3.2 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

This section describes existing air quality conditions in the project area and vicinity, including the attainment status for air pollutants of concern within the two air basins traversed by the project corridor. This section includes an overview of the regulatory framework for air quality management in the project area, a discussion of potential environmental consequences, and mitigation strategies for both construction and operational phases.

Air pollution is a general term that refers to one or more substances determined to degrade the quality of the atmosphere. Eight air pollutants have been identified by the United States Environmental Protection Agency (EPA) as being of nationwide concern, based on standards for human health:

- carbon monoxide (CO)
- sulfur oxides (SO_x), including sulfur dioxide (SO_2)
- hydrocarbons (HC)
- nitrogen oxides (NO_x)
- ozone (O_3)
- particulate matter sized 10 microns or less (PM_{10})
- particulate matter sized 2.5 microns or less ($PM_{2.5}$)
- lead (Pb)

All of these pollutants are further described below.

With the exception of hydrocarbons, these pollutants (NO_x in the form of NO_2 and SO_x in the form of SO_2) may be referred to collectively as *criteria pollutants*.

Pollutants that are considered *greenhouse gases* also affect air quality. Greenhouse gases include NO_x, HC, and carbon dioxide (CO_2). The precise sources of these pollutants, their effects on human health and general welfare, as well as their final disposition in the atmosphere vary considerably. In addition, diesel particulate matter (DPM) is also considered here.

3.2.1 REGULATORY REQUIREMENTS

The alternatives are subject to a number of air quality regulations developed and implemented at the federal and state levels. An overview of all relevant policies governing air quality in the project area can be found below.

Federal

Clean Air Act

Air quality is regulated at the federal level under the Clean Air Act (CAA) of 1970 and the related Final Conformity Rule.[1] The CAA Amendments of 1990[2] empower the EPA to establish environmental policies and regulations to ensure better air quality. In response, the EPA set National Ambient Air Quality Standards (NAAQS) for all air pollutants identified as being of nationwide concern, established emission standards for certain mobile sources (airplanes and locomotives), and designed procedures to oversee state air programs.

The CAA requires that states submit a State Implementation Plan (SIP) for all areas designated as *nonattainment* by federal air quality standards. *Nonattainment* is defined as any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the NAAQS for the pollutant.[3] The SIP, which is reviewed and approved by the EPA, must identify a plan for achieving the federal standards. Failure to follow this procedure could lead to denial of federal funding and permits. In cases where a SIP is submitted by the state but a nonattainment area remains below federal standards, the EPA is directed to prepare a federal implementation plan.

EPA has established *de minimis* thresholds[4] for criteria pollutant emissions to help determine whether conformity determinations will be required for a given project. **Table 3.2-1** lists the *de minimis* thresholds for the various criteria pollutants.

[1] Title 40, Code of Federal Regulations [CFR], Parts 51 and 93

[2] Public Law [P.L.] 101-549, November 15, 1990

[3] 42 U.S.C. § 7404[d][1][A]

[4] http://www.epa.gov/air/genconform/deminimis.html

Table 3.2-1 General Conformity De Minimis Thresholds

Pollutant	Area Type	Tons/Year
Ozone (VOC or NO_x)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO_x)	Marginal and moderate nonattainment inside an ozone transport region	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
Carbon monoxide, SO_2 and NO_2	All nonattainment and maintenance	100
Inhalable Particulate Matter (PM_{10})	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
Fine Particulate Matter ($PM_{2.5}$) Direct emissions, SO_2, NO_x (unless determined not to be a significant precursor), VOC or ammonia (if determined to be significant precursors)	All nonattainment and maintenance	100
Lead (Pb)	All nonattainment and maintenance	25

Source: EPA, 2014

Consistent with the CAA, "No federal agency may approve, accept or fund any transportation plan, program or project unless such plan, program or project has been found to conform to any applicable SIP in effect under this act."[5]

C*onformity* is defined as follows: conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards; such activities will not cause any of the following occurrences.

- Cause or contribute to any new violation of any NAAQS in any area.
- Increase the frequency or severity of any existing violation of any NAAQS in any area.
- Delay timely attainment of any NAAQS or any required interim emissions reductions or other milestones in any area.[6]

EPA's General Conformity Rule establishes NAAQS for six principal pollutants. Pursuant to the Rule, the lead federal agency must make a Conformity Determination for all federal actions in non-attainment or maintenance areas where the total of direct and indirect emissions of a non-attainment pollutant or its precursors exceeds levels established by the regulation. Federal conformity for projects under FRA is called "General Conformity."

In an area without a SIP, a federal action can be shown to "conform" by demonstrating there will be no increase in emission in the nonattainment or maintenance area from the Federal action that could cause new violations of the standards and/or no increase in the frequency or severity of previous violations.

In an area with a SIP, conformity can be demonstrated in one of four ways:

- By showing that the emission increases caused by an action are included in the SIP,
- by demonstrating that the State agrees to include the emission increases in the SIP,
- through offsetting the action's emissions in the same or nearby area,
- through mitigation to reduce the emission increase, or
- through an air quality modeling demonstration in some circumstances.

[5] 42 U.S.C. § 7401 et seq.

[6] 42 U.S.C. § 7506[c][1]

Urban Air Toxics

In addition to NAAQS for criteria pollutants, the CAA identified a list of 188 urban air toxics, alternatively known as toxic air contaminants (TACs). In its final ruling in March 2001, EPA narrowed this list to a group of 21 mobile-source air toxics (MSAT).[7] From this list of 21 MSATs, EPA identified six priority MSATs: benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1, 3-butadiene. To address emissions of MSATS, EPA has introduced a number of measures targeting cleaner fuels and cleaner engines.

Most air toxics originate from human-generated sources, including road mobile sources (e.g., cars, trucks, buses), non-road mobile sources (e.g., airplanes, locomotives), stationary sources (e.g., factories, refineries, power plants) and indoor sources (e.g., building materials). A smaller proportion of air toxics are released from natural sources such as volcanic eruptions and forest fires. Human health risks caused by exposure to urban air toxics at sufficiently high concentrations or extended durations include increased risk for cancer or other serious health effects, including damage to the immune system; and neurological, reproductive, developmental and respiratory problems.

In March 2001, EPA issued regulations requiring the producers of urban air toxics to decrease emissions of these pollutants by target dates in 2007 and 2020. As a result, on-highway emissions of benzene, formaldehyde, 1.3-butadiene and acetaldehyde will be reduced by amounts ranging from 67 percent to 76 percent between 1990 and 2020. On-highway DPM emissions will be reduced by 90 percent. These reductions are expected as a result of the national mobile source control programs, including:

- The reformulated gasoline program;
- A new threshold for the toxic content of gasoline;
- The national low-emission vehicle standards;
- The Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements; and
- The heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements.

[7] Control of Emissions of Hazardous Air Pollutants from Mobile Sources, 66 F.R. 17235

The predicated improvements are net emission reductions, which will be experienced even after growth in vehicle miles traveled (VMT) is taken into account.

Tools and modeling techniques exist for quantitative PM and CO hot-spot analysis associated with motor vehicles. However, neither EPA nor FRA has released guidance on how to evaluate the effect of future rail lines on ambient concentrations of urban air toxics in the context of NEPA. Specifically, EPA has not established NAAQS or provided other project-level standards for hazardous air pollutants. Furthermore, neither federal or state of California ambient standards exist for mobile source air toxics, although FHWA has developed interim guidance for the evaluation of such toxics generated within a highway context (from automobile and truck sources).[8]

Greenhouse Gas Regulatory Considerations

In December 2009, the EPA Administrator issued findings under the U.S. Clean Air Act that the current and projected GHG concentrations in the atmosphere threaten the health and welfare of current and future generations. In response, the United States EPA has introduced a series of policies designed to slow the growth of emissions, invest in science and technology, and enhance international cooperation.

These policies include a Renewable Fuel Standard Program that mandates a minimum volume of renewable fuel in all transportation fuel sold in the United States. The EPA partnered with the National Highway Traffic Safety Administration (NHTSA) to enable the production of a new generation of clean vehicles with improved fuel economy and reduced emissions of greenhouse gases.[9] Lastly, the EPA introduced the Greenhouse Gas Reporting Program. Through this program, the EPA tracks greenhouse gas data from large emission sources across a range of industry sectors.[10] In addition, the EPA has established multiple incentive-based programs that encourage voluntary GHG reductions. These programs include "ENERGY STAR," "Climate Leaders," and Methane Voluntary Programs.[11]

In 2010, the Council on Environmental Quality (CEQ) released draft guidance explaining how Federal agencies should analyze the environmental impacts of GHG emissions and climate change when they describe the environmental impacts of a proposed action under NEPA. It provides practical tools for agency reporting, including a presumptive threshold of 25,000 metric tons of carbon dioxide

[8] FHWA, 2014.
[9] US EPA, 2013a.
[10] US EPA, 2013c
[11] US EPA, 2013b

equivalent emissions from the proposed action to trigger a quantitative analysis, and instructs agencies how to assess the effects of climate change on the proposed action and their design.[12]

State

Air Quality Regulations

The responsibility for controlling air pollution in California is shared by 35 local or regional air pollution control/air quality management districts, CARB, and EPA.

As noted above, EPA establishes the NAAQS, sets emission standards for certain mobile sources (including locomotives), oversees state air programs, and reviews and approves the SIP.

The California Clean Air Act of 1988[13] (CCCA) and other provisions of the California Health and Safety Code (HSC)[14] entrusts CARB with preparing the SIP for EPA review and approval. CARB also sets state ambient air quality standards, adopts and enforces federal and state emission standards for mobile sources, and adopts standards and suggested control measures for TACs.

CARB must enforce the CCAA, which requires that all districts designated as nonattainment areas for any pollutant "adopt and enforce rules and regulations to achieve and maintain the state and federal ambient air quality standards in all areas affected by emission sources under their jurisdiction."

CARB also oversees local and regional air pollution control or air quality management districts. For the proposed project, the relevant air pollution control districts are the Monterey Bay Unified Air Pollution Control District (MBUAPCD) and the San Luis Obispo Air Pollution Control District (SLOAPCD). See **Figure 3.2-1**, Regional Air Basins, for a map depicting the two air pollution control districts. Per the CAA, each local district is charged with the distribution of permits for industrial pollutant sources and the development of plans and policies to meet standards set at the State and National level.

[12] CEQ, 2014

[13] Assembly Bill [AB] 2595

[14] HSC § 39000 *et seq.*

Greenhouse Gas Regulations

Order S-3-05

This executive order set targets for the reduction of California's Greenhouse Gas (GHG) emissions to:

1. 2000 levels by the year 2010,
2. 1990 levels by the year 2020, and
3. 80 percent below the 1990 levels by the year 2050.

The executive order also calls for the California Environmental Protection Agency (CalEPA) to prepare biennial reports on the potential impact of increased warming of the atmosphere on certain sectors of the California economy. The first of these reports, *Scenarios of Climate Change in California: An Overview* (Climate Scenarios report), was published in February 2006 (California Climate Change Center 2006).

- In September 2006, the State Assembly passed new legislation to address GHG emissions in California, Assembly Bill 32 (AB 32) or the Global Warming Solutions Act of 2006. Through AB 32, California established a new model for GHG emissions reduction, effectively acknowledging the political threat of climate change due to anthropogenic emissions. AB 32 further directed CARB to lay the foundation for tighter climate legislation through a series of measures with discrete deadlines. Since 2007, CARB has approved a scoping plan for GHG reductions in California that includes direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms;[15] identified 1990 levels of statewide GHG emissions, thereby articulating a 2020 emissions target;[16] implemented a series of nine discrete early action GHG emission reduction measures including regulations for landfills, motor vehicle fuels, refrigerants in cars, tire pressure, port operations and other sources;[17] adopted regulation requiring the largest industrial sources to report and verify their GHG emissions;[18] and established both the Environmental Justice Advisory Committee (EJAC) and the Economic and Technology Advancement Advisory Committee (ETAAC) to provide guidance to CARB throughout the development of related regulation.[19]

[15] HSC §38561
[16] HSC §38550
[17] HSC §38560.5
[18] HSC §38530
[19] HSC §38591

- In 2011, CARB adopted cap-and-trade regulation designed to meet the emissions reduction targets established in AB 32 through market-based mechanisms. The cap-and-trade program sets an enforceable emissions cap for major sources of GHG emissions, including refineries, power plants, industrial facilities, and transportation fuels. The State will oversee the distribution of tradable permits to these major emitters, the sum of which will equal the emissions allowed under the cap. This cap will reduce over time.[20]
- On December 6, 2007 CARB approved and adopted a statewide GHG emissions limit that is equivalent to the 1990 level, which is 427 million metric tons of carbon dioxide equivalent (an approximately 25 percent reduction in existing statewide GHG emissions);
- In 2007, CARB approved a list of nine discrete early action GHG emission reduction measures.

The proposed Scoping Plan was approved in August 2011. The Scoping Plan summarizes quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by 2020. Among the measures that became operative on January 1, 2012 are GHG reporting regulations, alternative compliance mechanisms, and potential monetary and non-monetary incentives that reduce GHG emissions from any sources. Cap-and-trade programs began on January 1, 2013 with a GHG emissions cap that will decline over time. The first update to the Scoping Plan was approved by CARB in May, 2014, which builds upon the initial Scoping Plan with new strategies and recommendations.

AB 32 also takes into account the relative contribution of each source or source category to help limit adverse impacts on small businesses and others by requiring CARB to recommend a minimum threshold of GHG emissions below which emissions reduction requirements would not apply. AB 32 also allows the Governor to adjust the deadlines established therein for individual regulations or the entire state to the earliest feasible date in the event of extraordinary circumstances, catastrophic events, or threat of significant economic harm.

The Sustainable Communities and Climate Protection Act of 2008 (SB 375) advanced California's GHG legislation by tying regional land use, housing, and transportation planning to emissions reduction targets. SB 375 directs CARB to develop regional

[20] HSC §38562(c)

GHG reductions targets for emissions associated with passenger vehicles in 2020 and 2035. Each of California's Metropolitan Planning Organizations (MPO) must then prepare a *Sustainable Communities Strategy* (SCS), wherein the MPO articulates a plan to meet the target established by CARB. The SCS must be reviewed by CARB and incorporated into the federally enforceable regional transportation plan.

Governor's Low Carbon Fuel Standard (Executive Order #S-01-07): Executive Order #S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through the introduction of a Low Carbon Fuel Standard. The Low Carbon Fuel Standard will be incorporated into the State Alternative Fuels Plan as required by AB 1007 and represents one of the proposed discrete early action GHG reduction measures identified by CARB pursuant to AB 32.

Ambient Air Quality Standards

Table 3.2-2 lists the relevant national and state ambient air quality standards for the criteria pollutants in the project corridor.

Federal primary standards are intended to protect the public health with an adequate margin of safety; secondary standards are intended to protect the nation's welfare, accounting for air-pollutant impacts on soil, water, visibility, vegetation, etc. Areas that violate these standards are designated nonattainment areas. Areas that once violated the standards but now meet the standards are classified as maintenance areas.

Local

Monterey County General Plan

Monterey County has adopted a draft Municipal Climate Action Plan (MCAP). The MCAP was prepared pursuant to policies and subsequent mitigation in the Monterey County General Plan (2010) to address GHG emissions associated with the County's own operations. The MCAP outlines a three-phased approached to achieve GHG emission reductions through 2020 by implementing many of the measures outlined in the AB 32 Scoping Plan. Beginning in phase 3 (2017) of the MCAP, the County will commence planning for the post 2020 period.[21]

[21] Monterey County, 2013

San Luis Obispo County General Plan

SLOCAPCD has adopted a set of GHG significance thresholds to ensure that new land use development is consistent with County GHG reduction goals. According to these thresholds, non-stationary sources shall be determined insignificant and consistent with AB 32 when they are in compliance with either a Qualified Greenhouse Gas Reduction Strategy or with the Bright-Line or Efficiency Threshold. The Bright-Line threshold of 1,150 Megatons of CO_2 emitted per year attempts to include all projects for which emissions would be less than "cumulatively considerable" to global climate change. The Efficiency Threshold includes all projects for which GHG emissions are below 4.9 megatons of CO_2 emitted per service population per year. For this analysis, construction emissions shall be amortized over the life of a project and added to the operational emissions.[22]

[22] Air Pollution Control District: San Luis Obispo County, 2012b.

Table 3.2-2 Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS[b]	NAAQS[a]		North Central Coast Air Basin†		San Luis Obispo County‡	
			Primary	Secondary	State Standards	National Standards	State Standards	National Standards
Ozone (O_3)	1-hour	0.09 ppm[c]	--	--	Nonattainment	Attainment/ Unclassified[d]	Nonattainment	Attainment
	8-hour	0.070 ppm	0.075 ppm	0.075 ppm				
Carbon Monoxide (CO)	1-hour	20 ppm	35 ppm	--	Attainment	Attainment/ Unclassified	Attainment	Unclassified
	8-hour	9 ppm	9 ppm	--				
Nitrogen Dioxide (NO_2)	1-hour	0.18 ppm	0.1 ppm**	--	Attainment	Attainment/ Unclassified[e]	Attainment	Unclassified
	Annual***	0.030 ppm	0.053 ppm	0.053 ppm				
Sulfur Dioxide (SO_2)	1-hour	0.25 ppm	0.075 ppm****	--	Attainment	Attainment[f]	Attainment	Unclassified
	3-hour	--	--	0.5 ppm				
	24-hour	0.04 ppm	--	--				
Inhalable Particulate Matter (PM_{10})	24-hour	50 µg/m^3 [c]	150 µg/m^3	150 µg/m^3	Nonattainment	Attainment	Nonattainment	Unclassified/ Attainment
	Annual***	20 µg/m^3	--	--				
Fine Particulate Matter ($PM_{2.5}$)	24-hour	--	35 µg/m^3 *	35 µg/m^3 **	Attainment	Attainment/ Unclassified[g]	Attainment	Unclassified/ Attainment
	Annual***	12 µg/m^3	12 µg/m^3	15 µg/m^3				
Sulfates	24-hour	25 µg/m^3	--	--	Attainment	No federal standard	Attainment	No federal standard
Lead (Pb)	30-day	1.5 µg/m^3	--	--	Attainment	Attainment/ Unclassified[h]	Attainment	No Attainment Information

Pollutant	Averaging Time	CAAQS[b]	NAAQS[a]		North Central Coast Air Basin†		San Luis Obispo County‡	
			Primary	Secondary	State Standards	National Standards	State Standards	National Standards
	Rolling 3 month average	--	0.15 µg/m^3	0.15 µg/m^3	--	Attainment	--	Attainment

Notes:

[a] The National Ambient Air Quality Standards, other than O_3 and those based on annual averages, are not to be exceeded more than once a year. The O_3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

[b] The California Ambient Air Quality Standards (CAAQS) for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, and $PM_{2.5}$ are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.

[c] ppm = parts per million by volume, µg/m^3 = micrograms per cubic meter

[d] On March 12, 2008, EPA adopted a new 8-hour ozone standard of 0.075 ppm. In April 2012, EPA designated the NCCAB attainment/unclassified based on 2009-2011 data, with a design value of 0.070 ppm.

[e] In 2011, EPA indicated it planned to designate the entire state as attainment/unclassified for the 2010 NO_2 standard. As of 2013, however, final designations have yet to be made by EPA.

[f] In June 2011, the ARB recommended to EPA that the entire state be designated as attainment for the 2010 primary SO_2 standard. Final designations have yet to be made by EPA.

[g] In 2006, EPA revised the 24-hour standard for $PM_{2.5}$ from 65 to 35 µg/m^3. In 2009, EPA designated the NCCAB as attainment/unclassified.

[h] On October 15, 2008 EPA substantially strengthened the national ambient air quality standard for lead by lowering the level of the primary standard from 1.5 µg/m^3 to 0.15 µg/m^3. Final designations were made by EPA in November 2011.

I CARB has identified vinyl chloride as a toxic air contaminant with no threshold level of exposure for adverse health effects yet determined.

* 98th percentile, averaged over 3 years

** Annual Arithmetic Mean

*** 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years

† North Central Coast Air Basin Attainment Status – January 2013 is based on 2009 to 2011 air monitoring data.

‡ San Luis Obispo County Attainment Status reflects the status as of October, 2012.

Sources: EPA, 2012; CARB, 2009; CARB, 2012

3.2.2 METHODS OF EVALUATION

Potential program-level impacts to air quality and greenhouse gas emissions were assessed using significance thresholds established by each of the two relevant air quality districts: each of which incorporate relevant NAAQS. The CEQA Guidelines air quality impact criteria contained in Appendix G were also consulted.

San Luis Obispo Air Pollution Control District (SLOAPCD) has established five categories of evaluation for determining the significance of a proposed project's impacts:

- Consistency with the most recent Clean Air Plan for San Luis Obispo County;
- Consistency with a plan for the reduction of greenhouse gas emissions that has been adopted by the jurisdiction in which the project is located and that, at a minimum, complies with State CEQA Guidelines Section 15183.5;
- Comparison of predicted ambient criteria pollutant concentrations resulting from the project to state and federal health standards, when applicable;
- Comparison of calculated project emissions to San Luis Obispo County APCD emission thresholds; and,
- The evaluation of special conditions that apply to certain projects.[23]

In Monterey, the MBUAPCD outlines similar criteria for determining a project's impact on air quality, in accordance with CEQA guidelines:

- Consistency with the applicable air quality plan;
- Consistency with any air quality standard and avoidance of contributing substantially to an existing or projected air quality violation;
- Avoids a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment;
- Avoids exposing sensitive receptors to substantial pollutant concentrations;
- Avoids the creation of objectionable odors that would affect a substantial number of people.[24]

[23] Air Pollution Control District: San Luis Obispo County, 2012a, p. 3-1

[24] Monterey Bay Unified Air Pollution Control District, 2008, p. 5-1

In accordance with the guidelines for each air district, a thorough emissions analysis would be performed during project-level evaluations to address both construction phase and operational phase impacts of the proposed improvements.

This section will also include a qualitative evaluation of the alternatives' consistency with SB 375. While primarily concerned with land use, a key intent of SB 375 was to help the applicable regional transportation plan comply with the Clean Air Act.

To the extent any of the proposed physical improvements are carried forward, such improvements would be subject to General Conformity review under the Clean Air Act. As stated in **Chapter 1.0, Purpose and Need,** and **Chapter 2.0, Alternatives,** there is considerable uncertainty as to whether some, all, or none of the physical improvements will be carried forward for further design, further environmental review, and eventual construction. Several components of the Build Alternative are highly conceptual in nature, like curve realignments; further design would be essential before any meaningful analysis could be completed. Therefore, a programmatic General Conformity determination at this Tier 1 level was deemed to be both impractical and infeasible. Additionally, as described in more detail below, implementation of the Build Alternative is expected to reduce VMT and associated emissions. Thus, it is not expected that the proposed improvements would result in the generation of air emissions that would exceed conformity threshold levels of pollutants for which the air basins are designated as nonattainment or maintenance areas.

3.2.3 AFFECTED ENVIRONMENT

The proposed project would be located within two air quality district jurisdictions: the MBUAPCD and the SLOAPCD. This analysis has been structured to estimate the potential impacts on the two air basins directly affected by the Build Alternative. The two associated air basins are the North Central Coast Air Basin and the South Central Coast Air Basins. **Table 3.2-2** above shows these air basins state and federal attainment statuses. State criteria pollutants are classified as in **attainment** (or unclassified) for the following pollutants:

- Carbon monoxide
- Nitrogen dioxide
- Sulfur dioxide
- Fine particulate matter ($PM_{2.5}$)
- Sulfates

- Lead
- Hydrogen sulfide

Both districts are in **nonattainment** for:

- ozone
- particulate matter (PM_{10}.)

Both air basins are considered in attainment (or unclassified) and below the federal thresholds for all of the criteria air pollutants.

Sensitive receptors are people that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include schools, parks and playgrounds, day care centers, nursing homes, hospitals, and residential dwelling units. The location of sensitive receptors is used to assess the impacts of project-related emissions on public health.[25] The project corridor traverses primarily agricultural lands between Salinas and San Luis Obispo. There is some concentration of sensitive receptors where the railway travels through urban areas, which include existing and proposed station areas.

3.2.4 ENVIRONMENTAL CONSEQUENCES

No Build Alternative

Without the proposed passenger service enhancement contemplated as part of the Build Alternative, passenger rail operations between Salinas and San Luis Obispo would not change. Coast Starlight service would continue through the corridor. Amtrak service to Southern California would continue to originate/terminate in San Luis Obispo. Options for passenger travel along the corridor would remain limited to automobiles and bus. Therefore, potential emissions reductions associated with improved passenger rail service would not be realized, and there would be little or no change in air pollutant/ greenhouse gas emissions related to passenger rail service in the Corridor.

As set forth in Chapter 9 of the SDP, freight rail operations in the Corridor are projected to increase. As of 2013, 2 daily long-haul freight trains travel between Salinas and San Luis Obispo. By the year 2020, the SDP projects that a total of 4

[25] Air Pollution Control District: San Luis Obispo County, 2012a

daily long-haul freight trains would travel along the Corridor. Accordingly, air pollutant and greenhouse gas emissions originating from freight rail sources would likely increase by up to 100 percent over existing conditions unless new freight rail service includes newer, less polluting locomotive technology.

The No Build Alternative also assumes the installation of PTC along the corridor. Neither the construction nor the operation of PTC would generate substantial emissions, as most PTC equipment would be based inside trains. The operation of such equipment would not be expected to substantially alter emissions of air pollutants or greenhouse gases from existing levels.

Build Alternative

Rail Operations

The Coast Corridor SDP includes a preliminary, high-level calculation of potential air quality effects for the set of improvements proposed for the entirety of the system (Los Angeles to San Francisco) based on system-wide ridership projections, and other rail uses (including freight). The SDP projects state rail ridership by region using the Amtrak/California Intercity Passenger Rail Forecasting Model,[26] and uses both the FHWA's Freight Analysis Framework database and the Surface Transportation Board's Confidential Carload Waybill Sample to predict future freight flow.

According to this preliminary assessment, the Build Alternative presents some small potential reductions in emissions of air pollutants and greenhouse gases. These reductions would be achieved through the implementation of Coast Daylight rail service and its related potential to attract passengers from other travel modes (especially automobile and airplane). The SDP projects that the Coast Daylight service would generate about 100,000 annual person trips by the year 2020. This averages to about 300 trips per day and translates in projected reduction about 11,000 daily VMT for the Central Coast/Monterey Bay region as a whole. The projected expansion of Coast Daylight service by the year 2040 would further reduce VMT in the Central Coast/Monterey Bay region by an additional 15,000 daily miles (26,000 daily miles total). These VMT reductions comprise relatively small amounts of total regional VMT and are thus expected to translate to small reductions in criteria pollutants - well below 1 percent of each of the criteria

[26] The Amtrak/Caltrans Model is based on extensive market and traveler behavior research throughout California (and nationwide), historical rail ridership and revenue data and trends, and demographic data.

pollutants generated in the Central Coast/Monterey Bay region.[27] Moreover, it should be noted that passenger rail has considerably lower greenhouse gas emissions per passenger mile than other modes, including aircraft, passenger cars and light-duty trucks.[28]

There is potential for some relatively small increases in emissions resulting from increased vehicles trips to and from the new stations proposed in Soledad and King City. However, the Soledad Specific Plan proposes substantial public transit improvements, including additional local bus services connecting residential and commercial areas. Improved pedestrian and bicycle access is also planned within the city.[29] The station design in King City includes parking for Amtrak Thru-Way buses, Greyhound buses, and bus pull-outs for two fixed route bus services.[30] These new activities in the station areas could result in increased emissions levels above existing conditions at the immediate station areas. However, these transit-related improvements and activities would ultimately contribute to emissions reductions on a more regional basis to the extent the improvements were associated with trips diverted from automobile to bus or train.

Physical Improvements

Construction-Period Effects

Emissions would be expected to result from the use of heavy machinery during construction. Additional temporary emissions, potentially including criteria pollutants like particulate matter, would result from idling or slowed locomotives due to any construction-related interruptions to existing rail operations.

Emissions generated from common construction activities include:

- Exhaust emissions of PM, NO_x, and other GHGs from fuel combustion for mobile heavy-duty diesel- and gasoline-powered equipment, portable auxiliary equipment, material delivery trucks, and worker commute trips.
- Fugitive PM dust from soil disturbance and demolition activity.
- Evaporative emissions of ROG or VOC from paving activity and the application of architectural coatings.[31]

[27] Caltrans Division of Rail, 2013b, pp. 13-4 – 13-7

[28] Caltrans Division of Rail, 2013a, p. 26, exhibits 2.9 and 2.10

[29] City of Soledad, 2012b

[30] City of King, 2013

[31] Sacramento Metropolitan Air Quality Management District, 2014

Construction activity related to signal upgrades would be expected to result in minor emissions because substantial use of heavy equipment would not be necessary to install signals. Air pollutant emission would primarily be associated with delivery of construction materials. Track upgrade construction would involve replacement of existing rail (wooden rail ties, etc.) with continuous welded rail (CWR), track structure realignment, track resurfacing, tie replacement, rehabilitation of existing sidings, and replacement of existing turnouts, as well as installation of powered switches at selected locations. Construction of curve/track realignments, new siding/siding extensions, the new second mainline, and new stations would result in emissions due to fuel use for heavy construction machinery. Additional temporary emissions would result from idling or slowed locomotives due to any construction-related interruptions to existing rail operations.

Operational Effects

Upgrading existing tracks (including replacing wooden rail ties with steel ties) would reduce friction and vibration. Improved stabilization would also require less frequent maintenance of the railway infrastructure. Less frequent maintenance would reduce emissions associated with maintenance vehicle trips and idling, as well as maintenance equipment use. The increase in efficiency associated with track upgrades would reduce the severity of localized carbon monoxide and particulate matter emissions, as well as other pollutants.

New powered switches and centralized traffic control (CTC) signals would improve the efficiency of train travel and result in better control of the railroad tracks. These features could be expected to reduce the amount of time trains spend waiting for dispatching instructions, improve train safety, and improve the overall reliability of service.[32] These improvements may enable traffic control to safely manage denser rail use and emissions would also be reduced as a result of less time idling.

Since the curve realignments are designed to improve operating efficiencies by reducing the need for deceleration and acceleration around existing curves, the proposed improvements may affect emissions. Currently, trains must slow down on the approach to a curve, and then speed back up following the curve. The proposed realignments would improve train operations by reducing these inefficiencies, thereby incrementally reducing air pollutant emissions associated with getting back up to speed. There may thus be additional emissions reductions associated with

[32] Caltrans Division of Rail, 2013b, pp. 9-4

improved fuel economy. As exact curve realignments are yet to be developed, no specific quantification of emissions reductions is possible as part of this program-level analysis.

Siding extensions and new sidings would be expected to increase train efficiency and reduce the overall time that passenger trains idle in sidings. This would be expected to result in a slight decrease in emissions. The proposed siding improvements are meant to serve longer freight trains, allowing passenger trains to pass by more efficiently. Since passenger trains currently idle in short sidings while (much longer) freight trains pass, the expected idling time for freight trains while (comparatively shorter) passenger trains is expected to represent an overall decrease in idling time. The decrease in idling time would be expected to reduce overall air pollutant emissions for trains on the rail.

A new second mainline would allow for increased speeds through the Santa Margarita/Cuesta Grade area, where track curvature and grades contribute to low average speeds through this portion of the railroad. Enhanced train movement with less dwelling would lead to an overall decrease in air pollutant emissions.

Implementation of new train stations would require new stops along the Coast Corridor route, and could be expected to increase emissions associated with deceleration, acceleration, and added idling at each station.

In terms of potential indirect effects, it should be noted that improved train service could result in an increase in ridership numbers. The increase in service, and corresponding increase in ridership, could be expected to decrease passenger travel by personal vehicle or bus, as well as freight transport by auto, truck or bus. These changes would collectively result in an overall decrease in air pollutant emissions. Potential emissions could be offset by implementation of the improvements, corresponding increase in ridership, and subsequent reduction in emissions.

3.2.5 AVOIDANCE, MINIMIZATION, AND MITIGATION STRATEGIES

It can be expected that improvements in air pollution controls for locomotives will result in continued reductions of pollutant emissions per mile of locomotive travel if freight and passenger locomotives utilize newer, higher-tech equipment. Over time, these new technologies and locomotive emission standards, paired with the mitigation measures outlined below, could contribute to an overall decrease in air pollutant emissions as a result of the Build Alternative. The timeline for implementation of these new technologies and emission standards is not certain, however, mitigation measures must be identified to address near-term solutions to

the potential impacts, particularly those related to the construction of some or all of the proposed physical improvements of the Build Alternative.

The Build Alternative will be designed to reduce air quality and GHG impacts along the Corridor. The following strategies have been identified at this preliminary stage to avoid, minimize, and/or mitigate any potentially significant impacts.

Construction-Period Strategies

During project implementation, all strategies should be evaluated to determine their appropriateness and effectiveness at reducing regional and localize criteria pollutant emissions.

Strategies that should be considered during construction could include:

MIN-AQ-1. Apply water suppression at least twice a day to all active construction areas to minimize dust.

MIN-AQ-2. Tarp all trucks hauling soil, sand, and other loose materials or require that all trucks maintain at least two feet of freeboard.

MIN-AQ-3. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.

MIN-AQ-4. Use water sweepers to sweep all paved access roads, parking areas and staging areas at construction sites daily.

MIN-AQ-5. Use water sweepers to sweep all streets daily if visible soil material is carried onto adjacent public streets.

MIN-AQ-6. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).

MIN-AQ-7. Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.).

MIN-AQ-8. Limit traffic speeds on unpaved roads to 15 miles per hour.

MIN-AQ-9. Introduce appropriate erosion control measures to reduce silt runoff to public roadways.

MIN-AQ-10. Replant vegetation as quickly as possible to minimize erosion in disturbed areas.

MIN-AQ-11. Use alternative fuels for construction equipment when feasible.

MIN-AQ-12. Minimize equipment idling time.

MIN-AQ-13. Maintain properly tuned equipment.

Operational Strategies

Strategies that should be considered during the operational phase of projects include:

MIN-AQ-14. Require filters for diesel particulate on locomotives.

MIN-AQ-15. Require liquefied natural gas for engines.

MIN-AQ-16. Reduce idling time to reduce DPM and other emissions.

MIN-AQ-17. Where possible, install anti-idling devices on all locomotives. These devices automatically shut-off the main diesel internal combustion engine that is used for locomotive motive power after a set amount of time when specified parameters (e.g., engine water temperature, ambient temperature, battery charge, railcar brake pressure, etc.) are at acceptable levels. The device can automatically restart the engine when parameters are determined to no longer be at acceptable levels. These can reduce emissions at sidings and while trains dwell at stations.

MIN-AQ-18. Retrofit head-end power sources (HEPs) in passenger locomotives with after-treatment technologies to reduce emissions.

MIN-AQ-19. Use a combination of lean-NO_x catalyst and diesel particulate filter.

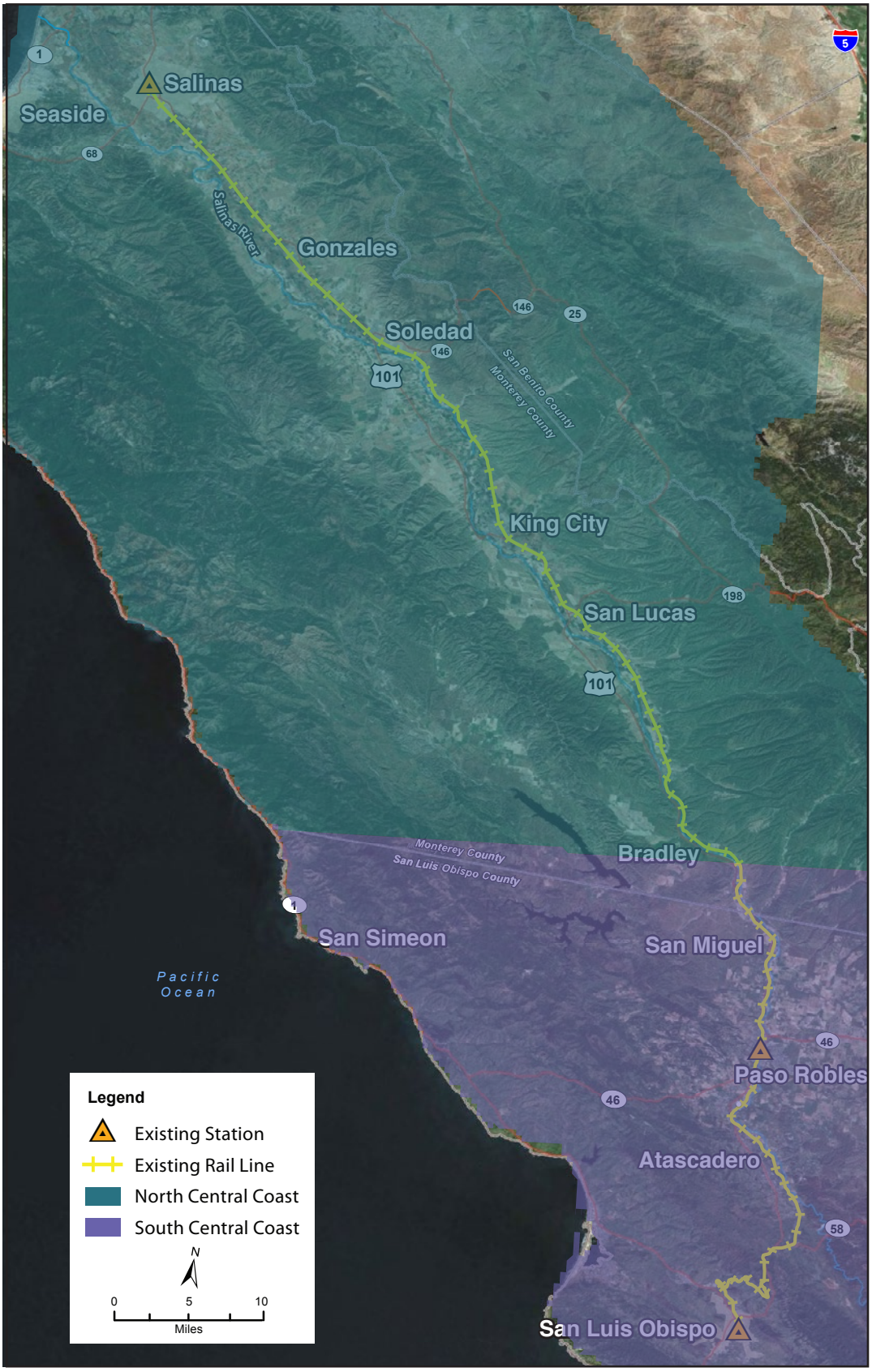
MIN-AQ-20. Design stations and associated ingress/egress to provide efficient vehicle movements, to reduce idling time and congestion.

3.2.6 SUBSEQUENT ANALYSIS

As specific program elements are implemented, more detailed air quality analysis may be appropriate in order to fully determine potential impacts. This analysis could include the following:

- Hotspots can form, particularly around existing and new stations, as a result of changes in train service. Local traffic counts can help identify these potential hotspots near access roads to any new station location.
- Potential sensitive receptors for air toxics must be identified for any new air quality conditions. A risk assessment of the potential impacts to health will be performed in consultation with appropriate regulatory agencies.

Additional evaluation of potential construction impacts may also be warranted to quantify the emissions associated with construction vehicle traffic, excavation, worker trips, and other related construction activities. A construction-period monitoring program may also be appropriate.



Regional Air Basins

Figure 3.2-1

Source: EPA, 2010

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