Air Quality Technical Report

Perris Valley Line Commuter Rail

Riverside County, California

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Riverside County Transportation Commission

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AIR QUALITY TECHNICAL REPORT

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RIVERSIDE COUNTY, CALIFORNIA

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A. PROJECT DESCRIPTION

The Riverside County Transportation Commission (RCTC) proposes to establish a commuter rail service between Riverside and South Perris. The proposed Perris Valley Line (PVL) project would be an extension of the SCRRA/Metrolink 91 line from the existing Riverside Downtown Station, along a portion of the BNSF main line, and would connect to the San Jacinto Branch Line (SJBL) using a new railway connection known as the Citrus Connection. For the opening year of 2012, the PVL would include installation and rehabilitation of track; construction of four stations, a Layover Facility; improvements to existing at-grade crossings and culverts; replacement of two existing bridges along the SJBL at the San Jacinto River; and construction of communication towers and landscape walls. The proposed rail corridor would be approximately 24 miles in length. This *Air Quality Technical Report* provides an update of the air quality analysis presented in the Draft Environmental Assessment (2004) in conformity with the requirements of the California Environmental Quality Act (CEQA).

B. ENVIRONMENTAL SETTING

The California Air Resources Board (CARB) has divided the state into regions called air basins that share similar meteorological and topographical features. The project area is located in western Riverside County (west of the San Gorgonio Pass), which is within the South Coast Air Basin (SCAB). The SCAB is a 6,745-square-mile area comprised of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties. The air basin's climate and topography are highly conducive to the formation and transport of air pollution. Peak ozone (O_3) concentrations in the last two decades have occurred at the base of the mountains around Azusa and Glendora in Los Angeles County, and at Crestline in the mountain area above the City of San Bernardino. Both peak O_3 concentrations and the number of exceedances have decreased within the SCAB throughout the 1990s. In addition, carbon monoxide (CO) concentrations have lessened throughout the air basin during the past decade as a result of strict new emission controls and reformulated gasoline sold in winter months. In response to a scientific consensus linking greenhouse gas emissions from human activities to global climate change, CARB is seeking to consider the cumulative effects of carbon dioxide (CO_2) released by new projects within the SCAB.

Regulatory and Planning

The South Coast Air Quality Management District (SCAQMD) is responsible for air quality conditions in the SCAB. Regionally, the SCAQMD and the Southern California Association of Governments (SCAG) prepare the Air Quality Management Plan (AQMP), which contains measures to meet state and federal requirements. When approved by the CARB and the U.S. Environmental Protection Agency (USEPA), the AQMP becomes part of the State Implementation Plan (SIP).

Federal Standards

The federal Clean Air Act (CAA), enacted in 1970 and amended twice thereafter (including the 1990 amendments), establishes the framework for modern air pollution control. The CAA directs the USEPA to establish ambient air standards for six pollutants: ozone (O_3), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). The standards are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety and the latter to protect environmental values, such as plant and animal life.

The CAA requires states to submit a SIP for areas designated as nonattainment for federal air quality standards. The SIP, which is reviewed and approved by USEPA, must demonstrate how the federal standards would be achieved. Failure to submit a plan or secure approval could lead to denial of federal funding and permits. In cases where the SIP is submitted by the state but fails to demonstrate achievement of the standards, the USEPA is directed to prepare a federal implementation plan.

State Standards

Responsibility for achieving California's Ambient Air Quality Standards (CAAQS), which are more stringent than federal standards, is placed on the CARB and local air pollution control districts. State standards are to be achieved through district-level air quality management plans that are incorporated into the SIP. The California CAA requires local and regional air pollution control districts that are not attaining one or more of the CAAQS to expeditiously adopt plans specifically designed to attain these standards. Each plan must be designed to achieve an annual five percent reduction in district-wide emissions of each nonattainment pollutant or its precursors.

Recently enacted amendments to the California CAA impose additional requirements that are designed to ensure an improvement in air quality within the next five years. More specifically, local districts with moderate air pollution that did not achieve "transitional nonattainment" status by December 31, 1997 must implement the more stringent measures applicable to districts with serious air pollution.

Transportation Conformity

The concept of transportation conformity was introduced in the 1977 amendments to the CAA, which includes a provision to ensure that transportation investments conform to the SIP in meeting the National Ambient Air Quality Standards (NAAQS). Conformity requirements were made substantially more rigorous in the federal CAA amendments of 1990, and the transportation conformity regulation that details implementation of the conformity requirements was first issued in November 1993, with a number of subsequent amendments. The most recent complete set of amendments to the Transportation Conformity Rule is found at 40 Code of Federal Regulations (CFR) parts 51 and 93 (August 15, 1997). Additionally, on July 1, 2004, USEPA published a set of the Transportation Conformity Rule Amendments, amending the August 1997 regulations, in Federal Register (FR) Volume 69 No. 26. The new amendments provide regulations for the new 8-hour O_3 and $PM_{2.5}$ NAAQS. More recently, a March 2006 ruling establishes revised criteria for determining which transportation projects must be analyzed for local particle emissions impacts in PM2.5 and PM10 nonattainment and maintenance areas.

Based on projects included in the Regional Transportation Plan (RTP), transportation-related air quality analyses are conducted to determine whether the implementation of those projects would conform to SIP emission budgets or other tests showing that attainment requirements of the CAA are met. If the conformity analysis is successful, the regional planning organization and the appropriate Federal agencies make a determination that the RTP is in conformity with the SIP for achieving the goals of the CAA. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of a proposed project is the same as described in the RTP, then that project is deemed to meet regional conformity requirements for purposes of project-level analysis. The General Conformity Rule may also require localized (hot spot) analyses if an area is nonattainment or maintenance for carbon monoxide and/or particulate matter.

Regional Planning

Regional Transportation Improvement Program
The SCAG, as the Metropolitan Planning Organization (MPO) for Southern California, is mandated to comply with federal and state transportation and air quality regulations. SCAG is a six-county region (Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura) that contains four air basins that are administered by five air districts.

All potential emissions from projects included in a Regional Transportation Improvement Plan (RTIP) meet the transportation conformity requirements outlined in that RTIP. This means that all of the emissions from projects included in the RTIP have been accounted for in the regional emissions burden. The proposed PVL project is included in SCAG's 2008 RTIP (Project ID RIV520109), as shown in Appendix A, which means the project's operational emissions (including the O_3 precursor emissions reactive organic compounds [ROC] and NO_2) meet the transportation conformity requirements imposed by USEPA and SCAQMD. As such, a project under these circumstances would normally undergo a project-level rather than a regional-level air quality analysis. However, a regional assessment was also conservatively performed for the proposed PVL rail project. SCAG determined that the PVL is not a Project of Air Quality Concern (POAQC) on April 16, 2010, http://www.scag.ca.gov/tcwg/projectlist/march10.htm. A copy of the TCWG review form is shown in Appendix F.

Local and Regional Requirements
The air quality management agencies of direct importance to the SCAQMD portion of Riverside County include USEPA, CARB, and the SCAQMD. USEPA has established federal ambient air quality standards for which CARB and the SCAQMD have primary implementation responsibility. CARB and the SCAQMD are also responsible for ensuring that state ambient air quality standards are met. SCAG develops the RTP and RTIP in consultation with local air management districts. The RTP includes projects that strive to meet the goals and objectives of the NAAQS. The RTP is also in accord with USEPA's Transportation Conformity Rule as it pertains to air quality standards in Riverside County.

Federal and State Ambient Air Quality Standards

Existing air quality conditions in the project area can be characterized in terms of the ambient air quality standards that the State of California and the federal government have established for several different pollutants. For some pollutants, separate standards have been set for different measurement periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). Table 1 shows the 2009 state and federal standards for relevant air pollutants.

Table 1: Ambient Air Quality Standards 2009

Pollutant	Averaging Time	State[1]	National[2]	
		Concentration[3]	Primary[3,4]	Secondary[3,5]
Ozone (O_3)	1 hour	0.09 ppm	--	Same as Primary Standard
	8 hours	0.070 ppm	0.075 ppm	
Particulate Matter (PM_{10})	24 hours	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as Primary Standard
	AAM	20 $\mu g/m^3$	--	
Fine Particulate Matter ($PM_{2.5}$)	24 hours	--	35 $\mu g/m^3$	Same as Primary Standard
	AAM	12 $\mu g/m^3$	15 $\mu g/m^3$	
Carbon Monoxide (CO)	8 hours	9.0 ppm	9 ppm	None
	1 hour	20 ppm	35 ppm	
Nitrogen Dioxide (NO_2)	AAM	0.030 ppm	0.053 ppm	Same as Primary Standard
	1 hour	0.18 ppm	--	
Lead (Pb)[6]	30 days	1.5 $\mu g/m^3$	--	--
	Calendar Quarter	--	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$
Sulfur Dioxide (SO_2)	AAM	--	0.030 ppm	--
	24 hours	0.04 ppm	0.14 ppm	--
	3 hours	--	--	0.5 ppm
	1 hour	0.25 ppm	--	--
Visibility-Reducing Particles	8 hours	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.	N/A	N/A
Sulfates (SO_4)	24 hours	25 $\mu g/m^3$	N/A	N/A
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	N/A	N/A
continues next page				

Table 1: Ambient Air Quality Standards 2009 (continued)

Notes:
N/A = standard is not applicable
ppm = parts per million by volume
AAM = annual arithmetic mean
µg/m^3 = micrograms per cubic meter

Notes:

1. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
5. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
6. The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Source: Ambient Air Quality Standards, California Air Resources Board, February 22, 2009

South Coast Air Quality Management District CEQA Guidelines

SCAQMD has published guidance on conducting air quality analyses under CEQA by establishing thresholds of significance for regional impacts, which are summarized in Table 2. Thresholds are shown for criteria pollutant emissions during construction activities and project operation. A project is considered to have a regional air quality impact if emissions from its construction and/or operational activities exceed these thresholds.

Table 2: SCAQMD Air Quality Significance Thresholds

Pollutant	Construction	Operation
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Source: SCAQMD CEQA Handbook (SCAQMD, 1993)		

Mobile Source Air Toxic Regulation

The Clean Air Act identified 188 pollutants as being air toxics, which are also known as hazardous air pollutants (HAP). From this list, the USEPA identified a group of 21 as mobile source air toxics (MSAT) in its final rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17235) in March 2001. From this list of 21 MSATs, the USEPA has identified six MSATs, benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene, as being priority MSATs. To address emissions of MSATs, the USEPA has issued a number of regulations that would dramatically decrease MSATs through cleaner fuels and cleaner engines.

In the early 1980s, the CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act (Assembly Bill [AB] 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

Air toxics analysis is a new and emerging issue and is a continuing area of research. Although much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques available for assessing project-specific health impacts from MSATs continue to be developed. Shown in Table 3 are the SCAQMD thresholds for the assessment of Toxic Air Contaminants. The Federal Highway Administration (FHWA) is currently preparing guidance as to how mobile source health risks should factor into project-level decision making. In addition, USEPA has not established regulatory concentration targets for the six relevant MSAT pollutants appropriate for use in the project development process.

Table 3: Toxic Air Contaminant Threshold

TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Hazard Index ≥ 1.0 (project increment)
Source: SCAQMD CEQA Handbook (SCAQMD, 1993)	

Greenhouse Gas Regulations
While climate change has been an international concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change, the efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to deal with GHG emissions and climate change at the state level. AB 1493 requires CARB to develop and implement regulations to reduce automobile and light truck GHG emissions.

On June 1, 2005, Governor Schwarzenegger signed Executive Order (EO) S-3-05. The goal of this EO is to reduce California's GHG emissions to 1) 2000 levels by 2010, 2) to 1990 levels by 2020 and 3) 80 percent below 1990 levels by 2050. The majority of GHG emissions are from the burning of fossil fuels, and 40 percent of all human-made GHG emissions are the result of transportation. Enhancing operations and improving travel times in high congestion travel corridors, such as I-215, would lead to an overall reduction in GHG emissions.

Climate and Meteorological Conditions

<u>Air Basin</u>

The strength and position of the subtropical high pressure cell over the Pacific Ocean, as with all of Southern California in large part, controls the climate in and around the project area. The high pressure maintains moderate temperatures and comfortable humidity, and limits precipitation to a few storms during the winter "wet" season. Temperatures are normally mild, except in the summer months which commonly bring substantially higher temperatures. In all portions of the SCAB, temperatures well above 100 ºF have been recorded in recent years. The annual average temperature in the SCAB is approximately 62 ºF.

Although Riverside County generates the lowest emissions of any county in the SCAB, air quality in the county is among the air basin's worst due to onshore winds transporting vast amounts of pollutants from Los Angeles and Orange counties inland.

The dominant land-sea breeze circulation usually drives winds in the project area. Regional wind patterns are dominated by daytime onshore sea breezes. At night, the wind generally slows and reverses direction, traveling towards the sea. Local canyons will alter wind direction, with wind tending to flow parallel to the canyons. During the transition period from one wind pattern to the other, the dominant wind direction rotates into the south and causes a minor southerly wind direction. The frequency of calm winds (less than two miles per hour) is less than ten percent. Therefore, little stagnation occurs in the project vicinity, especially during busy daytime traffic hours.

Southern California frequently has temperature inversions that inhibit the dispersion of pollutants. Inversions may be either ground-based or elevated. Ground-based inversions sometimes referred to as radiation inversions, are most severe during clear, cold, early winter mornings. Under conditions of a ground-based inversion, very little mixing or turbulence occurs, and high concentrations of primary pollutants may occur local to major roadways. A variety of meteorological phenomena can generate elevated inversions. Elevated inversions act as a lid, or upper boundary, and restrict vertical mixing. Below the elevated inversion, dispersion is not restricted. Mixing heights for elevated inversions are lower in the summer and more persistent. This low summer inversion puts a lid over the SCAB and is responsible for the high levels of O_3 observed during summer months in the air basin.

Local

Latitude, topography, and the influence of the nearby Pacific Ocean produce a Mediterranean climate in the project area, consisting of warm, dry summers and mild, wet winters. However, at a local level, the project area exhibits substantial climatic variation. Average January high temperatures range from 66 ºF in the northwestern project area near Riverside to 63 ºF near Perris in the southeastern project area. Nighttime lows in January and February can drop below freezing throughout the project area. Average July high temperatures range from 94 ºF in the northwestern project area near Riverside to 97 ºF near Perris in the southeastern project area. Low altitude areas, however, have long mid-summer stretches of daily highs exceeding 110 ºF. Average annual precipitation ranges from about ten inches in the Riverside and Moreno Valley areas to eleven inches in Perris Valley. Annual rainfall in the project area typically ranges from ten to 15 inches per year. Annual average wind speed in Riverside is six miles per hour.

Existing Local Air Quality

The SCAQMD monitors air quality conditions at 37 source receptor areas throughout the SCAB. The project area extends from the City of Riverside to the City of Perris. The closest air basin monitoring stations for this area are located in Rubidoux on Mission Boulevard, in Riverside on Magnolia Avenue, and in Perris on North D Street. The Rubidoux monitoring station measures ambient levels of O_3, particulates, CO, nitrogen dioxide, and sulfur dioxide. The Riverside monitoring station measures $PM_{2.5}$ and CO ambient levels. The Perris monitoring station measures O_3 and PM_{10} ambient levels. Data from the three monitoring stations, including two located in receptor areas along the study corridor at Riverside and Perris, were used to characterize existing conditions in the vicinity of the proposed project, and establish a baseline for estimating future conditions both with and without the proposed project.

If a pollutant concentration is lower than the state or federal standard, the area is classified as being in attainment for that pollutant. If a pollutant exceeds a state or federal standard, the area is considered a nonattainment area. If data are insufficient to determine whether a pollutant is violating the standard, the area is designated unclassified. The CARB has designated the SCAB as nonattainment for O_3, $PM_{2.5}$ and PM_{10}; and the USEPA has designated the SCAB as nonattainment for O_3 (Severe-17 classification for the 8-hour standard); CO (Serious classification), PM_{10} (Serious classification) and $PM_{2.5}$ (refer to Table 4).

Table 5 summarizes the local levels of these four pollutants for 2006, 2007 and 2008 and compares them to national and state air quality standards. The Rubidoux monitoring station shows exceedances of the Federal and state standards for O_3, PM_{10} and $PM_{2.5}$. At the Riverside monitoring station, the federal standard for $PM_{2.5}$ was exceeded. The Perris Valley monitoring station has exceeded the state standard for PM_{10}, and the federal and state standards for O_3.

Riverside County emissions inventories are presented in Table 6. These data are collected by CARB for the South Coast Air Basin.

Table 4: Regional Criteria Pollutants Attainment Status 2009

Pollutant	Status	
	Federal	**State**
Ozone (O_3)	1-hour: N/A 8-hour: Severe-17 Nonattainment	1-hour: Nonattainment Not yet rated for 8-hour standard
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment/Maintenance	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Particulates (PM_{10})	Serious Nonattainment	Nonattainment
Fine Particulates ($PM_{2.5}$)	Nonattainment	Nonattainment
Lead (Pb)	No Designation	Attainment
Source: Federal Register and CARB, 2009		

Table 5: 2006-2008 Air Quality Summary for Project Area Monitoring System

Air-Pollutant	Standard Exceedance	Rubidoux			Riverside			Perris Valley		
		2006	2007	2008	2006	2007	2008	2006	2007	2008
Ozone (O_3)	Maximum 1-hr. concentration (ppm)	**0.151**	**0.131**	**0.146**				**0.169**	**0.138**	**0.142**
	Maximum 8-hr. concentration (ppm)	**0.117**	**0.111**	**0.116**				**0.123**	**0.117**	**0.115**
	Days >0.09 ppm (State 1-hr. standard)	45	31	54	Not Monitored			77	66	65
	Days >0.12 ppm (Federal 1-hr. standard)[1]	8	2	8				12	4	4
	Days > 0.075 ppm (Federal 8-hr. standard)	57	46	64				83	73	77
	Days > 0.070 ppm (State 8-hr standard)	75	69	89				98	88	94
Respirable Particulate Matter (PM_{10})	Maximum State 24-hr concentration (µg/m^3)	**106**	**540**	**70**				**119**	**1155**	**87**
	Maximum Federal 24-hr concentration(µg/m^3)	**109**	**559**	**82**				**125**	**1212**	**85**
	Days >50 µg/m^3 (State 24-hr. standard)	69	65	7				18	25	8
	Days >150 µg/m^3 (Federal 24-hr. standard)	0	1	0	Not Monitored			0	2	0
	Calculated >20 µg/m^3 (State annual standard)	52.7	57.0	44.8				N/A	N/A	N/A
	Calculated 3-year average ≤ 20 µg/m^3 (State annual standard)	53	57	57				37	37	N/A
Fine Particulate Matter ($PM_{2.5}$)	Maximum 24-hr. concentration (ug/m^3)	**68.4**	**75.6**	**53.3**	**55.3**	**68.5**	**42.9**			
	Days >65 µg/m^3 (Federal 24-hr. primary std.)[1]	32	33	7	9	8	2			
	Calculated >15 µg/m^3 (Federal annual std.)	20.7	19.6	18.1	18.6	17.7	N/A	Not Monitored		
	Calculated 3-year average ≤ 15 µg/m^3 (Federal annual standard)	19	19	16.4	16.9	18.3	N/A			
Carbon Monoxide (CO)	Maximum 8-hr. concentration (ppm)	2.29	2.93	1.86	2.38	2.16	1.93	Not Monitored		
	Day > 9 ppm (State/Federal 8-hr. standard)	0	0	0	0	0	0			
Nitrogen Dioxide (NO_2)	Maximum 1-hr. concentration (ppm)	0.076	0.072	0.092						
	Days >0.25 ppm (State 1-hr. standard)[2]	0	0	0	Not Monitored			Not Monitored		
	Calculated >0.0534 ppm (Federal annual std)	0.020	0.020	0.019						
Sulfur Dioxide (SO_2)	Maximum 24-hr. concentration (ppm)	0.003	0.004	0.003						
	Days >0.04 ppm (State 24-hr. standard)	0	0	0	Not Monitored			Not Monitored		
	Days >0.14 ppm (Federal 24-hr. standard)	0	0	0						
	>0.03 ppm (Federal annual primary standard)	0.003	0.001	0.002						

N/A = data not available ppm = parts per million µg/m^3 = micrograms per cubic meter **bold = exceedance of state or federal standard**

Source: SCAQMD Air Quality Data 2006-2008 California Air Quality Data Summaries 2006-2008, CARB (2009)

1. National 1-hour ozone standard revoked in all areas as of April 15, 2009
2. California measures its 24-hour PM10 standard using different methods than USEPA therefore 2 different concentrations are reported

Table 6: 2008 Emission Inventory for Riverside County - SCAB (tons per day)

Stationary Sources	TOG	ROG	CO	NOx	SOx	PM	PM10	PM2.5
Fuel Combustion	2.2	0.3	1.8	3.5	0.4	0.2	0.2	0.2
Waste Disposal	3.4	1.2	0	0.1	0	0.4	0.2	0
Cleaning And Surface Coatings	4.3	3.8	0	0	0	0.2	0.2	0.1
Petroleum Production And Marketing	2.4	2.3	-	-	0	-	-	-
Industrial Processes	2.5	2.3	0	0.1	0	4.5	2.6	1
*** Total Stationary Sources**	**14.8**	**10**	**1.9**	**3.7**	**0.4**	**5.2**	**3.1**	**1.4**
Areawide Sources	**TOG**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**PM10**	**PM2.5**
Solvent Evaporation	14.4	12.6	-	-	-	0	0	0
Miscellaneous Processes	40.7	4	10.8	2.2	0.1	77.8	38.6	7.2
*** Total Areawide Sources**	**55.1**	**16.7**	**10.8**	**2.2**	**0.1**	**77.8**	**38.6**	**7.2**
Mobile Sources	**TOG**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**PM10**	**PM2.5**
On-Road Motor Vehicles	25.9	23.4	264.5	57.4	0.3	3.2	3.2	2.3
Other Mobile Sources	14.4	13.3	70.2	22.7	0.1	1.5	1.5	1.3
*** Total Mobile Sources**	**40.3**	**36.7**	**334.6**	**80.1**	**0.3**	**4.8**	**4.7**	**3.7**
Natural (Non-Anthropogenic) Sources	**TOG**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**PM10**	**PM2.5**
Natural Sources	27.8	24.1	37.7	1.1	0.3	4	3.8	3.2
*** Total Natural (Non-Anthropogenic) Sources**	**27.8**	**24.1**	**37.7**	**1.1**	**0.3**	**4**	**3.8**	**3.2**
Total Riverside County In South Coast Air Basin	**138**	**87.4**	**385**	**87.2**	**1.2**	**91.8**	**50.3**	**15.4**

Source: CARB, 2009 SCAB – South Coast Air Basin

Description of Relevant Air Pollutants

Criteria Pollutants

Ozone (O_3) is a respiratory irritant that increases susceptibility to respiratory infections. It is also an oxidant that can cause substantial damage to vegetation and other materials. O_3, which is a regional pollutant, is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. O_3 precursors, which include reactive organic compounds (ROC) and NOx, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone primarily forms in summer when it becomes an air pollution problem. In addition, photochemical reactions take time to occur, so high ozone levels often occur downwind of the emission source. The SCAB is classified as Nonattainment Severe-17 (Severe-17 = has 17 years from 1992 to reach attainment). Unless the SCAB is granted an extension by the USEPA, the region has until 2009 to demonstrate conformity with the NAAQS. CARB sent a letter with recommendations for areas of attainment of the ozone standard in March of 2009 and is awaiting response from the USEPA.

Inhalable Particulate Matter (such as $PM_{2.5}$ and PM_{10}) can damage human health and retard plant growth. Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particular matter less than ten micrometers in diameter can enter the lungs and bloodstream. Exposure to these particles can cause a number of health problems such as decreased lung function, development of chronic bronchitis, and irregular heartbeat. Particulates also reduce visibility and corrode materials. Particulate emissions are generated by a wide variety of sources, including industrial emissions, dust suspended by vehicle traffic and construction equipment, and secondary aerosols formed by reactions in the atmosphere.

Carbon Monoxide (CO) is a public health concern because it combines readily with hemoglobin and reduces the amount of oxygen transported in the bloodstream. CO can cause health problems such as fatigue, headache, confusion, dizziness, and even death. Motor vehicle emissions are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when a period of light winds combines with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

Nitrogen Oxides (NOx) are a family of highly reactive gases that are primary precursors to the formation of ground-level ozone, reacting in the atmosphere to form acid rain. NOx is emitted from the use of solvents and combustion processes in which fuel is burned at high temperatures, principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A brownish gas, nitrogen dioxide is a strong oxidizing agent that reacts in the air to form corrosive nitric acid, as well as toxic organic nitrates.

NOx can irritate the lungs, cause lung damage, and lower resistance to respiratory infections such as influenza. The effects of short-term exposure are still unclear, but continued or frequent exposure to concentrations that are typically much higher than those normally found in the ambient air may cause increased incidence of acute respiratory illness in children. Health effects associated with NOx are an increase in the incidence of chronic bronchitis and lung irritation. Chronic exposure to nitrogen dioxide (NO_2) may lead to eye and mucus membrane aggravation along with pulmonary dysfunction. NOx can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to production of particulate nitrates. Airborne NOx can also impair visibility. NOx is a major component of acid deposition in California. NOx may affect both terrestrial and aquatic ecosystems. NOx in the air is a potentially significant contributor to a number of environmental effects such as acid rain and eutrophication in coastal waters. Eutrophication occurs when a body of water suffers an increase in nutrients that reduces the amount of oxygen in the water, producing an environment that is destructive to fish and other animal life.

Sulfur Oxides (SOx) are a family of colorless, pungent gases, which include sulfur dioxide (SO_2), and are formed primarily by combustion of sulfur-containing fossil fuels (mainly coal and oil), metal smelting, and other industrial processes. Sulfur oxides can react to form sulfates, which significantly reduce visibility. SOx are a precursor to particulate matter formation, for which the project area is in non-attainment.

The major health concerns associated with exposure to high concentrations of SOx include effects related to breathing, respiratory illness, alterations in pulmonary defenses, and aggravation of existing cardiovascular disease. Major subgroups of the population that are most sensitive to SOx include individuals with cardiovascular disease or chronic lung disease (such as bronchitis or emphysema), as well as children and the elderly. Emissions of SOx also can damage the foliage of trees and agricultural crops. Together, SOx, and NOx are the major precursors to acid rain, which is associated with the acidification of lakes and streams and accelerated corrosion of buildings and monuments.

Lead is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used several decades ago to increase the octane rating in automotive fuel. Since gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels and the use of leaded fuel has been mostly phased out, the ambient concentrations of lead have dropped dramatically.

Short-term exposure to high levels of lead can cause vomiting, diarrhea, convulsions, coma, or even death. However, even small amounts of lead can be harmful, especially to infants, young children, and pregnant women. Symptoms of long-term exposure to lower lead levels may be less noticeable but are still serious. Anemia is common, and damage to the nervous system may cause impaired mental function. Other symptoms are appetite loss, abdominal pain, constipation, fatigue, sleeplessness, irritability, and headache. Continued excessive exposure, as in an industrial setting, can affect the kidneys.

Lead exposure is most serious for young children because they absorb lead more easily than adults and are more susceptible to its harmful effects. Even low-level exposure may harm the intellectual development, behavior, size, and hearing of infants. During pregnancy, especially in the last trimester, lead can cross the placenta and affect the fetus. Female workers exposed to high levels of lead have more miscarriages and stillbirths.

Toxic Air Contaminants

Although ambient air quality standards exist for criteria pollutants, no ambient standards exist for toxic air contaminants (TACs). These contaminants are sometimes also referred to as mobile source air toxins or MSATs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, the CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risk each presents. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor, called a Hazard Index, is used to evaluate risk. The carcinogenic nature of the six TACs identified by the EPA is briefly described below:

- Benzene is characterized as a known human carcinogen.
- The potential carcinogenicity of acrolein cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- Formaldehyde is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- 1,3-butadiene is characterized as carcinogenic to humans by inhalation.
- Acetaldehyde is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- Diesel exhaust (DE) or Diesel particulate matter (DPM) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary noncancerous hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

Greenhouse Gases

Many chemical compounds found in the Earth's atmosphere act as "greenhouse gases." These gases allow sunlight to enter the atmosphere freely. When sunlight strikes the Earth's surface, some of it is re-radiated back towards space as infrared radiation (heat). Greenhouse gases absorb this infrared radiation and trap its heat in the atmosphere. It is widely accepted that the accumulation of GHGs has contributed to an increase in the temperature of the earth's atmosphere and has contributed to global climate change. Many gases exhibit these greenhouse properties. Many occur naturally. Some are also produced by human activities and some are exclusively human made (for example, industrial gases). The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and water vapor (H_2O).

Carbon Dioxide (CO_2) results from fossil fuel combustion in stationary and mobile sources. It contributes to the greenhouse effect, but not to stratospheric ozone depletion. In 2004, CO_2 accounted for approximately 84 percent of total GHG emissions in the state.[1] In the SCAB, approximately 48 percent of CO_2 emissions come from transportation, residential and utility sources, which contribute approximately 13 percent each; 20 percent come from industry; and the remainder comes from a variety of other sources.[2]

[1] California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004, Staff Final Report*, Publication CEC-600-2006-013-D, December 2006.

[2] South Coast Air Quality Management District, *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*, May 6, 2005.

Atmospheric methane (CH_4) is emitted from both non-biogenic and biogenic sources. Non-biogenic sources include fossil fuel mining and burning, biomass burning, waste treatment, geologic sources, and leaks in natural gas pipelines. Biogenic sources include wetlands, rice agriculture, livestock, landfills, forest, oceans, and termites. CH_4 sources can also be divided into anthropogenic and natural. Anthropogenic sources include rice agriculture, livestock, landfills, and waste treatment, some biomass burning, and fossil fuel combustion. Natural sources are wetlands, oceans, forests, fire, termites and geological sources. Anthropogenic sources currently account for more than 60 percent of the total global emissions. In the SCAB, more than 50 percent of human-induced CH_4 emissions come from natural gas pipelines, while landfills contribute 24 percent. CH_4 emissions from landfills are reduced by SCAQMD Rule 1150.1 - Control of Gaseous Emissions from Active Landfills. CH_4 emissions from petroleum sources are reduced by a number of rules in SCAQMD Regulation XI that control fugitive emissions from petroleum production, refining, and distribution.[3]

Other regulated GHGs include Nitrous Oxide, Sulfur Hexafluoride, Hydrofluorocarbons, and Perfluorocarbons. These gases all possess heat-trapping potentials hundreds to thousands of times more effective than CO_2. Emission sources of nitrous oxide gases include, but are not limited to, waste combustion, waste water treatment, fossil fuel combustion, and fertilizer production. Because the volume of emissions is small, the net effect of nitrous oxide emissions relative to CO_2 or CH_4 is relatively small. SF_6, HFC, and PFC emissions occur at even lower rates.

Chlorofluorocarbons (CFCs) are emitted from blowing agents used in producing foam insulation. They are also used in air conditioners and refrigerators and as solvents to clean electronic microcircuits. CFCs are primary contributors to stratospheric ozone depletion and to global climate change. Sixty-three percent of CFC emissions in the SCAB come from the industrial sector. Some CFCs are classified as TACs and regulated by SCAQMD Rule 1401 – New Source Review of Toxic Air Contaminants and SCAQMD Rule 1402 Control of Toxic Air Contaminants from Existing Sources.

Carbon dioxide equivalents are often used as a metric measure to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). Carbon dioxide equivalents are commonly expressed as "million metric tons of carbon dioxide equivalents (MMTCO2Eq)." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP.

[3] *Ibid*.

C. EVALUATION METHODOLOGY

The fundamental approach to evaluating project-related air quality is to determine documented air quality conditions for the study area and assess the anticipated air quality impacts associated with the proposed project. The net increases and decreases in operational and construction air emissions are compared to the No Project Alternative and the PVL project for the opening year of 2012. The No Project Alternative includes air quality impacts of proposed I-215 highway improvements, as defined in the *Final Environmental Impact Statement: I-215 Improvements* (California Department of Transportation, 2001). However, in the case of the regional assessments, because the required No Project Alternative and PVL project data are not available at this time, the evaluation approach involved only assessing the net increases and or decreases in operational and construction air pollutant emissions.

The air quality analysis was prepared to conform to FTA, CARB, SCAQMD, and SCAG criteria. Investigation methods, modeling protocols, and conformity issues relating to air quality were developed, discussed, and reviewed with the responsible agencies as needed.

The methodology used to evaluate the operational and construction effects of the PVL is described below.

Operational Assessment Methodology

The operational air quality assessment associated with the proposed project includes the study of criteria pollutants, ozone precursors, MSATs and greenhouse gases. The emission of these pollutants can result in potential impacts on a local and/or regional level. Impacts from CO, particulate matter and MSATs can occur on a local and regional level while ozone precursors (ROC and NO_X) and greenhouse gases are primarily regional pollutants. These pollutants are primarily emitted via motor vehicle exhaust. Certain pollutants, MSATs (such as DPM and acrolein) and SO_x are also emitted from the operation of diesel locomotives.

Regional Impact Analysis

The proposed project area is within the South Coast Air Basin which is in nonattainment for ozone, $PM_{2.5}$ and PM_{10}. While a hot-spot analysis is not required for particulate matter, the region's nonattainment status prohibits the PVL from significantly contributing to particulate pollutant levels. The proposed project is also prohibited from significantly contributing to ozone pollutant levels.

Existing and future VMT projections for the proposed project were not separately calculated for the PVL. However, projected PVL ridership data was available to make engineering judgments about project related VMT reductions as shown in Appendix E. Therefore, the regional assessment involved estimating the net project-related emissions of CO, NO_x, ROC, SO_x, PM_{10} and $PM_{2.5}$ from motor vehicles. Emissions estimates were calculated within the project area for the 2012 project build year. Emissions estimates were based on project-related vehicle miles traveled (VMT) traveling at average speeds within the PVL project traffic network. An approximation of reduced VMT (as shown in Appendix E) was calculated based on the assumption that the proposed PVL service would replace single passenger vehicles driving from South Perris to Riverside to connect to SCRRA/Metrolink service. It is also considered that the South Perris to Los Angeles service is in addition to and not replacing any existing service. Therefore the emissions for the time of the entire trip to LA must be accounted for. The resulting diversion from private car use to PVL ridership is estimated to reduce VMT by approximately 34 million miles per year in the project area. This estimate includes vehicle miles traveled from private homes to the proposed stations. An average motor vehicle travel speed of 30 mph was assumed. Emission factors were determined by using the CARB emission factor model EMFAC2007 v2.3.

Regional emissions of CO, NO_x, ROC, SO_2, PM_{10} and $PM_{2.5}$ from PVL diesel locomotives scheduled to operate within the project area in the year 2012 were calculated based on a technical guidance from the USEPA.[4] This USEPA technical memo provides diesel locomotive emission factors and methods to calculate daily project emissions, based on estimated daily usage for the locomotives.

Greenhouse Gas Emissions

On February 16, 2010, the Office of Administrative Law filed with the Secretary of State the amendments to the California Environmental Quality Act (CEQA) Guidelines providing guidance regarding the analysis of greenhouse gases (GHG) in CEQA documents. The amendments, which were approved by the Natural Resources Agency in December 2009 pursuant to Senate Bill 97, became effective on March 18. The amendments are intended to minimize inconsistencies in the analysis of GHG going forward and to provide CEQA lead agencies with guidance on the evaluation of GHG emissions and their associated impacts. Specifically, the new Guidelines confirm that the method of analysis is left to the sound discretion of the lead agency. (CEQA Guidelines §15064.4.) Additionally, the new guidelines confirm that a lead agency may use either a quantitative analysis or a qualitative analysis in determining whether a project may have a potentially significant impact on climate change. (CEQA Guidelines §15064.4.) The analysis required by RCTC includes both quantitative and qualitative elements. The results of the quantitative portions of this assessment are shown in Table 12. Moreover, and as permitted by the revised CEQA Guidelines and Appendix G, RCTC has determined that the analysis of GHGs and Climate Change is more appropriate included in the Air Quality Section rather than as a stand-alone Section of the EIR. Accordingly, this analysis fully complies with the newly revised State CEQA Guidelines.

GHGs are considered to contribute to global warming by absorbing infrared radiation and trapping heat in the atmosphere. Because this is a global effect, it is difficult to ascertain the effects from an individual project. While there are many types of greenhouse gases, the most prevalent contributors to the greenhouse effect in the Earth's atmosphere are water vapor, carbon dioxide (CO_2) (53 percent), methane (CH_4) (17 percent), near-surface ozone (O_3) (13 percent), nitrous oxide (N_2O) (12 percent), and chlorofluorocarbons (CFCs) (5 percent). Carbon dioxide is the greenhouse gas most closely linked to passenger car and light truck emissions and recent studies have shown that carbon dioxide (CO_2) accounted for approximately 84 percent of total GHG emissions in the state of California.[5]. Worldwide, the State of California ranks between the 12^{th} to 16^{th} largest emitter of CO_2 (the most prevalent GHG) and is responsible for approximately two percent of the world's CO_2 emissions (CEC, 2006). Since CO_2 is the most abundant greenhouse gas in the project area, it is assumed that a reduction in CO_2 will indicate a reduction in the less prominent greenhouse gases.

[4] Emission factors for Locomotives, EPA-420-F-09-025, April 2009

[5] California Energy Commission*, Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004, Staff Final Report*, Publication CEC-600-2006-013-D, December 2006.

According to a recent paper by the Association of Environmental Professionals (Hendrix and Wilson, 2007), an individual project does not generate enough GHGs to significantly influence global climate change; rather, global climate change is a cumulative effect. However, for this project, some baseline quantification of the opportunity to switch from private vehicle to the PVL was prepared to demonstrate the regional benefits that would accrue with the PVL. The CO_2 emissions from the operation of the diesel locomotives is estimated based on national usage data for commuter rail and compared to the reduction in CO_2 emissions expected from the diverted ridership to the PVL.

As mentioned above for the regional pollutant assessment, projections of VMT were not separately prepared for this analysis, and assumptions regarding the operation of the proposed project were made, as detailed above. The same procedure described above for the regional impact analysis was used for the assessment of GHGs.

Local Impact Analysis

Carbon Monoxide Modeling Protocol—Screening Procedure

The California Department of Transportation, in coordination with the University of California, Davis, Institute of Transportation Studies, has developed the *Transportation Project-Level Carbon Monoxide Protocol* (California Department of Transportation, Garza et al., 1997). This CO Protocol details a qualitative step-by-step screening procedure to determine whether project-related CO concentrations have a potential to generate new air quality violations, worsen existing violations, or delay attainment of NAAQS for CO. If the screening procedure reveals that such a potential may exist, then the CO Protocol details a quantitative method to ascertain project-related CO impacts. FTA has no separate guidance for assessing CO impacts. Based on this protocol, a potential for air quality impacts was determined to exist and further analysis was required.

Carbon Monoxide Modeling Protocol—Intersection Analysis

Within an urban setting, vehicle exhaust is the primary source of CO emissions. Consequently, the highest CO concentrations are generally found within close proximity to congested intersection locations (LOS D or worse). Under typical meteorological conditions, CO concentrations tend to decrease as the distance from the emissions source (i.e., congested intersection) increases. For purposes of providing a conservative, worst-case impact analysis, CO concentrations are typically analyzed at congested intersection locations, because if impacts are less than significant in close proximity of the congested intersections, impacts would also be less than significant at more distant sensitive receptor locations.

The SCAQMD recommends a hot-spot evaluation of potential localized CO impacts when volumes-to-capacity ratios are increased by two percent at intersections with a Level-of-Service (LOS) of ~~C~~D or worse. Based on these criteria, four intersections were selected for analysis based on information provided in the *Perris Valley Line Commuter Rail Traffic Technical Report* (STV Incorporated, 2011). The selected locations were at the proposed Downtown Perris Station site, where a large amount of parking is expected to be located and, thus, a significant number of vehicle trips would be expected to be generated. The traffic analyses did not include at-grade crossing locations since the project would operate with twelve trains per day and only one train daily during the peak traffic hours. Moreover, it was determined that the delay to vehicular traffic due to peak hour crossing closings would not be any more disruptive to traffic operations than a single red phase of a typical traffic signal (30-40 seconds), which would not be considered significant.

Local area CO concentrations were projected using the CAL3QHC line-source dispersion model. The analysis of CO impacts followed the protocol recommended by the California Department of Transportation, as detailed in their publication *Transportation Project-Level Carbon Monoxide Protocol* (California Department of Transportation, Garza et al., 1997). It is also consistent with procedures identified through the SCAQMD's CO modeling protocol, with all four corners of each intersection analyzed to determine whether project development would result in a CO concentration that exceeds federal or state CO standards.

Carbon Monoxide - Parking Lot Analysis

In addition to congested intersection locations, proposed parking lot locations were also evaluated for CO hot spots. There would be four stations with parking lots. Lot size would range from approximately 440 spaces (Downtown Perris Station) to 880 spaces (South Perris Station). For purposes of providing a conservative, worst-case impact analysis, CO concentrations were evaluated for the largest parking lot (880 spaces), because if impacts are less than significant at the largest parking lot location, impacts would also be less than significant at each of the smaller parking lot locations. Although the parking lot with the largest amount of vehicles was analyzed (South Perris), the screening distance of the lot closest to sensitive receptors (Downtown Perris) was used to model the pollutant concentration.

The parking lot CO hot spot analysis considered emissions from all three vehicular emissions categories: engine start, idle time, and vehicle miles of travel. Emissions factors were ascertained using EMFAC2007 emissions model. Dispersion modeling was conducted using the EPA SCREEN3 model, using EMFAC2007-generated emissions factors. EMFAC2007 emissions factors, and detailed emissions calculation worksheets are provided in Appendix B.

Sensitive Receptors

Some land uses are considered more sensitive to changes in air quality than others, depending on the types of population groups exposed and the activities involved. According to CARB, air pollution has an adverse effect on four primary groups of people: (1) children under 14 years of age, (2) the elderly over 65 years of age, (3) athletes, and (4) people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include hospitals, daycare facilities, elder care facilities, elementary schools, and parks. For the proposed PVL project, the sensitive receptors closest to the alignment are:

- Highland Elementary School - located approximately 65 feet (20 meters) east of the alignment near the intersection of Watkins Drive and Blaine Street near the campus of UC-Riverside
- Highland Park - located approximately 75 feet (23 meters) east of the alignment
- UC-Riverside Child Development Center - located approximately 110 feet (34 meters) west of the alignment in Riverside
- Hyatt Elementary School - located in the Box Springs area near Watkins Drive approximately 130 feet (40 meters) west of the alignment

- Nan Sanders Elementary School - located approximately 100 feet (31 meters) west of the alignment in Perris
- City of Perris Senior Center - located approximately 70 feet (21 meters) east of the alignment in Perris
- ~~Highland Elementary School - located approximately 46 meters (150 feet) east of the alignment near the intersection of Watkins Drive and Blaine Street near the campus of UC-Riverside~~
- ~~Highland Park - located approximately 26 meters (85 feet) east of the alignment~~
- ~~UC-Riverside Child Development Center - located approximately 38 meters (125 feet) west of the alignment in Riverside~~
- ~~Hyatt Elementary School - located in the Box Springs area near Watkins Drive approximately 152 meters (500 feet) west of the alignment~~
- ~~Nan Sanders Elementary School - located approximately 38 meters (125 feet) west of the alignment in Perris~~
- ~~City of Perris Senior Center – located approximately 24 meters (80 feet) east of the alignment in Perris~~

None of these sensitive receptors are located near the intersections that are projected to have the most potential for future congestion, as identified in the Traffic Technical Report to this EIR. In addition, these receptors would not be close to any of the proposed parking lots. Potential air quality impacts at sensitive receptor locations with respect to both intersections and parking lots are discussed below.

An analysis of the potential for impact to sensitive receptors is performed in circumstances where CO pollution could be expected to occur, such as at parking facilities where extensive idling could occur and at intersections where a large volume of automobiles and trucks could be expected. At the intersections identified in the traffic analysis (refer to the Traffic Technical Report) as having the potential for most future congestion, the *Guideline for Modeling Carbon Monoxide from Roadway Intersections* (USEPA, 1992) was used to determine receptor locations on sidewalks and near discrete sensitive receptor locations. Consequently, the CO hot spot analysis evaluated the potential impacts to these sensitive receptors and calculated pollutant concentrations. Pollutant concentrations decrease as distance from the pollutant source to a receptor increases; therefore, if the analysis determined that there would be a less than significant impact at the sensitive receptors closest to the congested intersection, then it is expected that impacts to receptors located further away from these intersections (such as the sensitive receptors listed above) would also be less than significant and would not require analysis. As mentioned above, none of the specific sensitive receptors listed above would be near any of these congested intersections.

In addition to the intersection analysis, an assessment of sensitive receptors near the proposed PVL station parking lots was also conducted. The assessment identified residential receptors located close to the proposed station parking lots. Specifically, the parking lot for the proposed commuter rail station at Palmyrita Avenue (one of the Hunter Park Station options) would be located approximately 35 meters (115 feet) south and east of residences, while the Downtown Perris Station would be located approximately 65 meters (215 feet) east of a row of homes. At these locations where receptor distances are nearest to the pollutant source, as shown previously in the Parking Lot Analysis, the proposed station parking lots are not expected to generate significant CO concentrations, and a less than significant impact would occur. Other receptors located even further away (such as St. James Catholic School and Perris Elementary School in Perris) would also experience less than significant impacts.

In addition to potential impacts from intersections and parking lots, a health risk assessment with respect to diesel emission from PVL locomotive operations was also considered. Emission would be from trains traveling along the alignment as well as those idling temporarily within layover yards. As a result, air quality modeling was conducted to predict maximum concentrations of air toxic pollutants. Based on these predicted concentrations, the resulting assessment indicated that the "health risk" to sensitive receptors within the project corridor would be substantially below the SCAQMD threshold of significance. Therefore, the potential health risk from train operations would be less than significant.

PM2.5 and PM10 Evaluation Protocol—Screening Procedure

In March 2006, USEPA issued a guidance document titled *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in* $PM_{2.5}$ *and* PM_{10} *Nonattainment and Maintenance Areas*. This guidance details a qualitative step-by-step screening procedure to determine whether project-related particulate emissions have a potential to generate new air quality violations, worsen existing violations, or delay attainment of NAAQS for $PM_{2.5}$ or PM_{10}.

The proposed project is in an area designated as nonattainment for PM_{10} and $PM_{2.5}$. According to the most recent USEPA Transportation Conformity Guidance, a $PM_{10}/PM_{2.5}$ hot-spot analysis is required for a POAQC in non-attainment areas (40 CFR 93.123 (b) (1)). Projects that are exempt under 40 CFR 93.126 or not POAQC do not require hot-spot analysis.

The proposed project does not meet the criteria of an exempt project under 40 CFR 93.126. However, the USEPA specifies in 40 CFR 93.123(b) (1) that only projects considered POAQC are required to undergo a $PM_{10}/PM_{2.5}$ hot-spot analysis. USEPA defines projects of air quality concern as certain highway and transit projects that involve significant levels of diesel traffic or any other project that is identified by the $PM_{2.5}$ SIP as a localized air quality concern. A discussion of the proposed PVL compared to POAQC, as defined by 40 CFR 93.123(b) (1), is provided below:

1) *New or expanded highway projects with greater than 125,000 annual average daily traffic (AADT) and 8 percent or more of such AADT is diesel truck traffic.* The proposed project is not a new or expanded highway project.

2) *New or expanded highway projects affecting intersections that are at Level of Service (LOS) D, E, or F with a significant number of diesel vehicles or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.* The proposed project is not a new or expanded highway project.

3) *New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location.* Although the proposed project has a rail terminal component, it would not alter travel patterns to/from any existing bus or rail terminal.

4) *Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location.* Although the proposed project would expand service to an existing commuter rail terminal (Riverside Downtown Station), it would not increase the number of diesel vehicles congregating at any single location. In addition, the proposed Layover Facility in South Perris would only

accommodate a maximum of four SCRRA/Metrolink trains. These trains would receive overnight light maintenance (cleaning, inspection etc.). Heavy maintenance of these vehicles requiring excessive engine idling would be done at an existing off-site SCRRA/Metrolink facility.

5) *Projects in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ and PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.* The project site is not in or affecting an area or location identified in any $PM_{2.5}$ or PM_{10} implementation plan. The immediate project area is not considered to be a site of violation or possible violation.

Based on the discussion provided above, the proposed project would not be considered a POAQC with respect to PM_{10} or $PM_{2.5}$ emissions as defined by 40 CFR 93.123(b) (1). Therefore, a $PM_{10}/PM_{2.5}$ hot-spot evaluation is not required, and the proposed project can be screened from further analysis.

An Interagency Consultation project review form for $PM_{2.5}$ and PM_{10} hot spot concurrence is required to be submitted to the SCAG Transportation Conformity Working Group (TCWG) for concurrence with this finding prior to final project approval. On April 16, 2010, the SCAG TCWG determined that the PVL was not a POAQC, http://www.scag.ca.gov/tcwg/projectlist/march10.htm). A copy of the TCWG review form is shown in Appendix F.~~Once TCWG concurrence is given, Clean Air Act 40 CFR 93.116 requirements are met without an explicit hot-spot analysis.~~

Mobile Source Air Toxics—Screening Procedure

The FHWA has issued interim guidance on how MSATs should be addressed for highway projects and has subsequently developed a tiered approach for analyzing them. FTA has no separate guidance. Depending on the specific project circumstances, FHWA has identified three levels of analysis:

1) no analysis for exempt projects or projects with no potential for meaningful MSAT effects,

2) qualitative analysis for projects with low-potential MSAT effects, or

3) quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

For the PVL, the amount of MSATs emitted would be proportional to the amount of project-related rail activity, assuming that other variables (such as traffic and rail activity not associated with this project) would remain the same. The rail activity estimated for the proposed project would be higher than that for the no-action condition, because of the additional activity associated with the proposed rail line extension. This increase in rail activity would mean that the twelve daily train trips between Riverside and Perris would result in MSAT emissions (particularly diesel particulate matter) in the vicinity of the SJBL alignment. The higher emissions could be offset somewhat by two factors: 1) the decrease in regional automobile commuter traffic due to increased use of commuter rail; and 2) increased speeds on area highways due to the decrease in automobile traffic (according to USEPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases). However the extent to which these emissions decreases would offset the project-related emissions increases is difficult to determine.

In addition, even with the PVL in place, emissions would likely be lower than present levels in the design year as a result of USEPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the USEPA-projected reductions are so significant (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future as well. Therefore the PVL has a low-potential for impacts from MSATs and falls under category (2) of the FHWA guidance above and only requires a qualitative assessment.

Mobile Source Air Toxics—Health Risk Assessment

To estimate the localized MSAT effect of the new train service, a health risk assessment will be conducted following CEQA air quality guidelines. This health risk assessment takes into account the effects of air toxic contaminants on human health. Diesel $PM_{2.5}$ and PM_{10}, and acrolein were selected for analysis as they would be the primary MSAT pollutants emitted by diesel train exhaust and are identified by the USEPA as in the group of priority MSATs. ~~This assessment calculates a health risk index based on the emission factors of the existing SCRRA/Metrolink diesel locomotives as well as the running and idle times of the engines.~~This assessment calculates a health risk index based on the emissions from diesel locomotives currently being used by SCRRA/Metrolink on other rail lines, as well as the running and idle times of the engines. This estimate is conservative since engines used by the project completion year will be required to meet stricter USEPA emissions standards. SCAQMD, in its CEQA Air Quality Handbook, identifies an excess individual cancer risk of one in one million to be ~~a~~ minimal and risk levels up to ten in one million are considered less than significant. The chronic hazard indexes for these two toxics are also calculated to determine the likelihood of chronic health effects due to exposure. As shown above in Table 3, per SCAQMD, a hazard index less than 1.0 is considered less than significant.

Construction Period Impacts Methodology

Construction is a source of fugitive dust and exhaust emissions that can have substantial temporary impacts on local air quality causing exceedance of CAAQS for PM_{10} and/or $PM_{2.5}$. Dust emissions would result from earthmoving and use of heavy equipment, as well as land clearing, ground excavation, and cut-and-fill operations. Dust emissions can vary substantially from day to day, depending on the level of activity, the specific operations, and the prevailing weather. ~~As the proposed PVL project would not involve extensive soils work,~~However, as most standard dust prevention measures would significantly reduce the level of soil-related dust, a major portion of the dust emissions ~~for~~from the proposed project would be caused by construction-related vehicle traffic~~ on temporary construction roadways~~. Construction emissions from vehicular exhaust would result from the movement and operation of vehicles related to construction activities. Emissions would be generated by both off-site and on-site activities. Off-site emission producing ~~actives~~activities include construction work crews traveling to and from the work site. They also include on-road emissions from delivery trucks and dump trucks in addition to locomotive emissions from freight deliveries. On-site emission producing ~~actives~~activities include the operation of off-road construction machinery and vehicles. Pollutants of interest with respect to construction exhaust emissions include CO, NO_x, ROC, SO_2, PM_{10}, $PM_{2.5}$ and the GHG CO_2.

In order to assess construction emissions, daily average emissions were calculated for all construction activities. These emissions were then compared to the SCAQMD daily construction emission pollutant thresholds shown above in Table 2. This reasonable worst-case construction day included installation of culverts, all road crossings and crossing improvements, embankment work, all track work, turnout work, stations (including parking areas where applicable) and the Layover Facility, Mapes Road construction, bridge replacement (including demolition and removal of existing bridges), noise barriers, landscape walls, and installation of signals and communication. For each activity, the duration of the activity, the number and types of construction equipment, and equipment horsepower were used as inputs to define daily emissions. Fuel type was assumed to be diesel, to assure a conservative analysis of particulate matter. The assessment assumed that low vehicle speeds and fugitive dust suppression measures (application of dust palliatives, covering of dust piles, etc.) would be strictly enforced within the construction zones. As a result, fugitive dust emissions of particulate matter were assumed negligible. Other ~~K~~key assumptions include:

- As the detailed PVL project construction schedule is not available at this point in the project ~~(30% engineering drawings)~~, estimates of construction machinery/equipment and construction duration, work crew trip estimates and delivery estimates using best professional judgments from a senior railroad professional engineer are provided in Appendix D. Estimates are provided for each individual construction task.
- On-site emissions come from EPA NONROAD2008 construction model emissions tables.
- The "Embankment Construction" is the only task with extensive soils work. Therefore, a fugitive dust analysis was conducted using the 2007 URBEMIS Construction Emissions Model (see Appendix D).
- ~~No~~Some construction sites would require~~d~~ the ~~import/~~export of soils ~~material~~. The amount of soils that would be removed is based on the "90% Mass Haul Diagram Exhibit" provided in Appendix D.
- Although the overall construction ~~would be approximately~~duration is estimated at 18 months, emissions estimates conservatively assume a peak construction year period for ~~all~~most construction activities. Emissions estimates for soils exports are based on the first 12 months of construction when the great majority of soils would be removed.
- All construction activities are conservatively assumed to occur simultaneously.
- The use of a "Diesel Oxidation Catalyst" and "Aqueous Diesel Fuel" will be required for all non road construction vehicles and equipment. This would reduce NOx emission by 15%.
- No idling of off road machinery or trucks would be allowed, which would reduce emission of exhaust particulate matter.

This approach also assumes that process emissions (which include on-site soil movement as well as fugitive dust emissions) will be negligible (with the exception of Embankment Work) due to inclusion of dust control measures such as:

- Water shall be applied by means of truck(s), hoses and/or sprinklers as needed prior to any land clearing or earth movement to minimize dust emission. Haul vehicles transporting soil into or out of the worksite shall be covered.
- Water shall be applied to disturbed areas a minimum of two times per day or more as necessary.
- On-site vehicles limited to a speed of less than five mph.

- All visibly dry disturbed soil surface areas of operation shall be watered to minimize dust emission.
- Soil pile surfaces shall be moistened if dust is being emitted from the pile(s). Adequately secured tarps, plastic or other material shall be employed to further reduce dust emissions.
- SCAQMD Rule 1113 requires all facilities to use CARB-certified low-VOC paints during construction of commercial and industrial facilities. In accordance with that requirement, the project will include special conditions in its design-build specifications to require the following:
  - To the extent practicable, use required coatings and solvents with a VOC content lower than required under SCAQMD Rule 2113.
  - To the extent practicable, use non-VOC paints and architectural coatings.
- All paints shall be applied either by hand application or by using high-volume low-pressure spray equipment.

~~Other project control measures would include:~~

- ~~The use of a “Diesel Oxidation Catalyst” and “Aqueous Diesel Fuel” will be required for all non-road construction vehicles and equipment. This would reduce NOx emission by 15%.~~
- ~~No idling of off road machinery or trucks. Reduces exhaust PM.~~

Additions to the PVL project construction plans and documents shall be made for all control measures.

Analysis background material spreadsheet calculations, in addition to the URBEMIS model run, are included in Appendix D. Although not included in the SCAQMD construction threshold limits, emissions of the GHG CO_2 were calculated for the construction period to help give quantifiable estimate of the overall carbon footprint of the PVL project.

D. SIGNIFICANCE CRITERIA

A project's air quality impacts can be separated into short-term impacts, arising from construction, and long-term permanent impacts resulting from project operations. Determination of significant impact is the responsibility of the lead agency, which is the RCTC for the CEQA document. Much of RCTC’s concern under CEQA is with the long-term impacts of proposed projects. Short-term impacts from construction of the proposed PVL were calculated as described above. Unless construction period impacts are shown to exceed defined regional thresholds, they are usually considered as temporary by FTA and addressed through compliance with local and regional construction regulations. Because of the required specific focus on construction-period air quality under CEQA, RCTC also evaluates short-term air quality impacts, and potential mitigation for those impacts.

For evaluating the air quality impacts for the operation of this project, air quality screening tables and significance thresholds appearing in the SCAQMD’s *CEQA Air Quality Handbook* are applied. Based on the emission thresholds of significance in Chapter 6 of the SCAQMD’s handbook, projects that have potential for significant air quality impacts were further assessed against the thresholds replicated in Table 7 below. If operational emissions exceed the thresholds listed in Table 7, both SCAQMD and FTA would consider the emissions significant.

The SCAQMD emission thresholds apply to all federally regulated air pollutants except lead, which is not exceeded in the SCAB.

For the PVL, air emission quantities and quality concentrations were predicted to determine operational impacts. The air quality analyses address three aspects of potential air quality impacts as follows:

1. Reduction in regional emissions associated with a reduction in vehicle miles travelled (VMT).

2. Increase in regional emissions associated with diesel locomotive emissions.

3. Comparison of Numbers 1 and 2 above to determine net impact of project on regional emissions.

Because of commuter movement away from private vehicle driving and changes in VMT with the proposed project, the transportation-related air emissions would change in the region. SCAG prepared the ridership analysis establishing transit passenger patronage and VMT during the opening 2012 year. Due to riders switching modes of travel, changes in mesoscale air emissions generated were calculated and compared to long term SCAG criteria. The CARB's EMFAC2007 emission factor program estimated air emissions per vehicle mile traveled. Available data from the state vehicle emissions inventory provided the vehicular emission factors during the appropriate years. The operational air quality impacts analysis of the proposed project considers the diesel locomotive emissions including idle time.

Table 7: Criteria for Assessing Long Term Air Quality Impacts

Pollutant	Operations Pounds/day
Reactive Organic Compounds (ROC)	55
Nitrogen Oxides (NO_x)	55
Carbon Monoxide (CO)	550[1]
Particulate Matter (PM_{10})	150[2]
Particulate Matter ($PM_{2.5}$)	55
Sulfur Oxides (SO_x)	150

1. In addition, CO concentrations resulting from the project operations must not exceed the 1-hour and 8-hour CAAQS.
2. In addition, PM_{10} and $PM_{2.5}$ concentrations resulting from project operations must not exceed their respective CAAQS.

Source: South Coast Air Quality Management District, CEQA Air Quality Handbook (revised), 1993

E. ENVIRONMENTAL IMPACTS - 2012

Impact Assessment

Regional Emissions

Table 8 shows the air quality impacts that would occur during operation of the proposed PVL, with the following operational characteristics. The proposed project would operate 12 one-way trains (four from Perris to LA and one from LA to Perris in the morning peak; one roundtrip from LA to Perris to LA midday; four from LA to Perris and one from Perris to LA in the afternoon/evening). This schedule is executed using six train sets featuring F59PHI locomotives, which are currently used by SCRRA/Metrolink. Four of the trains would layover at South Perris to fulfill the morning schedule, while two train sets would reside at LA Union Station to perform the AM and midday schedule out of LA Union Station. The operational analysis includes the incremental increase in train service over the approximately 168-mile round trip route between South Perris and LA Union Station. In addition, the operational air quality impacts analysis includes the four new stations anticipated to be in service during the initial operation, plus Riverside Downtown Station which is already in service. SO_x emissions were calculated by assuming operational times based on the proposed schedule and use of ultra low sulfur diesel (ULSD) fuel which will be used exclusively by 2012 as mandated by USEPA. The operational emissions of the trains are based on fuel consumption during the entire trip from South Perris to LA Union Station, and thus include fuel consumed during the train's running and idling phases. Appendix E details the calculation.

Table 8: Net Change in Operational Emissions (in pounds per day)

Source Category	Pollutant					
	Sulfur Oxides (SO_x)	**Carbon Monoxide (CO)**	**Reactive Organic Compounds (ROC)**	**Oxides of Nitrogen (NOx)**	**Particulate Matter (PM_{10})[1]**	**Fine Particulates ($PM_{2.5}$)[1]**
Train Emissions[2]	0.1	30	6	114	4	4
Vehicular Emissions Reduced	1	1227	26	73	8	8
NET PROJECT EMISSIONS	-1	- 1197	- 20	41	- 4	- 4
SCAQMD Significance Thresholds for Operation	150	550	55	55	150	55
Significant?	NO	NO	NO	NO	NO	NO

Note: Vehicular Emissions assessed with EMFAC2007, V2.2, July 15, 2009 for summertime.
1. $PM_{2.5}$ emissions calculated consistent with methodology provided in the SCAQMD guidance document *Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology* (2006).
2. Assumes 6 F59PHI diesel engines (meeting EPA Tier 2 emission standards) each operating one 168 mile round trip per day between S. Perris and LA.

Source: STV Incorporated, 2009

The proposed PVL project would result in decreased emissions of carbon monoxide, volatile organic compounds, SO_x $PM_{2.5}$ and PM_{10}. Nitrogen oxide emissions would increase, but the increase would be less than significant. With the reductions in these pollutants, the proposed project would produce a cumulative net benefit to the region's air quality. As rail passenger ridership increases over time and the diesel engines continue to meet EPA's more stringent emission standards, there would be ongoing and increasing air quality benefits.

It is also important to note that the proposed project is included in SCAG's 2008 Adopted RTIP (Project ID RIV520109), as shown in Appendix A. Its presence in the RTIP shows that the project's operational emissions meet the transportation conformity requirements imposed by USEPA and SCAQMD.

Localized Emissions

The project's CO concentrations for AM and PM peak hour periods (one- and eight-hour) are provided in Table 9 (opening year 2012 concentrations). As shown in this table, the project would not have a significant impact upon one-hour or eight-hour local CO concentrations due to mobile source emissions.

Because significant impacts would not occur at the intersections with the highest traffic volumes located adjacent to sensitive receptors, no significant impacts are anticipated to occur at any other locations in the study area because the conditions yielding CO hotspots would not be worse than those occurring at the analyzed intersections. Consequently, the sensitive receptors included in this analysis would not be significantly affected by CO emissions generated by the net changes in traffic that would occur with the project. Because the project does not cause an exceedance or exacerbate an existing exceedance of an AAQS, the project's localized operational air quality impacts would therefore be less than significant. No mitigation measures are necessary.

Table 9: Local Area Carbon Monoxide Dispersion Analysis (2012)

Intersection	Peak Period [a]	2012					
		Maximum 1-Hour Base Concentration (ppm) [b]	Maximum 1-Hour With-Project Concentration (ppm) [c]	Significant 1-Hour Concentration Impact? [d]	Maximum 8-Hour Base Concentration (ppm) [e]	Maximum 8-Hour With-Project Concentration (ppm) [f]	Significant 8-Hour Concentration Impact? [d]
C St. @ 4th St.	AM	4.3	4.3	No	3.1	3.1	No
	PM	4.4	4.4	No	3.2	3.2	No
D St. @ 4th St.	AM	4.2	4.2	No	3.0	3.0	No
	PM	4.4	4.4	No	3.2	3.2	No
D St.@ San Jacinto Avenue	AM	4.1	4.1	No	3.0	3.0	No
	PM	4.4	4.4	No	3.2	3.2	No
Perris Blvd @ Nuevo Road	AM	4.5	4.5	No	3.3	3.3	No
	PM	4.7	4.7	No	3.4	3.4	No

Notes:
CAL3QHC dispersion model output sheets and EMFAC 2007 emission factors
ppm = parts per million
[a] Peak hour traffic volumes are based on the Traffic Technical Report prepared by STV Incorporated, 2011.
[b] SCAQMD 2012 1-hour ambient background concentration (4.1 ppm) + 2012 base traffic CO 1-hour contribution.
[c] SCAQMD 2012 1-hour ambient background concentration (4.1 ppm) + 2012 with-project traffic CO 1-hour contribution.
[d] The State standard for the 1-hour average CO concentration is 20 ppm, and the 8-hour average concentration is 9.0 ppm.
[e] SCAQMD 2012 8-hour ambient background concentration (2.9 ppm) + 2012 base traffic CO 8-hour contribution.
[f] SCAQMD 2012 8-hour ambient background concentration (2.9 ppm) + 2012 with-project traffic CO 8-hour contribution.

Parking Lot Analysis

The analysis of parking lot conditions was prepared to assess the potential impacts to individuals from “cold start” emissions. Emissions from “cold starts” are those that could occur when peak hour riders, in this case, return to their vehicles from the train. This would occur during the evening peak periods for the PVL. The pollutant of concern is CO. NOx is primarily a regional pollutant so localized impacts from parking lot operations would be less than significant.

The largest parking lot at South Perris was evaluated, and if impacts were to be identified at this location, then the next largest parking lot would be evaluated as well. If no impacts were identified, then none of the other parking lots would result in any impacts. To prepare the parking lot analysis, a key modeling assumption was to place sensitive receptors around the proposed 880-space parking lot perimeter, set back at a model default distance of 25 meters. This assumption is conservative, as there are no sensitive receptors within 200 meters of the proposed parking lot at South Perris.

Based on the above-described approach, the maximum off-site CO concentration at any sensitive receptor location was determined to be 7.9 parts per million and 5.6 parts per million for the one-hour and eight-hour averaging periods, respectively. These maximum concentrations occurred at a distance of 100 meters from the proposed parking lot. At the model default distance of 25 meters, the one-hour and 8 hour-concentrations were 7.2 and 5.0 parts per million respectively, as shown in Table 10. These worst-case concentrations are below the NAAQS of 35 parts per million and 9 parts per million for the one-hour and eight-hour averaging periods, respectively. They are also below the CAAQS one-hour concentration not exceeding 20 parts per million (ppm), and the eight-hour concentration of nine ppm. Accordingly, the project’s localized operational air quality impacts would be less than significant. No mitigation measures are necessary.

Table 10: Parking Lot Carbon Monoxide Analysis

Parking Lot	1-Hour Concentration (ppm)	Significant Impact?		8-Hour Concentration (ppm)	Significant Impact?	
		CAAQS (20 ppm)	NAAQS (35 ppm)		CAAQS (9 ppm)	NAAQS (9 ppm)
South Perris Station	7.2	NO	NO	5.0	NO	NO

Concentrations measured at model default distance of 25 meters
CAAQS = California Ambient Air Quality Standard
NAAQS = National Ambient Air Quality Standard
Analysis done for lot at full capacity (880 cars) and all cars leaving during PM peak hour

PM10 and PM2.5

Based on the criteria listed in *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas*, the proposed project would not be considered a POAQC with respect to PM_{10} or $PM_{2.5}$ emissions as defined by 40 CFR 93.123(b) (1). The steel on steel interaction between the train wheels and the rails is not expected to cause any fugitive dust. Therefore, a $PM_{10}/PM_{2.5}$ hot-spot evaluation is not required, and the proposed project can be screened from further analysis.

An Interagency Consultation project review form for $PM_{2.5}$ and PM_{10} hot spot concurrence is required to be submitted to the SCAG Transportation Conformity Working Group (TCWG) for concurrence with this finding prior to final project approval. On April 16, 2010, the SCAG TCWG determined that the PVL was not a POAQC, http://www.scag.ca.gov/tcwg/projectlist/march10.htm). A copy of the TCWG review form is shown in Appendix F.~~Once TCWG concurrence is given, Clean Air Act 40 CFR 93.116 requirements are met without an explicit hot-spot analysis.~~

Mobile Source Air Toxics

The FHWA has established interim guidance for analyzing the potential effect of MSATs. (FTA currently has no guidance on this topic). This guidance stipulates that a qualitative assessment be performed for highway related projects that establish a low-potential for MSAT effects. Based on this guidance document, the proposed project falls under category (2) above, projects with low potential MSAT effects. As such, a qualitative MSAT analysis utilizing a health risk assessment is provided for diesel exhaust particulates and Acrolein.

The results of the health risk assessment are shown in Table 11. The health risk assessment is presented in full detail in Appendix C. Per the SCREEN3 modeling program, the maximum concentrations of these pollutants occurs at a distance of 25 meters from the source.

Table 11: Calculated Risk at Point of Greatest Concentration

Pollutant	Risk Factor	Maximum Concentration ($\mu g/m^3$)[1]	Calculated Risk (Health Index - HI)	Threshold of Significance
Diesel Exhaust Particulate	Excess Lifetime Cancer Risk	0.01078	3.226/million	10/million
Diesel Exhaust Particulate	Chronic Hazard	0.01078	HI = 0.002	HI = 1.0
Acrolein	Acute Hazard	0.005055	HI = 0.004	HI = 1.0
Source: SCAQMD CEQA Air Quality Handbook, STV Incorporated (2010) 1. Represents the maximum calculated pollutant concentrations				

The additional commuter rail activity contemplated as part of the PVL would have a negligible effect on diesel particulate matter or acrolein emissions in the vicinity of nearby homes, schools and businesses along the PVL alignment. As locomotive diesel engines continue to meet EPA's more stringent TIER3 emission standards, there would be ongoing and increasing air quality benefits. In addition, on a region-wide basis, USEPA's vehicle and fuel regulations, coupled with fleet turnover, would cause substantial reductions over time so that in almost all cases, the MSAT levels in the future would be significantly lower than today.

Based on the results shown in Table 11, there would be no exceedances of the impact thresholds for any of the criteria pollutants arising from the operation of the proposed commuter rail service; no mitigation of long-term impacts is necessary.

As requested by the SCAG TCWG, prior to construction, RCTC would submit a project review form for the $PM_{2.5}$ and PM_{10} hot spot analysis to TCWG for their concurrence with the finding that the proposed project would not be considered a POAQC with respect to PM_{10} or $PM_{2.5}$ emissions as defined by 40 CFR 93.123(b) (1).

Greenhouse Gas Emissions

In accordance with the new CEQA Guidelines, a qualitative assessment of GHG emissions was performed. The results of the assessment are shown below in Table 12.

The existing and future vehicle miles traveled (VMT) projections for the proposed project were not available. Therefore an approximation of reduced VMT (as shown in Appendix E) was calculated based on the assumption that the proposed PVL service would replace the single passenger vehicles driving from South Perris to Riverside to connect to the existing rail service. The diversion from private car use to PVL ridership is estimated to reduce VMT by approximately 34 million miles per year in the project area. This estimate includes vehicle miles traveled from private homes to the proposed stations. Based on emission factors from EMFAC2007 in the project operation year of 2012, the reduction in VMT was calculated to result in decreased CO_2 emissions of about 160,000 lbs per day. As CO_2 is the most abundant GHG found in automobile emissions, a reduction in CO_2 indicates a reduction in the less prominent exhaust based GHGs. Therefore, it is unlikely that the proposed PVL project operations would increase the GHG burden in the region, but would likely result in a quantifiable reduction in GHG.

Table 12: Greenhouse Gas Qualitative Assessment

Pollutant Source	CO_2 pounds/day
Diesel Locomotives	11,400
Passenger Vehicles	-158,000
Net change in CO_2	-146,600

Summary of Impacts

The proposed PVL project would reduce some long-distance trip-making that now occurs via automobile, resulting in a corresponding improvement in air quality. Although the total amount of air quality improvement is small compared to the region, the introduction of commuter rail service provides an ongoing opportunity for reducing trips. The proposed rail service would result in a net decrease in CO, ROC, and NOx emissions. In addition, SCRRA/Metrolink will be replacing engines over time and the next generation would meet USEPA Stage III requirements, which have lower emission characteristics than the current fleet. As these new engines are incorporated into the fleet, air quality benefits would increase.

Riverside County and the study corridor are forecasted to have substantial increases in population and employment over the coming decades. The general result of such growth would be increased travel on the existing roadway network, demand for additional capacity on those existing facilities, demand for new roadways, as well as additional demand for transit services. The cumulative impacts of increased transportation demands would likely be degradation of air quality as the volume of travel continues to expand, conversion of land use from agriculture/vacant to residential and commercial development, a corresponding reduction of habitats as land uses change, and increased demands on public facilities.

F. CONSTRUCTION PERIOD IMPACTS

As shown in Table 13, based upon the evaluation of the reasonable worst-case construction day, the construction of the PVL would not result in exceedances of the SCAQMD CEQA daily construction emission limits. Significant adverse impacts would not occur; nonetheless, best management practices are recommended following to control localized emissions.

Table 13: PVL Predicted Daily Construction Emissions (lbs)

	CO	NOx	PM10	PM2.5	VOC	SOx
PVL Total Emissions	~~40~~44	~~88~~98	~~6~~49	~~5~~15	~~8~~9	2
SCAQMD Construction Emission Limits	550	100	150	55	75	150
Significant?	NO	NO	NO	NO	NO	NO

In accordance with the new CEQA Guidelines, a qualitative assessment of CO_2 emissions was performed. The results of the assessment indicate that emissions created by construction activities would total approximately ~~10,083~~12,118 lbs per day during the construction period. This estimate coupled with the net decrease in operational emissions of ~~160,000~~146,600 lbs per day indicates that the implementation of the proposed PVL project would not result in increases in CO_2 pollutant emissions.

Construction Best Management Practices

During the construction period, contractors would be required to implement Best Management Practices (BMPs) to control fugitive dust emissions in accordance with SCAQMD Rule 403. In addition to these regulatory requirements, the following construction-phase air quality BMPs would also apply and be included in RCTC contract documents:

- AQ-1: All land clearing/earth-moving activity areas shall be watered to control dust as necessary to remain visibly moist during active operations.
- AQ-2: Streets shall be swept as needed during construction, but not more frequently than hourly, if visible soils~~ material~~ ~~has~~have been carried onto adjacent public paved roads.
- AQ-3: Construction equipment shall be visually inspected prior to leaving the site and loose dirt shall be washed off with wheel washers as necessary.
- AQ-4: Water three times daily or apply non-toxic soil stabilizers, according to manufacturers' specifications, as needed to reduce off-site transport of fugitive dust from all unpaved staging areas and unpaved road surfaces.
- AQ-5: Traffic speeds on all unpaved roads shall not exceed 5 mph.
- AQ-6: All equipment shall be properly tuned and maintained in accordance with manufacturer's specifications.
- AQ-7: Contractors shall maintain and operate construction equipment so as to minimize exhaust emissions. During construction, trucks and vehicles in loading and unloading

queues would have their engines turned off when not in use, to reduce vehicle emissions.

- AQ-8: Establish an on-site construction equipment staging area and construction worker parking lots, located on either paved surfaces or unpaved surfaces subject to soil stabilization.
- AQ-9: Use electricity from power poles, rather than temporary diesel or gasoline powered generators.
- AQ-10: Use on-site mobile equipment powered by alternative fuel sources (i.e., ultra-low sulfur diesel, methanol, natural gas, propane or butane).
- AQ-11: Develop a construction traffic management plan that includes, but is not limited to: (1) consolidating truck deliveries (2) utilizing the existing rail freight line for materials delivery.
- AQ-12: Construction grading on days when the wind gusts exceed 25 miles per hour would be prohibited to control fugitive dust.

With application and compliance with the construction-period mitigation measures, potential impacts during construction would be less than significant. By such avoidance, impacts would be less than significant.

Summary of Construction Period Impacts

The overall potential for air quality impacts to be cumulatively significant is reduced because the proposed project would comply with state and regional air quality requirements that construction projects mitigate their individual impacts to less than significant levels, based on their forecasted construction schedule and levels of activity. Traffic and construction data pertaining to the construction of the other projects is a requirement for a quantitative assessment of cumulative impacts. However, it is assumed that concurrent projects are following the same construction BMPs or are included in the RTIP (in which the impacts of their emissions would be already accounted for in the regional burden) and thus their impacts would not be considered significant.

Construction of the proposed Downtown Perris Station could occur simultaneously with the construction of other proposed downtown revitalization projects, which could result in cumulative construction impacts. One of these, the Perris Multimodal Transit Center, is currently in the process of being built so there would be no potential for any cumulative impacts since it would be completed before the PVL project. The extent of the potential impacts with other projects would depend on the location, magnitude, and duration of construction activities for each of the projects. CEQA analysis conducted for this proposed project indicates the use of several pollution control measures to aid in reducing emissions. However, the proposed project would avoid exceeding SCAQMD criteria thereby would reduce any potential for cumulative construction period impacts. It is assumed and likely that other construction projects in Perris would also be conducted with similar mitigation and control measures in place.

Development projects, such as the Meridian Business Park in Moreno Valley (formerly known as March Business Center), would also be required to impose mitigation measure to address fugitive dust or exceedances of other criteria pollutants during construction. Since construction of each element of these master planned developments would also have to include mitigation measures, the overall potential for cumulative air quality impacts would be reduced. However, the Meridian Business Park would be built over the next 20 to 25 years and as such is unlikely to interfere with the PVL construction schedule which would be implemented over the next two years. As such, the overall potential for cumulative impacts would be reduced.