2. Affected Environment

2.1 Baseline Data Collection Methodology

The background air quality conditions were determined through a review of criteria pollutant attainment/nonattainment designation data and ambient criteria pollutant concentration data sources that included, but were not limited to, the following:

- U.S. EPA Greenbook data
- State of California, Air Resources Board data
- South Coast Air Quality Management District data
- Proponent's Environmental Assessment

Data obtained will include the latest available existing data from the above sources.

The affected jurisdictions include the Kern County Air Pollution Control District (KCAPCD), the Antelope Valley Air Quality Management District (AVAQMD), and the South Coast Air Quality Management District (SCAQMD). Additionally, the Project route covers two separate air basins, the Mojave Desert Air Basin (MDAB) and South Coast Air Basin (SoCAB) which are separated by the border of the SCAQMD and AVAQMD in the Project area. The Project also traverses through the Angeles National Forest (ANF) and the United States Army Corps of Engineers (USACE) land. Figure 2-1 and Figure 2-2, located at the end of this section, show the location of the proposed Project and Project alternatives along with the local air quality jurisdiction, national forest borders, and USACE land borders. CEQA guidelines and rules and regulations from these local jurisdictions have been reviewed and included as applicable for this Project.

2.2 Regional Setting

The regional setting is the same for the proposed Project and all Project alternatives as all of the alternatives are variations of the proposed Project without significant differences in location or context from an air quality setting perspective. Therefore, the regional setting is provided once for the proposed Project and alternatives.

Meteorological Conditions

The climate of northwestern Los Angeles County and southeastern Kern County is characterized by hot, dry summers and mild to cold winters with seasonally heavy precipitation that occur primarily during the winter months. Summer typically has clear skies, high temperatures, and low humidity. Monthly climate summaries for Mojave, Lancaster, and El Monte, California, locations within each local jurisdiction traversed by the Project route, were selected to characterize the climate of the study area. As described in Table 2-1, average summer (June-August) high and low temperatures in the study area range from 96°F to 50°F, respectively. Average winter (December-March) high and low temperatures in the study area range from 71°F to 34°F. The average annual precipitation of Mojave, Lancaster, and El Monte, California, ranges roughly from 6.6 inches to 18.6 inches with over 70 percent occurring between December and March. Little precipitation occurs during summer because a high-pressure cell blocks migrating storm systems over the eastern Pacific. The Project areas at higher altitudes in the Angeles National Forest (ANF) may have temperatures and precipitation that vary somewhat from that experienced in Mojave, Lancaster, and El Monte.

Table 2-1. Monthly Average Temperatures and Precipitation									
Month	Mojave			Lancaster			El Monte		
	Temperature, °F		Precipitation Inches	Temperature, °F		Precipitation Inches	Temperature, °F		Precipitation Inches
	Max	Min		Max	Min		Max	Min	
January	58	34	1.34	57	31	1.60	70	56	4.07
February	62	37	1.51	61	35	1.62	71	45	4.66
March	66	41	1.13	65	39	1.44	72	47	3.76
April	72	46	0.22	71	45	0.32	77	50	1.01
May	81	54	0.15	79	53	0.12	79	55	0.41
June	91	62	0.05	89	60	0.05	84	59	0.16
July	97	67	0.16	95	66	0.10	89	62	0.03
August	96	66	0.27	95	64	0.14	90	63	0.10
September	90	59	0.28	88	57	0.20	88	61	0.44
October	79	49	0.28	78	46	0.30	83	55	0.57
November	66	39	0.43	65	35	0.50	76	46	1.29
December	58	33	0.81	57	29	1.01	71	42	2.06

Source: The Weather Channel 2008.
Note: Averaged over a minimum period of 30 years.

The northern end of the Project would be located in the Antelope Valley south and east of the Tehachapi Mountains within the Mojave Desert Air Basin (MDAB). The Project route travels in a general north to south direction crossing through the Antelope Valley, splitting into two routes, south through the Angeles National Forest (ANF), and continuing south through both East and West San Gabriel Valley converging into the Los Angeles Plain in Monterey Park. From Monterey Park the Project continues east to Southeastern Ontario.

The Clean Air Act identifies some wildernesses, Class I Areas, for special protection from long term air pollution emitted by stationary sources. This project is in fact being proposed to reduce dependence on stationary sources like conventional power plants. But it is also know that air pollutants emitted by this project, like nitric oxides, ozone and fugitive dust have impacts on visibility and the aquatic and terrestrial ecosystem of these wildernesses. There is only one wilderness area within 10 kilometers of the transmission route (San Gabriel Wilderness) and twenty-six wilderness areas within 100 kilometers of the transmission route. Table 2-2 provides a list of the wilderness areas and their closest distance to the project. Eight of these wilderness areas are also designated as federal Class 1 Areas. The nearest Class I Federal Lands area to the Project is the San Gabriel Wilderness. The route for Segment 6 of the Project comes to within one-tenth of a mile from the western border of the San Gabriel Wilderness. The next closest Class I Area is the Pleasant View Ridge Wilderness which is approximately 4 miles away from Segment 6.

Table 2-2. Wilderness Areas, Jurisdiction, and Nearest Project Element		
FS Wilderness Areas	Distance to Project (km)	Nearest Project Element
Aqua Tibia*	78.2	Mira Loma Substation
Bighorn Mountain	78.2	Mira Loma Substation
Chumash	57.6	Segment 4
Cucamonga*	21.8	Segment 8B
Dick Smith	86.5	Segment 4
Domeland*	74.2	Segment 10
Kiavah	59.6	Segment 10
Magic Mountain	11.8	Segment 11
Matilija	87.4	Segment 4
Pleasant View Ridge	7.0	Segment 6

Table 2-2. Wilderness Areas, Jurisdiction, and Nearest Project Element

FS Wilderness Areas	Distance to Project (km)	Nearest Project Element
San Gabriel*	0.04	Segment 6
San Gorgonio*	55.8	Mira Loma Substation
San Jacinto*	74.1	Mira Loma Substation
San Mateo Canyon	44.0	Mira Loma Substation
Sespe	38.3	Segment 4
Sheep Mountain	17.3	Segment 6
BLM Wilderness Areas		
Bighorn Mountain	82.9	Mira Loma Substation
Black Mountain	93.5	Segment 10
Bright Star	47.9	Segment 10
Chimney Peak	88.0	Segment 10
Domeland*	72.4	Segment 10
El Paso Mountains	57.8	Segment 10
Golden Valley	75.3	Segment 10
Grass Valley	84.6	Segment 10
Kiavah	56.5	Segment 10
Owens Peak	71.2	Segment 10
Sacatar Trail	94.3	Segment 10
San Gorgonio*	77.7	Mira Loma Substation

* Class 1 Federal Lands

Existing Air Quality

The United States Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and the local air districts classify an area as attainment, unclassified, or nonattainment depending on whether or not the monitored ambient air quality data shows compliance, insufficient data available, or non-compliance with the ambient air quality standards, respectively. The National and California Ambient Air Quality Standards (NAAQS and CAAQS) relevant to the Project are provided in Table 2-3.

Table 2-3. National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards	Health Effects
Ozone (O_3)	1-hour	0.09 ppm	—	Breathing difficulties, lung tissue damage
	8-hour	0.070 ppm	0.075 ppm	
Respirable particulate matter (PM_{10})	24-hour	50 μg/m^3	150 μg/m^3	Increased respiratory disease, lung damage, cancer, premature death
	Annual mean	20 μg/m^3	—	
Fine particulate matter ($PM_{2.5}$)	24-hour	—	35 μg/m^3	Increased respiratory disease, lung damage, cancer, premature death
	Annual mean	12 μg/m^3	15 μg/m^3	
Carbon monoxide (CO)	1-hour	20 ppm	35 pm	Chest pain in heart patients, headaches, reduced mental alertness
	8-hour	9.0 ppm	9.0 ppm	
Nitrogen dioxide (NO_2)	1-hour	0.18 ppm	—	Lung irritation and damage
	Annual mean	0.030 ppm	0.053 ppm	
Sulfur dioxide (SO_2)	1-hour	0.25 ppm	—	Increases lung disease and breathing problems for asthmatics
	24-hour	0.04 ppm	0.14 ppm	
	Annual mean	—	0.03 ppm	

Notes: ppm=parts per million; μg/m^3= micrograms per cubic meter; "—" = no standard
Source: CARB 2008, CARB 2009d.

The ambient air quality standards shown in Table 2-3 are health-based standards established by the ARB and U.S.EPA. The AAQS are set at levels to adequately protect the health of all members of the public, including those most sensitive to adverse air quality impacts such as the aged, people with existing illnesses, children, and infants, including a margin of safety.

The TRTP project will have a relatively large amount of construction emissions that will be spread out over a very long project route, but will not have a large amount of emissions at any given location or emissions of long-term duration at any given location, such as a new stationary industrial facility. In general, TRTP can be characterized as having the potential for very short-term impacts at any given location, and so will not create or significantly contribute to any of the chronic lung disease health conditions noted in Table 2-3. The same conclusion can be made for any other chronic health impacts, such as carcinogenic impacts from diesel particulate matter (DPM) emissions.

The proposed Project area would be located within the MDAB, which is under the jurisdiction of the Kern County Air Pollution Control District KCAPCD, the Antelope Valley Air Quality Management District (AVAQMD), and the South Coast Air Basin (SoCAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Table 2-4 summarizes the federal and State attainment status of criteria pollutants for the Project area based on the NAAQS and CAAQS, respectively.

Table 2-4. Attainment Status for the Mojave Desert Air Basin and South Coast Air Basin

Pollutant	Attainment Status Mojave Desert Air Basin		Attainment Status South Coast Air Basin	
	Federal	State	Federal	State
Ozone – 1 Hr	N/A	Extreme and Moderate Nonattainment [1]	N/A	Extreme Nonattainment
Ozone – 8 Hr	Moderate[2] and Former Subpart 1 Nonattainment [3]		Severe-17 Nonattainment [4]	
CO	Attainment	Attainment	Attainment	Attainment
NO_2	Attainment	Attainment	Attainment	Attainment
SO_2	Attainment	Attainment	Attainment	Attainment
PM10	Attainment	Nonattainment	Serious Nonattainment	Nonattainment
PM2.5	Attainment	Attainment	Nonattainment	Nonattainment

Source: CARB 2009a, USEPA 2009
N/A – Not Applicable
1 - The Antelope Valley Air Quality Management District portion of the MDAB is classified as extreme nonattainment of the state ozone standard due to historical SoCAB designation while Kern County is designated as moderate nonattainment of the state ozone standards.
2 - Kern County is in the process of being re-classified to moderate nonattainment of the federal 8-hour state ozone standard.
3 – In its 8-hour ozone SIP submittal, the California Air Resource Board requested that EPA reclassify the AVAQMD portion of the MDAB as severe-17 nonattainment for 8-hour ozone; however, EPA has not rendered a decision on the request.
4 – In its 8-hour ozone SIP submittal, the California Air Resource Board requested that EPA reclassify the SoCAB as extreme nonattainment for 8-hour ozone; however, EPA has not rendered a decision on the request.

The Project site would be in southeastern Kern County, San Bernardino County, and Los Angeles County. Ozone, CO, NO_2, PM10, and PM2.5 concentrations are currently recorded at the Lancaster Pondera Street and Division Street monitoring stations, located approximately nine miles east of the Antelope Substation. Ozone, NO_2, PM10, and PM2.5 are currently recorded at the Mojave monitoring station, located in the western portion of the eastern county of the Mojave Desert Air Basin (MDAB) under the jurisdiction of the Kern County Air Pollution Control District (KCAPCD). SO_2 is currently recorded at the Trona and Riverside Rubidoux monitoring stations.

Exhibits 2-1 through 2-3 summarize the historical air quality data for the Project area collected at the nearest representative air quality monitoring stations in Mojave, Lancaster, and El Monte, respectively. Various monitoring stations in the area were used to compile data from 1997 to 2008 (11-year period). For ozone, nitrogen dioxide and PM10, the Mojave monitoring station was used (1997-2008). And for PM2.5, the Mojave monitoring station was used (1999-2008). The following monitoring stations that were used for ozone, carbon monoxide, nitrogen, and PM10 in the Lancaster area were Lancaster West Pondera Street (1997-2001) and Lancaster Division Street (2002-2008). And the following monitoring stations that were used for PM2.5 in the Lancaster area were Lancaster West Pondera Street (1999-2001) and Lancaster Division Street (2002-2004). And for sulfur dioxide, the Trona Athol & Telegraph monitoring station was used (1997-2008).

For ozone in the South Coast Air Basin area, the following monitoring stations were used due to insufficient data available: Glendora Laurel monitoring station was used (1997-2008). For carbon monoxide in the South Coast Air Basin area, the following monitoring stations were used: Pasadena South Wilson Avenue (1998, 2000-2002, 2004-2008), Pomona (1999, 2003), and Pico Rivera (1997). For nitrogen dioxide in the South Coast Air Basin area, the following monitoring stations were used: Pasadena South Wilson Avenue (1997-1998, 2000-2002, 2005-2008), Pomona (1999), and Pico Rivera (2003-2004). For PM10 in the South Coast Air Basin area, the following monitoring stations were used: Ontario Airport (1997), and Ontario 1408 Francis Street (1998-2008). For PM2.5 in the South Coast Air Basin area, the following monitoring stations were used: Ontario 1408 Francis Street (1999), and Azusa (2000-2008). And for sulfur dioxide, the Riverside Rubidoux monitoring station was used (1997-2008).

In Exhibits 2-1 through 2-3, the short term normalized concentrations are provided from 1997 to 2007. Normalized concentrations represent the ratio of the highest measured concentrations in a given year to the most-stringent currently applicable national or State ambient air quality standard. Therefore, normalized concentrations lower than one indicate that the measured concentrations were lower than the most-stringent ambient air quality standard and conversely normalized concentrations greater than one indicate that the measured concentrations were higher than the most-stringent ambient air quality standard and also gives an indication of the magnitude behavior above the standards being experienced in the Project area.

As shown in Exhibits 2-1 through 2-3, ambient air quality in the Project area is above the State 1-hour and 8-hour ozone standards, the State 24-hour PM10 standard and other SoCAB above the federal 24-hour PM 2.5 standard.

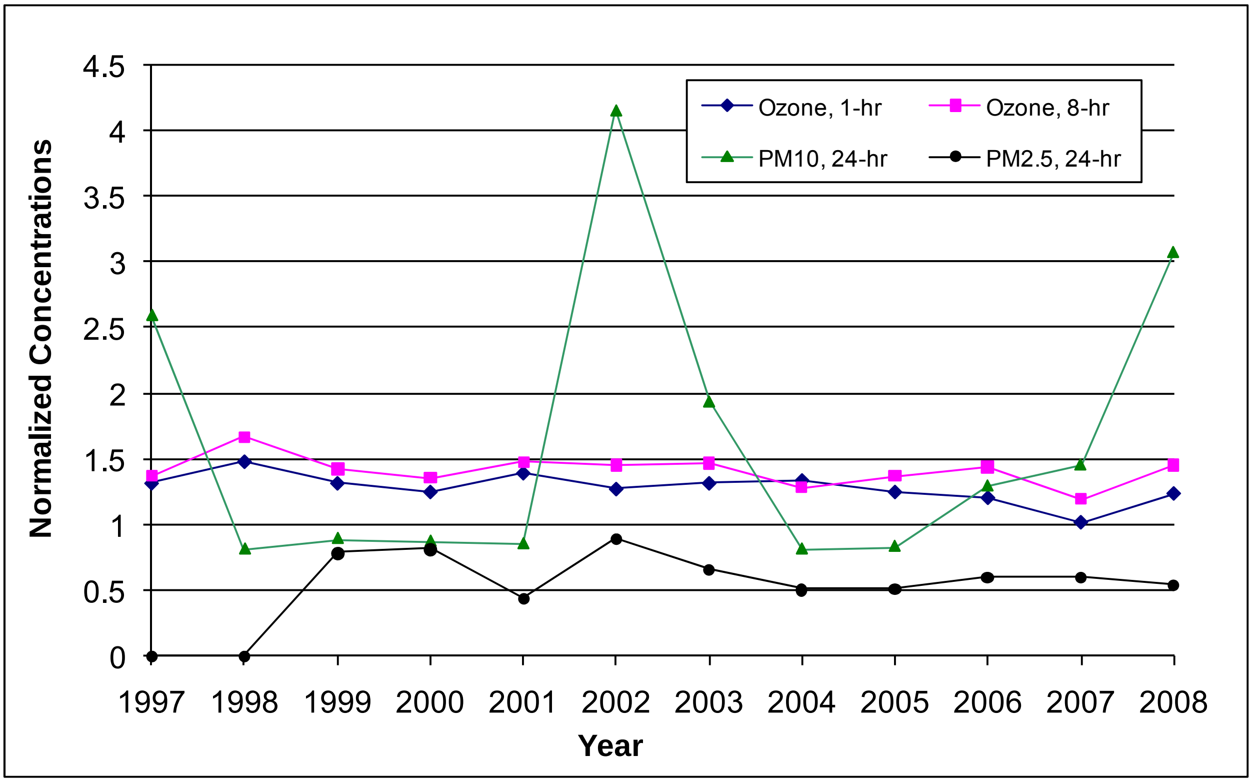
Ozone

In the presence of ultraviolet radiation, both NOx and VOCs go through a number of complex chemical reactions to form ozone. Table 2-5 summarizes the best representative ambient ozone data for the Project area collected over the past six to ten years from monitoring stations in Mojave, Lancaster and SoCAB. The table includes the maximum hourly concentration and the number of days above the National and State standards. As indicated in this table, ozone formation is generally higher in spring and summer and lower in the winter. The Kern County portion of MDAB is classified as moderate nonattainment for 1-hour ozone CAAQS, whereas the AVAQMD portion of the MDAB and the SoCAB are classified as extreme nonattainment areas, respectfully. The Kern County portion of the MDAB is currently classified as a former Subpart 1 nonattainment area and the AVAQMD portion of the MDAB is classified as a moderate nonattainment area for the 8-hour ozone NAAQS, whereas the SoCAB is classified as a severe-17 nonattainment area[2].

The year 1997 to 2007 trends for the maximum 1-hour and 8-hour ozone concentrations, referenced to the most stringent standard, and the number of days exceeding the California 1-hour standard and the Federal 8-hour standard for the Mojave, Lancaster, South Coast Air Basin areas are shown in Exhibit 2-4 and 2-5, respectively.

As shown in Exhibits 2-4 and 2-5, long-term trends in reduced emissions of ozone precursors have led to reduced ozone formation in the Project area through 1999. After 1999, ozone increased in the Project area although a downward trend between 2003 and 2004 is apparent. In general, ozone continues to be above the State 1-hour and federal 8-hour ozone standards.

Exhibit 2-1. Normalized Maximum Short-term Historical Air Pollutant Concentrations in Mojave 1997-2008

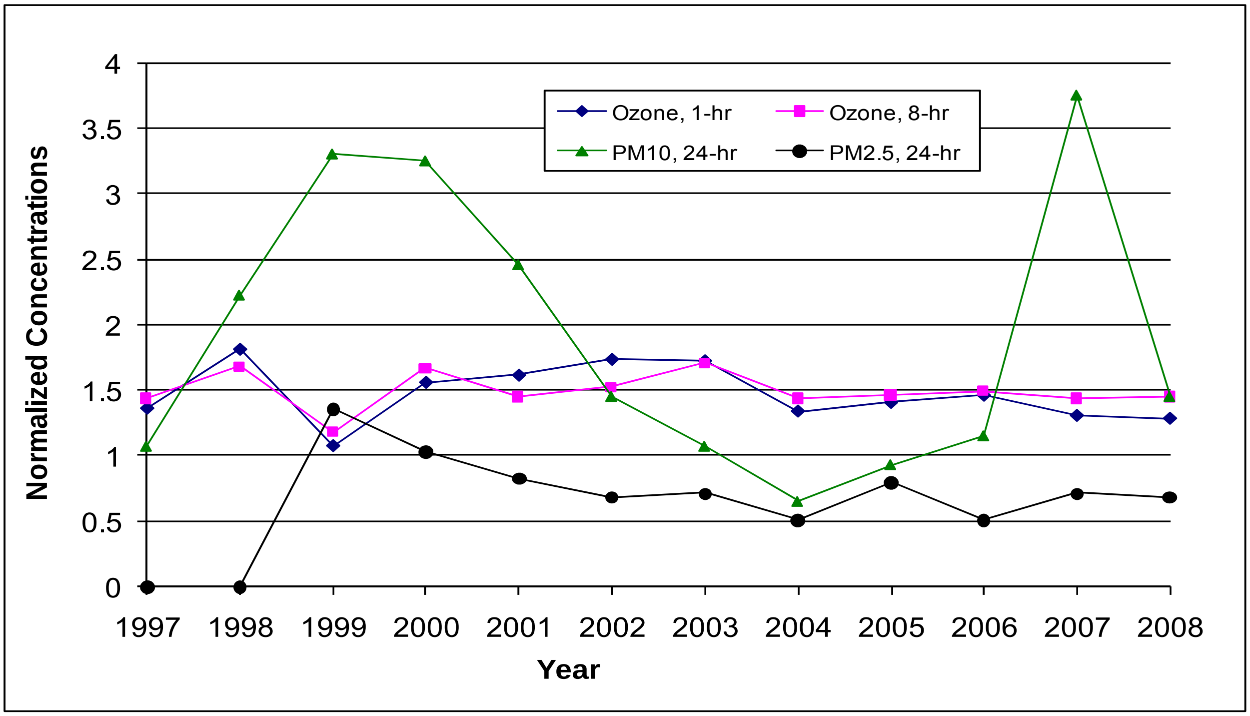


Source: CARB 2009b, CARB 2009c.

Note: A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. For example, in 1990 the highest 1-hour average ozone concentration measured at Lancaster Pondera Street was 0.150 ppm. Since the most stringent ambient air quality standard is the State standard of 0.09 ppm, the 1990 normalized concentration is 0.150/0.09 = 1.67.

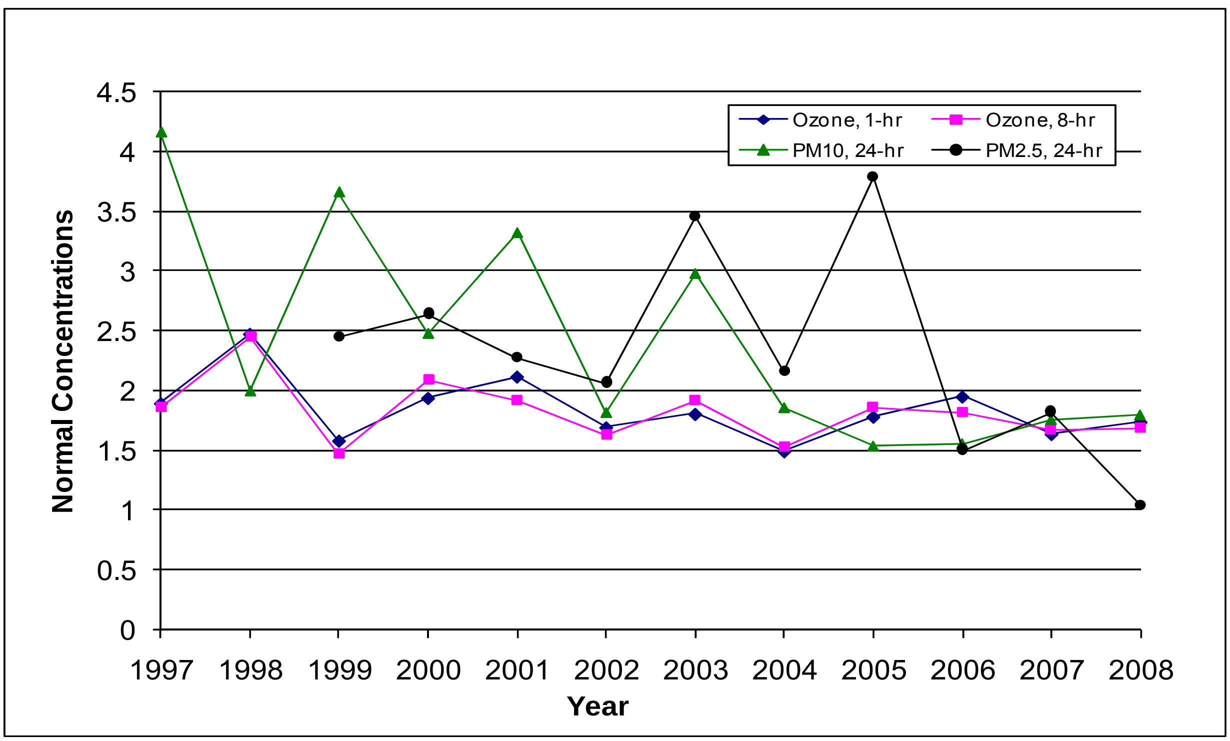
[2] Each of these jurisdictions/air basins are in the process of being redesignated. Eastern Kern County is in the process of being redesignated by USEPA to moderate nonattainment; while CARB in its latest SIP submittal is requesting to AVAQMD portion of the MDAB be redesignated to Severe-17 nonattainment and the SoCAB be redesignated to extreme nonattainment.

Exhibit 2-2. Normalized Maximum Short-term Historical Air Pollutant Concentrations in Lancaster 1997-2008



Source: CARB 2009b, CARB 2009c.

Exhibit 2-3. Normalized Maximum Short-term Historical Air Pollutant Concentrations in South Coast Air Basin 1997-2008



Source: CARB 2009b, CARB 2009c.

Table 2-5. Ozone Air Quality Summary 1997-2008

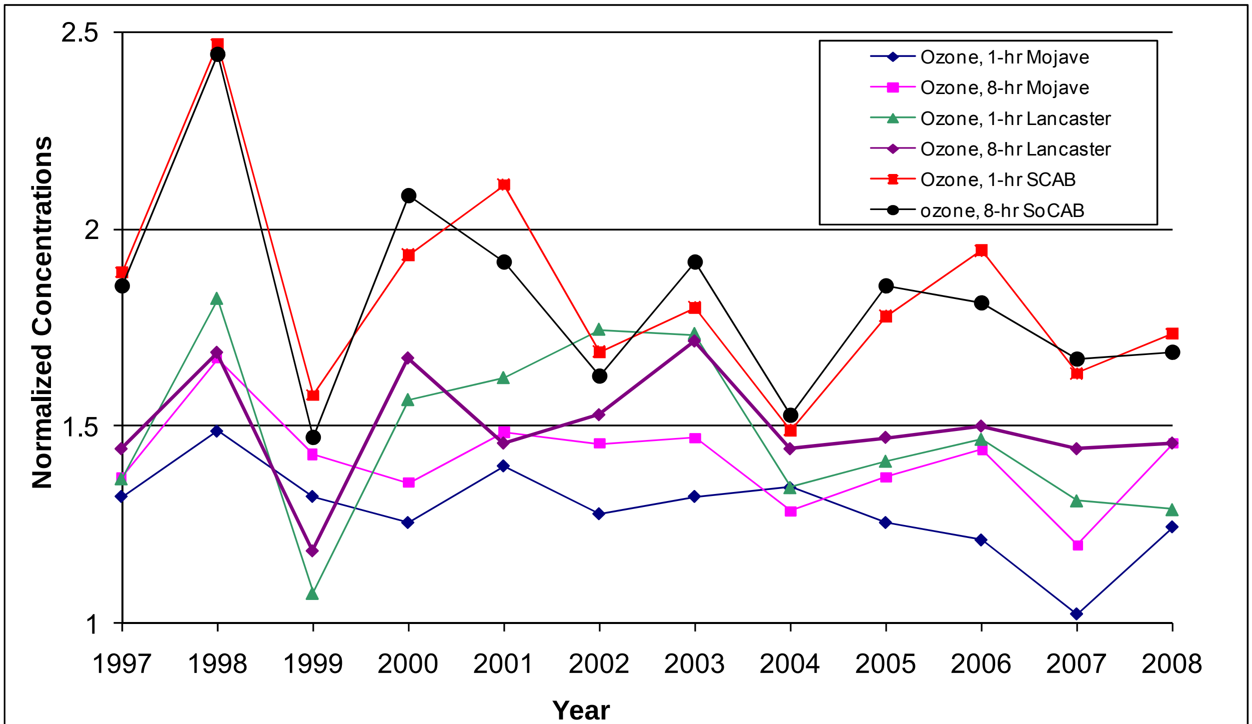
Year	Days Above NAAQS 1-Hr	Days Above CAAQS 1-Hr	Month of Max. 1-Hr Avg.	Max. 1-Hr Avg. (ppm)	Days Above NAAQS 8-Hr	Month of Max. 8-Hr Avg.	Max. 8-Hr Avg. (ppm)
	Mojave 923 - Poole Street						
1997	0	22	DEC	0.119	51	JUN	0.096
1998	2	43	JUL	0.134	71	JUL	0.117
1999	0	39	SEP	0.119	76	JUL	0.100
2000	0	25	JUL	0.113	58	JUL	0.095
2001	1	33	AUG	0.126	69	AUG	0.104
2002	0	18	JUL	0.115	61	JUL	0.102
2003	0	31	JUL	0.119	54	JUN	0.103
2004	0	8	SEP	0.121	21	JUN	0.090
2005	0	8	JUN	0.113	26	JUN	0.096
2006	0	10	JUN	0.109	27	JUN	0.101
2007	0	0	AUG	0.092	6	JUN	0.084
2008	0	51	JUL	0.112	41	JUL	0.102
	Lancaster – W Pondera Street						
1997	0	14	JUN	0.123	19	JUN	0.101
1998	8	24	JUL	0.164	36	JUL	0.118
1999	0	1	JUN	0.097	4	JUN	0.083
2000	2	35	JUL	0.141	59	JUL	0.117
2001	3	37	JUL	0.146	55	AUG	0.102
Lancaster – 43301 Division Street							
2001	0	0	NOV	0.052	0	NOV	0.044
2002	5	46	JUL	0.157	69	AUG	0.107
2003	4	50	JUL	0.156	64	JUL	0.120
2004	0	37	JUN	0.121	59	JUN	0.101
2005	1	42	AUG	0.127	60	JUL	0.103
2006	2	22	JUL	0.132	39	JUN	0.105
2007	0	16	AUG	0.118	42	JUN	0.101
2008	0	18	JUL	0.116	34	JUL	0.102
	South Coast Air Basin – Glendora -Laurel						
1997	18	67	JUL	0.170	45	JUL	0.130
1998	28	61	JUL	0.222	49	JUL	0.171
1999	3	25	JUL	0.142	19	AUG	0.103
2000	11	39	MAY	0.172	30	MAY	0.146
2001	13	61	AUG	0.190	49	JUN	0.134
2002	12	45	JUL	0.152	33	JUL	0.114
2003	22	61	SEP	0.162	58	JUL	0.134
2004	5	42	JUN	0.134	33	JUN	0.107
2005	8	31	MAY	0.160	27	MAY	0.130
2006	11	37	JUL	0.175	30	JUL	0.127
2007	3	25	SEP	0.147	26	JUL	0.117
2008	12	48	JUN	0.156	46	MAY	0.118

Source: CARB 2009c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.09 ppm
National Ambient Air Quality Standard (NAAQS): 1-hr, 0.12 ppm; 8-hr, 0.08 ppm

Carbon Monoxide (CO)

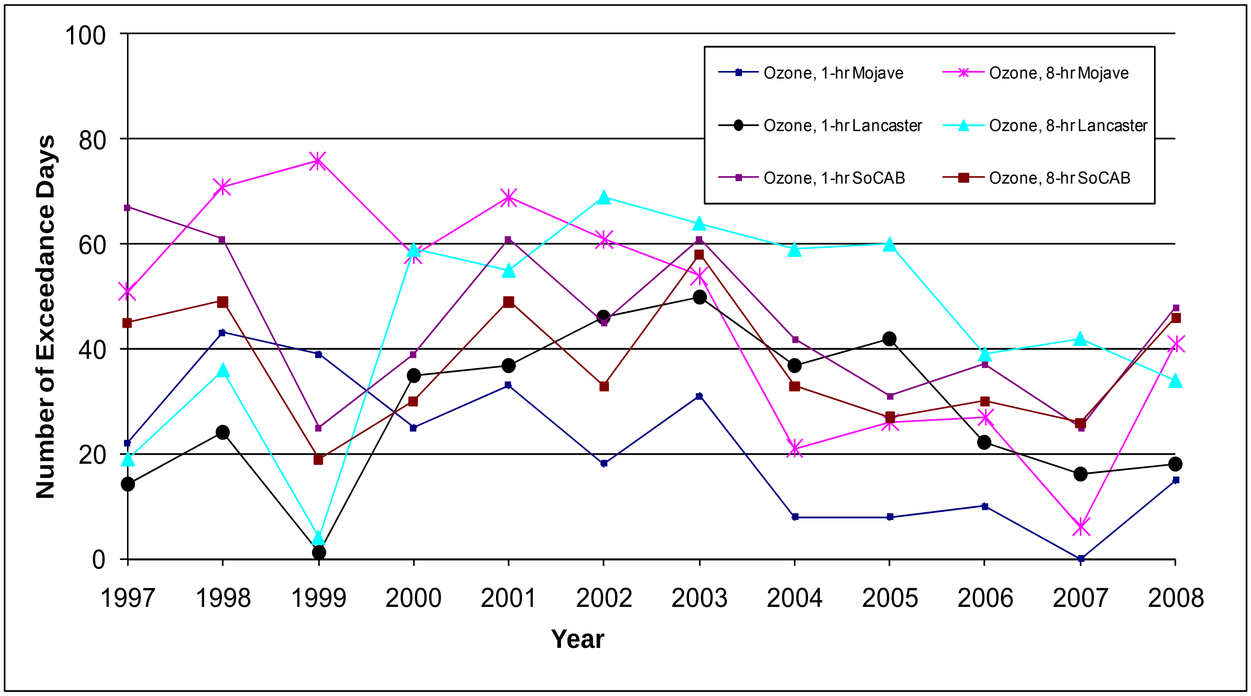
CO is generally found in high concentrations only near a significant source of emissions (i.e., freeway, busy intersection, etc.). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since mobile sources (motor vehicles) are the main cause of CO, ambient concentrations of CO are highly dependent on motor vehicle activity. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon. Carbon monoxide concentrations in Los Angeles County and the rest of the State have declined significantly due to two Statewide programs: (1) the 1992 wintertime oxygenated gasoline program, and (2) Phases I and II of the reformulated gasoline program. Additionally, overall vehicle fleet turnover from higher-emitting older engines to lower-emitting new engines is a significant factor in the declining CO levels.

Exhibit 2-4. Normalized Ozone Air Quality Maximum Concentrations 1997-2008



Source: CARB 2009b, CARB 2009c.
Note: A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for 1-hour ozone is the State standard of 0.09 ppm, and for 8-hr ozone is the national standard of 0.08 ppm.

Exhibit 2-5. Ozone – Number of Days Exceeding the CAAQS for 1-Hr and NAAQS for 8-Hr 1997-2008



Source: CARB 2009b, CARB 2009c.

Table 2-6 summarizes the best representative ambient carbon monoxide data for the Project area collected over the past ten years from Lancaster and South Coast Air Basin monitoring stations. The table includes the maximum 1-hour and 8-hour concentrations.

Table 2-6. Carbon Monoxide Air Quality Summary 1997-2008

Year	Maximum 1-Hr Avg. (ppm)	Month of Max. 8-Hr Avg.	Maximum 8-Hr Avg. (ppm)
Lancaster – W Pondera Street			
1997	5.9	DEC	3.99
1998	5.4	DEC	3.59
1999	7.2	JAN	5.41
2000	6.0	DEC	4.34
2001	6.1	JAN	3.33
Lancaster – 43301 Division Street			
2001	2.6	DEC	1.70
2002	3.4	SEP	2.24
2003	3.2	DEC	1.88
2004	2.9	JAN	1.72
2005	2.9	DEC	1.54
2006	3.2	DEC	1.60
2007	2.5	JAN	1.25
2008	---	NOV	1.04
South Coast Air Basin			
1997	9.2 [+]	NOV	6.10
1998	8.4 [*]	NOV	6.30
1999	10 [-]	JAN	6.46

Table 2-6. Carbon Monoxide Air Quality Summary 1997-2008			
Year	Maximum 1-Hr Avg. (ppm)	Month of Max. 8-Hr Avg.	Maximum 8-Hr Avg. (ppm)
2000	9.0 *	DEC	7.51
2001	6.6 *	JAN	5.10
2002	6.0 *	NOV	4.05
2003	5.8 -	OCT	4.38
2004	5.2 *	DEC	3.46
2005	4.3 *	JAN	2.83
2006	4.1 *	JAN	2.80
2007	3.3 *	NOV	2.28
2008	--- *	NOV	2.21

Source: CARB 2009b, CARB 2009c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 20; 8-hr, 9.0 ppm
National Ambient Air Quality Standard (NAAQS): 1-hr, 35 ppm; 8-hr, 9 ppm
* used Pasadena – S Wilson Avenue monitoring station
+ used Pico Rivera monitoring station
- used Pomona monitoring station

Much of the proposed Project site route area, or alternative route areas, would be expected to have lower CO levels than those presented in Table 2-6, as much of the route would be located in remote areas that would experience minimal or no nearby vehicle traffic, which is the major contributor to CO emissions. As indicated in the table, there have been no exceedances of CAAQS or NAAQS since at least 1997 for the 1-hour and the 8-hour CO standards in Lancaster or in the SoCAB monitoring stations most representative for the Project route. The Antelope Valley is designated as an attainment area for the carbon monoxide CAAQS and NAAQS. The SoCAB is designated as attainment of the carbon monoxide CAAQS and NAAQS, but was previously a serious federal CO that is still listed as a carbon monoxide maintenance area.

Nitrogen Dioxide (NO_2)

The majority of the NOx emitted from combustion sources is in the form of NO, while the balance is mainly NO_2. NO is oxidized by O_2 (oxygen) in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 generally occur during the fall and not in the winter, when atmospheric conditions favor the trapping of ground level releases of NO but lack significant radiation intensity (less sunlight) to oxidize NO to NO_2. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality standard. NO is also oxidized by O_3 to form NO_2. The formation of NO_2 in the summer with the help of the ozone occurs according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

In urban areas, the ozone concentration level is typically high. That level will drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in downwind rural areas (without sources of fresh NOx emissions) ozone concentrations can remain relatively high.

Table 2-7 summarizes the best representative ambient nitrogen dioxide data for the Project area collected over the past ten years from various monitoring stations. The table includes the maximum 1-hour and annual concentrations. As indicated in the table, there have been no exceedances of California Ambient Air Quality

Standards or National Ambient Air Quality Standards since at least 1997 for the 1-hour and the annual NO_2 standards. The MDAB is designated as either unclassified or in attainment for nitrogen dioxide. The SoCAB, as a former federal NO_2 nonattainment area, is designated as attainment and a maintenance area for the NO_2 NAAQS, and is currently designated as attainment of the NO_2 CAAQS.

Table 2-7. Nitrogen Dioxide Air Quality Summary 1997-2008

Year	Month of Max. 1-Hr Avg.	Maximum 1-Hr Avg. (ppm)	Maximum Annual Avg. (ppm)
Mojave – 923 Poole Street			
1997	DEC	0.075	0.010
1998	AUG	0.082	0.011
1999	SEP	0.083	0.010
2000	FEB	0.071	0.010
2001	SEP	0.071	0.010
2002	NOV	0.071	0.009
2003	FEB	0.073	0.009
2004	OCT	0.064	0.008
2005	APR	0.044	---
2006	---	---	---
2007	---	---	---
2008	---	---	---
Lancaster – W Pondera Street			
1997	OCT	0.071	0.014
1998	NOV	0.077	0.016
1999	NOV	0.083	0.018
2000	NOV	0.065	0.016
2001	OCT	0.075	---
Lancaster – 43301 Division Street			
2001	NOV	0.060	---
2002	JUN	0.101	0.016
2003	MAY	0.067	0.015
2004	AUG	0.103	0.015
2005	SEP	0.074	0.015
2006	JUN	0.066	0.015
2007	OCT	0.064	0.015
2008	NOV	0.062	0.013
South Coast Air Basin			
1997 -	NOV	0.171	0.034
1998 -	NOV	0.166	0.035
1999 *	NOV	0.162	0.051
2000 -	DEC	0.173	0.029
2001 -	OCT	0.149	0.034
2002 -	FEB	0.154	0.033
2003 +	OCT	0.142	0.035
2004 +	OCT	0.124	0.031
2005 -	NOV	0.104	0.024
2006	NOV	0.120	0.025
2007	NOV	0.092	0.024
2008	NOV	0.105	0.023

Source: CARB 2009c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.25 ppm
National Ambient Air Quality Standard (NAAQS): Annual, 0.053 ppm
* used Pomona monitoring station
+ used Pico Rivera monitoring station
- used Pasadena-S Wilson Avenue station

Respirable Particulate Matter (PM10)

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx, VOC, and ammonia, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates, because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

Table 2-8 summarizes the ambient particulate matter (PM10) data collected from various monitoring stations nearest the Project area. The table includes the maximum 24-hour and annual arithmetic average concentrations.

Table 2-8. Particulate Matter (PM 10) Air Quality Summary 1997-2008

Year	Days * Above Daily NAAQS	Days * Above Daily CAAQS	Month of Max. Daily Avg.	Max. Daily Avg. ($\mu g/m^3$)	State Annual Arithmetic Mean ($\mu g/m^3$)
Mojave – 923 Poole Street					
1997	0	6.1	AUG	130	18.4
1998	0	0	APR	41	15
1999	0	0	SEP	45	17.7
2000	0	0	OCT	44	---
2001	0	0	JUN	43	18.2
2002	6.6	6.6	OCT	208	21.4
2003	0	12.1	FEB	97	19.3
2004	0	0	SEP	41	18.3
2005	0	0	SEP	42	---
2006	0	13.1	SEP	65	19.5
2007	0	18	APR	73	---
2008	0	13.1	OCT	154	22.4
Lancaster – W Pondera Street					
1997	0	12	FEB	54	---
1998	0	12	DEC	80	---
1999	0	12.6	DEC	85	28.6
2000	---	---	MAR	162.9	---
2001	---	---	MAY	123.3	---
Lancaster – 43301 Division Street					
2001	---	---	NOV	50.1	---
2002	0	6.1	DEC	73	29.7
2003	0	6.1	OCT	57	23.2
2004	0	0	SEP	56	---
2005	0	0	JUL	53	---
2006	0	25.7	SEP	63	25.2
2007	6.5	18.3	APR	188	28.3
2008	0	6	APR	73	---
South Coast Air Basin					
1997 [+]	6	126	OCT	208	---
1998 [-]	0	12	DEC	100	---
1999 [-]	6	222	MAY	183	---
2000 [-]	0	156	NOV	124	---
2001 [-]	6	154	JAN	166	52.4
2002 [-]	0	138	SEP	91	---
2003 [-]	0	90	OCT	149	41.3
2004 [-]	0	84	MAR	93	---
2005 [-]	0	109	NOV	77	39.5
2006 [-]	0	82	FEB	78	40.9

Table 2-8. Particulate Matter (PM 10) Air Quality Summary 1997-2008

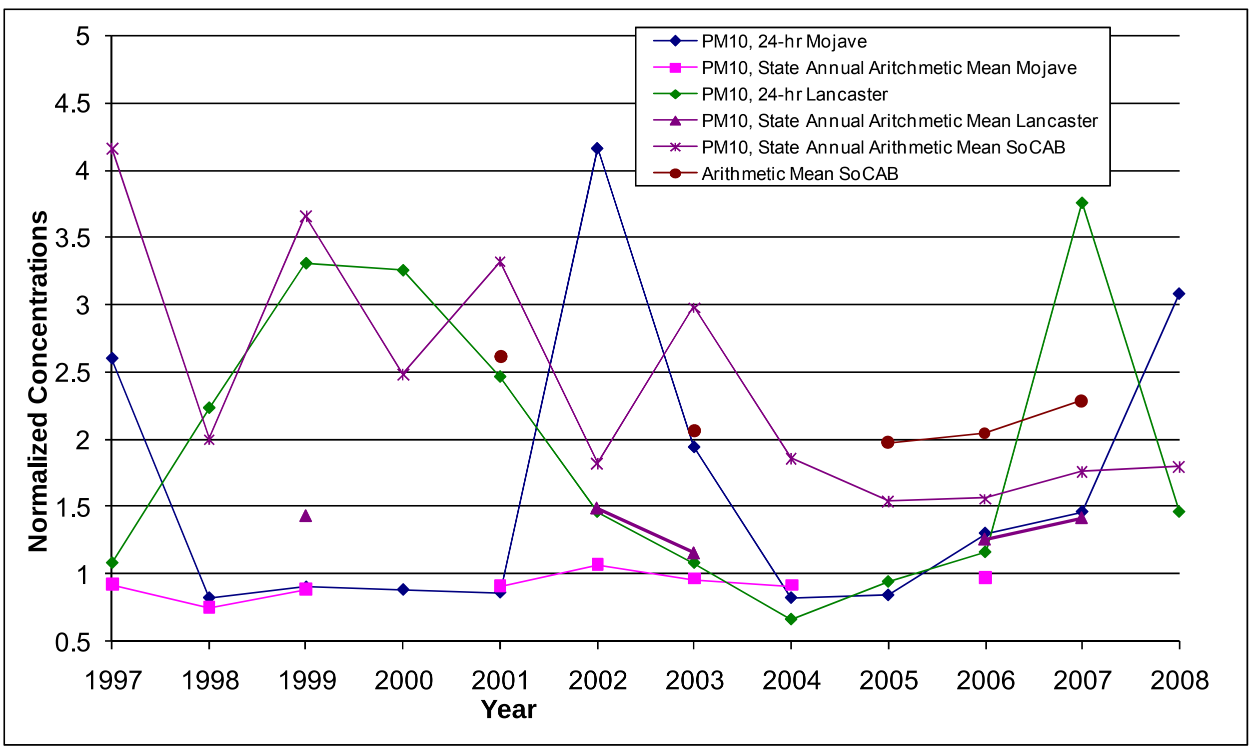
Year	Days * Above Daily NAAQS	Days * Above Daily CAAQS	Month of Max. Daily Avg.	Max. Daily Avg. (µg/m³)	State Annual Arithmetic Mean (µg/m³)
2007 -	6	75	NOV	88	45.7
2008 -	0	18	JUL	90	---

Source: CARB 2009c.
California Ambient Air Quality Standard (CAAQS): 24-hr, 50 µg/m3; annual arithmetic, 20 µg/m3
National Ambient Air Quality Standard (NAAQS): 24-hr, 150 µg/m3; annual arithmetic, 50 µg/m3
* Days above the State and national standard (calculated): Because PM10 is monitored approximately once every six days, the potential number of exceedance days is calculated by multiplying the actual number of days of exceedance by six.
+ used Ontario- Airport monitoring station (due to the insufficient (or no) data available to determine the value)
- used Ontario- 1408 Francis Street monitoring station

As shown in Table 2-8, the Project area experiences exceedances of the State and 24-hour PM10 standards and the State annual arithmetic mean PM10 standards. The western MDAB is unclassified for the federal PM10 standard and in nonattainment of the State PM10 standard, whereas the SoCAB is in serious nonattainment for the federal PM10 standard and in nonattainment of the State PM10 standard.

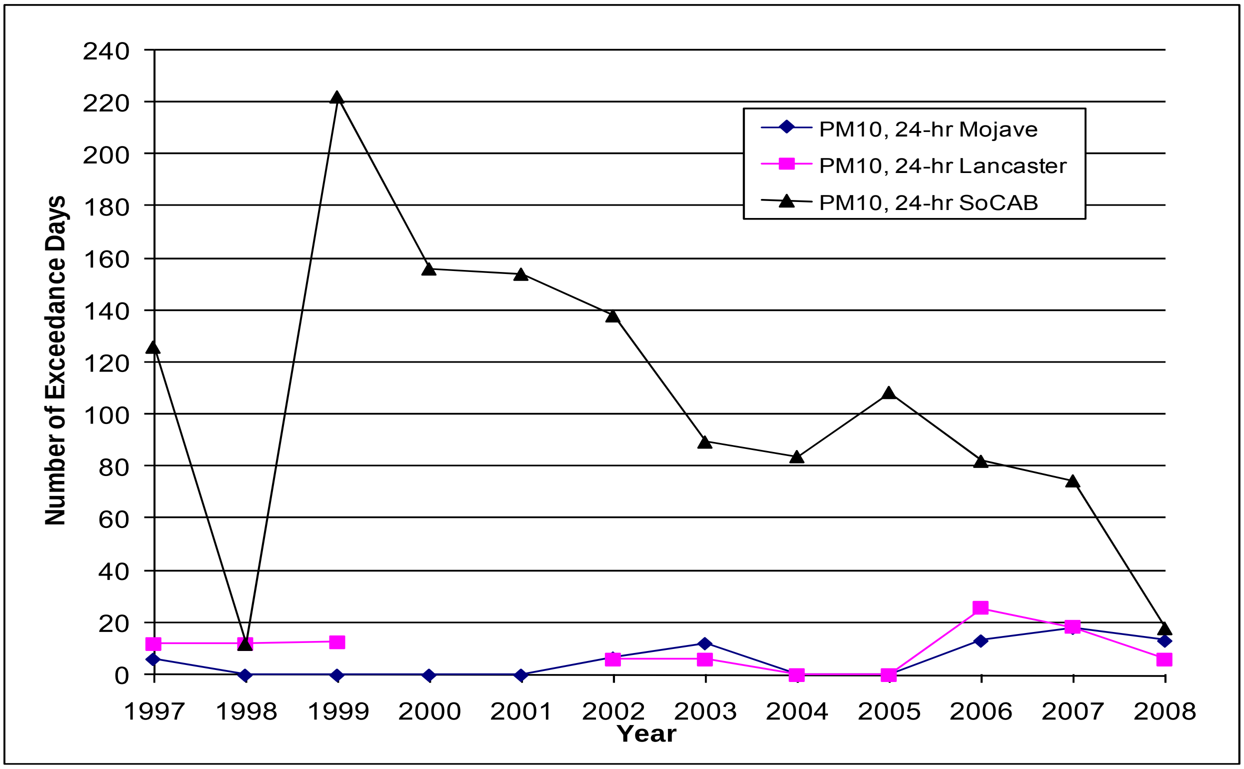
The year 1997 to 2007 trends for the maximum 24-hour PM10 and State annual arithmetic mean PM10, referenced to the most stringent standard, and the number of days exceeding the California 24-hour PM10 standard for the Lancaster West Pondera Street (1997-2001), and Lancaster Division Street (2002-2004) monitoring stations are shown in Exhibits 2-6 and 2-7, respectively.

Exhibit 2-6. Normalized PM10 Air Quality Maximum Concentrations 1997-2008



Source: CARB 2009b, CARB 2009c.
a. A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for 24-hour PM10 is the State standard of 50 µg/m³, and for State annual arithmetic mean PM10 is the State standard of 20 µg/m³.

Exhibit 2-7. PM10 24-Hour – Number of Days Exceeding the CAAQS 1997-2008



Source: CARB 2009b, CARB 2009c.

Fine Particulate Matter (PM2.5)

Table 2-9 summarizes the ambient fine particulate matter data collected over the past eight years from Mojave, Azusa, and Lancaster monitoring stations located near the Project area.

As shown in Table 2-9, the 98th percentile 24-hour average PM2.5 concentration levels into SoCAB exceed the NAAQS of 35 μg/m^3 and exceed the federal and state annual averages of 15 μg/m^3 and 12 μg/m^3, respectively. The Mojave and Lancaster concentration levels are below all CAAQS and NAAQS. The SoCAB is designated nonattainment for the federal and State PM2.5 standards, while the western MDAB and entire MDAB are in attainment of the Federal and State PM2.5 standards, respectively.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content such as coal or heavy fuel oils can emit very large amounts of SO_2 when combusted. Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels, gaseous, liquid and solid.

Table 2-9 Fine Particulate Matter (PM2.5) Air Quality Summary 1999-2008

Year	Month of Max. Daily Avg.	Max. Daily Avg. (μg/m³)	98th Percentile of Max. Daily Avg. (μg/m³)	Days Above 98th Percentile Daily NAAQS	National 24-Hr Standard Design Value (μg/m³)	National Annual Avg. (μg/m³)	National Annual Standard Design Value (μg/m³)
Mojave – 923 Poole Street							
1999	FEB	27.6	---	0	---	---	---
2000	DEC	28.7	---	0	---	---	---
2001	MAY	15.3	13.9	0	---	6.1	---
2002	OCT	31.4	---	0	---	---	---
2003	NOV	23.2	---	0	---	---	---
2004	JUN	17.8	---	0	---	---	---
2005	JUL	18.1	---	0	---	---	---
2006	SEP	21.3	21.3	0	---	---	---
2007	DEC	21.1	19.9	0	---	6.2	---
2008	JUL	19.1	17.8	0	---	6.8	---
Lancaster – W Pondera Street							
1999	JUL	47.6	23.5	0	---	11.2	---
2000	DEC	36	21.0	0	---	10.5	---
2001	JAN	35	---	0	---	---	---
Lancaster – 43301 Division Street							
2001	DEC	29.0	---	0	---	---	---
2002	OCT	24.0	---	0	---	---	---
2003	MAR	25.0	17.0	0	---	9.4	---
2004	JUL	18.0	15.0	0	---	8.5	---
2005	FEB	28.0	16	0	16	8.9	8
2006	SEP	18.0	13	0	15	7.4	8
2007	OCT	25	20	0	16	8.0	8.1
2008	MAY	24	---	---	---	---	---
South Coast Air Basin							
1999+	JAN	85.8	85.6	---	---	25.4	---
2000*	OCT	92.5	61.6	35.1	---	20.2	---
2001*	NOV	79.7	61.4	49.3	62	21.7	---
2002*	OCT	72.4	52.6	46.8	59	20.7	20.8
2003*	JUL	121.2	55.5	---	57	19.3	20.6
2004*	JUL	75.6	53.8	---	54	18.3	19.4
2005*	JUL	132.6	53.2	---	54	17	18.2
2006*	NOV	52.7	38.4	---	48	15.4	16.9
2007*	NOV	63.8	49.2	---	47	15.7	15.7
2008*	FEB	36.4	26.5	---	38	---	---

Source: CARB 2009c.
National Ambient Air Quality Standard: 3-Year Average - 98th Percentile of 24-Hr Avg. Conc., 65 μg/m³.
3-Year Average of Annual Arithmetic Mean (National Annual Average), 15 μg/m³; 3-Year Average of Annual Arithmetic Mean (State Annual Average), 12μg/m³
+ used Ontario-1408 Francis Street monitoring station
* used Azusa monitoring station

The MDAB and the SoCAB are designated attainment or unclassified for all SO_2 State and federal ambient air quality standards. The closest currently operating SO_2 monitoring stations to the Project area is in Trona Athol & Telegraph and Riverside Rubidoux, which have shown no exceedances of CAAQS or NAAQS between 1997 and 2007.

Due to the restrictions for the use of high sulfur fuels, reduction in gasoline and diesel sulfur contents and reduction in SOx emissions from other industrial sources, such as refineries, SOx pollution is no longer a major air quality concern in most of California including the Project area.

Table 2-10. Sulfur Dioxide Air Quality Summary 1997-2008

Year	Month of Max. 1-Hr Avg.	Maximum 1-Hr Avg. (ppm)	Maximum Annual Avg. (ppm)
Trona – Athol & Telegraph			
1997	NOV	0.005	0.001
1998	MAR	0.010	0.001
1999	NOV	0.006	0.002
2000	OCT	0.006	0.001
2001	AUG	0.007	0.001
2002	SEP	0.007	0.001
2003	APR	0.003	0.001
2004	MAR	0.005	0.001
2005	NOV	0.004	0.001
2006	APR	0.004	0.001
2007	JUN	0.005	0.001
2008	MAY	0.005	0.001
Riverside – Rubidoux			
1997	NOV	0.005	0.001
1998	NOV	0.009	0.001
1999	FEB	0.012	0.002
2000	MAR	0.038	0.001
2001	AUG	0.009	0.001
2002	FEB	0.003	---
2003	JUL	0.012	0.002
2004	JUN	0.015	0.003
2005	SEP	0.011	0.003
2006	NOV	0.003	0.001
2007	MAR	0.004	0.002
2008	JUL	0.003	0.001

Source: CARB 2009c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.25 ppm
National Ambient Air Quality Standard (NAAQS): Annual, 0.053 ppm

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

A land use survey was conducted to identify sensitive receptors (e.g., local residences, schools, hospitals, churches, recreational facilities) in the general vicinity of the proposed Project alignment. In the Kern County and Antelope Valley Project segments, and through Angeles National Forest, the transmission lines would travel through generally undeveloped areas where only a few rural residences have been identified. However, south of where the transmission line would exit Angeles National Forest the Project segments travel through populated areas in Los Angeles and San Bernardino County where residences and other sensitive receptors will be located near or adjacent the construction route/construction sites. Additional information about specific sensitive receptors that may be impacted by the proposed Project will be provided with the evaluation of impacts for each of the Project alternatives.

Greenhouse Gases

Greenhouse gases (GHG) that may contribute to global climate change include water vapor, carbon dioxide (CO_2), several trace gases and aerosols. Currently, California regulates the following man-made emissions for GHG control: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6). In response to Executive Order S-3-05 (June 2005), which declared California's particular vulnerability to climate change, the California Global Warming Solutions Act of 2006, Assembly Bill 32 (AB32), was signed into effect on September 27, 2006. In passing the bill, the California Legislature found that

> *"Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems"* (California Health & Safety Code, Sec. 38500, Division 25.5, Part 1).

Emissions of CO_2 occur largely from combustion of fossil fuels. The major categories of fossil fuel combustion CO_2 sources can be broken into sectors for residential, commercial, industrial, transportation, and electricity generation. The transportation sector includes all motor gasoline and diesel fuel combustion, and the GHG emissions of this sector are not split into activities or uses (i.e., there is no separate estimate for the level of GHG emissions caused by gasoline or diesel fuel combustion related to statewide construction activities). Other GHG emissions such as methane (CH_4) and nitrous oxide (N_2O) are also tracked by State inventories but occur in much smaller quantities. The global warming potential of methane is about 21 times that of CO_2. When quantifying GHG emissions, the different global warming potentials of GHG pollutants are usually taken into account by normalizing their rates to an equivalent CO_2 emission rate (CO_2e).

California's greenhouse gas emissions are large in a world-scale context and growing over time (CEC, 2007). The State is responsible for approximately 500 million metric tons of CO_2 equivalent ($MMTCO_2e$) or more than one percent of the 49,000 $MMTCO_2e$ emitted globally (IPCC, 2007). Electricity generation within California is responsible for about 50 million metric tons of CO_2 (depending on yearly variations) or 15 percent of the total statewide CO_2 emissions and about one percent of statewide methane emissions. Electricity generation in other states delivered to California over high-voltage transmission lines also causes a substantial quantity of GHG emissions, about 10 percent more than the amount from in-state electricity generation. The use of sulfur hexafluoride (SF_6) in power transformers and circuit breakers at power plants and along transmission lines also poses a concern, because this pollutant can slowly escape from the equipment, and it has an extremely high global warming potential (one ton of SF_6 is equivalent to approximately 23,900 tons of CO_2).

Statewide emissions of greenhouse gases from relevant source categories in 1990 and later years are summarized in Table 2-11.

Table 2-11. California Greenhouse Gas Emissions (million metric tons CO_2e)

Emission Inventory Category	1990		2000	2001	2002	2003	2004	2005
Residential Fuel Combustion (CO_2)	28.97		30.25	27.21	27.32	26.40	27.86	---
Commercial Fuel Combustion (CO_2)	12.65		15.63	12.04	17.84	15.06	12.1	---
Industrial Fuel Combustion (CO_2)	66.12		76.17	80.48	71.53	65.47	67.1	---
Transportation Fuel Combustion (CO_2)	161.08		181.68	182.49	190.19	180.64	187.95	---
Electricity Generation, In-State (CO_2)	43.36		55.87	61.35	47.78	45.92	55.10	49.0
Elec. Generation Subtotal, Natural Gas (CO_2)	36.42		49.71	55.48	41.98	40.56	48.94	43.0
Elec. Generation Subtotal, Coal (CO_2)	2.33		2.26	2.13	2.39	2.17	2.58	2.2
Elec. Generation Subtotal, Petroleum (CO_2)	4.61		3.90	3.74	3.41	3.20	3.59	3.7
Methane (all CH_4 shown as CO_2e)	25.82		26.32	26.62	27.07	27.49	27.80	---
Nitrous Oxide (all N_2O shown as CO_2e)	32.75		31.43	30.76	34.48	33.85	33.34	---
Electricity Transmission and Distribution (SF_6 shown as CO_2e)	2.32		1.14	1.10	1.04	1.01	1.02	---
Total California Greenhouse Gas Emissions without Electricity Imports	389.97		440.47	446.35	444.86	423.20	439.19	---
Electricity Imports (CO_2e)	43.31		40.48	47.37	51.73	56.44	60.81	---
Total California Greenhouse Gas Emissions with Electricity Imports	433.28		480.94	493.72	496.59	479.64	500.00	---

Source: California Energy Commission, 2007. (Totals include source categories not shown. Data reflect changes in memo from CEC to CARB dated January 23, 2007.)

The proposed project would serve both existing and future renewable power, primarily wind power, sources in the western high desert. This will allow a reduction in the use of other power generation facilities including fossil fueled fired power plants within the SoCAB or elsewhere allowing a reduction in GHG emissions from electricity generation.

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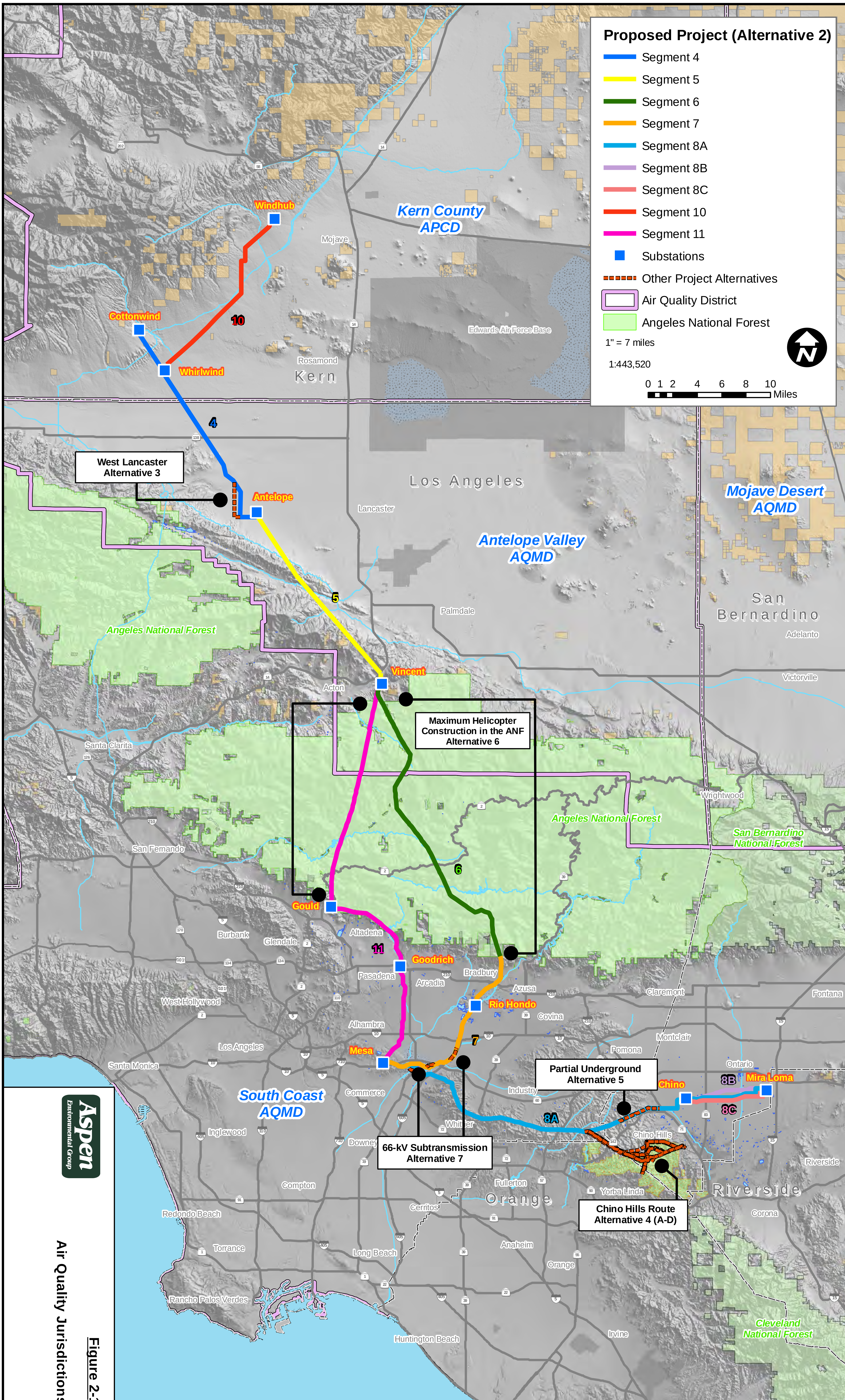

Figure 2-1

Air Quality Jurisdictions

Aspen Environmental Group

Mileposts
Alt7 66-kV Underground Re-Route
Alt7 66-kV Option 1 Ovhd Re-Route
Segment 7
Segment 8A
Army Corps Boundary
Alt7 66-kV Option 2 Ovhd Re-Route

0 750 1,500 3,000 Feet

Figure 2-2 (New)

Army Corps Land Boundary - Whittier Narrows