE DEPOSITION Data Provided.

\*\*Model Uses DRY DEPLETION. DDPLETE = T

\*\*Model Uses WET DEPLETION. WETDPLT = T

\*\*Model Uses URBAN Dispersion Algorithm for the SBL for 593 Source(s),  
for Total of 1 Urban Area(s):

Urban Population = 2015355.0 ; Urban Roughness Length = 1.000 m

\*\*Model Uses Regulatory DEFAULT Options:

1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.
6. Urban Roughness Length of 1.0 Meter Assumed.

\*\*Other Options Specified:

TEMP\_Sub - Meteorological data includes TEMP substitutions

\*\*Model Assumes No FLAGPOLE Receptor Heights.

\*\*The User Specified a Pollutant Type of: DPM

\*\*Model Calculates ANNUAL Averages Only

\*\*This Run Includes: 593 Source(s); 1 Source Group(s); and  
123 Receptor(s)

with: 0 POINT(s), including  
0 POINTCAP(s) and 0 POINTHOR(s)  
and: 593 VOLUME source(s)  
and: 0 AREA type source(s)  
and: 0 LINE source(s)  
and: 0 OPENPIT source(s)

\*\*Model Set To Continue RUNning After the Setup Testing.

\*\*The AERMET Input Meteorological Data Version Date: 14134

\*\*Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor  
Model Outputs External File(s) of High Values for Plotting  
(PLOTFILE Keyword)  
Model Outputs Separate Summary File of High Ranked Values  
(SUMMFILE Keyword)

\*\*NOTE: The Following Flags May Appear Following CONC Values: c for  
Calm Hours

m for

Missing Hours

b for

Both Calm and Missing Hours

\*\*Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 305.00 ;  
Decay Coef. = 0.000 ; Rot. Angle = 0.0  
Emission Units = GRAMS/SEC  
; Emission Rate Unit Factor = 0.10000E+07  
Output Units = MICROGRAMS/M\*\*3

\*\*Approximate Storage Requirements of Model = 3.8 MB of RAM.

\*\*Detailed Error/Message File: DPM.err

\*\*File for Summary of Results: DPM.sum



```

*** AERMOD - VERSION 15181 ***    *** C:\Lakes\AERMOD View\Rancho
Palma\DPM\DPM.isc                ***          12/11/15
*** AERMET - VERSION 14134 ***    ***
***          12:24:18

```

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```

**MODELOPTs:   RegDEFAULT CONC      ELEV      DRYDPLT      WETDPLT      URBAN

```

\*\*\* UP TO THE FIRST 24 HOURS OF

METEOROLOGICAL DATA \*\*\*

```

Surface file:   ..\snbo8.sfc
Met Version:   14134
Profile file:  ..\snbo8.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 3190          Upper air station no.:
3190
Name: UNKNOWN          Name:
UNKNOWN
Year: 2007            Year:
2007

```

First 24 hours of scalar data

YR	MO	DY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0	BOWEN
ALB	REF	WS	WD	HT	REF	TA	HT	IPCODE	PRATE	RH	SFCP	CCVR	
07	01	01	01	-0.5	0.030	-9.000	-9.000	-999.	12.		4.4	0.32	1.00
1.00		0.50	27.	9.	279.9	6.***	-9.00	999.	977.	10			
07	01	01	02	-0.5	0.030	-9.000	-9.000	-999.	12.		4.3	0.32	1.00
1.00		0.50	7.	9.	279.2	6.***	-9.00	999.	977.	10			
07	01	01	03	-0.5	0.030	-9.000	-9.000	-999.	12.		4.3	0.32	1.00
1.00		0.50	97.	9.	278.8	6.***	-9.00	999.	977.	10			
07	01	01	04	-0.7	0.030	-9.000	-9.000	-999.	12.		3.1	0.32	1.00
1.00		0.50	148.	9.	278.1	6.***	-9.00	999.	977.	0			
07	01	01	05	-2.4	0.054	-9.000	-9.000	-999.	30.		5.5	0.32	1.00
1.00		0.90	87.	9.	278.1	6.***	-9.00	999.	977.	0			
07	01	01	06	-1.7	0.054	-9.000	-9.000	-999.	30.		7.8	0.32	1.00
1.00		0.90	208.	9.	277.0	6.***	-9.00	999.	977.	10			
07	01	01	07	-1.7	0.054	-9.000	-9.000	-999.	30.		7.8	0.32	1.00
1.00		0.90	156.	9.	277.5	6.***	-9.00	999.	977.	10			
07	01	01	08	-1.7	0.054	-9.000	-9.000	-999.	30.		7.8	0.32	1.00
0.52		0.90	60.	9.	277.5	6.***	-9.00	999.	977.	6			
07	01	01	09	34.6	0.390	0.621	0.005	241.	585.	-149.6	0.32	1.00	
0.31		3.10	264.	9.	282.5	6.***	-9.00	999.	977.	4			
07	01	01	10	78.0	0.267	1.066	0.005	541.	341.	-21.3	0.32	1.00	
0.24		1.80	242.	9.	289.2	6.***	-9.00	999.	977.	0			
07	01	01	11	112.9	0.612	1.395	0.019	839.	1149.	-176.9	0.32	1.00	
0.21		4.90	82.	9.	290.4	6.***	-9.00	999.	977.	0			
07	01	01	12	130.3	0.615	1.611	0.020	1120.	1158.	-155.8	0.32	1.00	
0.20		4.90	74.	9.	290.9	6.***	-9.00	999.	977.	0			
07	01	01	13	128.2	0.671	1.662	0.015	1250.	1315.	-204.9	0.32	1.00	
0.20		5.40	59.	9.	290.9	6.***	-9.00	999.	977.	0			

07	01	01	14	107.5	0.712	1.575	0.007	1267.	1439.	-292.1	0.32	1.00
0.22	5.80	58.	9.	291.4	6.***	-9.00	999.	977.	0			
07	01	01	15	68.1	0.602	1.356	0.021	1277.	1137.	-279.3	0.32	1.00
0.25	4.90	40.	9.	291.4	6.***	-9.00	999.	977.	0			
07	01	01	16	18.1	0.438	0.872	0.021	1278.	724.	-405.7	0.32	1.00
0.34	3.60	312.	9.	292.0	6.***	-9.00	999.	977.	0			
07	01	01	17	-25.8	0.263	-9.000	-9.000	-999.	353.	61.6	0.32	1.00
0.63	2.70	342.	9.	290.9	6.***	-9.00	999.	977.	0			
07	01	01	18	-4.9	0.077	-9.000	-9.000	-999.	114.	8.1	0.32	1.00
1.00	1.30	256.	9.	289.2	6.***	-9.00	999.	977.	0			
07	01	01	19	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32	1.00
1.00	1.30	191.	9.	289.9	6.***	-9.00	999.	977.	0			
07	01	01	20	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32	1.00
1.00	1.30	197.	9.	289.9	6.***	-9.00	999.	977.	0			
07	01	01	21	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32	1.00
1.00	1.30	190.	9.	289.9	6.***	-9.00	999.	977.	0			
07	01	01	22	-2.4	0.054	-9.000	-9.000	-999.	30.	5.6	0.32	1.00
1.00	0.90	188.	9.	289.2	6.***	-9.00	999.	977.	0			
07	01	01	23	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32	1.00
1.00	1.80	162.	9.	289.9	6.***	-9.00	999.	977.	0			
07	01	01	24	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32	1.00
1.00	1.80	42.	9.	289.2	6.***	-9.00	999.	977.	0			

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	5.5	0	-999.	-99.00	279.9	99.0	-99.00	-99.00
07	01	01	01	9.1	1	27.	0.50	-999.0	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)





\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\DPM\DPM.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 12:24:18

PAGE 5

\*\*MODELOPTs: RegDEFAULT CONC ELEV DRYDPLT WETDPLT URBAN

\*\*\* Message Summary : AERMOD Model Execution \*\*\*

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)  
A Total of 2 Warning Message(s)  
A Total of 1086 Informational Message(s)

A Total of 43824 Hours Were Processed

A Total of 37 Calm Hours Identified

A Total of 1049 Missing Hours Identified ( 2.39 Percent)

Met Data File Includes 0.00 Millimeters ( 0.000 Inches) of  
Precipitation

\*\*\*\*\* FATAL ERROR MESSAGES \*\*\*\*\*  
\*\*\* NONE \*\*\*

\*\*\*\*\* WARNING MESSAGES \*\*\*\*\*  
ME W531 3154 MEOpen: CAUTION! Met Station ID Missing from  
SURFFILE for SURFDATA  
MX W496 43825 MAIN: Total precipitation in SURFFILE is zero  
(0.0) with WetDepos

\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\CO\CO.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:41:18

PAGE 1

\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* MODEL SETUP OPTIONS

SUMMARY \*\*\*

-----  
-----

\*\*Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --

\*\*NO GAS DEPOSITION Data Provided.

\*\*NO PARTICLE DEPOSITION Data Provided.

\*\*Model Uses NO DRY DEPLETION. DRYDPLT = F

\*\*Model Uses NO WET DEPLETION. WETDPLT = F

\*\*Model Uses URBAN Dispersion Algorithm for the SBL for 593 Source(s),  
for Total of 1 Urban Area(s):

Urban Population = 2015355.0 ; Urban Roughness Length = 1.000 m

\*\*Model Uses Regulatory DEFAULT Options:

1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.
6. Urban Roughness Length of 1.0 Meter Assumed.

\*\*Other Options Specified:

TEMP\_Sub - Meteorological data includes TEMP substitutions

\*\*Model Assumes No FLAGPOLE Receptor Heights.

\*\*The User Specified a Pollutant Type of: CO

\*\*Model Calculates 2 Short Term Average(s) of: 1-HR 8-HR

\*\*This Run Includes: 593 Source(s); 1 Source Group(s); and  
17 Receptor(s)

with: 0 POINT(s), including  
0 POINTCAP(s) and 0 POINTHOR(s)  
and: 593 VOLUME source(s)  
and: 0 AREA type source(s)  
and: 0 LINE source(s)  
and: 0 OPENPIT source(s)

\*\*Model Set To Continue RUNning After the Setup Testing.

\*\*The AERMET Input Meteorological Data Version Date: 14134

\*\*Output Options Selected:

Model Outputs Tables of Highest Short Term Values by Receptor  
(RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting  
(PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values  
(SUMMFILE Keyword)

\*\*NOTE: The Following Flags May Appear Following CONC Values: c for  
Calm Hours

m for  
Missing Hours

b for  
Both Calm and Missing Hours

\*\*Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 305.00 ;

Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC

; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M\*\*3

\*\*Approximate Storage Requirements of Model = 3.8 MB of RAM.

\*\*Detailed Error/Message File: CO.err

\*\*File for Summary of Results: CO.sum



```

*** AERMOD - VERSION 15181 ***   *** C:\Lakes\AERMOD View\Rancho
Palma\CO\CO.isc                 ***           12/11/15
*** AERMET - VERSION 14134 ***   ***
***           11:41:18

```

PAGE 3

\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* UP TO THE FIRST 24 HOURS OF

METEOROLOGICAL DATA \*\*\*

```

Surface file:  ..\snbo8.sfc
Met Version:  14134
Profile file:  ..\snbo8.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 3190           Upper air station no.:
3190
Name: UNKNOWN                       Name:
UNKNOWN
Year: 2007                          Year:
2007

```

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0
BOWEN	ALBEDO	REF	WS	WD	HT	REF	TA	HT					
07	01	01	1	01	-0.5	0.030	-9.000	-9.000	-999.	12.	4.4	0.32	
1.00	1.00		0.50	27.	9.1	279.9	5.5						
07	01	01	1	02	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00		0.50	7.	9.1	279.2	5.5						
07	01	01	1	03	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00		0.50	97.	9.1	278.8	5.5						
07	01	01	1	04	-0.7	0.030	-9.000	-9.000	-999.	12.	3.1	0.32	
1.00	1.00		0.50	148.	9.1	278.1	5.5						
07	01	01	1	05	-2.4	0.054	-9.000	-9.000	-999.	30.	5.5	0.32	
1.00	1.00		0.90	87.	9.1	278.1	5.5						
07	01	01	1	06	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00		0.90	208.	9.1	277.0	5.5						
07	01	01	1	07	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00		0.90	156.	9.1	277.5	5.5						
07	01	01	1	08	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	0.52		0.90	60.	9.1	277.5	5.5						
07	01	01	1	09	34.6	0.390	0.621	0.005	241.	585.	-149.6	0.32	
1.00	0.31		3.10	264.	9.1	282.5	5.5						
07	01	01	1	10	78.0	0.267	1.066	0.005	541.	341.	-21.3	0.32	
1.00	0.24		1.80	242.	9.1	289.2	5.5						
07	01	01	1	11	112.9	0.612	1.395	0.019	839.	1149.	-176.9	0.32	
1.00	0.21		4.90	82.	9.1	290.4	5.5						
07	01	01	1	12	130.3	0.615	1.611	0.020	1120.	1158.	-155.8	0.32	
1.00	0.20		4.90	74.	9.1	290.9	5.5						
07	01	01	1	13	128.2	0.671	1.662	0.015	1250.	1315.	-204.9	0.32	
1.00	0.20		5.40	59.	9.1	290.9	5.5						

07	01	01	1	14	107.5	0.712	1.575	0.007	1267.	1439.	-292.1	0.32
1.00	0.22	5.80	58.	9.1	291.4	5.5						
07	01	01	1	15	68.1	0.602	1.356	0.021	1277.	1137.	-279.3	0.32
1.00	0.25	4.90	40.	9.1	291.4	5.5						
07	01	01	1	16	18.1	0.438	0.872	0.021	1278.	724.	-405.7	0.32
1.00	0.34	3.60	312.	9.1	292.0	5.5						
07	01	01	1	17	-25.8	0.263	-9.000	-9.000	-999.	353.	61.6	0.32
1.00	0.63	2.70	342.	9.1	290.9	5.5						
07	01	01	1	18	-4.9	0.077	-9.000	-9.000	-999.	114.	8.1	0.32
1.00	1.00	1.30	256.	9.1	289.2	5.5						
07	01	01	1	19	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	191.	9.1	289.9	5.5						
07	01	01	1	20	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	197.	9.1	289.9	5.5						
07	01	01	1	21	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	190.	9.1	289.9	5.5						
07	01	01	1	22	-2.4	0.054	-9.000	-9.000	-999.	30.	5.6	0.32
1.00	1.00	0.90	188.	9.1	289.2	5.5						
07	01	01	1	23	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	162.	9.1	289.9	5.5						
07	01	01	1	24	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	42.	9.1	289.2	5.5						

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	5.5	0	-999.	-99.00	279.9	99.0	-99.00	-99.00
07	01	01	01	9.1	1	27.	0.50	-999.0	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)





\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\CO\CO.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:41:18

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\*\*MODELOPTs: RegDFAULT CONC ELEV URBAN

\*\*\* THE SUMMARY OF

HIGHEST 8-HR RESULTS \*\*\*

MICROGRAMS/M\*\*3

\*\* CONC OF CO IN  
\*\*

DATE

NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH)

RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

-----  
-----

ALL HIGH 1ST HIGH VALUE IS 207.64112m ON 11081508: AT (  
466291.88, 3783831.12, 529.27, 1659.00, 0.00) DC

\*\*\* RECEPTOR TYPES: GC = GRIDCART  
GP = GRIDPOLR  
DC = DISCCART  
DP = DISCPOLR

\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\CO\CO.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:41:18

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\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* Message Summary : AERMOD Model Execution \*\*\*

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)  
A Total of 1 Warning Message(s)  
A Total of 1086 Informational Message(s)  
  
A Total of 43824 Hours Were Processed  
  
A Total of 37 Calm Hours Identified  
  
A Total of 1049 Missing Hours Identified ( 2.39 Percent)

\*\*\*\*\* FATAL ERROR MESSAGES \*\*\*\*\*  
\*\*\* NONE \*\*\*

\*\*\*\*\* WARNING MESSAGES \*\*\*\*\*  
ME W531 1375 MEOPEN: CAUTION! Met Station ID Missing from  
SURFFILE for SURFDATA

\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\NO2\NO2.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:56:18

PAGE 1

\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* MODEL SETUP OPTIONS

SUMMARY \*\*\*

-----  
-----

\*\*Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --

\*\*NO GAS DEPOSITION Data Provided.

\*\*NO PARTICLE DEPOSITION Data Provided.

\*\*Model Uses NO DRY DEPLETION. DRYDPLT = F

\*\*Model Uses NO WET DEPLETION. WETDPLT = F

\*\*Model Uses URBAN Dispersion Algorithm for the SBL for 593 Source(s),  
for Total of 1 Urban Area(s):

Urban Population = 2015355.0 ; Urban Roughness Length = 1.000 m

\*\*Model Uses Regulatory DEFAULT Options:

1. Stack-tip Downwash.

2. Model Accounts for ELEVated Terrain Effects.

3. Use Calms Processing Routine.

4. Use Missing Data Processing Routine.

5. No Exponential Decay.

6. Urban Roughness Length of 1.0 Meter Assumed.

\*\*Other Options Specified:

TEMP\_Sub - Meteorological data includes TEMP substitutions

\*\*Model Assumes No FLAGPOLE Receptor Heights.

\*\*The User Specified a Pollutant Type of: NOX

\*\*Model Calculates 1 Short Term Average(s) of: 1-HR

\*\*This Run Includes: 593 Source(s); 1 Source Group(s); and  
17 Receptor(s)

with: 0 POINT(s), including  
0 POINTCAP(s) and 0 POINTHOR(s)  
and: 593 VOLUME source(s)  
and: 0 AREA type source(s)  
and: 0 LINE source(s)  
and: 0 OPENPIT source(s)

\*\*Model Set To Continue RUNning After the Setup Testing.

\*\*The AERMET Input Meteorological Data Version Date: 14134

\*\*Output Options Selected:

Model Outputs Tables of Highest Short Term Values by Receptor  
(RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting  
(PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values  
(SUMMFILE Keyword)

\*\*NOTE: The Following Flags May Appear Following CONC Values: c for  
Calm Hours

m for  
Missing Hours

b for  
Both Calm and Missing Hours

\*\*Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 305.00 ;

Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC

; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M\*\*3

\*\*Approximate Storage Requirements of Model = 3.8 MB of RAM.

\*\*Detailed Error/Message File: NO2.err

\*\*File for Summary of Results: NO2.sum



```

*** AERMOD - VERSION 15181 ***   *** C:\Lakes\AERMOD View\Rancho
Palma\NO2\NO2.isc                ***           12/11/15
*** AERMET - VERSION 14134 ***   ***
***           11:56:18

```

PAGE 3

\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* UP TO THE FIRST 24 HOURS OF

METEOROLOGICAL DATA \*\*\*

```

Surface file:  ..\snbo8.sfc
Met Version:  14134
Profile file:  ..\snbo8.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 3190           Upper air station no.:
3190
Name: UNKNOWN                       Name:
UNKNOWN
Year: 2007                           Year:
2007

```

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0
BOWEN	ALBEDO	REF	WS	WD	HT	REF	TA	HT					
07	01	01	1	01	-0.5	0.030	-9.000	-9.000	-999.	12.	4.4	0.32	
1.00	1.00			0.50	27.	9.1	279.9	5.5					
07	01	01	1	02	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00			0.50	7.	9.1	279.2	5.5					
07	01	01	1	03	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00			0.50	97.	9.1	278.8	5.5					
07	01	01	1	04	-0.7	0.030	-9.000	-9.000	-999.	12.	3.1	0.32	
1.00	1.00			0.50	148.	9.1	278.1	5.5					
07	01	01	1	05	-2.4	0.054	-9.000	-9.000	-999.	30.	5.5	0.32	
1.00	1.00			0.90	87.	9.1	278.1	5.5					
07	01	01	1	06	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00			0.90	208.	9.1	277.0	5.5					
07	01	01	1	07	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00			0.90	156.	9.1	277.5	5.5					
07	01	01	1	08	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	0.52			0.90	60.	9.1	277.5	5.5					
07	01	01	1	09	34.6	0.390	0.621	0.005	241.	585.	-149.6	0.32	
1.00	0.31			3.10	264.	9.1	282.5	5.5					
07	01	01	1	10	78.0	0.267	1.066	0.005	541.	341.	-21.3	0.32	
1.00	0.24			1.80	242.	9.1	289.2	5.5					
07	01	01	1	11	112.9	0.612	1.395	0.019	839.	1149.	-176.9	0.32	
1.00	0.21			4.90	82.	9.1	290.4	5.5					
07	01	01	1	12	130.3	0.615	1.611	0.020	1120.	1158.	-155.8	0.32	
1.00	0.20			4.90	74.	9.1	290.9	5.5					
07	01	01	1	13	128.2	0.671	1.662	0.015	1250.	1315.	-204.9	0.32	
1.00	0.20			5.40	59.	9.1	290.9	5.5					

07	01	01	1	14	107.5	0.712	1.575	0.007	1267.	1439.	-292.1	0.32
1.00	0.22	5.80	58.	9.1	291.4	5.5						
07	01	01	1	15	68.1	0.602	1.356	0.021	1277.	1137.	-279.3	0.32
1.00	0.25	4.90	40.	9.1	291.4	5.5						
07	01	01	1	16	18.1	0.438	0.872	0.021	1278.	724.	-405.7	0.32
1.00	0.34	3.60	312.	9.1	292.0	5.5						
07	01	01	1	17	-25.8	0.263	-9.000	-9.000	-999.	353.	61.6	0.32
1.00	0.63	2.70	342.	9.1	290.9	5.5						
07	01	01	1	18	-4.9	0.077	-9.000	-9.000	-999.	114.	8.1	0.32
1.00	1.00	1.30	256.	9.1	289.2	5.5						
07	01	01	1	19	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	191.	9.1	289.9	5.5						
07	01	01	1	20	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	197.	9.1	289.9	5.5						
07	01	01	1	21	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	190.	9.1	289.9	5.5						
07	01	01	1	22	-2.4	0.054	-9.000	-9.000	-999.	30.	5.6	0.32
1.00	1.00	0.90	188.	9.1	289.2	5.5						
07	01	01	1	23	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	162.	9.1	289.9	5.5						
07	01	01	1	24	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	42.	9.1	289.2	5.5						

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	5.5	0	-999.	-99.00	279.9	99.0	-99.00	-99.00
07	01	01	01	9.1	1	27.	0.50	-999.0	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\NO2\NO2.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:56:18

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\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* THE SUMMARY OF

HIGHEST 1-HR RESULTS \*\*\*

MICROGRAMS/M\*\*3

\*\* CONC OF NOX IN  
\*\*

DATE

NETWORK

GROUP ID AVERAGE CONC (YYMMDDHH)

RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

-----  
-----

ALL HIGH 1ST HIGH VALUE IS 44.01094 ON 11122720: AT (  
466188.89, 3783931.72, 533.85, 1659.00, 0.00) DC

\*\*\* RECEPTOR TYPES: GC = GRIDCART  
GP = GRIDPOLR  
DC = DISCCART  
DP = DISCPOLR



\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\NO2\NO2.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:56:18

PAGE 5

\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* Message Summary : AERMOD Model Execution \*\*\*

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)  
A Total of 1 Warning Message(s)  
A Total of 1086 Informational Message(s)  
  
A Total of 43824 Hours Were Processed  
  
A Total of 37 Calm Hours Identified  
  
A Total of 1049 Missing Hours Identified ( 2.39 Percent)

\*\*\*\*\* FATAL ERROR MESSAGES \*\*\*\*\*  
\*\*\* NONE \*\*\*

\*\*\*\*\* WARNING MESSAGES \*\*\*\*\*  
ME W531 1375 MEOPEN: CAUTION! Met Station ID Missing from  
SURFFILE for SURFDATA

\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\PM10\PM10.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:02:55

PAGE 1

\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* MODEL SETUP OPTIONS

SUMMARY \*\*\*

-----  
-----

\*\*Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --

\*\*NO GAS DEPOSITION Data Provided.

\*\*NO PARTICLE DEPOSITION Data Provided.

\*\*Model Uses NO DRY DEPLETION. DRYDPLT = F

\*\*Model Uses NO WET DEPLETION. WETDPLT = F

\*\*Model Uses URBAN Dispersion Algorithm for the SBL for 593 Source(s),  
for Total of 1 Urban Area(s):

Urban Population = 2015355.0 ; Urban Roughness Length = 1.000 m

\*\*Model Uses Regulatory DEFAULT Options:

1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.
6. Urban Roughness Length of 1.0 Meter Assumed.

\*\*Other Options Specified:

TEMP\_Sub - Meteorological data includes TEMP substitutions

\*\*Model Assumes No FLAGPOLE Receptor Heights.

\*\*The User Specified a Pollutant Type of: PM\_10

\*\*Model Calculates 1 Short Term Average(s) of: 24-HR  
and Calculates ANNUAL Averages

\*\*This Run Includes: 593 Source(s); 1 Source Group(s); and  
17 Receptor(s)

with: 0 POINT(s), including  
0 POINTCAP(s) and 0 POINTHOR(s)  
and: 593 VOLUME source(s)  
and: 0 AREA type source(s)  
and: 0 LINE source(s)  
and: 0 OPENPIT source(s)

\*\*Model Set To Continue RUNning After the Setup Testing.

\*\*The AERMET Input Meteorological Data Version Date: 14134

\*\*Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor

(RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting

(PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values

(SUMMFILE Keyword)

\*\*NOTE: The Following Flags May Appear Following CONC Values: c for  
Calm Hours

m for

Missing Hours

b for

Both Calm and Missing Hours

\*\*Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 305.00 ;

Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC

; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M\*\*3

\*\*Approximate Storage Requirements of Model = 3.8 MB of RAM.

\*\*Detailed Error/Message File: PM10.err

\*\*File for Summary of Results: PM10.sum



```

*** AERMOD - VERSION 15181 ***   *** C:\Lakes\AERMOD View\Rancho
Palma\PM10\PM10.isc             ***           12/11/15
*** AERMET - VERSION 14134 ***   ***
***           11:02:55

```

PAGE 3

\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* UP TO THE FIRST 24 HOURS OF

METEOROLOGICAL DATA \*\*\*

```

Surface file:  ..\snbo8.sfc
Met Version:  14134
Profile file:  ..\snbo8.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 3190           Upper air station no.:
3190
Name: UNKNOWN                       Name:
UNKNOWN
Year: 2007                          Year:
2007

```

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0
BOWEN	ALBEDO	REF	WS	WD	HT	REF	TA	HT					
07	01	01	1	01	-0.5	0.030	-9.000	-9.000	-999.	12.	4.4	0.32	
1.00	1.00		0.50	27.	9.1	279.9	5.5						
07	01	01	1	02	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00		0.50	7.	9.1	279.2	5.5						
07	01	01	1	03	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00		0.50	97.	9.1	278.8	5.5						
07	01	01	1	04	-0.7	0.030	-9.000	-9.000	-999.	12.	3.1	0.32	
1.00	1.00		0.50	148.	9.1	278.1	5.5						
07	01	01	1	05	-2.4	0.054	-9.000	-9.000	-999.	30.	5.5	0.32	
1.00	1.00		0.90	87.	9.1	278.1	5.5						
07	01	01	1	06	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00		0.90	208.	9.1	277.0	5.5						
07	01	01	1	07	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00		0.90	156.	9.1	277.5	5.5						
07	01	01	1	08	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	0.52		0.90	60.	9.1	277.5	5.5						
07	01	01	1	09	34.6	0.390	0.621	0.005	241.	585.	-149.6	0.32	
1.00	0.31		3.10	264.	9.1	282.5	5.5						
07	01	01	1	10	78.0	0.267	1.066	0.005	541.	341.	-21.3	0.32	
1.00	0.24		1.80	242.	9.1	289.2	5.5						
07	01	01	1	11	112.9	0.612	1.395	0.019	839.	1149.	-176.9	0.32	
1.00	0.21		4.90	82.	9.1	290.4	5.5						
07	01	01	1	12	130.3	0.615	1.611	0.020	1120.	1158.	-155.8	0.32	
1.00	0.20		4.90	74.	9.1	290.9	5.5						
07	01	01	1	13	128.2	0.671	1.662	0.015	1250.	1315.	-204.9	0.32	
1.00	0.20		5.40	59.	9.1	290.9	5.5						

07	01	01	1	14	107.5	0.712	1.575	0.007	1267.	1439.	-292.1	0.32
1.00	0.22	5.80	58.	9.1	291.4	5.5						
07	01	01	1	15	68.1	0.602	1.356	0.021	1277.	1137.	-279.3	0.32
1.00	0.25	4.90	40.	9.1	291.4	5.5						
07	01	01	1	16	18.1	0.438	0.872	0.021	1278.	724.	-405.7	0.32
1.00	0.34	3.60	312.	9.1	292.0	5.5						
07	01	01	1	17	-25.8	0.263	-9.000	-9.000	-999.	353.	61.6	0.32
1.00	0.63	2.70	342.	9.1	290.9	5.5						
07	01	01	1	18	-4.9	0.077	-9.000	-9.000	-999.	114.	8.1	0.32
1.00	1.00	1.30	256.	9.1	289.2	5.5						
07	01	01	1	19	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	191.	9.1	289.9	5.5						
07	01	01	1	20	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	197.	9.1	289.9	5.5						
07	01	01	1	21	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	190.	9.1	289.9	5.5						
07	01	01	1	22	-2.4	0.054	-9.000	-9.000	-999.	30.	5.6	0.32
1.00	1.00	0.90	188.	9.1	289.2	5.5						
07	01	01	1	23	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	162.	9.1	289.9	5.5						
07	01	01	1	24	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	42.	9.1	289.2	5.5						

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	5.5	0	-999.	-99.00	279.9	99.0	-99.00	-99.00
07	01	01	01	9.1	1	27.	0.50	-999.0	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)



\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\PM10\PM10.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:02:55

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\*\*MODELOPTs: RegDFAULT CONC ELEV URBAN

\*\*\* THE SUMMARY OF

HIGHEST 24-HR RESULTS \*\*\*

MICROGRAMS/M\*\*3 \*\* CONC OF PM\_10 IN \*\*

DATE

NETWORK  
GROUP ID AVERAGE CONC (YYMMDDHH)  
RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID  
-----  
-----

ALL HIGH 1ST HIGH VALUE IS 7.38349 ON 11111824: AT (  
466291.88, 3783831.12, 529.27, 1659.00, 0.00) DC

\*\*\* RECEPTOR TYPES: GC = GRIDCART  
GP = GRIDPOLR  
DC = DISCCART  
DP = DISCPOLR



\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\PM10\PM10.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:02:55

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\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* Message Summary : AERMOD Model Execution \*\*\*

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)  
A Total of 1 Warning Message(s)  
A Total of 1086 Informational Message(s)  
  
A Total of 43824 Hours Were Processed  
  
A Total of 37 Calm Hours Identified  
  
A Total of 1049 Missing Hours Identified ( 2.39 Percent)

\*\*\*\*\* FATAL ERROR MESSAGES \*\*\*\*\*  
\*\*\* NONE \*\*\*

\*\*\*\*\* WARNING MESSAGES \*\*\*\*\*  
ME W531 1375 MEOPEN: CAUTION! Met Station ID Missing from  
SURFFILE for SURFDATA



\*\*The AERMET Input Meteorological Data Version Date: 14134

\*\*Output Options Selected:

Model Outputs Tables of Highest Short Term Values by Receptor  
(RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting  
(PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values  
(SUMMFILE Keyword)

\*\*NOTE: The Following Flags May Appear Following CONC Values: c for  
Calm Hours

m for  
Missing Hours

b for  
Both Calm and Missing Hours

\*\*Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 305.00 ;

Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC

; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M\*\*3

\*\*Approximate Storage Requirements of Model = 3.8 MB of RAM.

\*\*Detailed Error/Message File: PM25.err

\*\*File for Summary of Results: PM25.sum



```

*** AERMOD - VERSION 15181 ***   *** C:\Lakes\AERMOD View\Rancho
Palma\PM25\PM25.isc             ***           12/11/15
*** AERMET - VERSION 14134 ***   ***
***           11:23:26

```

PAGE 3

\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* UP TO THE FIRST 24 HOURS OF

METEOROLOGICAL DATA \*\*\*

```

Surface file:  ..\snbo8.sfc
Met Version:  14134
Profile file:  ..\snbo8.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 3190           Upper air station no.:
3190
Name: UNKNOWN                       Name:
UNKNOWN
Year: 2007                          Year:
2007

```

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0
BOWEN	ALBEDO	REF	WS	WD	HT	REF	TA	HT					
07	01	01	1	01	-0.5	0.030	-9.000	-9.000	-999.	12.	4.4	0.32	
1.00	1.00		0.50	27.	9.1	279.9	5.5						
07	01	01	1	02	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00		0.50	7.	9.1	279.2	5.5						
07	01	01	1	03	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00		0.50	97.	9.1	278.8	5.5						
07	01	01	1	04	-0.7	0.030	-9.000	-9.000	-999.	12.	3.1	0.32	
1.00	1.00		0.50	148.	9.1	278.1	5.5						
07	01	01	1	05	-2.4	0.054	-9.000	-9.000	-999.	30.	5.5	0.32	
1.00	1.00		0.90	87.	9.1	278.1	5.5						
07	01	01	1	06	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00		0.90	208.	9.1	277.0	5.5						
07	01	01	1	07	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00		0.90	156.	9.1	277.5	5.5						
07	01	01	1	08	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	0.52		0.90	60.	9.1	277.5	5.5						
07	01	01	1	09	34.6	0.390	0.621	0.005	241.	585.	-149.6	0.32	
1.00	0.31		3.10	264.	9.1	282.5	5.5						
07	01	01	1	10	78.0	0.267	1.066	0.005	541.	341.	-21.3	0.32	
1.00	0.24		1.80	242.	9.1	289.2	5.5						
07	01	01	1	11	112.9	0.612	1.395	0.019	839.	1149.	-176.9	0.32	
1.00	0.21		4.90	82.	9.1	290.4	5.5						
07	01	01	1	12	130.3	0.615	1.611	0.020	1120.	1158.	-155.8	0.32	
1.00	0.20		4.90	74.	9.1	290.9	5.5						
07	01	01	1	13	128.2	0.671	1.662	0.015	1250.	1315.	-204.9	0.32	
1.00	0.20		5.40	59.	9.1	290.9	5.5						

07	01	01	1	14	107.5	0.712	1.575	0.007	1267.	1439.	-292.1	0.32
1.00	0.22	5.80	58.	9.1	291.4	5.5						
07	01	01	1	15	68.1	0.602	1.356	0.021	1277.	1137.	-279.3	0.32
1.00	0.25	4.90	40.	9.1	291.4	5.5						
07	01	01	1	16	18.1	0.438	0.872	0.021	1278.	724.	-405.7	0.32
1.00	0.34	3.60	312.	9.1	292.0	5.5						
07	01	01	1	17	-25.8	0.263	-9.000	-9.000	-999.	353.	61.6	0.32
1.00	0.63	2.70	342.	9.1	290.9	5.5						
07	01	01	1	18	-4.9	0.077	-9.000	-9.000	-999.	114.	8.1	0.32
1.00	1.00	1.30	256.	9.1	289.2	5.5						
07	01	01	1	19	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	191.	9.1	289.9	5.5						
07	01	01	1	20	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	197.	9.1	289.9	5.5						
07	01	01	1	21	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	190.	9.1	289.9	5.5						
07	01	01	1	22	-2.4	0.054	-9.000	-9.000	-999.	30.	5.6	0.32
1.00	1.00	0.90	188.	9.1	289.2	5.5						
07	01	01	1	23	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	162.	9.1	289.9	5.5						
07	01	01	1	24	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	42.	9.1	289.2	5.5						

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	5.5	0	-999.	-99.00	279.9	99.0	-99.00	-99.00
07	01	01	01	9.1	1	27.	0.50	-999.0	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)



\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\PM25\PM25.isc \*\*\* 12/11/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 11:23:26

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\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* Message Summary : AERMOD Model Execution \*\*\*

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)  
A Total of 1 Warning Message(s)  
A Total of 1086 Informational Message(s)  
  
A Total of 43824 Hours Were Processed  
  
A Total of 37 Calm Hours Identified  
  
A Total of 1049 Missing Hours Identified ( 2.39 Percent)

\*\*\*\*\* FATAL ERROR MESSAGES \*\*\*\*\*  
\*\*\* NONE \*\*\*

\*\*\*\*\* WARNING MESSAGES \*\*\*\*\*  
ME W531 1375 MEOPEN: CAUTION! Met Station ID Missing from  
SURFFILE for SURFDATA



\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\TOGGAS\TOGGAS.isc \*\*\* 12/09/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 15:43:06

PAGE 1

\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* MODEL SETUP OPTIONS

SUMMARY \*\*\*

-----  
-----

\*\*Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --

\*\*NO GAS DEPOSITION Data Provided.

\*\*NO PARTICLE DEPOSITION Data Provided.

\*\*Model Uses NO DRY DEPLETION. DRYDPLT = F

\*\*Model Uses NO WET DEPLETION. WETDPLT = F

\*\*Model Uses URBAN Dispersion Algorithm for the SBL for 593 Source(s),  
for Total of 1 Urban Area(s):

Urban Population = 2015355.0 ; Urban Roughness Length = 1.000 m

\*\*Model Uses Regulatory DEFAULT Options:

1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.
6. Urban Roughness Length of 1.0 Meter Assumed.

\*\*Other Options Specified:

TEMP\_Sub - Meteorological data includes TEMP substitutions

\*\*Model Assumes No FLAGPOLE Receptor Heights.

\*\*The User Specified a Pollutant Type of: TOGGAS

\*\*Model Calculates 2 Short Term Average(s) of: 1-HR 8-HR  
and Calculates ANNUAL Averages

\*\*This Run Includes: 593 Source(s); 1 Source Group(s); and  
17 Receptor(s)

with: 0 POINT(s), including  
0 POINTCAP(s) and 0 POINTHOR(s)  
and: 593 VOLUME source(s)  
and: 0 AREA type source(s)  
and: 0 LINE source(s)  
and: 0 OPENPIT source(s)

\*\*Model Set To Continue RUNning After the Setup Testing.

\*\*The AERMET Input Meteorological Data Version Date: 14134

\*\*Output Options Selected:

Model Outputs Tables of ANNUAL Averages by Receptor

Model Outputs Tables of Highest Short Term Values by Receptor

(RECTABLE Keyword)

Model Outputs External File(s) of High Values for Plotting

(PLOTFILE Keyword)

Model Outputs Separate Summary File of High Ranked Values

(SUMMFILE Keyword)

\*\*NOTE: The Following Flags May Appear Following CONC Values: c for  
Calm Hours

m for

Missing Hours

b for

Both Calm and Missing Hours

\*\*Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 305.00 ;

Decay Coef. = 0.000 ; Rot. Angle = 0.0

Emission Units = GRAMS/SEC

; Emission Rate Unit Factor = 0.10000E+07

Output Units = MICROGRAMS/M\*\*3

\*\*Approximate Storage Requirements of Model = 3.8 MB of RAM.

\*\*Detailed Error/Message File: TOGGAS.err

\*\*File for Summary of Results: TOGGAS.sum



\*\*\* AERMOD - VERSION 15181 \*\*\*  
 Palma\TOGGAS\TOGGAS.isc  
 \*\*\* AERMET - VERSION 14134 \*\*\*  
 \*\*\* 15:43:06

\*\*\* C:\Lakes\AERMOD View\Rancho  
 \*\*\* 12/09/15

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\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* UP TO THE FIRST 24 HOURS OF

METEOROLOGICAL DATA \*\*\*

Surface file: ..\snbo8.sfc  
 Met Version: 14134  
 Profile file: ..\snbo8.PFL  
 Surface format: FREE  
 Profile format: FREE  
 Surface station no.: 3190  
 3190

Upper air station no.:

UNKNOWN Name: UNKNOWN  
 2007 Year: 2007

Name:  
 Year:

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O	LEN	Z0
BOWEN	ALBEDO	REF	WS	WD	HT	REF	TA	HT					
07	01	01	1	01	-0.5	0.030	-9.000	-9.000	-999.	12.	4.4	0.32	
1.00	1.00			0.50	27.	9.1	279.9	5.5					
07	01	01	1	02	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00			0.50	7.	9.1	279.2	5.5					
07	01	01	1	03	-0.5	0.030	-9.000	-9.000	-999.	12.	4.3	0.32	
1.00	1.00			0.50	97.	9.1	278.8	5.5					
07	01	01	1	04	-0.7	0.030	-9.000	-9.000	-999.	12.	3.1	0.32	
1.00	1.00			0.50	148.	9.1	278.1	5.5					
07	01	01	1	05	-2.4	0.054	-9.000	-9.000	-999.	30.	5.5	0.32	
1.00	1.00			0.90	87.	9.1	278.1	5.5					
07	01	01	1	06	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00			0.90	208.	9.1	277.0	5.5					
07	01	01	1	07	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	1.00			0.90	156.	9.1	277.5	5.5					
07	01	01	1	08	-1.7	0.054	-9.000	-9.000	-999.	30.	7.8	0.32	
1.00	0.52			0.90	60.	9.1	277.5	5.5					
07	01	01	1	09	34.6	0.390	0.621	0.005	241.	585.	-149.6	0.32	
1.00	0.31			3.10	264.	9.1	282.5	5.5					
07	01	01	1	10	78.0	0.267	1.066	0.005	541.	341.	-21.3	0.32	
1.00	0.24			1.80	242.	9.1	289.2	5.5					
07	01	01	1	11	112.9	0.612	1.395	0.019	839.	1149.	-176.9	0.32	
1.00	0.21			4.90	82.	9.1	290.4	5.5					
07	01	01	1	12	130.3	0.615	1.611	0.020	1120.	1158.	-155.8	0.32	
1.00	0.20			4.90	74.	9.1	290.9	5.5					
07	01	01	1	13	128.2	0.671	1.662	0.015	1250.	1315.	-204.9	0.32	
1.00	0.20			5.40	59.	9.1	290.9	5.5					

07	01	01	1	14	107.5	0.712	1.575	0.007	1267.	1439.	-292.1	0.32
1.00	0.22	5.80	58.	9.1	291.4	5.5						
07	01	01	1	15	68.1	0.602	1.356	0.021	1277.	1137.	-279.3	0.32
1.00	0.25	4.90	40.	9.1	291.4	5.5						
07	01	01	1	16	18.1	0.438	0.872	0.021	1278.	724.	-405.7	0.32
1.00	0.34	3.60	312.	9.1	292.0	5.5						
07	01	01	1	17	-25.8	0.263	-9.000	-9.000	-999.	353.	61.6	0.32
1.00	0.63	2.70	342.	9.1	290.9	5.5						
07	01	01	1	18	-4.9	0.077	-9.000	-9.000	-999.	114.	8.1	0.32
1.00	1.00	1.30	256.	9.1	289.2	5.5						
07	01	01	1	19	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	191.	9.1	289.9	5.5						
07	01	01	1	20	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	197.	9.1	289.9	5.5						
07	01	01	1	21	-4.9	0.077	-9.000	-9.000	-999.	52.	8.1	0.32
1.00	1.00	1.30	190.	9.1	289.9	5.5						
07	01	01	1	22	-2.4	0.054	-9.000	-9.000	-999.	30.	5.6	0.32
1.00	1.00	0.90	188.	9.1	289.2	5.5						
07	01	01	1	23	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	162.	9.1	289.9	5.5						
07	01	01	1	24	-9.5	0.107	-9.000	-9.000	-999.	84.	11.3	0.32
1.00	1.00	1.80	42.	9.1	289.2	5.5						

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	5.5	0	-999.	-99.00	279.9	99.0	-99.00	-99.00
07	01	01	01	9.1	1	27.	0.50	-999.0	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)









\*\*\* AERMOD - VERSION 15181 \*\*\* \*\*\* C:\Lakes\AERMOD View\Rancho  
Palma\TOGGAS\TOGGAS.isc \*\*\* 12/09/15  
\*\*\* AERMET - VERSION 14134 \*\*\* \*\*\*  
\*\*\* 15:43:06

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\*\*MODELOPTs: RegDEFAULT CONC ELEV URBAN

\*\*\* Message Summary : AERMOD Model Execution \*\*\*

----- Summary of Total Messages -----

A Total of 0 Fatal Error Message(s)  
A Total of 1 Warning Message(s)  
A Total of 1086 Informational Message(s)  
  
A Total of 43824 Hours Were Processed  
  
A Total of 37 Calm Hours Identified  
  
A Total of 1049 Missing Hours Identified ( 2.39 Percent)

\*\*\*\*\* FATAL ERROR MESSAGES \*\*\*\*\*  
\*\*\* NONE \*\*\*

\*\*\*\*\* WARNING MESSAGES \*\*\*\*\*  
ME W531 1375 MEOPEN: CAUTION! Met Station ID Missing from  
SURFFILE for SURFDATA