**FINAL**
**AIR QUALITY ANALYSIS**
**(UPDATE)**

# I-5 NCC Project

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# INTRODUCTION

## 1.1 INTRODUCTION

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) propose improvements to maintain or improve the existing and future traffic operations on the existing Interstate 5 (I-5) freeway from La Jolla Village Drive in San Diego to Harbor Drive in Oceanside/Camp Pendleton, extending approximately 43.4 kilometers (km) (27 miles [mi]) from kilopost (KP) R45.7 to KP R89.1 (post mile [PM] R28.4 to PM R55.4) on I-5.

The, *I-5 North Coast Corridor Project (I-5 NCC),* sponsors include FHWA, Caltrans and the San Diego Association of Governments (SANDAG). The proposed project improvements include one or two High Occupancy Vehicle (HOV) Managed Lanes (ML) in each direction, auxiliary lanes where needed, and possibly one general-purpose lane in each direction. The HOV/Managed Lanes would be available for carpools, vanpools, busses at no cost and be available to single-occupant vehicles for a fee when there is sufficient capacity.

The purpose of this report is to update the Air Quality Analysis dated August 2007. Also, to describe the existing regional and local air quality of the project area, identify the potential air quality impacts of the proposed project, and demonstrate air quality conformity of the project with the State Implementation Plan (SIP), as required by the federal Clean Air Act (CAA). This report also identifies measures to mitigate or minimize pollutant emissions that could occur during project construction.

## 1.2 SUMMARY

The project site is located in the San Diego Air Basin (SDAB), which currently meets federal standards for all criteria air pollutants, except ozone ($O_3$). The SDAB has been designated as nonattainment/marginal area for the 8-hour $O_3$ standard. The SDAB is designated as a federal maintenance area for carbon monoxide (CO) following its redesignation from nonattainment to a CO attainment area. Table 1 shows the pollutants for which the area has been classified federal nonattainment or maintenance and the number of violations within the past three years.

The SDAB meets California standards for all criteria air pollutants, except $O_3$, particulate matter sized 10 microns or less ($PM_{10}$), and particulate matter sized 2.5 microns or less ($PM_{2.5}$). Therefore, the SDAB has been designated as a California nonattainment area for $O_3$, $PM_{10}$, and $PM_{2.5}$.

1 Regional Location Map

# 2 Project Vicinity Map

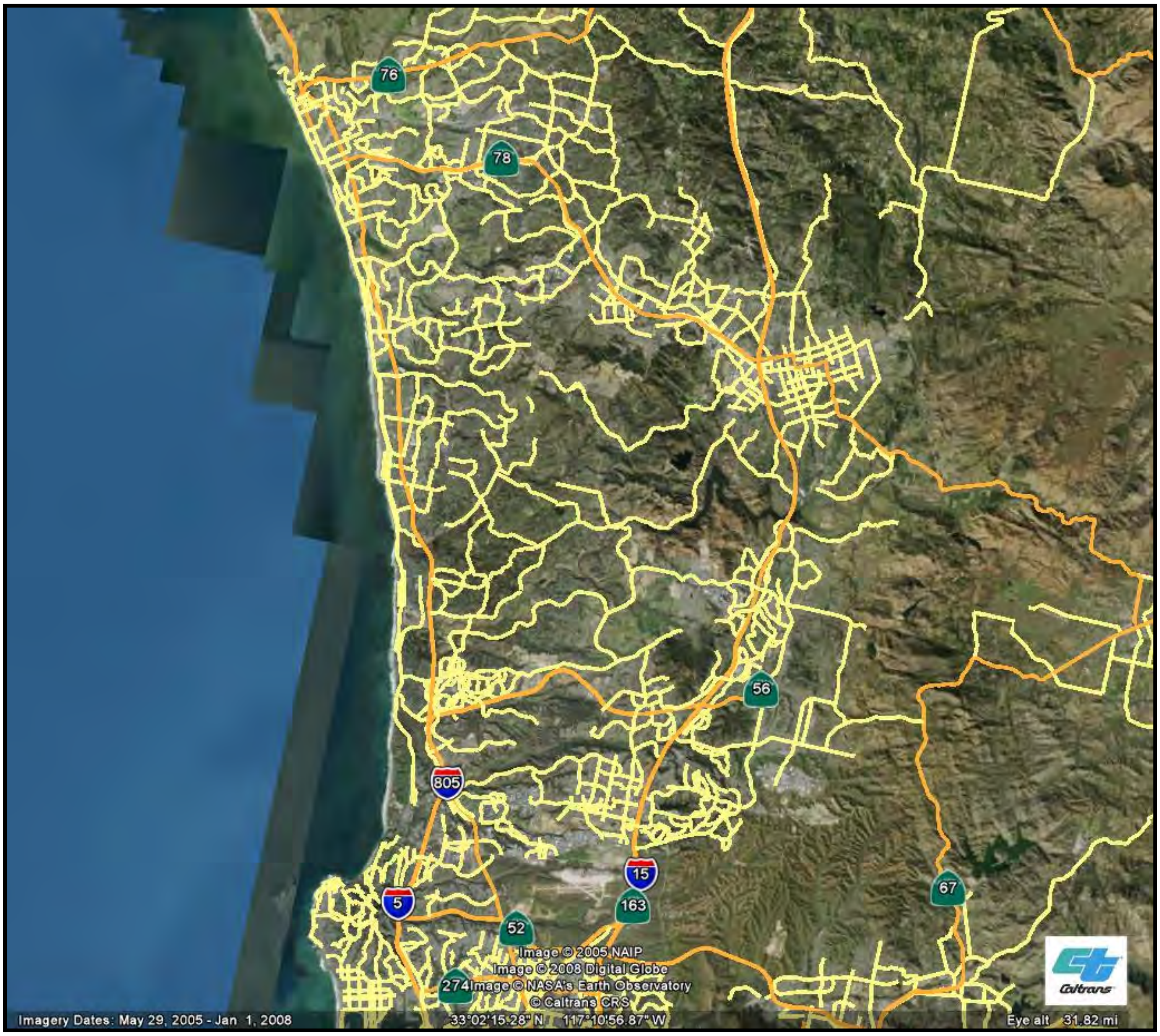

**Table 1**
**Federal Nonattainment and Attainment/Maintenance Pollutants in the SDAB**

| Pollutant | Federal Attainment Status | Exceedances in the Last 3 Years |
|---|---|---|
| $O_3$ – 8-hour | Nonattainment / Marginal* | 0 in 2010; 0 in 2011; 2 in 2012 |
| CO | Attainment / Maintenance | None |

Source: ARB 2013a, USEPA 2013d

*In March 2013 the EPA approved CARB's request to redesignate the SDAB to an attainment/maintenance area for the 1997 8-hour ozone federal standard. The status shown reflects the current 2008 8-hour ozone federal standard.

Note: ARB indicates that exceedances are not necessarily violations.

The federal CAA requires that areas designated as nonattainment or maintenance areas demonstrate that federal actions conform to the SIP and similar approved plans. Transportation measures, such as the proposed project, are analyzed for conformity with the SIP as part of regional transportation plans (RTP) and regional transportation improvement programs (RTIP). Table 2 identifies the status of the SIP.

**Table 2**
**Status of State Implementation Plan in San Diego**

| Pollutants | Status |
|---|---|
| Ozone ($O_3$) | In July 1997, the U.S. Environmental Protection Agency (USEPA) established a new federal 8-hour standard for $O_3$ of 0.085 parts per million (ppm). The USEPA designated 15 areas in California that violate the federal 8-hour $O_3$ standard on April 15, 2004. Each nonattainment area's classification and attainment deadline is based on the severity of its $O_3$ problem. San Diego's nonattainment area deadline is 2009. The San Diego County SIP was approved by the California Air Resources Board (ARB) on May 24, 2007. The EPA approved the submittal dated, December 28, 2012, for the Redesignation Request and Maintenance plan for the 1997 National Ozone Standard for San Diego County, as a revision to the SIP, final rule effective July 5, 2013. |
| Carbon Monoxide (CO) | On April 26, 1996, the ARB approved the "Carbon Monoxide Redesignation Request and Maintenance Plan for Ten Federal Planning Areas" as part of the SIP for CO. The USEPA approved this revision on June 1, 1998, and redesignated San Diego to attainment. On October 22, 1998, the ARB revised the SIP to incorporate the effects of the recent ARB action to remove the wintertime oxygen requirement for gasoline in certain areas. On July 22, 2004, the ARB approved an update to the SIP that shows how the 10 areas will maintain the standard through 2018, revises emission estimates, and establishes new on-road motor vehicle emission budgets for transportation conformity purposes. |

Source: ARB 2013c

The metropolitan planning organization responsible for the preparation of regional transportation plans and the associated air quality analyses is the San Diego Association of Governments (SANDAG). The applicable regional transportation plans are the *2050 San Diego Regional Transportation Plan – Our Region Our Future (2050 RTP)* and the *2012 Regional Transportation Improvement Program* (2012 RTIP). A proposed project needs to be identified in both the RTP and the RTIP to conform to the SIP.

The I-5 NCC project is fully funded and is in the 2050 RTP, which was found to conform by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) on December 2, 2011 and adopted by the SANDAG board of directors on October 28, 2011. The project is also included in the 2012 RTIP. The 2012 RTIP was found to conform by FHWA and FTA on December 14, 2012 and adopted by the SANDAG on September 28, 2012. The design concept and scope of the proposed project is consistent with the project description in the 2050 RTP, the 2012 RTIP, and the assumptions in SANDAG's regional emissions analysis.

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

## 1.3 PROJECT DESCRIPTION

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

### 10 + 4 Barrier

The 10 + 4 Barrier alternative would build one general-purpose lane in each direction on I-5

from south of Del Mar Heights Road in San Diego to SR-78 in Oceanside. Two HOV/Managed Lanes would be built in each direction from north of the I-805/I-5 freeway-to-freeway connector in San Diego to Harbor Drive/Vandegrift Boulevard in Oceanside.
This alternative would separate HOV/Managed Lanes from general-purpose lanes with a concrete barrier. This physical barrier would require standard 10-foot emergency shoulder widths on either side of it from north of Del Mar Heights Road to south of SR-78. A variable buffer of up to five feet in width identified by painted stripes would separate HOV/Managed Lanes from general-purpose lanes from Voigt Drive to Del Mar Heights Road and from SR-78 to Harbor Drive/Vandegrift Boulevard in Oceanside.

**10 + 4 Buffer**

The 10+4 Buffer alternative would add the same number of through lanes (one general purpose and two HOV/Managed in each direction) and function similarly to the 10+4 Barrier alternative, but would use a painted buffer with a width of up to five feet to separate HOV/Managed Lanes from general-purpose lanes for the entire length of the project. The projected cost (right-of-way, support and construction) for the alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $3.5 billion.

**8 + 4 Barrier**

The 8+4 Barrier alternative would not add any general purpose lanes to the existing highway. Two HOV/Managed Lanes would be added in each direction, separated from general purpose lanes as described above for the 10+4 Barrier alternative. This physical barrier would require standard 10-foot emergency shoulder widths on either side of it from north of Del Mar Heights Road to south of SR-78. A variable buffer of up to five feet in width identified by painted stripes would separate HOV/Managed Lanes from general-purpose lanes from Voigt Drive to Del Mar Heights Road and from SR-78 to Harbor Drive/Vandegrift Boulevard. The projected cost (right-of-way, support, and construction) for this alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $4.1 billion.

**8 + 4 Buffer**

The 8+4 Buffer alternative would not add any general purpose lanes to the existing highway. It would function similarly to the 8+4 Barrier alternative but would separate HOV/Managed Lanes from general-purpose lanes with a variable painted buffer (up to five feet in width) for the entire length of the project in lieu of the barrier. The projected cost (right-of-way, support, and construction) for this alternative was estimated in the Draft EIR/EIS in 2010 dollars as approximately $3.3 billion.

For the purposes of this update only the 8+4 Buffer Alternative will be analyzed, which is the Preferred Alternative.

# CHAPTER 2.0
# AIR POLLUTANTS

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

Seven air pollutants have been identified by the USEPA as being of concern nationwide: carbon monoxide (CO); ozone ($O_3$); nitrogen dioxide ($NO_2$); $PM_{10}$, also called respirable particulate and suspended particulate; $PM_{2.5}$; sulfur dioxide ($SO_2$); and lead. These pollutants are collectively referred to as criteria pollutants. The sources of these pollutants, their effects on human health and the nation's welfare, and their final deposition in the atmosphere vary considerably.

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

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

In addition to the seven criteria air pollutants, toxic air contaminants including mobile source air toxics are discussed below.

## 2.1 CARBON MONOXIDE (CO)

CO is a colorless and odorless gas which, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Relatively high concentrations are typically found near crowded intersections and along heavily used roadways carrying slow-moving traffic. Even under the severest meteorological and traffic conditions, high concentrations of CO are limited to locations within a relatively short distance (300 to 600 feet) of heavily traveled roadways. Overall, CO emissions are decreasing as a result of the Federal

Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973. CO concentrations are typically higher in winter. As a result, California has required the use of oxygenated gasoline in the winter months to reduce CO emissions.

## 2.2 OZONE ($O_3$)

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

## 2.3 NITROGEN DIOXIDE ($NO_2$)

$NO_2$ is a product of combustion and is generated in vehicles and in stationary sources such as power plants and boilers. $NO_2$ can cause lung damage. As noted above, $NO_2$ is part of the $NO_X$ family and is a principal contributor to $O_3$ and smog. In 2007, the ARB reduced the 1-hour average standard for $NO_2$ to 0.18 parts per million (ppm) and established a new annual standard of 0.030 ppm.

## 2.4 RESPIRABLE PARTICULATE MATTER ($PM_{10}$)

Particulate matter includes both liquid and solid particles of a wide range of sizes and composition. While some $PM_{10}$ comes from automobile exhaust, the principal source in San Diego County is dust from construction and from the action of vehicle wheels on paved and unpaved roads. In other areas, agriculture, wind-blown sand, and fireplaces can be important sources. $PM_{10}$ can cause increased respiratory disease, lung damage, and premature death. Control of $PM_{10}$ is achieved through the control of dust at construction sites, the cleaning of paved roads, and the wetting or paving of frequently used unpaved roads. The USEPA revised the NAAQS for $PM_{10}$ in 2006, eliminating the annual standard.

## 2.5 FINE PARTICULATE MATTER ($PM_{2.5}$)

The sources, health effects, and control of $PM_{2.5}$ are similar to those of $PM_{10}$. In 1997, the USEPA determined that the health effects of $PM_{2.5}$ were severe enough to warrant an additional standard, and standards for $PM_{2.5}$ became effective on September 15, 1997. The U.S. Supreme Court affirmed the standards, and policies and systems to implement these new standards. Formal attainment classifications for $PM_{2.5}$ were formally published on December 17, 2004, by the USEPA (USEPA 2004).

On June 20, 2002, the ARB adopted amendments for statewide annual ambient particulate matter air quality standards. These standards were revised/established due to increasing concerns by the ARB that previous standards were inadequate, as almost everyone in California is exposed to levels at or above the current state standards during some part of the year, and the statewide potential for significant health impacts associated with particulate matter exposure was determined to be large and wide ranging (ARB 2002). Based upon a desire to set clean air goals throughout California, the ARB created a new annual average standard for $PM_{2.5}$ at 12 micrograms per cubic meter ($\mu g/m^3$). The USEPA revised the NAAQS for $PM_{2.5}$ in 2006, reducing the 24-hour standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$.

## 2.6 SULFUR DIOXIDE ($SO_2$)

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

## 2.7 LEAD

Lead is a stable compound that persists and accumulates both in the environment and in animals. Previously, the lead used in gasoline anti-knock additives represented a major source of lead emissions to the atmosphere. The USEPA began working to reduce lead emissions soon after its inception, issuing the first reduction standards in l973, which called for a gradual phase down of lead to one tenth of a gram per gallon by 1986. The average lead content in gasoline in 1973 was 2 to 3 grams per gallon or about 200,000 tons of lead per year. In 1975, passenger cars and light trucks were manufactured with a more elaborate emission control system, which included a catalytic converter that required lead-free fuel. In 1995, leaded fuel accounted for only 0.6 percent of total gasoline sales and less than 2,000 tons of lead per year. Effective January 1, 1996, the federal CAA banned the sale of the small amount of leaded fuel that was still available in some parts of the country for use in on-road vehicles (USEPA 1996). Lead emissions have significantly decreased due to the near elimination of the use of leaded gasoline.

## 2.8 TOXIC AIR CONTAMINANTS

In addition to the criteria air pollutants, EPA regulates toxic air contaminants (TAC), also known as hazardous air pollutants. Concentrations of TACs are also used as indicators of ambient-air-quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health impacts may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which the ambient standards have been established. Most TACs originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Air toxics are air pollutants that cause adverse health effects. The USEPA has focused most of its air toxics efforts to date on carcinogens, which are compounds that cause cancer; however, non-cancer health effects such as reproductive and neurological problems are also of concern to USEPA. Motor vehicles emit several pollutants that USEPA classifies as known or probable human carcinogens. Benzene, for instance, is a known human carcinogen, while formaldehyde, acetaldehyde, 1,3-butadiene and diesel particulate matter are probable human carcinogens. Studies are underway to determine whether other toxic substances are present in mobile source emissions.

The USEPA estimates that mobile source (vehicles) air toxics account for as much as half of all cancers attributed to outdoor sources. This estimate is not based on actual cancer cases, but on models that predict the maximum number of cancers that could be expected from current levels of exposure to mobile source emissions. The models consider available health studies, air quality data, and other information about the types of vehicles and fuels currently in use. Non-road mobile sources, such as tractors and snowmobiles, also emit air toxics.

Some toxic compounds are present in gasoline and are emitted to the air when gasoline evaporates or passes through the engine as unburned fuel. Benzene, for example, is a component of gasoline. A significant amount of automotive benzene comes from the incomplete combustion of compounds in gasoline such as toluene and xylene that are chemically very similar to benzene. Like benzene itself, these compounds occur naturally in petroleum and become more concentrated when petroleum is refined to produce high-octane gasoline. Formaldehyde, acetaldehyde, diesel particulate matter, and 1,3-butadiene are not present in fuel but are by-products of incomplete combustion. Formaldehyde and acetaldehyde are also formed through a secondary process when other mobile source pollutants undergo chemical reactions in the atmosphere.

Note that the five organic-based MSAT's listed are also listed as toxic air contaminants by the California ARB. These toxics include Benzene, Acrolein, Formaldehyde, 1,3-butadiene, and Acetaldehyde. The particulate matter fraction of diesel exhaust (Diesel PM) has also been identified by the California ARB as a toxic air contaminant.

**Mobile Source Air Toxics (MSATs)**

The Clean Air Act identified 188 TACs. The EPA has assessed this expansive list of toxics and identified a group of 21 TAC's as Mobile Source Air Toxics (MSATs), which are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. The EPA also extracted a subset of this list of 21 MSAT's that it now labels as the seven priority MSATs. These are *acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter*. While these MSATs are considered the priority transportation toxics, the EPA stresses that the lists are subject to change and may be adjusted in future rules (FHWA 2012).

The EPA has issued a number of regulations that will dramatically decrease MSATs through cleaner fuels and cleaner engines. According to an FHWA analysis, even if the number of vehicle miles traveled increases by 64 percent, reductions of 57 percent to 87 percent in MSATs are projected from 2000 to 2020. Project MSAT impacts are discussed in Section 5.1 of this report.

**Diesel Exhaust Particulate**

In 1999, the ARB identified particulate emissions from diesel-fueled engines as a TAC. Once a substance is identified as a TAC, the ARB is required by law to determine if there is a need for further control. This is referred to as risk management (ARB 2006). The process of further studies is ongoing at the ARB, with committees meeting to analyze both stationary and mobile diesel engine sources, as well as many other aspects of the problem. In October 2000, the ARB approved the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* and *the Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* (ARB 2000a and 2000b). ARB programs in progress relating to truck emissions are included in the following paragraphs. There are other programs for risk reduction for off-road diesel engines.

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

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

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

## 2.9 ASBESTOS

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

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

**<u>Naturally Occurring Asbestos (NOA) -bearing Serpentine</u>**

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

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

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# CHAPTER 3.0
# APPLICABLE STANDARDS

## 3.1 FEDERAL AND STATE STANDARDS

The federal CAA (42 U.S.C. §§ 7401-7671q) requires the adoption of national ambient air quality standards (NAAQS) to protect the public health and welfare from the effects of air pollution. The NAAQS have been updated as needed. Current standards are set for $SO_2$, CO, $NO_2$, $O_3$, $PM_{10}$, $PM_{2.5}$, and lead. The ARB has established the California Ambient Air Quality Standards (CAAQS) that are generally more restrictive than the NAAQS and include additional pollutants. The federal and California air quality standards are shown in Table 3.

## 3.2 REGIONAL AUTHORITY

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

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

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

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

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

## Table 3
## National and California Ambient Air Quality Standards

### Ambient Air Quality Standards

| Pollutant | Averaging Time | California Standards [1] | | National Standards [2] | | |
|---|---|---|---|---|---|---|
| | | Concentration [3] | Method [4] | Primary [3,5] | Secondary [3,6] | Method [7] |
| Ozone ($O_3$) | 1 Hour | 0.09 ppm (180 μg/m$^3$) | Ultraviolet Photometry | — | Same as Primary Standard | Ultraviolet Photometry |
| | 8 Hour | 0.070 ppm (137 μg/m$^3$) | | 0.075 ppm (147 μg/m$^3$) | | |
| Respirable Particulate Matter (PM10)[8] | 24 Hour | 50 μg/m$^3$ | Gravimetric or Beta Attenuation | 150 μg/m$^3$ | Same as Primary Standard | Inertial Separation and Gravimetric Analysis |
| | Annual Arithmetic Mean | 20 μg/m$^3$ | | — | | |
| Fine Particulate Matter (PM2.5)[8] | 24 Hour | — | — | 35 μg/m$^3$ | Same as Primary Standard | Inertial Separation and Gravimetric Analysis |
| | Annual Arithmetic Mean | 12 μg/m$^3$ | Gravimetric or Beta Attenuation | 12.0 μg/m$^3$ | 15 μg/m$^3$ | |
| Carbon Monoxide (CO) | 1 Hour | 20 ppm (23 mg/m$^3$) | Non-Dispersive Infrared Photometry (NDIR) | 35 ppm (40 mg/m$^3$) | — | Non-Dispersive Infrared Photometry (NDIR) |
| | 8 Hour | 9.0 ppm (10 mg/m$^3$) | | 9 ppm (10 mg/m$^3$) | — | |
| | 8 Hour (Lake Tahoe) | 6 ppm (7 mg/m$^3$) | | — | — | |
| Nitrogen Dioxide ($NO_2$)[9] | 1 Hour | 0.18 ppm (339 μg/m$^3$) | Gas Phase Chemiluminescence | 100 ppb (188 μg/m$^3$) | — | Gas Phase Chemiluminescence |
| | Annual Arithmetic Mean | 0.030 ppm (57 μg/m$^3$) | | 0.053 ppm (100 μg/m$^3$) | Same as Primary Standard | |
| Sulfur Dioxide ($SO_2$)[10] | 1 Hour | 0.25 ppm (655 μg/m$^3$) | Ultraviolet Fluorescence | 75 ppb (196 μg/m$^3$) | — | Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method) |
| | 3 Hour | — | | — | 0.5 ppm (1300 μg/m$^3$) | |
| | 24 Hour | 0.04 ppm (105 μg/m$^3$) | | 0.14 ppm (for certain areas)[10] | — | |
| | Annual Arithmetic Mean | — | | 0.030 ppm (for certain areas)[10] | — | |
| Lead[11,12] | 30 Day Average | 1.5 μg/m$^3$ | Atomic Absorption | — | — | High Volume Sampler and Atomic Absorption |
| | Calendar Quarter | — | | 1.5 μg/m$^3$ (for certain areas)[12] | Same as Primary Standard | |
| | Rolling 3-Month Average | — | | 0.15 μg/m$^3$ | | |
| Visibility Reducing Particles[13] | 8 Hour | See footnote 13 | Beta Attenuation and Transmittance through Filter Tape | No National Standards | | |
| Sulfates | 24 Hour | 25 μg/m$^3$ | Ion Chromatography | | | |
| Hydrogen Sulfide | 1 Hour | 0.03 ppm (42 μg/m$^3$) | Ultraviolet Fluorescence | | | |
| Vinyl Chloride[11] | 24 Hour | 0.01 ppm (26 μg/m$^3$) | Gas Chromatography | | | |

**See footnotes on next page ...**

For more information please call ARB-PIO at (916) 322-2990 — **California Air Resources Board (6/4/13)**

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and 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 arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site 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 $\mu g/m^3$ 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 the U.S. EPA for further clarification and current national 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. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

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

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

7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

9. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

10. On June 2, 2010, a new 1-hour $SO_2$ standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 $SO_2$ national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

11. The ARB 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.

12. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

13. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

**For more information please call ARB-PIO at (916) 322-2990** **California Air Resources Board (6/4/13)**

## 3.3 CONFORMITY OF FEDERAL ACTIONS

Section 176(c) of the federal CAA requires:

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

In November 1993, the U.S. Department of Transportation (USDOT) and USEPA developed guidance for determining conformity of transportation plans, programs, and projects. This guidance is denoted as the Transportation Conformity Rule (40 C.F.R. §§ 51.390 and 40 C.F.R. §§ 93.100-129).

The metropolitan planning organization responsible for the preparation of regional transportation plan and program and the associated air quality analyses is SANDAG. The regional plan is the

RTP and the regional program is the RTIP. The most current approved versions of the plan and program are the 2050 RTP: Our Region Our Future (SANDAG 2013) and 2012 RTIP, (SANDAG 2013). The proposed project description is included in both of these plans, and thus conforms to the SIP. Details relative to the 2050 RTP and 2012 RTIP status and approvals, and the project listings are in Section 5.1 of this report.

# CHAPTER 4.0
# EXISTING CONDITIONS

## 4.1 ENVIRONMENTAL SETTING, CLIMATE, AND METEOROLOGY

The project is located in the SDAB, which is coincident with San Diego County. The climate of San Diego County is characterized by warm, dry summers and mild, wet winters. One of the main determinants of the climatology is a semipermanent high pressure area (the Pacific High) in the eastern Pacific Ocean. In the summer, this pressure center is located well to the north, causing storm tracks to be directed north of California. This high pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, this pattern changes, and low pressure storms are brought into the region, causing widespread precipitation. In San Diego County, the months of heaviest precipitation are November through April, averaging about 9 to 14 inches annually. The mean temperature is 62.2 degrees Fahrenheit (°F) and the mean maximum and mean minimum temperatures are 75.7°F and 48.5°F, respectively (WRCC 2006).

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

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

## 4.2 REGIONAL AND LOCAL AIR QUALITY

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

The SDAB currently meets the federal standards for all criteria pollutants except $O_3$. In July 1997, the U.S. Environmental Protection Agency (USEPA) established a new federal 8-hour standard for $O_3$ of 0.085 parts per million (ppm). The USEPA designated 15 areas in California that violate the federal 8-hour $O_3$ standard on April 15, 2004. Each nonattainment area's classification and attainment deadline is based on the severity of its $O_3$ problem. San Diego's nonattainment area deadline was 2009. The San Diego County SIP was approved by the California Air Resources Board (ARB) on May 24, 2007. The EPA approved the submittal dated, December 28, 2012, for the Redesignation Request and Maintenance plan for the 1997 National Ozone Standard for San Diego County, as a revision to the SIP, final rule effective July 5, 2013. The SDAB currently falls under a federal "maintenance plan" for CO, following a 1998 redesignation as a CO attainment area.

For the California standards, the SDAB is currently classified as nonattainment area for $O_3$, and a nonattainment area for $PM_{2.5}$ and $PM_{10}$ (ARB 2013a).

Ambient air pollutant concentrations in the SDAB are measured at 10 air quality monitoring stations operated by the APCD. The APCD air quality monitoring station that represents the project area, climate, and topography in the SDAB is the Del Mar-Mira Costa Monitoring Station. However, the Del Mar-Mira Costa Monitoring station only monitors $O_{3.}$ The next nearest monitoring station is San Diego Beardsley, 1110A Beardsley St, San Diego CA 92112. This station monitors CO, $NO_X$, $O_3$, $PM_{10}$, and $PM_{2.5}$. However, this station does not monitor $SO_{X,}$ therefore this pollutant's levels were taken from the El Cajon-Redwood Avenue Monitoring Station. Table 4 summarizes the excesses of standards and the highest pollutant levels recorded at these stations for the years 2010 to 2012.

## Table 4
## Ambient Air Quality Summary – San Diego-Beardsley

| Pollutant Standards | 2010 | 2011 | 2012 |
|---|---|---|---|
| **Carbon Monoxide (CO)** | | | |
| Maximum National 8-hour concentration (ppm) | 2.17 | 2.44 | 1.81 |
| Maximum California 8-hour concentration (ppm) | 2.17 | 2.44 | 1.81 |
| Number of Days Standard Exceeded | | | |
| NAAQS 1-hour (≥35 ppm) | 0 | 0 | 0 |
| CAAQS 8-hour (≥20 ppm) | 0 | 0 | 0 |
| NAAQS 8-hour (≥9 ppm) | 0 | 0 | 0 |
| CAAQS 8-hour (≥9 ppm) | 0 | 0 | 0 |
| **Nitrogen Dioxide ($NO_2$)** | | | |
| Maximum 1-hour concentration (ppm) | 0.077 | 0.067 | 0.065 |
| Annual Average (ppm) | 0.015 | 0.014 | 0.013 |
| Number of Days Standard Exceeded | | | |
| CAAQS 1-hour | 0 | 0 | 0 |
| **Sulfur Dioxide ($SO_X$)** [a] | | | |
| Maximum National 1-hour concentration (ppm) | 0.008 | 0.001 | 0.002 |
| Maximum California 24-hour conncentration (ppm) | 0.0025 | 0.0005 | 0.0005 |
| Number of Days Standard Exceeded | | | |
| NAAQS 1-hour (>0.075 ppm) | 0 | 0 | 0 |
| CAAQS 24-hour (>0.04 ppm) | 0 | 0 | 0 |
| **Ozone ($O_3$)** [b] | | | |
| Maximum 1-hour concentration (ppm) | 0.085 | 0.091 | 0.088 |
| Maximum 8-hour concentration (ppm) | 0.072 | 0.075 | 0.079 |
| Number of Days Standard Exceeded | | | |
| CAAQS 8-hour (>0.070 ppm) | 2 | 1 | 2 |
| CAAQS 1-hour (>0.09 ppm) | 2 | 1 | 3 |
| NAAQS 8-hour (>0.075 ppm) | 0 | 0 | 2 |
| **Particulate Matter ($PM_{10}$)** | | | |
| National maximum 24-hour concentration ($\mu g/m^3$) | 40.0 | 48.0 | 45.0 |
| National second highest 24-hour concentration ($\mu g/m^3$) | 38.0 | 47.0 | 43.0 |
| State maximum 24-hour concentration ($\mu g/m^3$) | 40.0 | 49.0 | 47.0 |
| State second highest 24-hour concentration ($\mu g/m^3$) | 39.0 | 48.0 | 45.0 |
| National[c] annual average concentration ($\mu g/m^3$) | 22.8 | 23.3 | 21.8 |
| State[d] annual average concentration ($\mu g/m^3$) | 23.4 | 24.0 | 22.2 |
| Number of Days Standard Exceeded | | | |
| NAAQS 24-hour (>150 $\mu g/m^3$) | 0 | 0 | 0 |
| CAAQS 24-hour (>50 $\mu g/m^3$) | 0 | 0 | 0 |
| **Particulate Matter ($PM_{2.5}$)** | | | |
| Maximum 24-hour concentration ($\mu g/m^3$) | 29.7 | 34.7 | 39.8 |
| Second highest 24-hour concentration ($\mu g/m^3$) | 26.2 | 33.9 | 34.7 |
| Third highest 24-hour concentration ($\mu g/m^3$) | 25.3 | 33.2 | 32.4 |
| Fourth highest 24-hour concentration ($\mu g/m^3$) | 24.3 | 25.4 | 31.8 |
| National[c] annual average concentration ($\mu g/m^3$) | 10.4 | 10.8 | 11.3 |
| State[d] annual average concentration ($\mu g/m^3$) | * | 10.9 | * |
| Number of Days Standard Exceeded | | | |
| NAAQS 24-hour (>65 $\mu g/m^3$) | 0 | 0 | 1 |

Notes:
* Data Unavailable
[a] Sulfur dioxide readings for 2011 and 2012 taken from the El Cajon-Redwood Avenue Monitoring Station. National 24-hour and Annual Arithmetic Mean revoked in June 2010.
[b] Ozone readings taken at Del Mar-Mira Costa Monitoring Station.
[c] National annual average based on arithmetic mean.
[d] State annual average based on geometric mean.

Source: CARB 2013b,c

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# CHAPTER 5.0
# FUTURE AIR QUALITY AND IMPACTS

## 5.1 LONG-TERM EMISSIONS

The project is in a federal nonattainment area for $O_3$ and is not exempt from Transportation Conformity requirements. The Metropolitan Planning Organization is SANDAG.

**Regional Air Quality**

On April 15, 2004, the USEPA designated the San Diego air basin as non-attainment for the new 8-Hour $O_3$ standard. This designation took effect on June 15, 2004. The Final Transportation Conformity Rule Amendments for the new 8-hour $O_3$ and $PM_{2.5}$ NAAQS requires that conformity of the RTP and the RTIP for nonattainment areas be determined to the 8-Hour $O_3$ standard by June 15, 2005.

The SANDAG Board adopted the 2050 RTP: Our Region Our Future on October 28, 2011. The FHWA and FTA issued a conformity finding on December 2, 2011. The project phases are listed on pages A-17 and A-18 of the 2050 RTP, in Table A.3, Phased Highway Projects-Revenue Constrained Plan, as I-5; Manchester Ave to SR78, La Jolla Village Drive to I-5/I-805 Merge, I-5/I-805 Merge to SR-56, SR-56 to Manchester Ave, Manchester Ave to Palomar Airport Road, Palomar Airport Road to SR-78 and SR-78 to Vandergrift Blvd.

On September 28, 2012, the SANDAG Board adopted the 2012 RTIP and the FHWA and FTA issued a finding of conformity on December 14, 2012. The 2012 RTIP has been amended 7 times since the original approval. The project is listed on page 33 of the original 2012 RTIP under project listings. The project is identified as Interstate 5-HOV/Managed Lanes, from La Jolla Village Drive to Harbor Drive, construct HOV/Managed lanes on I-5. (MPO ID: CAL09)

The I-5 NCC project is fully funded and is in the 2050 RTP and 2012 RTIP, as stated above. The design concept and scope of the proposed project is consistent with the project description in the 2050 RTP, the 2012 RTIP and the assumptions in SANDAG's regional emissions analysis.

## Local Air Quality ("Hot Spots")

### Carbon Monoxide

The Carbon Monoxide (CO) "Hot Spot" analysis that was performed in the August 2007, Air Quality Analysis, was performed using the most current protocol, Transportation Project-Level Carbon Monoxide Protocol (CO Protocol), University of California Davis, December 1997. A quantitative analysis was performed for the three worst intersections using Caline 4, dispersion modeling software, in conjunction with CT-EMFAC 2002. While there have been recent updates to the CT-EMFAC version the CO Protocol is still the same as well as the traffic information used for input.

The analysis performed resulted in CO concentrations below the Federal and State standards and therefore the proposed project would not result in or contribute to any significant local air quality impacts due to future operations. Any new analysis would result in similar findings if not better due to improvements in vehicle emissions technology and vehicle fleet turnover. Please refer to the Air Quality Analysis, dated August 2007, for the full analysis. No further analysis required.

### $PM_{10}$ and $PM_{2.5}$

On March 10, 2006, the USEPA published a final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in $PM_{2.5}$ and $PM_{10}$ nonattainment and maintenance areas. Based on that rule, the USEPA and FHWA published *Transportation Conformity Guidance for Qualitative Hot-spot Analyses in $PM_{2.5}$ and $PM_{10}$ Nonattainment and Maintenance Areas* (PM Guidance) (FHWA 2006b). While the SDAB is not a federally designated $PM_{2.5}$ or $PM_{10}$ nonattainment or maintenance area, it is designated as a state nonattainment area for both pollutants. Thus, to meet state requirements, the proposed project is assessed using the procedure outlined in the PM Guidance.

A hot spot analysis is defined in 40 CFR 93.101 as an estimation of likely future localized $PM_{2.5}$ or $PM_{10}$ pollutant concentrations and a comparison of those concentrations to the relevant air quality standards. A hot spot analysis assesses the air quality impacts on a scale smaller than an entire nonattainment or maintenance area, including, for example, congested roadway intersections and highways or transit terminals. Such an analysis is a means of demonstrating that a transportation project meets CAA conformity requirements to support state and local air quality goals with respect to potential localized air quality impacts. When a hot spot analysis is required, it is included within the project-level conformity determination that is made by the FHWA or FTA.

The PM Guidance describes qualitative hot spot analyses. Qualitative hot spot analyses involve more streamlined reviews of local factors such as local monitoring data near a proposed project location.

Projects of Air Quality Concern

To meet statutory requirements, the March 10, 2006, final rule requires $PM_{2.5}$ and $PM_{10}$ hot spot analyses to be performed for "projects of air quality concern." Qualitative hot spot analyses would be done for these projects. Projects not identified as projects of air quality concern (POAQC) are considered to meet statutory requirements without any further hot spot analyses.

The PM Guidance defines POAQC as projects within a federally designated $PM_{2.5}$ or $PM_{10}$ nonattainment or maintenance area, funded or approved by the FHWA or FTA, and one of the following types of projects:

- New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;
- Projects affecting intersections that are 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;
- New bus and rail terminals, and transfer points, that have a significant number of diesel vehicles congregating at a single location;
- Expanded bus and rail terminals, and transfer points, that significantly increase the number of diesel vehicles congregating at a single location; and
- Projects in, or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

Appendix A of the PM Guidance contains examples of POAQC and examples of projects that are not an air quality concern. Under the example of POAQC, a significant volume for a new highway or expressway is defined as facilities with an annual average daily traffic (AADT) volume of 125,000 or more, and a significant number of diesel vehicles is defined as 8 percent or more of the total AADT is diesel truck traffic.

The proposed project is not located in federally designated as a $PM_{2.5}$ and $PM_{10}$ nonattainment or maintenance area. Therefore, the proposed project does not meet the criteria of a POAQC as defined in the PM Guidance. $PM_{10}$ and $PM_{2.5}$ hot spot analyses are required by the USEPA Transportation Conformity Rule (40 CFR § 93.116 and 40 CFR § 93.123) to determine project-level conformity in $PM_{10}$ and $PM_{2.5}$ nonattainment or maintenance areas (FHWA 2006a).

The SDAB is not a federally designated $PM_{10}$ or $PM_{2.5}$ nonattainment or maintenance area; thus, the project does not require $PM_{10}$ or $PM_{2.5}$ hot spot analyses.

However, the SDAB is in nonattainment for $PM_{10}$ and $PM_{2.5}$ State standards as stated above. Following the PM Guidance, the I-5 NCC project does not meet the requirement set forth as a Project of Air Quality Concern. As defined above, the I-5 NCC project will expand the I-5 corridor but will not have a significant increase in diesel truck traffic, only 6% diesel trucks. The I-5 NCC project will not affect intersections that are LOS D, E, or F with a significant number of diesel vehicles, or change those to LOS D, E, or F, because of increased traffic volumes from a significant number of diesel vehicles related to the project. The I-5 NCC project will not create new bus and rail terminals, and transfer points, that have a significant number of diesel vehicles congregating at a single location. The I-5 NCC project will not expand bus and rail terminals, and transfer points, that significantly increase the number of diesel vehicles congregating at a single location. The I-5 NCC project will not significantly increase the number of diesel vehicles congregating at a single location affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation. The I-5 NCC project does not meet the criteria of a POAQC as defined in the PM Guidance and therefore does not require $PM_{10}$ or $PM_{2.5}$ hot spot analyses.

There has also been practical advice established, based on the California conformity working group practices, to help identify a Project of Air Quality Concern. This advice lists three types of projects:

1. Likely a POAQC
    a. Project services 10,000 +AADT of diesel trucks
    b. Project substantially affects truck traffic by means of congestion reduction, capacity expansion or realignment.

2. Could be a POAQC
    a. Project moves diesel emissions closer to sensitive receptors, somewhat independent of volume.
    b. Project increases truck volume 5-10%, even if volume falls short of EPA criteria

3. Not likely a POAQC
    a. Project has essentially the same build and no-build truck volume.

Using this advisory analysis and the PM "Hot Spot" methodology of localized analysis, the I-5 NCC project was broken up into 22 segments to determine the worst-case scenario of diesel truck AADT. According to Table 5, the worst case AADT of diesel trucks, for the 2030 8+4 preferred alternative, is located at Segment 5, south bound. This segment has an ADT of 7,434 trucks, which is well below the 10,000 + advisory limit and it is during off peak hours. The highest peak hour AADT truck traffic is only 1,790 at segment 2 south bound.

## Table 5

| | 2030 8+4 | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AADT by Segment | | | | | | | |
| | SB I-5 NC GP | | | | NB I-5 NC GP | | | |
| Segment | Peak | Trucks (6%) | OP | Trucks (6%) | Peak | Trucks (6%) | OP | Trucks (6%) |
| 1 | 14,994 | **900** | 85,072 | **5,104** | 25,101 | **1,506** | 83,571 | **5,014** |
| 2 | 15,570 | **934** | 71,706 | **4,302** | 18,611 | **1,117** | 67,516 | **4,051** |
| 3 | 17,494 | **1,050** | 71,044 | **4,263** | 17,900 | **1,074** | 89,371 | **5,362** |
| 4 | 29,832 | **1,790** | 115,943 | **6,957** | 28,372 | **1,702** | 112,486 | **6,749** |
| 5 | 27,417 | **1,645** | 123,893 | **7,434** | 26,304 | **1,578** | 110,616 | **6,637** |
| 6 | 24,501 | **1,470** | 112,262 | **6,736** | 23,776 | **1,427** | 104,788 | **6,287** |
| 7 | 22,618 | **1,357** | 111,630 | **6,698** | 23,768 | **1,426** | 107,615 | **6,457** |
| 8 | 20,051 | **1,203** | 101,623 | **6,097** | 20,563 | **1,234** | 97,923 | **5,875** |
| 9 | 19,303 | **1,158** | 97,345 | **5,841** | 19,460 | **1,168** | 94,890 | **5,693** |
| 10 | 18,608 | **1,116** | 95,765 | **5,746** | 19,731 | **1,184** | 93,338 | **5,600** |
| 11 | 18,234 | **1,094** | 94,648 | **5,679** | 18,803 | **1,128** | 91,168 | **5,470** |
| 12 | 17,494 | **1,050** | 94,224 | **5,653** | 19,623 | **1,177** | 91,887 | **5,513** |
| 13 | 16,970 | **1,018** | 92,111 | **5,527** | 19,389 | **1,163** | 89,671 | **5,380** |
| 14 | 17,430 | **1,046** | 89,804 | **5,388** | 18,146 | **1,089** | 85,906 | **5,154** |
| 15 | 20,442 | **1,227** | 87,813 | **5,269** | 19,036 | **1,142** | 80,967 | **4,858** |
| 16 | 22,264 | **1,336** | 91,709 | **5,503** | 20,720 | **1,243** | 82,189 | **4,931** |
| 17 | 22,615 | **1,357** | 92,816 | **5,569** | 20,257 | **1,215** | 81,876 | **4,913** |
| 18 | 19,040 | **1,142** | 85,541 | **5,132** | 19,640 | **1,178** | 80,209 | **4,813** |
| 19 | 13,935 | **836** | 88,601 | **5,316** | 21,114 | **1,267** | 86,567 | **5,194** |
| 20 | 14,454 | **867** | 86,762 | **5,206** | 21,006 | **1,260** | 82,998 | **4,980** |
| 21 | 13,687 | **821** | 82,277 | **4,937** | 21,158 | **1,269** | 79,727 | **4,784** |
| 22 | 13,692 | **822** | 86,688 | **5,201** | 19,274 | **1,156** | 77,175 | **4,631** |

Note: Peak hours are 6am-9am and 3pm-6pm, total of six hours. Off peak hours are all others, total of 18 hours. This is why off peak AADT is greater than peak AADT.

Table 6 depicts the AADT truck traffic for the 2030 no build alternative and shows the same segment with an increased AADT for trucks at 8,398. This project actually reduces the amount of AADT truck traffic, for this worst case scenario, by 964. Therefore, the I-5 NCC project will not affect truck traffic by means of congestion reduction, capacity expansion or realignment and does not fall under category 1 of this advisory analysis.

## Table 6

| | 2030 No Build | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | AADT by Segment | | | | | | | |
| | SB I-5 NC GP | | | | NB I-5 NC GP | | | |
| Segment | Peak | Trucks (6%) | OP | Trucks (6%) | Peak | Trucks (6%) | OP | Trucks (6%) |
| 1 | 8,016 | **481** | 91,605 | **5,496** | 17,373 | **1,042** | 90,671 | **5,440** |
| 2 | 7,937 | **476** | 80,002 | **4,800** | 11,078 | **665** | 70,375 | **4,223** |
| 3 | 7,864 | **472** | 74,161 | **4,450** | 12,853 | **771** | 69,676 | **4,181** |
| 4 | 11,258 | **675** | 131,291 | **7,877** | 17,497 | **1,050** | 117,112 | **7,027** |
| 5 | 11,509 | **691** | 139,969 | **8,398** | 17,038 | **1,022** | 119,890 | **7,193** |
| 6 | 9,462 | **568** | 122,045 | **7,323** | 16,118 | **967** | 111,906 | **6,714** |
| 7 | 9,299 | **558** | 127,372 | **7,642** | 16,644 | **999** | 115,077 | **6,905** |
| 8 | 8,385 | **503** | 124,849 | **7,491** | 15,888 | **953** | 119,633 | **7,178** |
| 9 | 8,066 | **484** | 121,113 | **7,267** | 15,500 | **930** | 112,189 | **6,731** |
| 10 | 7,899 | **474** | 118,107 | **7,086** | 15,113 | **907** | 110,148 | **6,609** |
| 11 | 7,829 | **470** | 116,478 | **6,989** | 14,868 | **892** | 108,843 | **6,531** |
| 12 | 7,571 | **454** | 115,547 | **6,933** | 14,904 | **894** | 106,842 | **6,411** |
| 13 | 7,675 | **461** | 113,796 | **6,828** | 14,763 | **886** | 105,048 | **6,303** |
| 14 | 7,501 | **450** | 113,235 | **6,794** | 14,399 | **864** | 100,265 | **6,016** |
| 15 | 8,432 | **506** | 114,634 | **6,878** | 13,196 | **792** | 103,319 | **6,199** |
| 16 | 9,058 | **543** | 120,565 | **7,234** | 13,024 | **781** | 107,515 | **6,451** |
| 17 | 9,171 | **550** | 121,165 | **7,270** | 12,945 | **777** | 105,246 | **6,315** |
| 18 | 8,701 | **522** | 114,861 | **6,892** | 12,610 | **757** | 101,140 | **6,068** |
| 19 | 6,871 | **412** | 113,456 | **6,807** | 16,264 | **976** | 107,313 | **6,439** |
| 20 | 7,313 | **439** | 114,974 | **6,898** | 15,980 | **959** | 99,229 | **5,954** |
| 21 | 6,878 | **413** | 104,160 | **6,250** | 16,042 | **963** | 88,730 | **5,324** |
| 22 | 6,986 | **419** | 105,012 | **6,301** | 15,577 | **935** | 83,426 | **5,006** |

Note: Peak hours are 6am-9am and 3pm-6pm, total of six hours. Off peak hours are all others, total of 18 hours. This is why off peak AADT is greater than peak AADT.

The 8+4 preferred alternative will only construct HOV lanes in the center of the alignment and will not add additional general purpose lanes. However, there will be some areas throughout the corridor that require additional right of way to accommodate the HOV lanes, which would translate into some minor shifting of the number four lane ranging from three to twenty five feet. As stated above the I-5 NCC project will not increase truck volumes 5-10 percent. In the worst case it will actually reduce truck AADT by 13%.

The third criterion in the advisory analysis is a project that is not likely a POAQC. This describes a project as one that has essentially the same build and no-build truck volume. The combined north bound and south bound truck volumes for the 8+4 preferred alternative is 294,848 AADT. However, the combined north bound and south bound truck volumes for the no-build alternative is 315,921. Not only does the I-5 NCC project meet the third criterion it exceeds it because the there will be a 7% reduction in diesel truck traffic.

As stated above the SDAB is not a federally designated $PM_{10}$ or $PM_{2.5}$ nonattainment or maintenance area; thus, the project does not require $PM_{10}$ or $PM_{2.5}$ hot spot analyses. Emissions burdens for these pollutants have been calculated in Table 7 below for CEQA purposes, which requires that the future build project be compared with the existing conditions. While PM10 will experience a slight increase due to increased volumes, diesel truck emissions, which are directly related to the pollutant $PM_{2.5,}$ will experience a 5% decrease for the 2030 8+4 preferred alternative when compared with existing conditions.

**Table 7**

| 2030 Changes (Δ) in Total Project PM Emission Rates | | | |
|---|---|---|---|
| | | 8+4 Alternative | |
| Toxic Air Contaminant | Existing Emissions (g/day) | (g/day) | Δ % From Existing |
| $PM_{10}$ (fugitive dust) | 329,920 | 368,236 | 12 |
| $PM_{2.5}$ (diesel) | 164,147 | 156,741 | -5 |
| Average Percent Change | | | 4 |

In conclusion, the I-5 NCC project does not meet the criteria of a POAQC as defined in the PM Guidance and falls under category 3 of the advisory analysis, not likely POAQC, and emissions show a reduction of 5% in the diesel related pollutant $PM_{2.5,}$ therefore it does not require a quantitative $PM_{10}$ or $PM_{2.5}$ hot spot analyses.

**Mobile Source Air Toxics**

Please refer to the Final Air Quality Analysis, Mobile Source Air Toxics (MSATs) Update, May 2013.

## 5.2 CONSTRUCTION IMPACTS

**Regional Emissions**

The principal criteria pollutants emitted during construction would be $PM_{10}$ and $PM_{2.5}$. The source of the pollutants would be fugitive[1] dust created during clearing, grubbing, excavation, and grading; demolition of structures and pavement; vehicle travel on paved and unpaved roads; and material blown from unprotected graded areas, stockpiles, and haul trucks. Generally, the distance that particles drift from their source depends on their size, emission height, and wind speed. About 50 percent of fugitive dust is made up of relatively large particles, greater than 100 microns in diameter. These particles are responsible for the reduced visibility often associated with construction, as well as the nuisance caused by the deposition of dust on vehicles, and in exterior areas used by people for recreation and business. Given their relatively large size, these particles tend to settle within 20 to 30 feet of their source. Small particles, less than 100 microns in diameter, can travel nearly 330 feet before settling to the ground, depending on wind speed. These smaller particles also contribute to visibility and nuisance impacts, and include $PM_{10}$ and $PM_{2.5}$, which are potential health hazards.

An additional important source of pollutants during construction would be the engine exhaust from construction equipment. The principal pollutants of concern would be $NO_X$ and ROG emissions that would contribute to the formation of $O_3$, which is a regional nonattainment pollutant.

Federal conformity regulations require analysis of construction impacts for projects when construction activities will last for more than 5 years. The proposed project would be broken

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

into separate construction contracts each one lasting less than 5 years; therefore, no quantitative estimates of regional construction emissions are required. However, the Air Quality Analysis dated, August 2007, did perform a construction emissions analysis and found that activities limited to 6.6 miles of roadway and bridge construction working simultaneously in the region would not have a significant impact on air quality. For further analysis related to this topic please review the Air Quality Analysis dated, August 2007. In addition, it is recommended that specific measures to control dust and particulates be incorporated into project specifications. These measures are identified in Chapter 6.0.

**Local Emissions**

According to 40 CFR § 93.123 (5), CO, $PM_{10}$, and $PM_{2.5}$ hot spot analyses are not required for construction-related activities that create a temporary increase in air emissions. Temporary is defined as increases that only occur during a construction phase and last 5 years or less at any individual site. Any one of the proposed project would not exceed the 5 year limit and would be considered temporary. Thus, no local hot spot is anticipated and a hot spot analysis is not required for construction of the proposed project.

Diesel particulate emissions may be a potential concern, as described in Section 2.8 of this report. While there is no formal guidance for impact analysis, potential adverse impacts would be increased if construction equipment and truck staging areas were to be located near receptors like schools, active recreation areas, or areas of higher population density. The nearest school to the project alignment, Megastar Children's Christian Academy, is approximately 0.02 mile from the I-5 NCC Project. Thus, a measure to reduce this potential impact has been identified in Chapter 6.0.

## 5.3 CUMULATIVE IMPACTS

The analysis of project impacts to regional air quality, as performed by SANDAG and the APCD in conjunction with the RTP and RTIP process, is a cumulative analysis. The proposed project would conform to the assumptions in the air quality conformity analyses for the 2050 RTP (SANDAG 2011) and 2012 RTIP (SANDAG 2012), which are long-range planning documents that include roadway projects throughout the region. Therefore, the project would not result in a cumulative impact to air quality.

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# CHAPTER 6.0
# POLLUTION ABATEMENT MEASURES

Most of the construction impacts to air quality are short-term in duration and, therefore, will not result in long-term adverse conditions. Implementation of the following measures, some of which may also be required for other purposes such as storm water pollution control will reduce any air quality impacts resulting from construction activities:

- The construction contractor shall comply with Caltrans' Standard Specifications in Section 14(2010).
    - Section 14-9.01specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
    - Section 14-9.02 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.
- Apply water or dust palliative to the site and equipment as frequently as necessary to control fugitive dust emissions. Fugitive emissions generally must meet a "no visible dust" criterion either at the point of emission or at the right of way line, depending on local regulations.
- Spread soil binder on any unpaved roads used for construction purposes, and all project construction parking areas.
- Wash off trucks as they leave the right-of-way as necessary to control fugitive dust emissions.
- Properly tune and maintain construction equipment and vehicles. Use low-sulfur fuel in all construction equipment as provided in California Code of Regulations Title 17, Section 93114.
- Develop a dust control plan documenting sprinkling, temporary paving, speed limits, and expedited revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.
- Locate equipment and materials storage sites as far away from residential and park uses as practical. Keep construction areas clean and orderly.

- Establish Environmentally Sensitive Areas (ESAs) or their equivalent near sensitive air receptors within which construction activities involving extended idling of diesel equipment would be prohibited, to the extent feasible.

- Use track-out reduction measures such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic.

- Cover all transported loads of soils and wet materials prior to transport, or provide adequate freeboard (space from the top of the material to the top of the truck) to minimize emission of dust (particulate matter) during transportation.

- Promptly and regularly remove dust and mud that are deposited on paved, public roads due to construction activity and traffic to decrease particulate matter.

- Route and schedule construction traffic to avoid peak travel times as much as possible, to reduce congestion and related air quality impacts caused by idling vehicles along local roads.

- Install mulch or plant vegetation as soon as practical after grading to reduce windblown particulate in the area. Be aware that certain methods of mulch placement, such as straw blowing, may themselves cause dust and visible emission issues, and may need to use controls such as dampened straw.

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

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# CHAPTER 7.0
# REFERENCES


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