CALIFORNIA
Final Area Designations for the 2015 Ozone National Ambient Air Quality Standards Technical Support Document (TSD)

1.0 Summary

This technical support document (TSD) describes the EPA's final designations for the areas in California listed in Table 1.1 below as nonattainment for the 2015 ozone National Ambient Air Quality Standards (NAAQS).

On October 1, 2015, the EPA promulgated revised primary and secondary ozone NAAQS (80 FR 65292; October 26, 2015). The EPA strengthened both standards to a level of 0.070 parts per million (ppm). In accordance with Section 107(d) of the Clean Air Act (CAA), whenever the EPA establishes a new or revised NAAQS, the EPA must promulgate designations for all areas of the country for that NAAQS.

Under section 107(d), states were required to submit area designation recommendations to the EPA for the 2015 ozone NAAQS no later than one year following promulgation of the standards, i.e., by October 1, 2016. Tribes were also invited to submit area designation recommendations and were given an opportunity for consultation.[1] On October 3, 2016, the state of California recommended that the counties and partial counties identified in Table 1.1 be designated as nonattainment for the 2015 ozone NAAQS based on air quality data from 2013-2015[2]. On October 1, 2016, the Pechanga Band of Luiseno Mission Indians recommended that the areas of Indian country identified in Table 1.1 be designated as nonattainment for the 2015 ozone NAAQS based on air quality data from 2013-2015[3]. On September 20, 2016, the Morongo Band of Mission Indians recommended that the areas of Indian country identified in Table 1.1 be designated as nonattainment for the 2015 ozone NAAQS based on air quality data from 2013-2015.[4]

After considering these recommendations and based on the EPA's technical analysis as described in this TSD, the EPA is designating the areas listed in Table 1.1 as nonattainment for the 2015 ozone NAAQS. The EPA must designate an area nonattainment if it has an air quality monitor that is violating the standard or if it has sources of emissions that are contributing to a violation of the

[1] In 2011, the EPA issued a memorandum outlining the EPA's approach for designating areas of Indian country. If the EPA either does not receive an initial designation recommendation from a tribe, or receives a recommendation that does not specify designation of a separate area, the EPA is designating the relevant tribe's area of Indian country as part of the surrounding area, and to the extent possible, to ensure that a single tribe's areas of Indian country are not inadvertently split based on the use of other jurisdictional boundaries (e.g., county boundaries) when designating the surrounding state areas. Please see EPA Policy for Designating Establishing Separate Air Quality Designations for Areas of Indian Country: https://www.epa.gov/sites/production/files/2016-02/documents/indian-country-separate-area.pdf and EPA Policy on Consultation and Coordination with Indian Tribes: https://www.epa.gov/sites/production/files/2013-08/documents/cons-and-coord-with-indian-tribes-policy.pdf.

[2] Letter from Kurt Karperos, Deputy Executive Officer, California Air Resources Board to Alexis Strauss, Acting Regional Administrator, U.S. EPA Region 9, October 3, 2016.

[3] Letter from Mark Macarro, Tribal Chairman, Pechanga Band of Luiseno Mission Indians to Elizabeth Adams, Air Division Acting Director, U.S. EPA Region 9, October 1, 2016.

[4] Letter from Robert Martin, Chairman, Morongo Band of Mission Indians to Deborah Jordan, Air Division Director, U.S. EPA Region 9, September 20, 2016.

NAAQS in a nearby area. Detailed descriptions of the nonattainment boundaries for these areas are found in the supporting technical analysis for each area in Sections 3-21.

Table 1.1. California State and Tribal Recommended Nonattainment Areas and the EPA's Final Designated Nonattainment Areas for the 2015 Ozone NAAQS.

Area	California's or Tribe's Recommended Nonattainment Counties [or Areas of Indian Country]	EPA's Final Nonattainment Counties [or Areas of Indian Country]
Amador County, CA*	Amador County	Amador County
• Buena Vista Rancheria of Me-Wuk Indians of California	• did not submit recommendation	• Buena Vista Rancheria of Me-Wuk Indians of California
• Jackson Band of Miwuk Indians	• did not submit recommendation	• Buena Vista Rancheria of Me-Wuk Indians of California
Butte County, CA*	Butte County	Butte County
• Berry Creek Rancheria of Maidu Indians of California	• did not submit recommendation	• Berry Creek Rancheria of Maidu Indians of California
• Enterprise Rancheria of Maidu Indians of California	• did not submit recommendation	• Enterprise Rancheria of Maidu Indians of California
• Mechoopda Indian Tribe of Chico Rancheria	• did not submit recommendation	• Mechoopda Indian Tribe of Chico Rancheria
• Mooretown Rancheria of Maidu Indians of California	• did not submit recommendation	• Mooretown Rancheria of Maidu Indians of California
Calaveras County, CA*	Calaveras County	Calaveras County
• California Valley Miwok Tribe	• did not submit recommendation	• California Valley Miwok Tribe
Imperial County, CA*	Imperial County	Imperial County
• Quechan Tribe of the Fort Yuma Indian Reservation	• did not submit recommendation	• Quechan Tribe of the Fort Yuma Indian Reservation
• Torres Martinez Desert Cahuilla Indians	• did not submit recommendation	• Torres Martinez Desert Cahuilla Indians (partial)
Kern County (Eastern Kern), CA	Kern County (partial)	Kern County (partial)
Los Angeles-San Bernardino Counties (West Mojave Desert), CA*	Los Angeles County (partial) San Bernardino County (partial)	Los Angeles County (partial) San Bernardino County (partial)

Area	California's or Tribe's Recommended Nonattainment Counties [or Areas of Indian Country]	EPA's Final Nonattainment Counties [or Areas of Indian Country]
• Twenty-Nine Palms Band of Mission Indians of California	• did not submit recommendation	• Twenty-Nine Palms Band of Mission Indians of California (partial)
Los Angeles-South Coast Air Basin, CA*	Los Angeles County (partial) Orange County Riverside County (partial) San Bernardino County (partial)	Los Angeles County (partial) Orange County Riverside County (partial) San Bernardino County (partial)
• Cahuilla Band of Indians	• did not submit recommendation	• Cahuilla Band of Indians
• Pechanga Band of Luiseno Mission Indians	Pechanga Band of Luiseno Mission Indians **	**Pechanga Band of Luiseno Mission Indians (partial)**
• Ramona Band of Cahuilla	• did not submit recommendation	• Ramona Band of Cahuilla
• San Manuel Band of Mission Indians	• did not submit recommendation	• San Manuel Band of Mission Indians
• Soboba Band of Luiseno Indians	• did not submit recommendation	• Soboba Band of Luiseno Indians
Mariposa County, CA	Mariposa County	Mariposa County
Morongo Band of Mission Indians	Morongo Band of Mission Indians	Morongo Band of Mission Indians
Nevada County (Western part), CA	Nevada County (partial)	Nevada County (partial)
Pechanga Band of Luiseno Mission Indians	Pechanga Band of Luiseno Mission Indians**	**Pechanga Band of Luiseno Mission Indians (partial)**
Riverside County (Coachella Valley), CA*	Riverside County (partial)	Riverside County (partial)
• Agua Caliente Band of Cahuilla Indians	• did not submit recommendation	• Agua Caliente Band of Cahuilla Indians
• Augustine Band of Cahuilla Indians	• did not submit recommendation	• Augustine Band of Cahuilla Indians
• Cabazon Band of Mission Indians	• did not submit recommendation	• Cabazon Band of Mission Indians
• Santa Rosa Band of Cahuilla Indians	• did not submit recommendation	• Santa Rosa Band of Cahuilla Indians
• Torres Martinez Desert Cahuilla Indians	• did not submit recommendation	• Torres Martinez Desert Cahuilla Indians (partial)
• Twenty-Nine Palms Band of Mission Indians of California	• did not submit recommendation	• Twenty-Nine Palms Band of Mission Indians of California (partial)

Area	California's or Tribe's Recommended Nonattainment Counties [or Areas of Indian Country]	EPA's Final Nonattainment Counties [or Areas of Indian Country]
Sacramento Metro, CA*	El Dorado County (partial) Placer County (partial) Sacramento County Solano County (partial) Sutter County (partial) Yolo County	El Dorado County (partial) Placer County (partial) Sacramento County Solano County (partial) Sutter County (partial) Yolo County
• Shingle Springs Band of Miwok Indians, Shingle Springs Rancheria	• did not submit recommendation	• Shingle Springs Band of Miwok Indians, Shingle Springs Rancheria
• United Auburn Indian Community of the Auburn Rancheria of California	• did not submit recommendation	• United Auburn Indian Community of the Auburn Rancheria of California
• Wilton Rancheria	• did not submit recommendation	• Wilton Rancheria
• Yocha Dehe Wintun Nation	• did not submit recommendation	• Yocha Dehe Wintun Nation
San Diego County, CA*	San Diego County	San Diego County
• Barona Group of Capitan Grande Band of Mission Indians	• did not submit recommendation	• Barona Group of Capitan Grande Band of Mission Indians
• Campo Band of Diegueno Mission Indians	• did not submit recommendation	• Campo Band of Diegueno Mission Indians
• Capitan Grande Band of Diegueno Mission Indians of California	• did not submit recommendation	• Capitan Grande Band of Diegueno Mission Indians of California
• Ewiiaapaayp Band of Kumeyaay Indians	• did not submit recommendation	• Ewiiaapaayp Band of Kumeyaay Indians
• Iipay Nation of Santa Ysabel	• did not submit recommendation	• Iipay Nation of Santa Ysabel
• Inaja Band of Diegueno Mission Indians of the Inaja and Cosmit Reservation	• did not submit recommendation	• Inaja Band of Diegueno Mission Indians of the Inaja and Cosmit Reservation
• Jamul Indian Village of California	• did not submit recommendation	• Jamul Indian Village of California
• La Jolla Band of Luiseno Indians	• did not submit recommendation	• La Jolla Band of Luiseno Indians
• La Posta Band of Diegueno Mission Indians	• did not submit recommendation	• La Posta Band of Diegueno Mission Indians

Area	California's or Tribe's Recommended Nonattainment Counties [or Areas of Indian Country]	EPA's Final Nonattainment Counties [or Areas of Indian Country]
• Los Coyotes Band of Cahuilla and Cupeno Indians	• did not submit recommendation	• Los Coyotes Band of Cahuilla and Cupeno Indians
• Manzanita Band of Diegueno Mission Indians	• did not submit recommendation	• Manzanita Band of Diegueno Mission Indians
• Mesa Grande Band of Diegueno Mission Indians	• did not submit recommendation	• Mesa Grande Band of Diegueno Mission Indians
• Pala Band of Mission Indians	• did not submit recommendation	• Pala Band of Mission Indians
• Pauma Band of Luiseno Mission Indians of the Pauma and Yuima Reservation	• did not submit recommendation	• Pauma Band of Luiseno Mission Indians of the Pauma and Yuima Reservation
• Rincon Band of Luiseno Mission Indians	• did not submit recommendation	• Rincon Band of Luiseno Mission Indians
• San Pasqual Band of Diegueno Mission Indians of California	• did not submit recommendation	• San Pasqual Band of Diegueno Mission Indians of California
• Sycuan Band of the Kumeyaay Nation	• did not submit recommendation	• Sycuan Band of the Kumeyaay Nation
• Viejas (Baron Long) Group of Capitan Grande Band of Mission Indians	• did not submit recommendation	• Viejas (Baron Long) Group of Capitan Grande Band of Mission Indians
San Francisco Bay Area, CA*	Alameda County Contra Costa County Marin County Napa County San Francisco County San Mateo County Santa Clara County Solano County (partial) Sonoma County (partial)	Alameda County Contra Costa County Marin County Napa County San Francisco County San Mateo County Santa Clara County Solano County (partial) Sonoma County (partial)
• Federated Indians of Graton Rancheria	• did not submit recommendation	• Federated Indians of Graton Rancheria
• Lytton Rancheria of California	• did not submit recommendation	• Lytton Rancheria of California

Area	California's or Tribe's Recommended Nonattainment Counties [or Areas of Indian Country]	EPA's Final Nonattainment Counties [or Areas of Indian Country]
San Joaquin Valley, CA*	Fresno County Kern County (partial) Kings County Madera County Merced County San Joaquin County Stanislaus County Tulare County	Fresno County Kern County (partial) Kings County Madera County Merced County San Joaquin County Stanislaus County Tulare County
• Big Sandy Rancheria of Western Mono Indians of California	• did not submit recommendation	• Big Sandy Rancheria of Western Mono Indians of California
• Cold Springs Rancheria of Mono Indians of California	• did not submit recommendation	• Cold Springs Rancheria of Mono Indians of California
• Northfork Rancheria of Mono Indians of California	• did not submit recommendation	• Northfork Rancheria of Mono Indians of California
• Picayune Rancheria of Chukchansi Indians of California	• did not submit recommendation	• Picayune Rancheria of Chukchansi Indians of California
• Santa Rosa Indian Community of the Santa Rosa Rancheria	• did not submit recommendation	• Santa Rosa Indian Community of the Santa Rosa Rancheria
• Table Mountain Rancheria of California	• did not submit recommendation	• Table Mountain Rancheria of California
• Tule River Indian Tribe of the Tule River Reservation	• did not submit recommendation	• Tule River Indian Tribe of the Tule River Reservation
San Luis Obispo (Eastern part), CA	San Luis Obispo County (partial)	San Luis Obispo County (partial)
Sutter Buttes, CA	Sutter County (partial)	Sutter County (partial)
Tuolumne County, CA*	Tuolumne County	Tuolumne County
• Chicken Ranch Rancheria of Me-Wuk Indians of California	• did not submit recommendation	• Chicken Ranch Rancheria of Me-Wuk Indians of California
• Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California	• did not submit recommendation	• Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California
Tuscan Buttes, CA	Tehama County (partial)	Tehama County (partial)
Ventura County, CA	Ventura County (partial)	Ventura County (partial)

EPA modifications to state or tribal recommendations are shown in **bold**.
*The areas noted are multi-jurisdictional nonattainment areas that include areas of Indian country of federally-recognized tribes. The areas of Indian country of each tribe that the EPA is designating as part of the nonattainment area are discussed in Sections 3-23, Technical Analysis.
**The Pechanga Band of Luiseno Mission Indians of the Pechanga Reservation recommended that their lands be designated as two separate nonattainment areas. We are designating a portion of these lands as the Pechanga Band of Luiseno Mission Indians, CA nonattainment area, and a portion as part of the Los Angeles-South Coast Air Basin, CA nonattainment area. Additional discussion is found in the Technical Analysis sections for these nonattainment areas.

In its recommendation letter, California recommended that the EPA designate as either attainment or unclassifiable all other counties and partial counties not identified in the state's Recommended Nonattainment Counties column of Table 1.1. On November 6, 2017 (82 FR 54232; November 16, 2017), the EPA signed a final rule which designated the counties listed in Table 1.2 below as attainment/unclassifiable.[5] EPA explains in section 2.0 the approach it is now taking to designate the remaining areas in the State.

Table 1.2 California Counties Designated on November 16, 2017.

County	**Designation**
Del Norte County	Attainment/Unclassifiable
Humboldt County	Attainment/Unclassifiable
Lake County	Attainment/Unclassifiable
Lassen County	Attainment/Unclassifiable
Modoc County	Attainment/Unclassifiable
Siskiyou County	Attainment/Unclassifiable

The EPA is designating all tribes in accordance with two guidance documents issued in December 2011 by the EPA Office of Air Quality Planning and Standards titled, "Guidance to Regions for Working with Tribes during the National Ambient Air Quality Standards (NAAQS) Designations Process,"[6] and "Policy for Establishing Separate Air Quality Designations for Areas of Indian Country."[7] As discussed in these policies, tribes retain sovereign authorities over their members and territories, and jurisdiction in Indian country generally rests with the relevant tribe and the federal government, not with states. As such, designating areas of Indian country as part of a multi-jurisdictional area has no effect on tribal sovereignty over those areas.

2.0 Nonattainment Area Analyses and Boundary Determination

The EPA evaluated and determined the boundaries for each nonattainment area on a case-by-case basis, considering the specific facts and circumstances of the area. In accordance with the CAA section 107(d), the EPA is designating as nonattainment the areas with the monitors that are violating the 2015 ozone NAAQS and nearby areas with emissions sources (i.e., stationary, mobile, and/or area sources) that contribute to the violations. As described in the EPA's designations guidance for the 2015

[5] In previous ozone designations and in the designation guidance for the 2015 ozone NAAQS, the EPA used the designation category label Unclassifiable/Attainment to identify both areas that were monitoring attainment and areas that did not have monitors but for which the EPA had reason to believe were likely attainment and were not contributing to a violation in a nearby area. The EPA is now reversing the order of the label to be Attainment/Unclassifiable so that the category is more clearly distinguished from the separate Unclassifiable category.
[6] https://www.epa.gov/sites/production/files/2016-02/documents/ozone-designation-tribes.pdf
[7] https://www.epa.gov/sites/production/files/2016-02/documents/indian-country-separate-area.pdf

NAAQS (hereafter referred to as the "ozone designations guidance"[8] after identifying each monitor indicating a violation of the ozone NAAQS in an area, the EPA analyzed those nearby areas with emissions potentially contributing to the violating area. In guidance issued in February 2016, the EPA provided that using the Core Based Statistical Area (CBSA) or Combined Statistical Area (CSA)[9] as a starting point for the contribution analysis is a reasonable approach to ensure that the nearby areas most likely to contribute to a violating area are evaluated. The area-specific analyses may support nonattainment boundaries that are smaller or larger than the CBSA or CSA.

On November 6, 2017, EPA issued attainment/unclassifiable designations for approximately 85% of the United States and one unclassifiable area designation.[10] At that time, consistent with statements in the designations guidance regarding the scope of the area EPA would analyze in determining nonattainment boundaries, EPA deferred designation for any counties in the larger of a CSA or CBSA where one or more counties in the CSA or CBSA was violating the standard and any counties with a violating monitor not located in a CSA or CBSA. In addition, EPA deferred designation for any other counties adjacent to a county with a violating monitor. The EPA also deferred designation for any county that had incomplete monitoring data, any county in the larger of the CSA or CBSA where such a county was located, and any county located adjacent to a county with incomplete monitoring data.

The EPA is proceeding to complete the remaining designations consistent with the designations guidance (and EPA's past practice) regarding the scope of the area EPA would analyze in determining nonattainment boundaries for the ozone NAAQS as outlined above. For those deferred areas where one or more counties violating the ozone NAAQS or with incomplete data are located in a CSA or CBSA, in most cases the technical analysis for the nonattainment area includes any counties in the larger of the relevant CSA or CBSA.

California is unique in that large portions of the State have historically been designated as nonattainment for the 1-hour and 8-hour ozone NAAQS. In addition, there is a mountain range traveling in a north-south direction that divides the eastern and western portions of the State which has factored in to how boundaries were drawn for previous ozone NAAQS. For those reasons, the EPA did not begin its analysis for nonattainment areas based purely on the boundaries of any CSA or CBSA. However, each county in every CSA or CBSA with a violating monitor is evaluated as part of the area of analysis for at least one nonattainment area. Nonattainment area boundaries for previous ozone NAAQS helped inform the starting point for the contribution analysis for each area. Table 2.1 below identifies the area of analysis for nonattainment areas in California. Where Table 2.1 below notes that the area of analysis included only a portion of an associated CBSA or CSA, the remainder of the CBSA was analyzed in the technical analysis section for an adjacent nonattainment area. This analytical approach is further discussed in Sections 3-21 of this technical support document. For counties with a violating monitor not located in a CSA or CBSA, EPA explains in the technical analysis sections, its decision whether to consider in the five-factor analysis for each area any other

[8] The EPA issued guidance on February 25, 2016, that identified important factors that the EPA evaluated in determining appropriate area designations and nonattainment boundaries for the 2015 ozone NAAQS. Available at https://www.epa.gov/ozone-designations/epa-guidance-area-designations-2015-ozone-naaqs.

[9] Lists of CBSAs and CSAs and their geographic components are provided at www.census.gov/population/www/metroareas/metrodef.html. The Office of Management and Budget (OMB) adopts standards for defining statistical areas. The statistical areas are delineated based on U.S. Census Bureau data. The lists are periodically updated by the OMB. The EPA used the most recent July 2015 update (OMB Bulletin No. 15-01), which is based on application of the 2010 OMB standards to the 2010 Census, 2006-2010 American Community Survey, as well as 2013 Population Estimates Program data.

[10] Air Quality Designations for the 2015 Ozone National Ambient Air Quality Standards published on November 16, 2017(82 FR 54232).

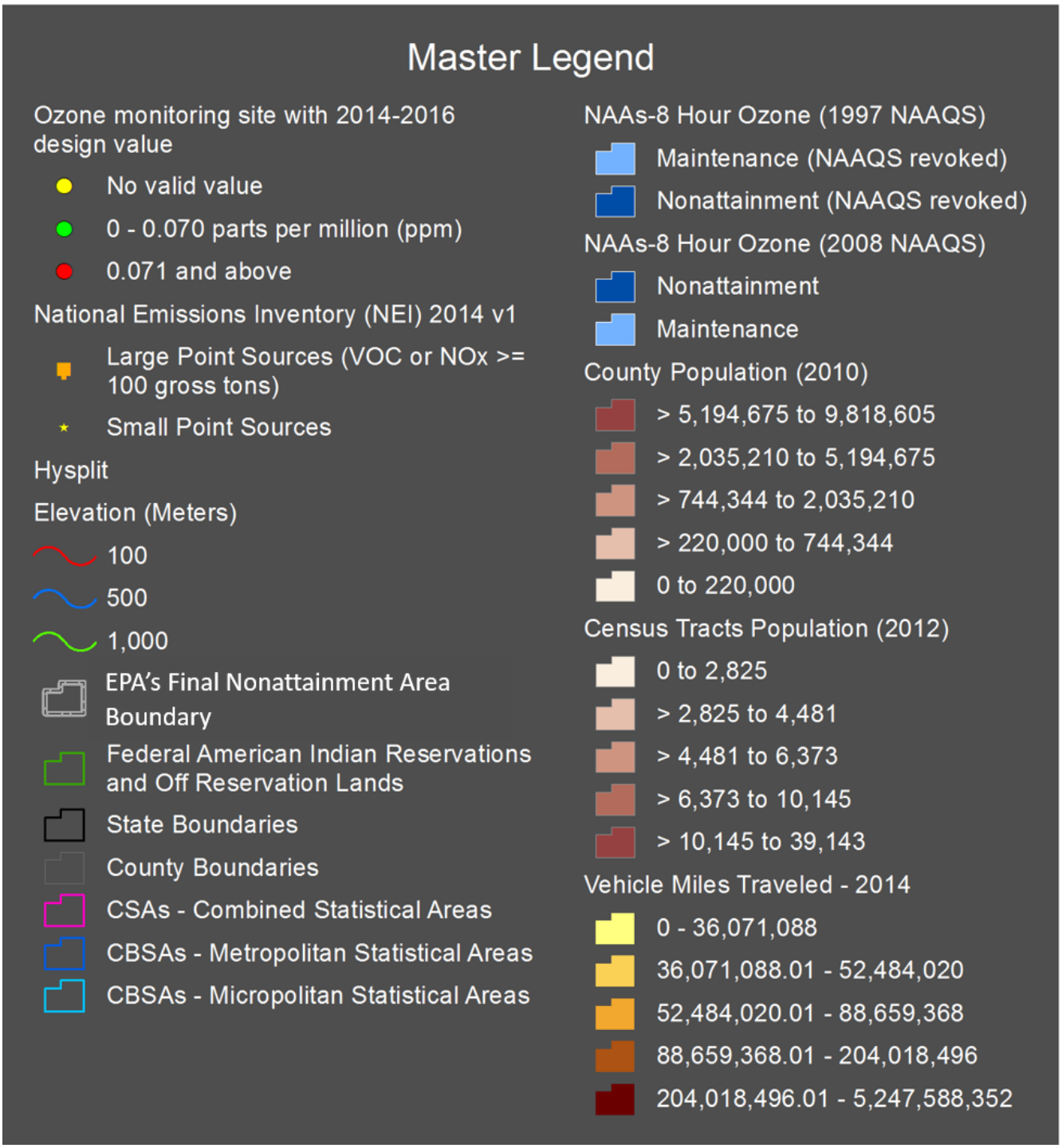
adjacent counties for which EPA previously deferred action. We are designating all counties not included in five-factor analyses for a specific nonattainment or unclassifiable area analyses, as attainment/unclassifiable. These deferred areas are identified in a separate document entitled "Designations for Deferred Counties and County Equivalents Not Addressed in the Technical Analyses." which is available in the docket.

Table 2.1. Area of Analysis for Nonattainment Areas in California

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Amador County, CA	Amador County	None	None
Butte County, CA	Butte County	Chico CBSA	None
Calaveras County, CA	Calaveras County	None	None
Imperial County, CA	Imperial County	El Centro CBSA	None
Kern County (Eastern Kern), CA	Kern County	Bakersfield CBSA	None
Los Angeles-San Bernardino Counties (West Mojave Desert), CA	Los Angeles County San Bernardino County	Los Angeles-Long Beach-Anaheim CBSA (partial)** Riverside-San Bernardino-Ontario CBSA (partial)**	Los Angeles-Long Beach CSA (partial)**
Los Angeles-South Coast Air Basin, CA	Los Angeles County Orange County Riverside County San Bernardino County	Los Angeles-Long Beach-Anaheim CBSA Riverside-San Bernardino-Ontario CBSA (partial)**	Los Angeles-Long Beach CSA (partial)**
Mariposa County, CA	Mariposa County	None	None
Morongo Band of Mission Indians	Riverside County (partial)*	Riverside-San Bernardino-Ontario CBSA (partial)**	Los Angeles-Long Beach CSA (partial)**
Nevada County (Western part), CA	Nevada County	Truckee-Grass Valley CBSA	Sacramento-Roseville CSA (partial)**
Pechanga Band of Luiseno Mission Indians	Riverside County (partial)* San Diego County (partial)*	Riverside-San Bernardino-Ontario CBSA (partial)** San Diego-Carlsbad CBSA (partial)**	Los Angeles-Long Beach CSA (partial)**
Riverside County (Coachella Valley), CA	Riverside County	Riverside-San Bernardino-Ontario CBSA (partial)**	Los Angeles-Long Beach CSA (partial)**
Sacramento Metro, CA	El Dorado County Placer County Sacramento County Solano County Sutter County Yolo County Yuba County	Sacramento--Roseville--Arden-Arcade CBSA Yuba City CBSA Vallejo-Fairfield CBSA	San Jose-San Francisco-Oakland CSA(partial)** Sacramento-Roseville CSA (partial)**

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
San Diego County, CA	San Diego County	San Diego-Carlsbad CBSA	None
San Francisco Bay Area, CA	Alameda County Contra Costa County Marin County Napa County San Benito County San Francisco County San Mateo County Santa Clara County Santa Cruz County Solano County Sonoma County	San Francisco-Oakland-Hayward CBSA Napa CBSA San Jose-Sunnyvale-Santa Clara CBSA Santa Cruz-Watsonville CBSA Vallejo-Fairfield CBSA Santa Rosa CBSA	San Jose-San Francisco-Oakland CSA (partial)**
San Joaquin Valley, CA	Fresno County Kern County Kings County Madera County Merced County San Joaquin County Stanislaus County Tulare County	Fresno CBSA Bakersfield CBSA Hanford-Corcoran CBSA Madera CBSA Merced CBSA Stockton-Lodi CBSA Modesto CBSA Visalia-Porterville CBSA	Fresno-Madera CSA Modesto-Merced CSA San Jose-San Francisco-Oakland CSA (partial)** Visalia-Porterville-Hanford CSA
San Luis Obispo (Eastern part), CA	San Luis Obispo County	San Luis Obispo-Paso Robles-Arroyo Grande CBSA	None
Sutter Buttes, CA	Sutter County	Yuba City CBSA (partial)**	Sacramento-Roseville CSA (partial)**
Tuolumne County, CA	Tuolumne County	Sonora CBSA	None
Tuscan Buttes, CA	Tehama County	Red Bluff CBSA	Redding-Red Bluff CSA (partial)***
Ventura County, CA	Ventura County	Oxnard-Thousand Oaks-Ventura CBSA	Los Angeles-Long Beach CSA (partial)**

*For tribal areas, the area of analysis is all lands under tribal jurisdiction.
**The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area. See sections 3-21 of this document for more information.
***Only the Red Bluff CBSA portion of the Redding-Red Bluff CSA was included in the area of analysis. See section 20 of this document for more information.



Figures in the remainder of this document refer to the master legend above.

3.0 Technical Analysis for Amador County, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area.

Table 3.1 identifies the area of analysis for the Amador County, CA final nonattainment area. The area of analysis includes all of Amador County. There is no CBSA or CSA associated with this area. The final nonattainment area differs from the existing 1997 nonattainment area that includes this county.

Amador County is adjacent to several areas, to the north, west and south, that the EPA is designating nonattainment for the 2015 ozone NAAQS. To the north and west of Amador County is the Sacramento-Roseville CSA; to the southwest is the Stockton-Lodi CBSA, which is the easternmost portion of the San Jose-San Francisco-Oakland CSA; and to the south is Calaveras County, which also is not part of a CSA or CBSA but has a monitor that shows a violation of the 2015 ozone NAAQS based on data from 2014-2016. Information specific to Calaveras County and the two adjacent CSA/CBSAs is contained in separate sections of the TSD for California. To the east of Amador County is Alpine County, which is not a part of a CSA or CBSA and does not have an air quality monitor.

The EPA designated Amador County unclassifiable/attainment for the 2008 ozone NAAQS. For the 1997 ozone NAAQS, Amador County was designated with Calaveras County as the two-county Central Mountain Counties nonattainment area.

Table 3.1 Area of Analysis.

Final Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Amador County, CA	Amador County	None	None

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 3.1 is a map of the EPA's nonattainment boundary for Amador County. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 2008 ozone NAAQS nonattainment boundaries. The EPA is not modifying the State's recommendation to designate Amador County as nonattainment with the same boundary as that of the county. Located within the county boundaries are several areas of Indian country belonging to two tribes: The Buena Vista Rancheria of Me-Wuk Indians of California (Buena Vista Rancheria) and Jackson Band of Miwuk Indians (Jackson Band). The tribes did not submit a recommendation and the EPA is including these tribal areas as part of the designated nonattainment area.

Figure 3.1 The EPA's Final Nonattainment Boundaries for Amador County, CA.

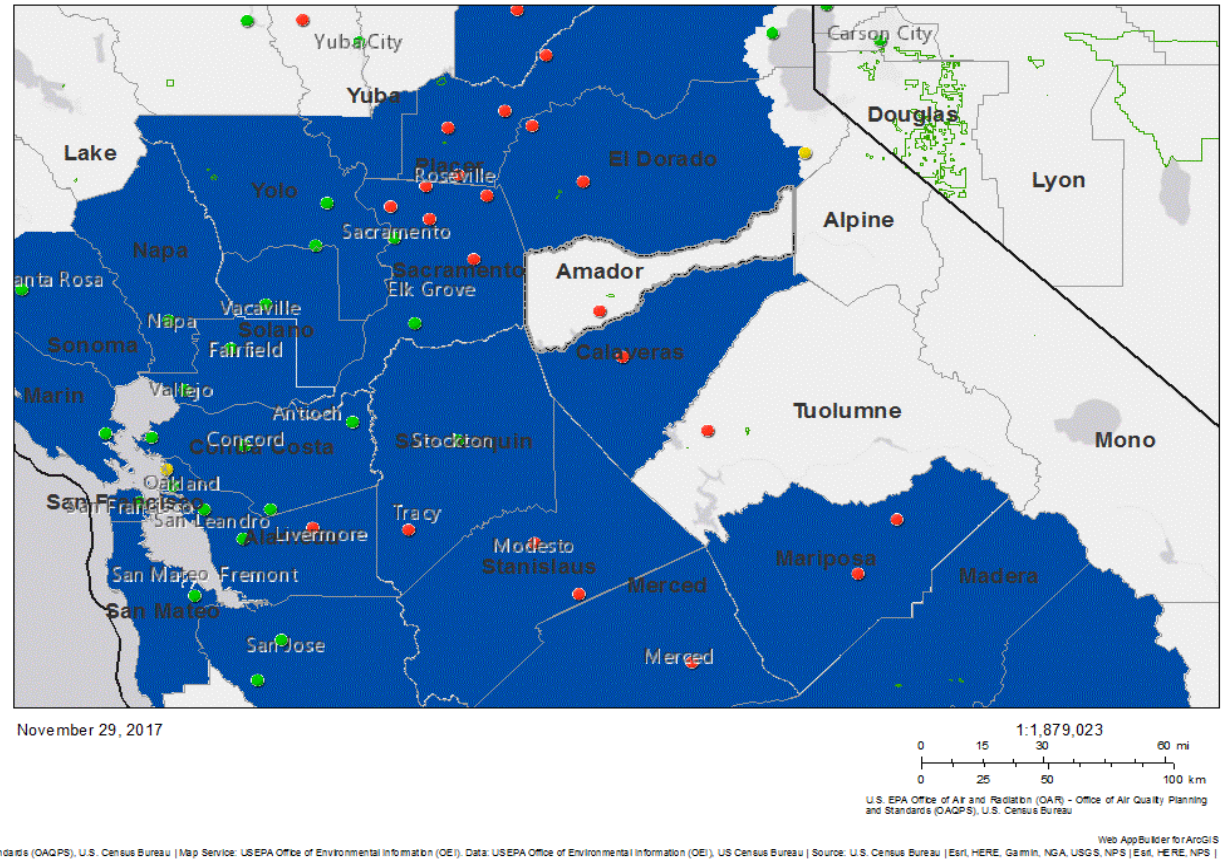


Figure 3.1 shows the EPA's nonattainment boundary for Amador County, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Amador County has a monitor in violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors

and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for the air quality monitor in the Amador County area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design value for the county in the area of analysis is shown in Table 3.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at:
https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 3.2 Air Quality Data (all values in ppm).

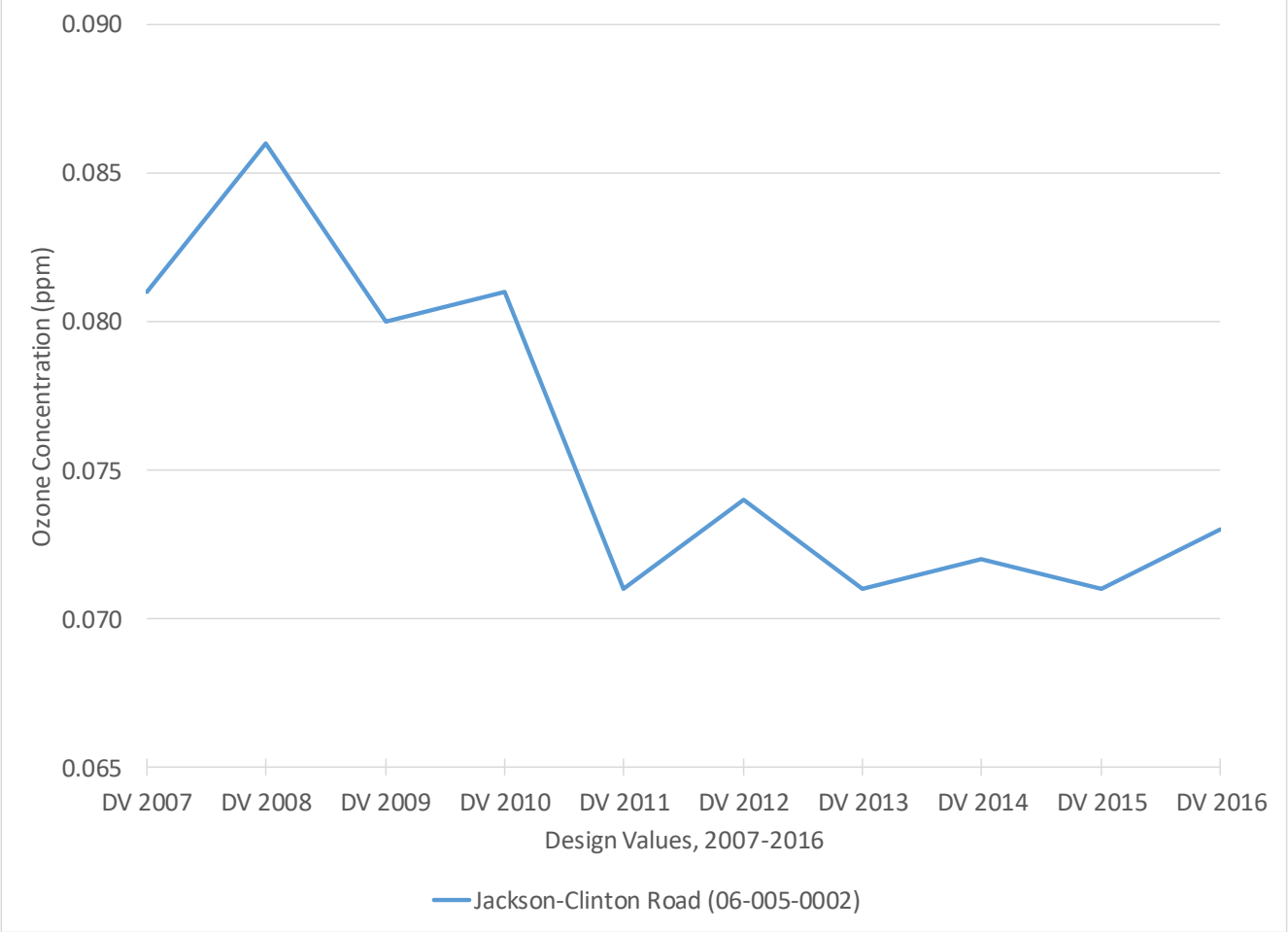
County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Amador, CA	Yes	06-005-0002	**0.073**	0.074	0.074	0.071

The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

Amador County shows a violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 3.1, shown previously, identifies the Amador County nonattainment area and the one monitor in the county. Table 3.2 identifies the design value for the monitor in the area of analysis. Figure 3.2 shows the historical trend of design values for the violating monitor. As indicated on the map, there is one violating monitor in Amador County. The violating monitor is the Jackson-Clinton ozone monitor, located in the southwestern portion of Amador County. The Jackson-Clinton monitor has a valid 2016 DV of 0.073 ppm. As shown in Figure 3.2, the Jackson-Clinton monitor's design values have been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally decreasing until 2011, but show no clear design value trend over the past four years.

Figure 3.2 Three-Year Design Values for Violating Monitors (2007 – 2016).



Amador County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 3.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Amador County nonattainment area.

Table 3.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Amador, CA	Yes	1,548	2,517
	Area wide:	1,548	2,517

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. Amador County has only one large point source, a wood products manufacturing facility located about 5 km to the northwest of the violating monitor, which emits 83 tons per year of NOx and 263 tons per year of VOC according to the 2014 NEI. The location of the large point source is shown with an orange icon in Figure 3.3 below. The nonattainment boundary is also shown.

Figure 3.3 Large Point Sources in the Area of Analysis.

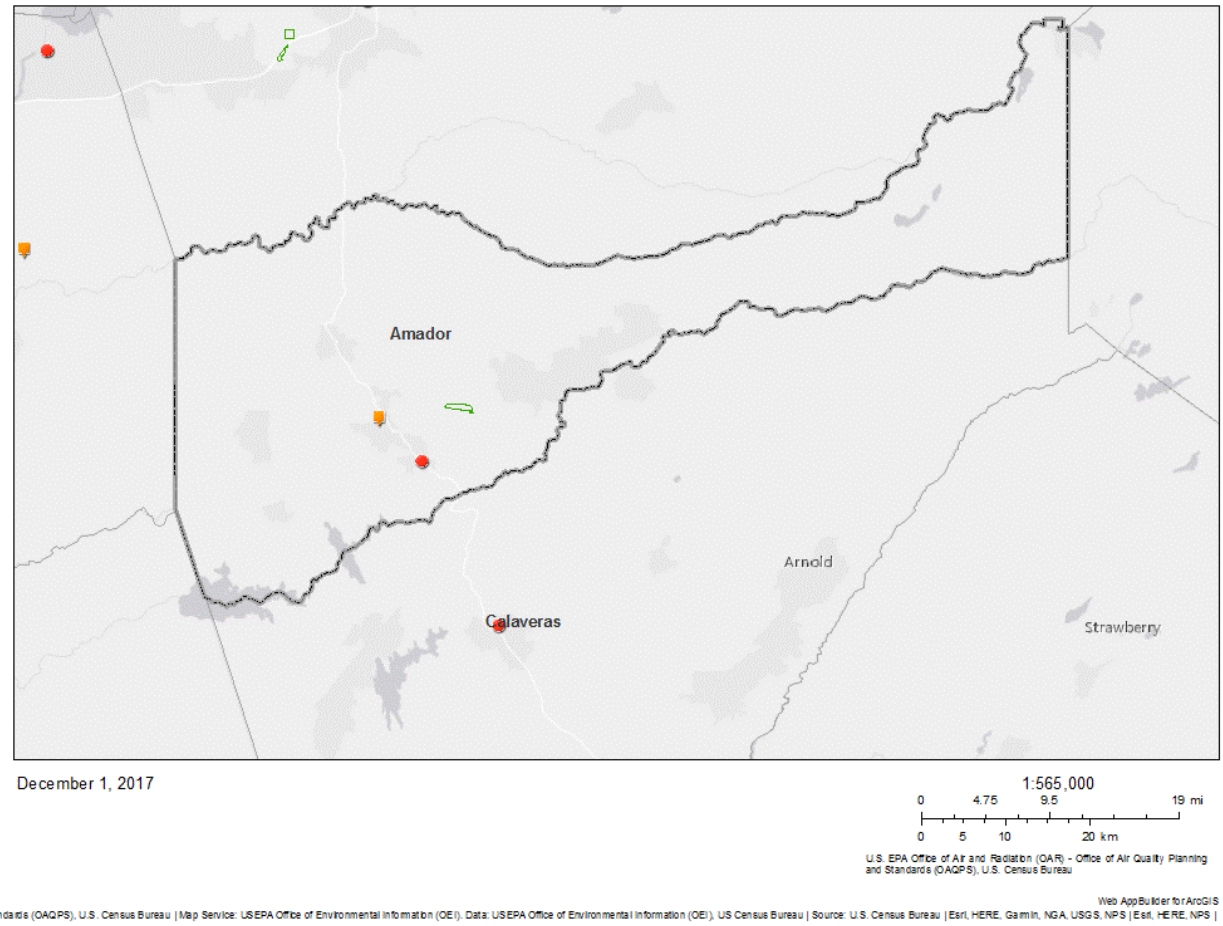


Figure 3.3 shows large point sources in the area of analysis for Amador County, CA as orange squares. The EPA's nonattainment boundary for Amador County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emissions showed that Amador County has emissions levels of 1,548 tpy of NO_x and 2,517 tpy of VOC within the area of analysis. The single large point source of ozone precursors is located in the western portion of Amador County, northwest of the violating monitor. Factor 3 will discuss whether meteorology indicates emissions/sources in this area may be causing or contributing to an exceedance or violation of the 2015 ozone NAAQS.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 3.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 3.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Amador, CA	Yes	38,091	37,001	62	-1,090	-3%
	Area wide:	38,091	37,001	62	-1,090	-3%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. www.census.gov/data.html.

Figure 3.4 shows the 2012 census tract-level population information for Amador County. Amador County had a 2015 population of approximately 37,000 people, with a 3% population decline during the 2010-2015 period. Amador County has no discrete population centers and the population density reflects that the county is generally rural. The western portion of Amador County contains census tracts with higher population than those census tracts in the eastern portion of the county, although the census tract containing the violating monitor has a lower population than surrounding census tracts within the county.

Figure 3.4 Census Tract-Level Population.

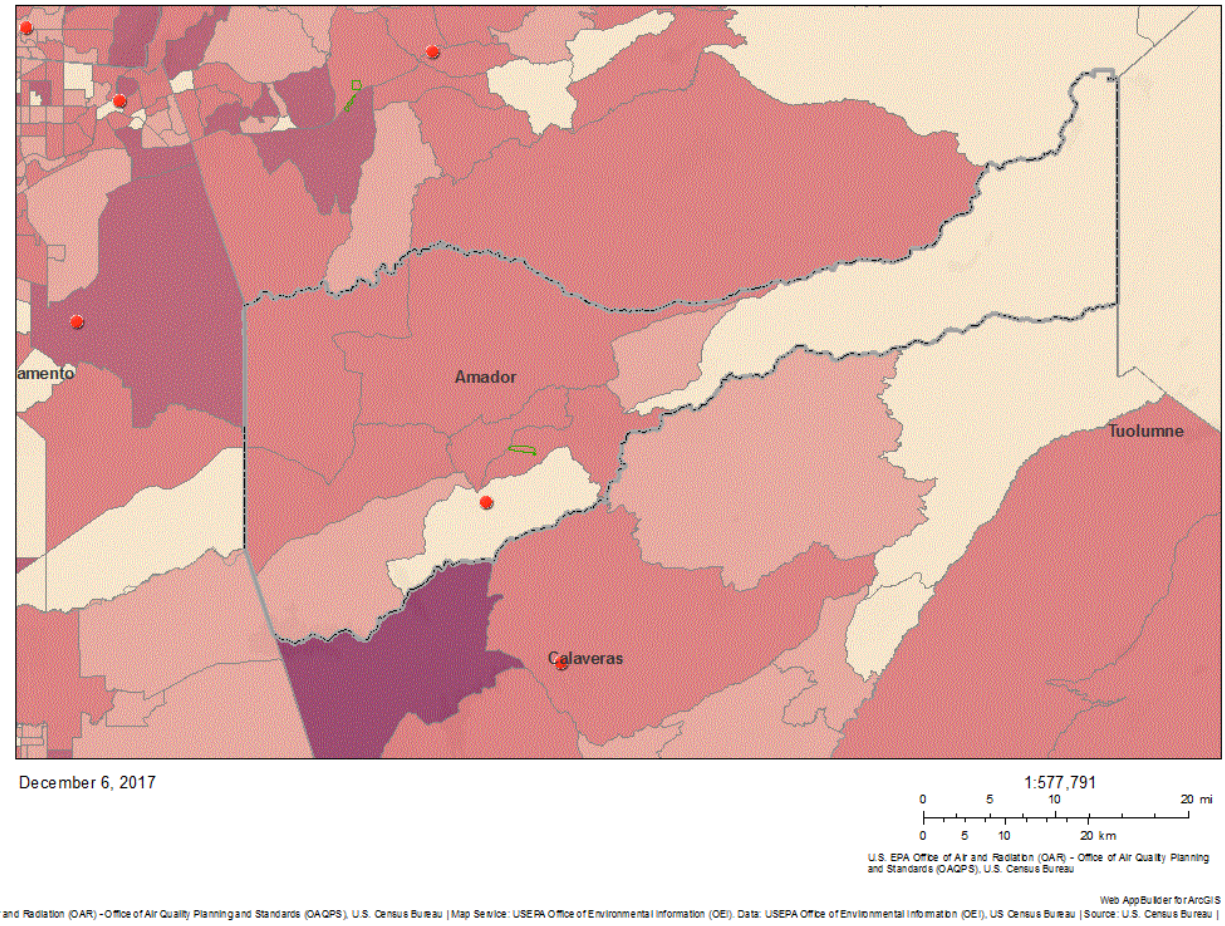


Figure 3.4 shows census tract-level population in the area of analysis for Amador County, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Amador County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 3.5 shows the traffic and commuting pattern data, including total VMT for Amador County, the number of residents who work in the county, the number of residents that work in the county with a violating monitor, and the percent of residents working in the county with a violating monitor. The data in Table 3.5 are 2014 data.

Table 3.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis
Amador, CA	Yes	367	17,551	4,696	26.8%
	Total:	367	17,551	4,696	26.8%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 3.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 3.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

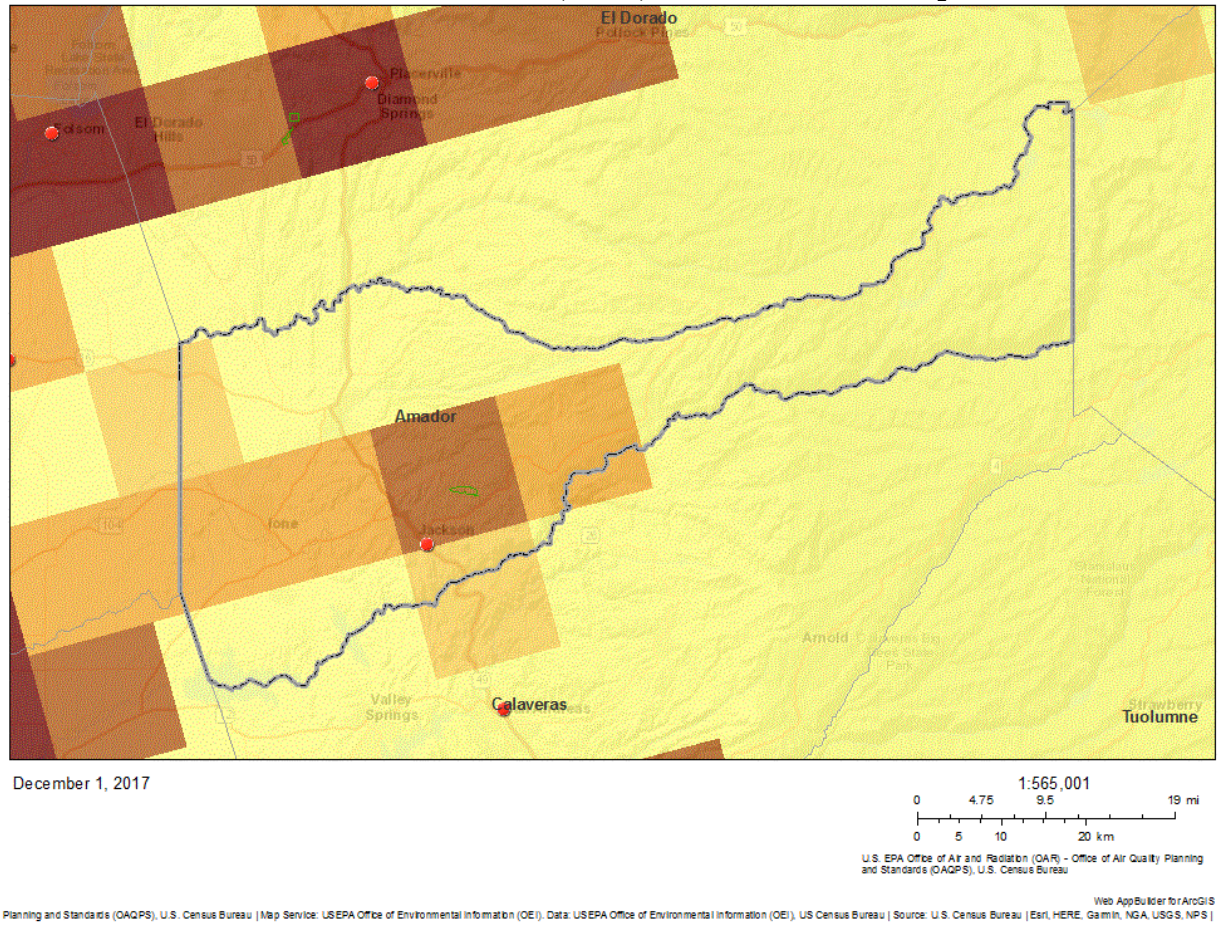


Figure 3.5 shows gridded VMT in the area of analysis for Amador County, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Amador County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on the 2014 NEI and On the Map data from the Census Bureau and shows that VMT levels in Amador County are consistent with an area that

is more rural than urban. The twelve-kilometer grid cell with the highest VMT in the county falls over the city of Jackson. The data also show that VMT levels in the western portion of Amador County are higher in areas that include transportation arteries with the largest number of commuters, and lower in the eastern portion of the county.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2013-2015 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 3.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8-hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

Figure 3.6 HYSPLIT Back Trajectories for the Violating Monitor.

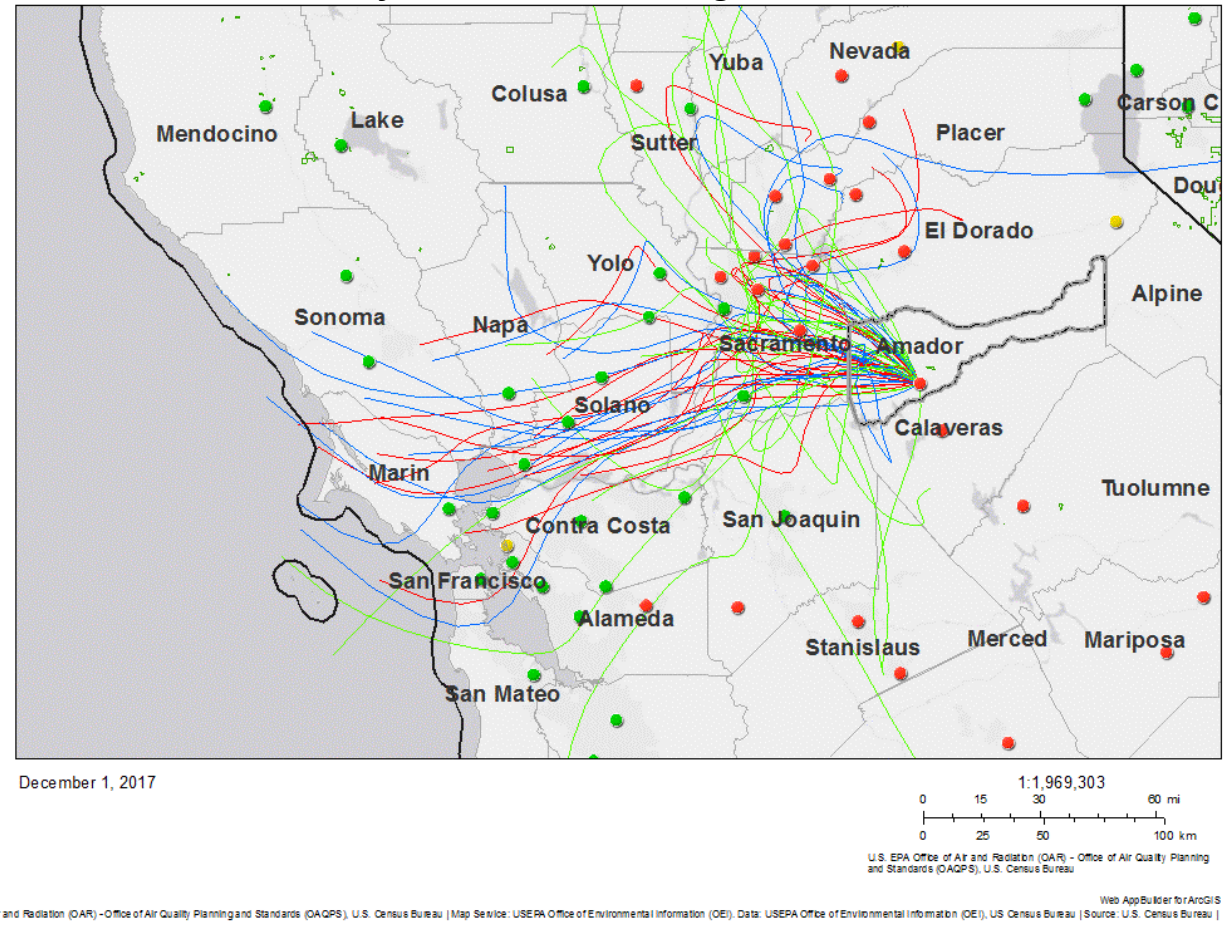


Figure 3.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Amador County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2013-2015 generally flow from the west-northwest and west-southwest, suggesting emissions transport from within Amador County and from the Sacramento and northern San Joaquin Valley areas, consistent with local topography.

Summers in Amador County are normally warm and dry. Winds are generally daytime upslope and nighttime downslope flows, caused by the differential heating or cooling of air near mountain ground surfaces relative to air at the same height over land at lower elevations.

Neighboring San Joaquin and Sacramento valleys can have temperature inversions from 2,000 to 2,500 feet (600 to 750 meters) above the valley floor to as high as 5,000 feet (1,500 meters). Ozone produced in the Sacramento and northern San Joaquin Valley and trapped under this inversion can reach fairly high into the mountain counties, or be advected there by daytime upslope flows. Previous assessments of transport by the California Air Resources Board have found a strong potential for ozone transport from the Sacramento and San Joaquin valleys up into the mountain counties.[6] Nighttime drainage

[6] "Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California". California Environmental Protection Agency, Air Resources Board, March 2001. http://www.arb.ca.gov/aqd/transport/assessments/assessments.htm

flows reverse this, so some of this pollution, in combination with pollution generated in the mountain counties themselves, could be transported back into the valleys, with the potential for some carryover into subsequent days.

North-south flow between Amador and Calaveras counties is possible, as there are fewer features to this transport pattern due to the weaker topographic relief in the western parts of both counties. There is likely some transport of pollutants between these two counties but the back trajectories indicate that air flow generally passes through the Sacramento Metro and San Joaquin Valley nonattainment areas before reaching the Amador County monitor. The EPA is designating Calaveras County, the Sacramento Metro area, and the San Joaquin Valley as separate nonattainment areas for the 2015 ozone NAAQS.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. Topography impacts pollutant formation and transport in California, and thus plays an important role in assessing which areas are contributing to monitored violations of the NAAQS. Figure 3.7 shows a topographic illustration of the physical features around the Amador County area.

California has historically been divided into 15 distinct air basins. Amador County is located in the Mountain Counties Air Basin. This is not a “basin” in the sense of a single watershed or an area that is more or less surrounded by high terrain. Rather it is a group of rural and largely mountainous counties compared to the more polluted, flatter, and more populous areas to the west (the broad Sacramento and San Joaquin valleys of central California). Amador County is in the foothills and mountains of the Sierra Nevada mountain range. Elevations increase from about 150 feet (46 meters) above mean sea level in the west to over 8,000 feet (2400 meters) in the east.

Air flow in the west-east direction is relatively unimpeded along the area’s river valleys, which extend well east into the interior of the county. Eastward transport of pollutants from the more urbanized areas to the west such as the Sacramento Metro area is thus possible during conditions of upslope flow. Conversely, westward transport of locally-generated pollution is possible during nighttime downslope flow.

Figure 3.7 Topographic Illustration of the Physical Features.

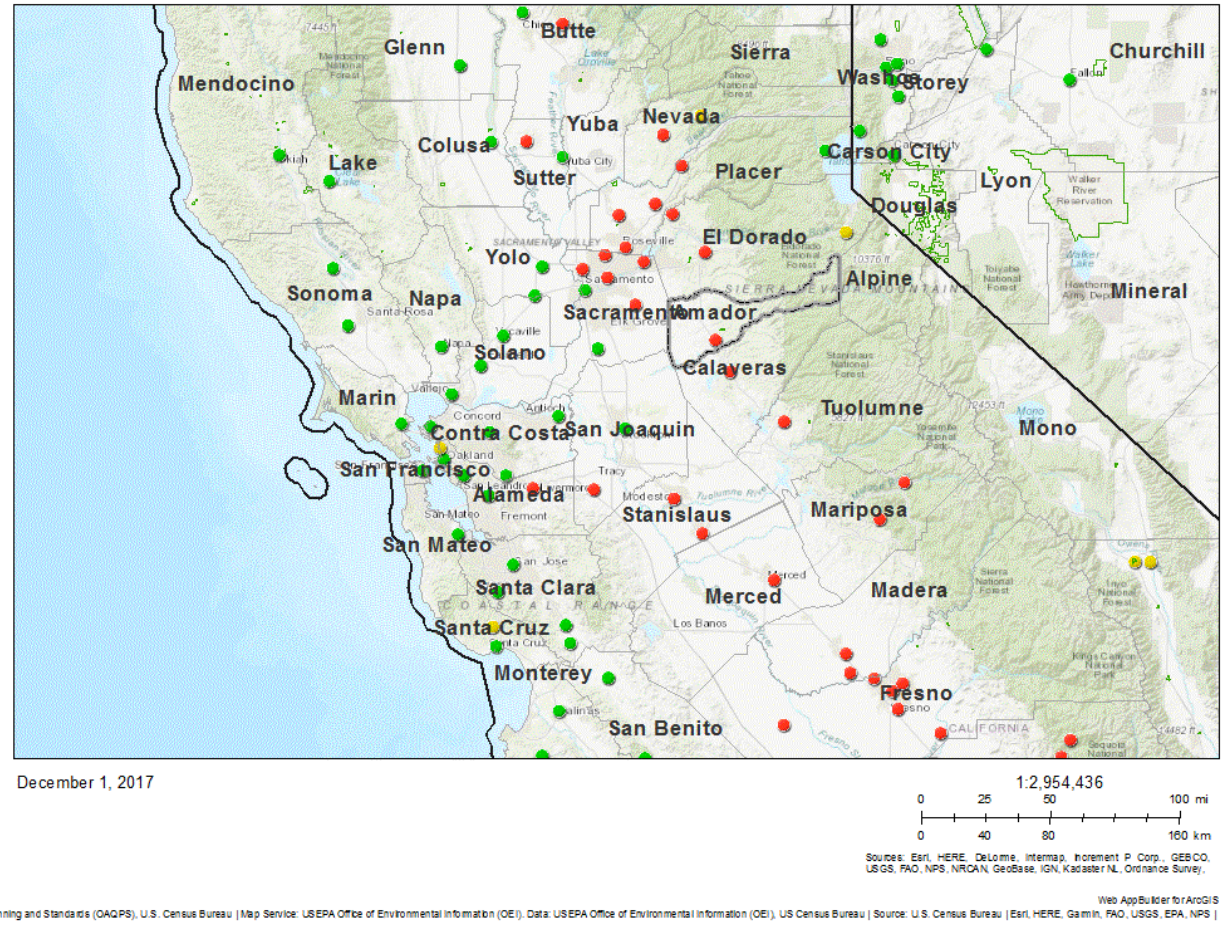


Figure 3.7 shows the topography in the area of analysis for Amador County, CA. The EPA's nonattainment boundary for Amador County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Amador County nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 3.8 shows the relevant jurisdictional boundaries for Amador County. While these jurisdictional boundaries do not include a CSA or CBSA, they follow county, air district, transportation planning agency, and former ozone nonattainment area boundaries.

Figure 3.8 Jurisdictional Boundaries.

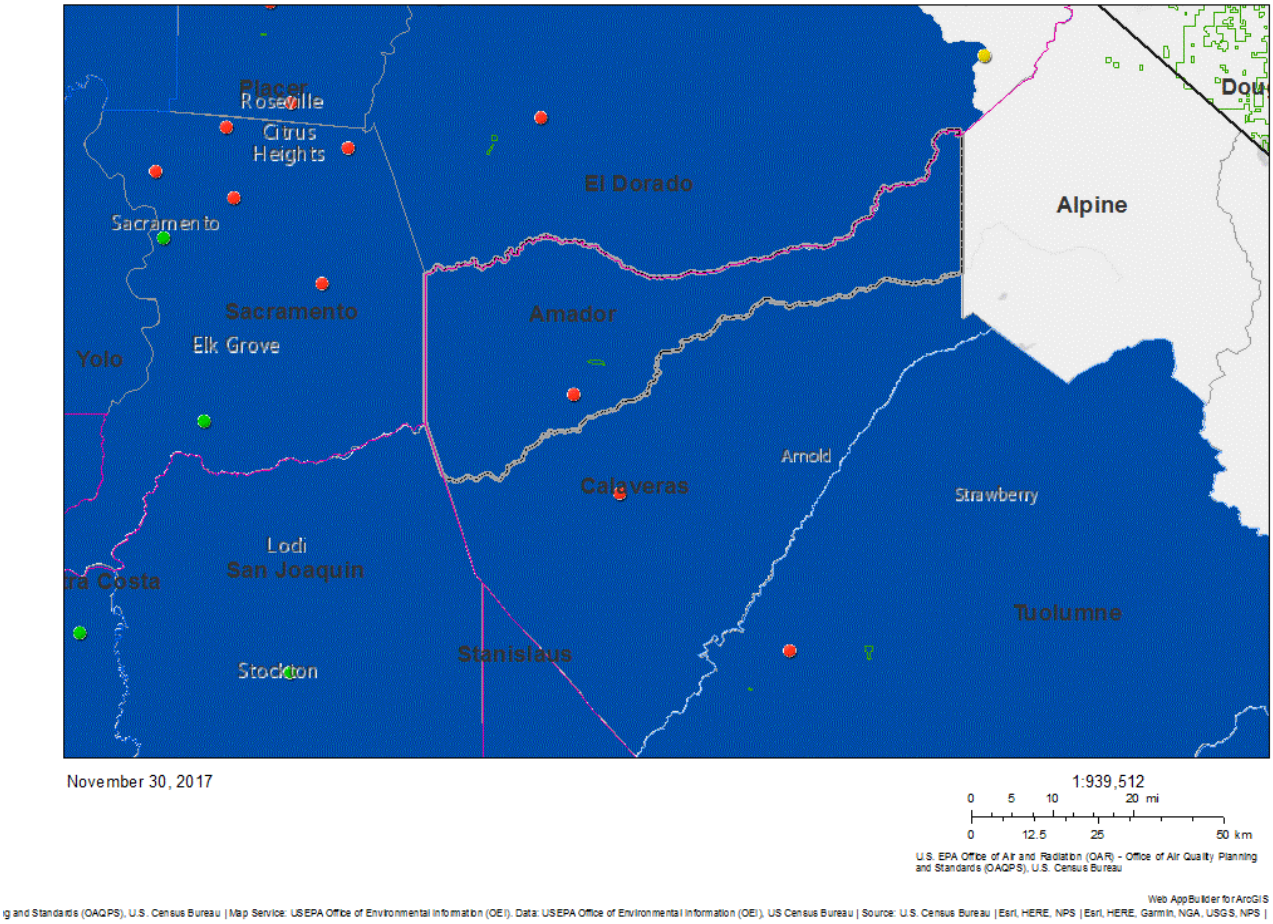


Figure 3.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines), in the area of analysis for Amador County, CA. The EPA's nonattainment boundary for Amador County, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

For the 1997 ozone NAAQS, Amador County and Calaveras County were designated together as one nonattainment area. For the 2008 ozone NAAQS, the areas were designated as separate areas, with Amador County being designated attainment/unclassifiable and Calaveras County being designated as nonattainment.

Both counties have their own county governments as well as their own air pollution control districts (Amador Air Pollution Control District (APCD) and the Calaveras County APCD). Each county also has its own transportation planning agency. The adjacent Sacramento Metro and San Joaquin Valley nonattainment areas are also under different air quality planning and transportation planning jurisdictions than Amador County. The Amador County Transportation Commission (ACTC) is the state-designated Regional Transportation Planning Agency (RTPA) and Local Transportation Commission (LTC) serving Amador County and its five incorporated cities: Amador City, Ione, Jackson, Plymouth, and Sutter Creek. Calaveras Council of Governments (CCOG) is the RTPA for the County of Calaveras and the city of Angels Camp. As an RTPA, the CCOG is the designated planning and administrative agency for transportation projects and programs in the county.

As mentioned above, the Amador County area also includes Indian country belonging to the following tribes: Buena Vista Rancheria and Jackson Band. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

Conclusion for Amador County, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to designate Amador County as the Amador County nonattainment area for the 2015 ozone NAAQS.

The air quality monitor in Amador County indicates a violation of the 2015 ozone NAAQS based on the 2016 design value, therefore the EPA is including this county in the final nonattainment area. Emissions and emission-related data show that Amador County has one large point source and some non-point sources (e.g., vehicles). Meteorological data indicate the winds transporting ozone and ozone precursors during exceedance days are predominately from the west-northwest and west-southwest, suggesting emission transport from within Amador County but also from the more heavily populated and industrialized areas of the Sacramento Metro nonattainment area and the northern portions of the San Joaquin Valley nonattainment area. This is consistent with the geography of the area where air flow in the west-east direction is relatively unimpeded along the area's river valleys, which extend well east into the interior of the county. The jurisdictional factor supports a separate boundary for Amador County from the adjacent nonattainment areas (i.e., Calaveras County, Sacramento, and San Joaquin Valley), as the adjacent areas have separate air pollution control districts, with separate jurisdictional boards and authorities. This is consistent with how the areas were designated for the 2008 ozone NAAQS, with Amador County designated attainment for that NAAQS. The County was designated together with Calaveras County as a single nonattainment area for the 1997 ozone NAAQS.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation and is designating Amador County, CA nonattainment for the 2015 ozone NAAQS.

4.0 Technical Analysis for Butte County, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area.

Table 4.1 identifies the area of analysis for the Butte County, CA nonattainment area. The area of analysis includes all of Butte County which also comprises all of the Chico core-based statistical area (CBSA). There is no combined statistical area (CSA) associated with this area. The nonattainment area is identical to the existing 1997 and 2008 Butte County nonattainment areas.

Table 4.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Butte County, CA	Butte County	Chico CBSA	None

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 4.1 is a map of the EPA's nonattainment boundary for Butte County. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries.

The EPA designated Butte County as the Chico, CA nonattainment area for the 1997 ozone NAAQS, and Butte County was also designated as the Chico (Butte County), CA nonattainment area for the 2008 ozone NAAQS. The boundaries for the 1997 and 2008 ozone NAAQS nonattainment areas were identical and included all of Butte County. The EPA is not modifying the State's recommendation to

[1] The EPA's Ozone Designations Guidance and Data web page can be found at https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data.

designate Butte County as nonattainment for the 2015 ozone NAAQS with the same boundary as that of the county. The Butte County area also includes Indian country of the following tribes: Berry Creek Rancheria of Maidu Indians of California (Berry Creek Rancheria), Enterprise Rancheria of Maidu Indians of California (Enterprise Rancheria), Mechoopda Indian Tribe of Chico Rancheria, and Mooretown Rancheria of Maidu Indians of California (Mooretown Rancheria). The tribes did not submit a recommendation and the EPA is including the tribal areas as part of the designated nonattainment area.

Figure 4.1: The EPA's Nonattainment Boundaries for Butte County, CA

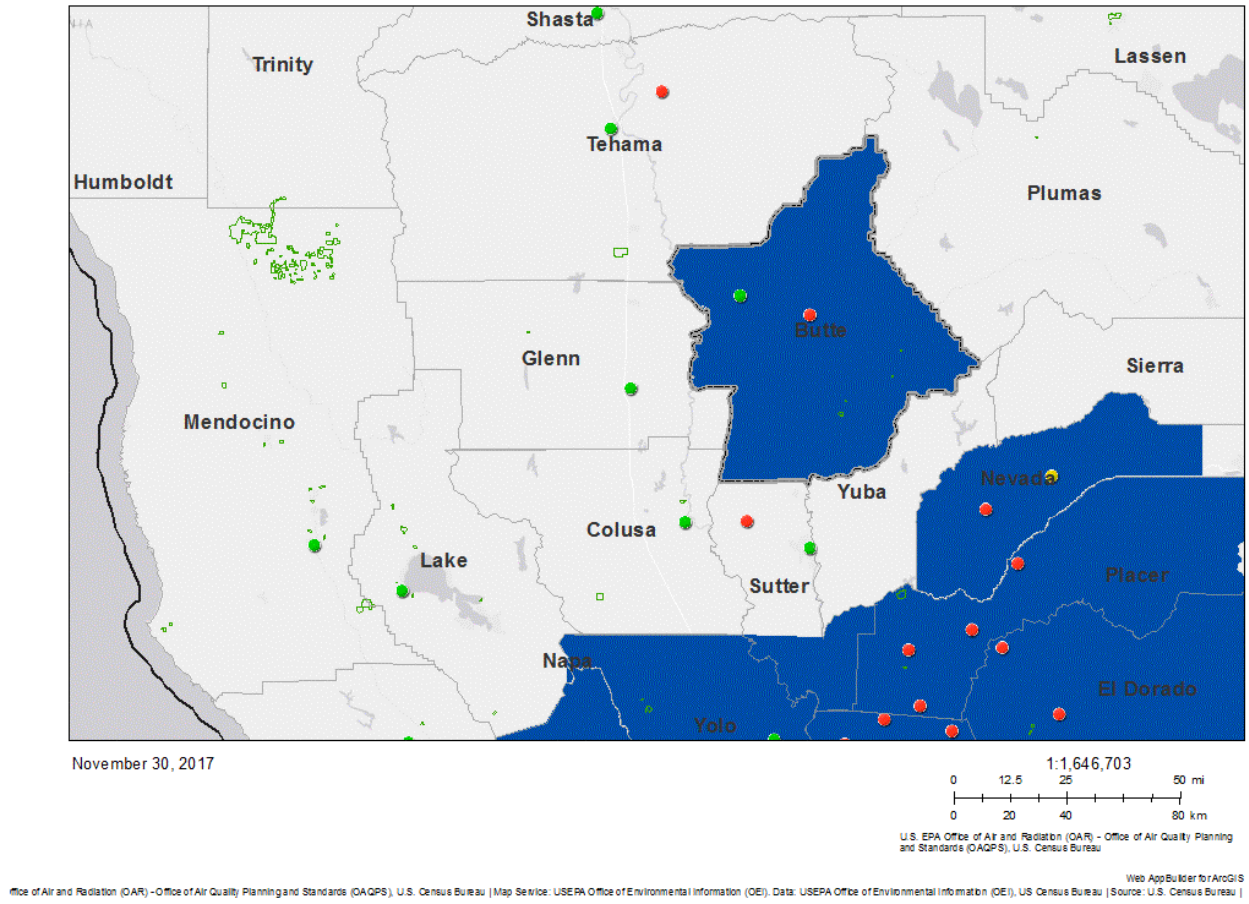


Figure 4.1 shows the EPA's nonattainment boundary for Butte County, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Butte County has a monitor in violation of the 2015 ozone NAAQS, therefore this county is included in the final nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Butte County area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 4.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance.

Table 4.2. Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Butte, CA	Yes	06-007-0007	**0.075**	0.074	0.075	0.077
		06-007-0008	0.066	0.066	0.067	0.067

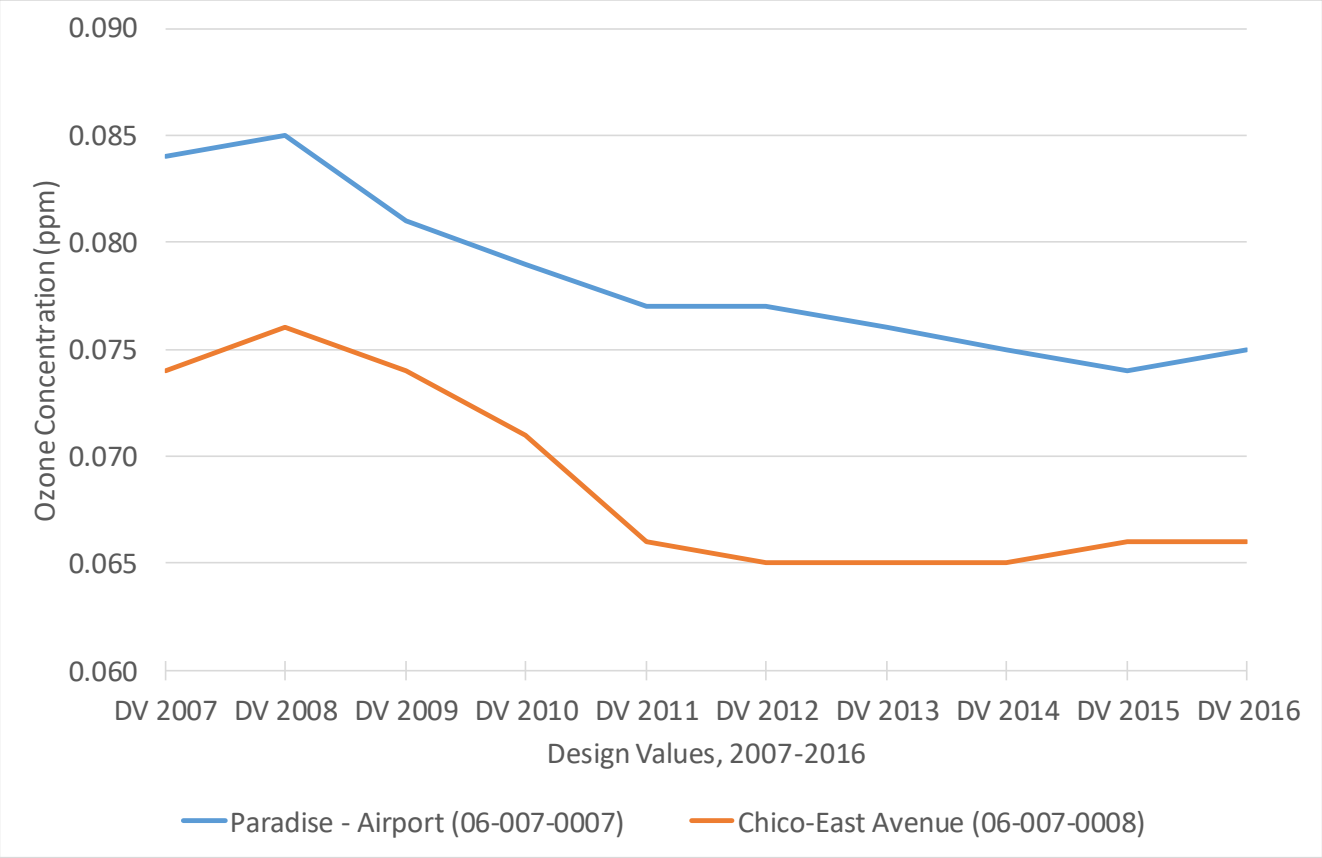
The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

Butte County shows a violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 4.1, shown previously, identifies the Butte County nonattainment area and the violating monitor. Table 4.2 identifies the design values for all monitors in the area of analysis. Figure 4.2 shows the historical trend of design values for the two monitors in the county. As indicated on the map, there is one violating monitor, Paradise-Airport (AQS ID 06-007-0007), that is located in the center of the county, in the northern Sierra Nevada foothills. The other monitor in the area of analysis, Chico-East Avenue (AQS ID 06-007-0008), is located approximately 20 km to the northwest of the Paradise-Airport monitor in the city of Chico and has a valid attaining 2016 DV of 0.066 ppm.

As shown in Figure 4.2, the trends for previous design values at monitoring sites located within the area of analysis show that the Paradise-Airport monitor has been above the 2015 ozone NAAQS for the past 10 years, while the Chico-East Avenue monitor has been below the 2015 ozone NAAQS since 2011. The data also show that ozone design values at the Paradise-Airport monitor have been generally trending down since 2008.

Figure 4.2 Three-Year Design Values for Monitors in the Area of Analysis (2007 – 2016).



Butte County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 4.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Butte County nonattainment area.

Table 4.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Butte, CA	Yes	5,336	5,160
	Area wide:	5,336	5,160

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown as square orange icons in Figure 4.3 below. The nonattainment boundary is also shown.

Figure 4.3 Large Point Sources in the Area of Analysis.

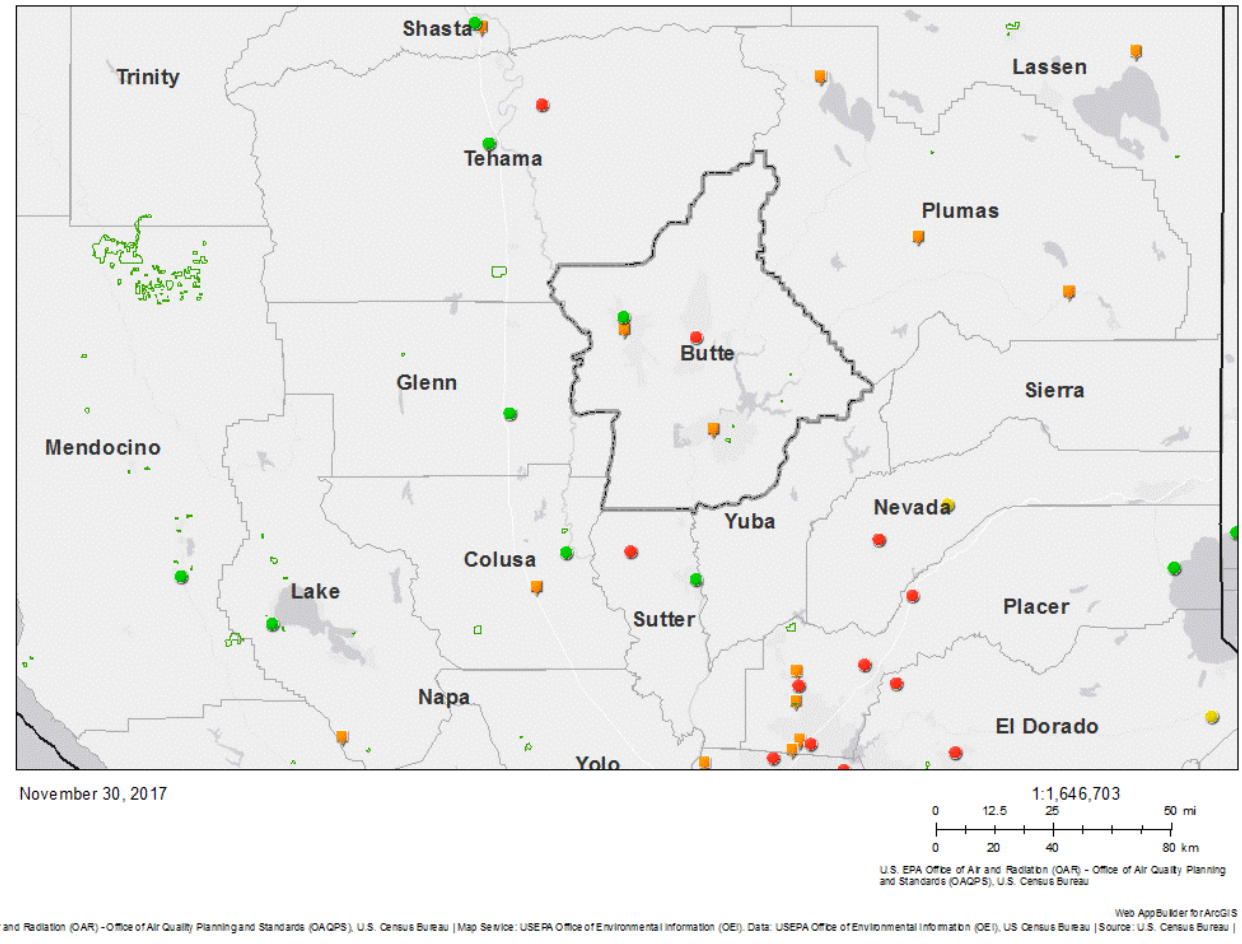


Figure 4.3 shows large point sources in the area of analysis for Butte County, CA as orange squares. The EPA's nonattainment boundary for Butte County, CA is shown as a gray line. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emissions showed that Butte County has emissions levels of 5,336 tpy total NO_x emissions, and 5,160 tpy total VOC emissions. Two large point sources of ozone precursors are located in the area of analysis.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 4.4 shows the population, population density, and population growth information for each county in the area of analysis. Figure 4.4 shows the census-tract level population density for Butte county.

Table 4.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Butte, CA	Yes	220,000	225,411	138	5,411	2%
	Area wide:	220,000	225,411	138	5,411	2%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html

Figure 4.4 Census Tract-Level Population

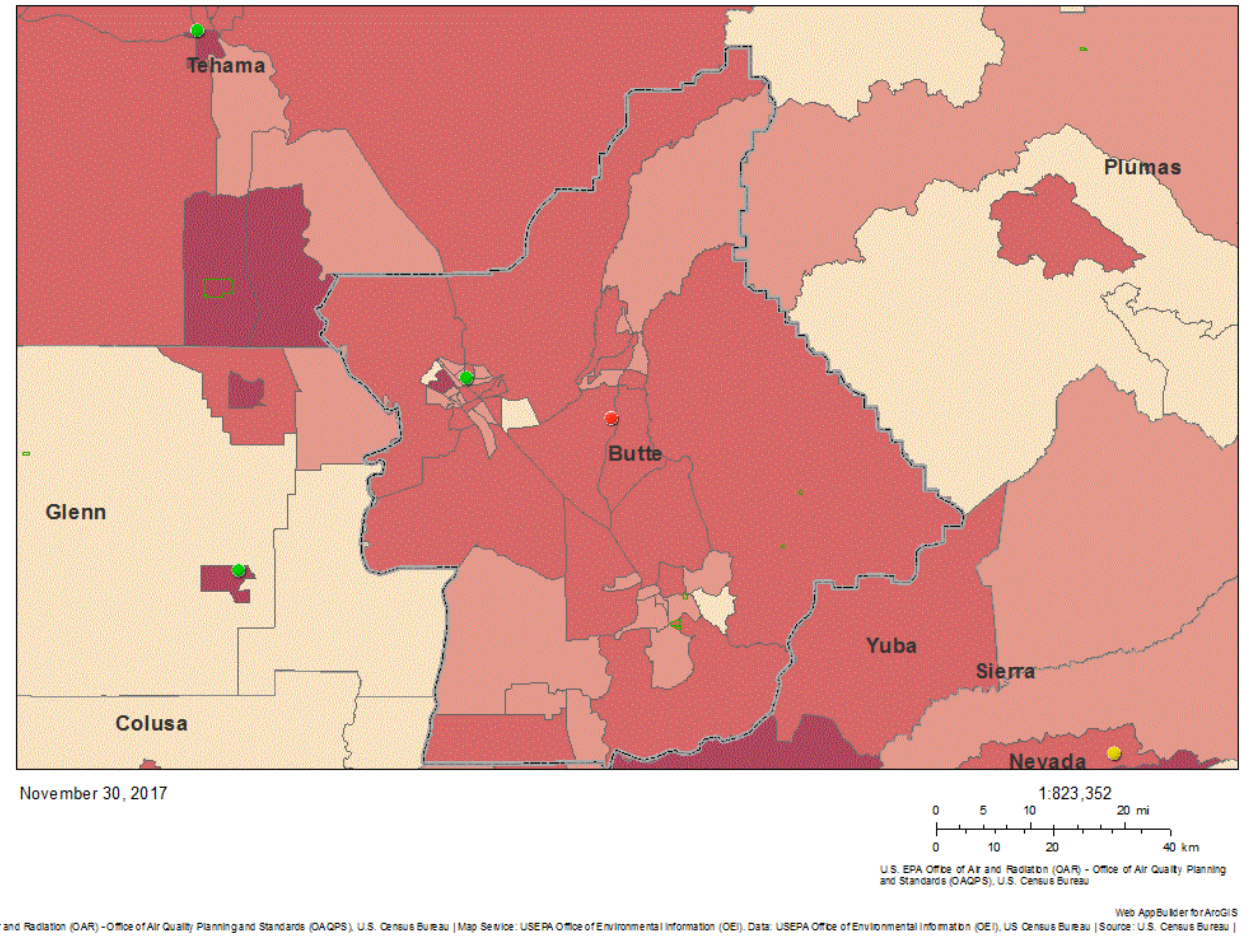


Figure 4.4 shows census tract population in the area of analysis for Butte County, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Butte County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Butte County had a 2010 population of 220,000, and a 2015 population of approximately 225,400 people. In 2015, the population density was approximately 138 people per square mile. Based on 2010 population numbers, Butte, as well as the surrounding counties all have populations of 220,000 people or less. The census tracts shown in Figure 4.4 for Butte County indicate a fairly uniform moderate population region, with census tracts in the northern and southwestern portions being slightly less populated than other sections of the county.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile

source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 4.5 shows the traffic and commuting pattern data, including total VMT for Butte County, number of residents who work in the county, number of residents that commute to Butte County, and the percent of residents working in the county. The data in Table 4.5 are 2014 data.

Table 4.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis
Butte, CA	**Yes**	**1,647**	**76,308**	**51,480**	**67.5%**
	Total:	1,647	76,308	**51,480**	**67.5%**

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 4.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 4.5 Twelve Kilometer Gridded VMT (Miles) with Transportation Arteries.

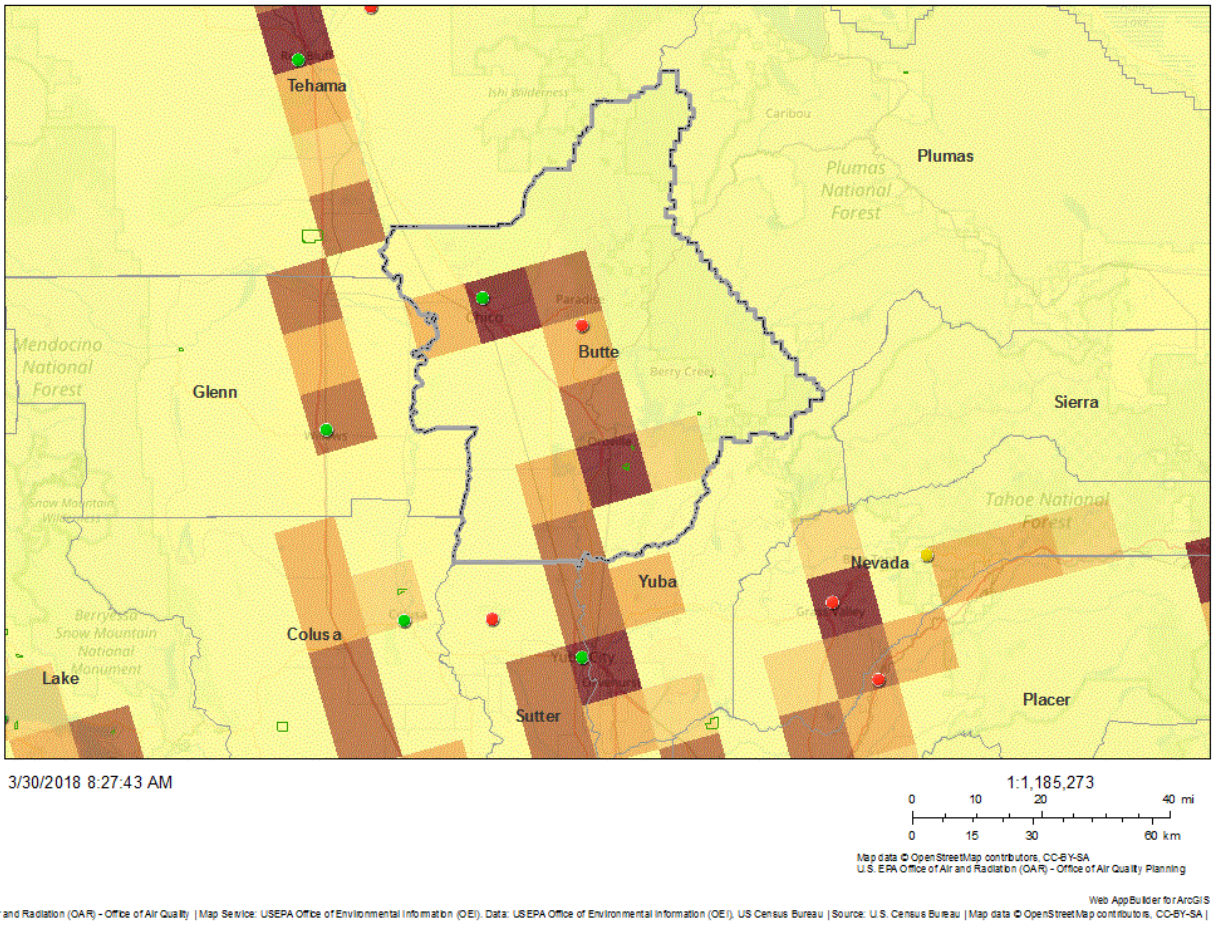


Figure 4.5 shows gridded VMT in the area of analysis for Butte, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. The EPA's nonattainment boundary for Butte County, CA is shown as a gray line with a dashed black center. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau,[6] and shows that Butte County has a total 2014 total VMT of 1,647 million miles. As shown in Figure 4.5, the higher VMT 12 km grid cells fall roughly along California Highway 99. All grid cells in the rest of Butte County have lower VMT.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 4.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating Paradise-Airport (AQS ID 06-007-0007) monitor.

[6] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/.

Figure 4.6. HYSPLIT Back Trajectories for Violating Monitor(s).

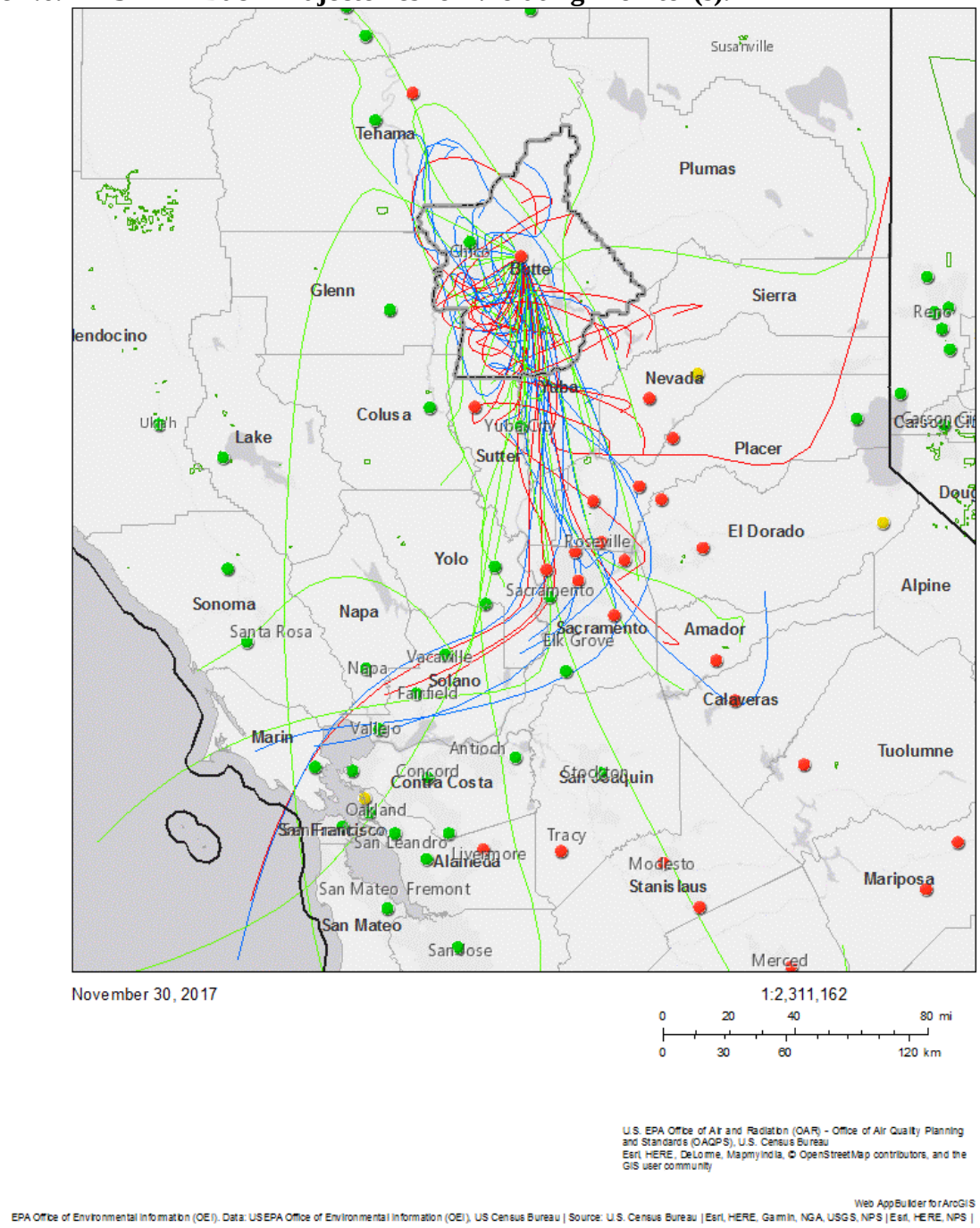


Figure 4.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Butte County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally pass through Butte County, which indicates that emission sources in Butte County (previously discussed in Factor 2) may be contributing to exceedances or violations of the 2015 ozone NAAQS. The starting points of some of the trajectories extend to the Sierra foothills to the east and southeast. This is consistent with downslope flow in the evening preceding the exceedances, and may indicate recirculation of pollutants, possibly transported to Butte County on the preceding day. Other trajectories extend to Sacramento and even to the San Francisco Bay Area. This suggests that pollution may be transported from the south to Butte County. The data also show that the winds during exceedance days are predominantly from the south.

The wind patterns indicate that local emissions within Butte County may be contributing to NAAQS exceedances or violations, and there also may be contribution from transport of pollutants from areas further south. The EPA is designating Sutter Buttes (part of Sutter County) and Sacramento Metro, both located to the south of Butte County, as their own nonattainment areas for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for those areas.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

In the western U.S., topography affects pollutant formation and transport in California, and thus plays an important role in assessing what areas are contributing to monitored violations of the NAAQS. California has historically been divided into fifteen distinct air basins. Butte County is located in the Sacramento Valley Air Basin, which includes the counties of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, Yolo, Yuba, and parts of Placer and Solano Counties. The Air Basin includes both the flat Sacramento Valley areas and the foothills of the surrounding mountain ranges.

The western half of Butte County is part of the Sacramento Valley. The broad, flat Sacramento Valley is the northern half of California's Central Valley. It is bounded on the west by the Northern Coast Ranges, on the north by the Siskiyou and Trinity Mountains, and on the east by the Sierra Nevada mountain range; it is open toward the south, ending in the vicinity of Sacramento. The Valley is about 65 km (40 mi) wide at the latitude of the Paradise - Airport monitor (AQS ID 06-007-0007) in Butte County. Other than distance, in this western portion there is little barrier to transport of pollutants from areas further south.

The eastern half of Butte County is part of the Sierra Nevada foothills, and is characterized by river valleys running roughly east-northeast to west-southwest, separated by mountain ridges. This tends to inhibit north-south flow within the county, but to allow east-west upslope and downslope flow. The increasing elevations eastward are likely a partial barrier to transport of pollutants to the less-populated eastern part of the county.

Figure 4.7. Topographic Illustration of the Physical Features.

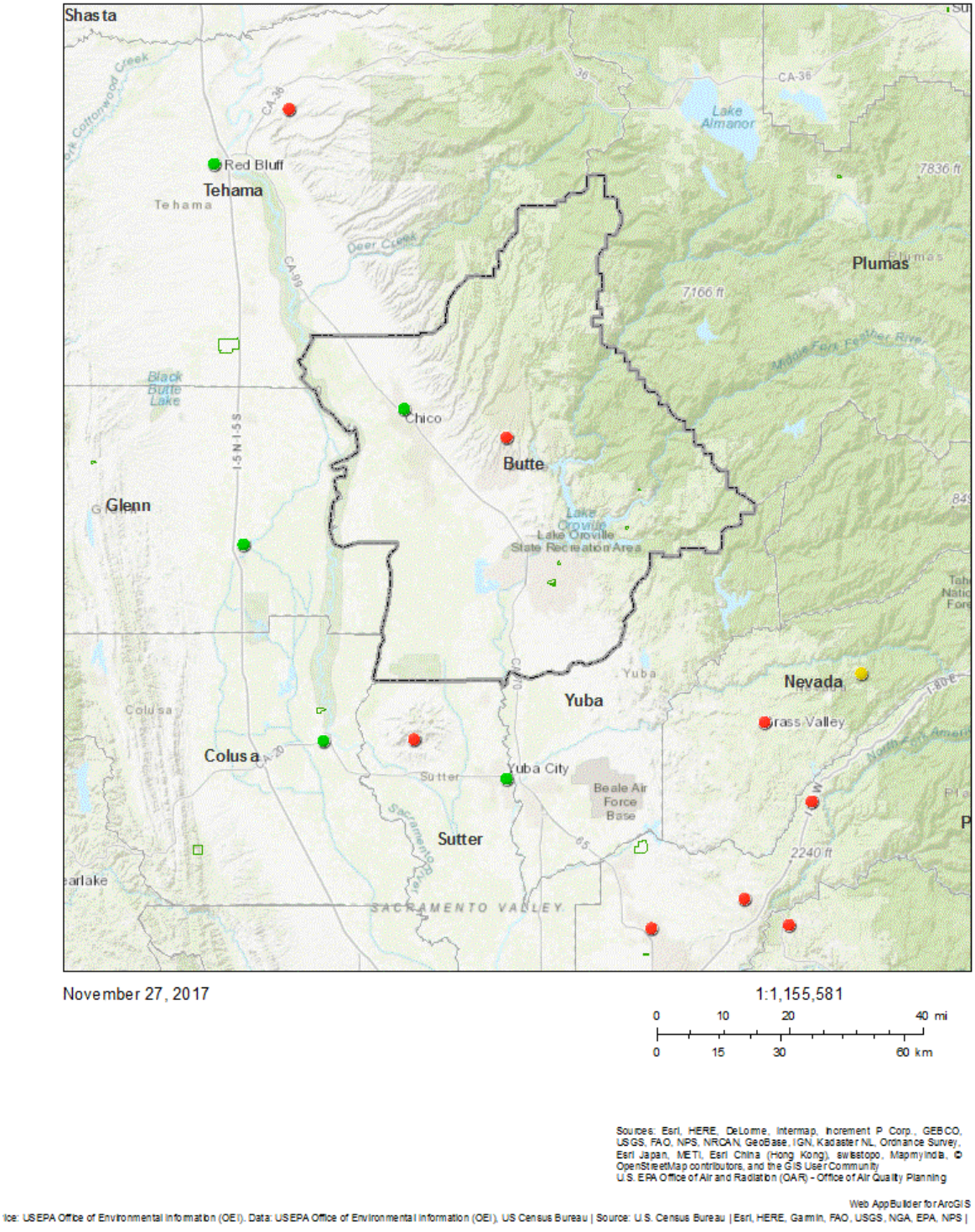


Figure 4.7 shows the topography in the area of analysis for Butte County, CA. The EPA's nonattainment boundary for Butte County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Butte County nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations (MPOs), and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 4.8 shows the relevant jurisdictional boundaries for Butte County, including county and CBSA boundaries, and areas of Indian country. Butte County is bounded by Colusa, Glenn, and Tehama counties to the west; Plumas county to the east; and the Yuba City MSA to the south. The Yuba City MSA, which includes Sutter and Yuba counties, is further discussed in the Technical Analysis sections for the Sutter Buttes and Sacramento Metro nonattainment areas. In Figure 4.8, the EPA's nonattainment boundary for Butte County (as well as the State's recommendation, and the County boundary) is shown with a red outline, CBSAs are show as blue outlined areas, and existing 1997 and 2008 ozone NAAQS nonattainment areas as solid blue areas.

Figure 4.8 Jurisdictional Boundaries.

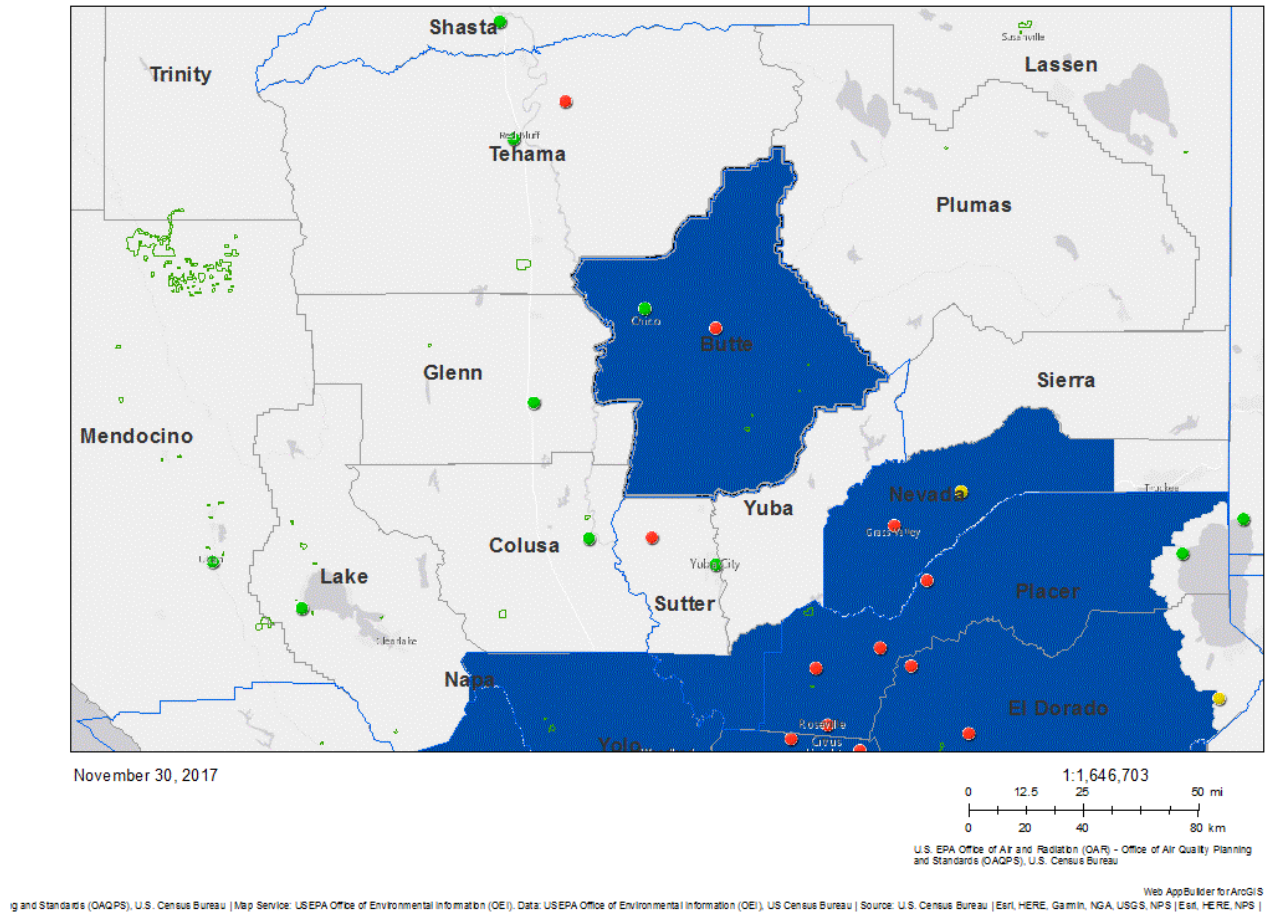


Figure 4.8 shows jurisdictional boundaries, including state boundaries (black lines), metropolitan statistical areas (dark blue lines), in the area of analysis for Butte County, CA. The EPA's nonattainment boundary for Butte County, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Butte County area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS. The State's recommended nonattainment area boundary is the county boundary, as well as the jurisdictional boundary for the local air planning agency, the Butte County Air Quality Management District. This boundary also represents the jurisdictional boundary of the local transportation planning agency, the Butte County Association of Governments. As noted in the introduction to the technical analysis above, the county also represents the entirety of the Chico MSA, named after its most populous city, Chico. The MSA is not associated with a larger CSA.

As mentioned above, the Butte County area also includes portions of Indian country of the following tribes: Berry Creek Rancheria, Enterprise Rancheria, Mechoopda Indian Tribe of Chico Rancheria, and Mooretown Rancheria. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits

of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

Conclusion for Butte County, CA

Based on the assessment of factors described above, the EPA has concluded that Butte County meets the CAA criteria for inclusion in the Butte County nonattainment area. This is the same area that was included in the Butte County nonattainment area for the 1997 and 2008 ozone NAAQS.

An air quality monitor in Butte County indicates a violation of the 2015 ozone NAAQS based on the 2016 design values, therefore, this county is included in the nonattainment area. Emissions and emissions-related data show that Butte County has two large point sources of ozone precursors. Meteorological data indicate that winds transporting ozone and ozone precursors during exceedance days are predominantly from the south, originating from Sacramento and even the San Francisco Bay Area. Yuba County has no large point sources (and relatively low NO_x and VOC combined emissions—see the Technical Analysis for Sacramento Metro, CA section of this document) and is likely not a significant source of transport from the south to Butte County. The EPA is designating Sutter Buttes (part of Sutter County) and Sacramento Metro, both located to the south of Butte County, as their own nonattainment areas for the 2015 ozone NAAQS. The eastern half of Butte County is part of the Sierra Nevada foothills; there is no significant topographic barrier to airflow from the north, west, or south. Butte County has its own local air planning agency, local transportation planning agency, represents the entirety of the Chico MSA, and was previously designated nonattainment for the 1997 and 2008 ozone NAAQS. The jurisdictional factor supports a separate boundary for Butte County from the nearby Sutter Buttes and Sacramento Metro nonattainment areas, as these areas are under different air quality planning and transportation planning jurisdictions.

Based on consideration of all five factors, the EPA is not modifying the State's recommendation and is designating Butte County, CA nonattainment for the 2015 ozone NAAQS.

5.0 Technical Analysis for Calaveras County, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area.

Table 5.1 identifies the area of analysis for the Calaveras County, CA final nonattainment area. The area of analysis includes all of Calaveras County. There is no CBSA or CSA associated with this area. The final nonattainment area differs from the existing 1997 nonattainment area and is the same as the existing 2008 Calaveras County, CA nonattainment area.

To the north, west, and south, Calaveras County is adjacent to several areas that the EPA is designating nonattainment for the 2015 ozone NAAQS. To the north of Calaveras County is Amador County, which is not a part of a CSA or CBSA. To the west is San Joaquin County, which is also the single-county Stockton-Lodi CBSA, which comprises the easternmost portion of the San Jose-San Francisco-Oakland CSA. To the southwest of Calaveras County is Stanislaus County, which is also the single-county Modesto CBSA (which is part of the Modesto-Merced CSA). To the south is Tuolumne County, which is also the single-county Sonora CBSA. Information specific to Amador County and the adjacent CSA/CBSAs is contained in separate sections of the TSD for California. To the east of Calaveras County is Alpine County, which is not a part of a CSA or CBSA and does not have an air quality monitor.

The EPA designated Calaveras County, CA as a nonattainment area for the 2008 ozone NAAQS. For the 1997 ozone NAAQS, Calaveras County was designated with Amador County as the two-county Central Mountain Counties nonattainment area based on both counties having violating monitors and the State's recommendation.

Table 5.1 Area of Analysis.

Final Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Calaveras County, CA	Calaveras County	None	None

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 5.1 is a map of the EPA's nonattainment boundary for Calaveras County. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 2008 ozone NAAQS nonattainment boundaries. The EPA is not modifying the State's recommendation to designate Calaveras County as nonattainment with the same boundary as that of the county. Located within the county boundary are areas of Indian country belonging to the California Valley Miwok Tribe. The tribe did not submit a recommendation and the EPA is including the tribal area as part of the designated nonattainment area.

Figure 5.1 The EPA's Final Nonattainment Boundaries for Calaveras County, CA.

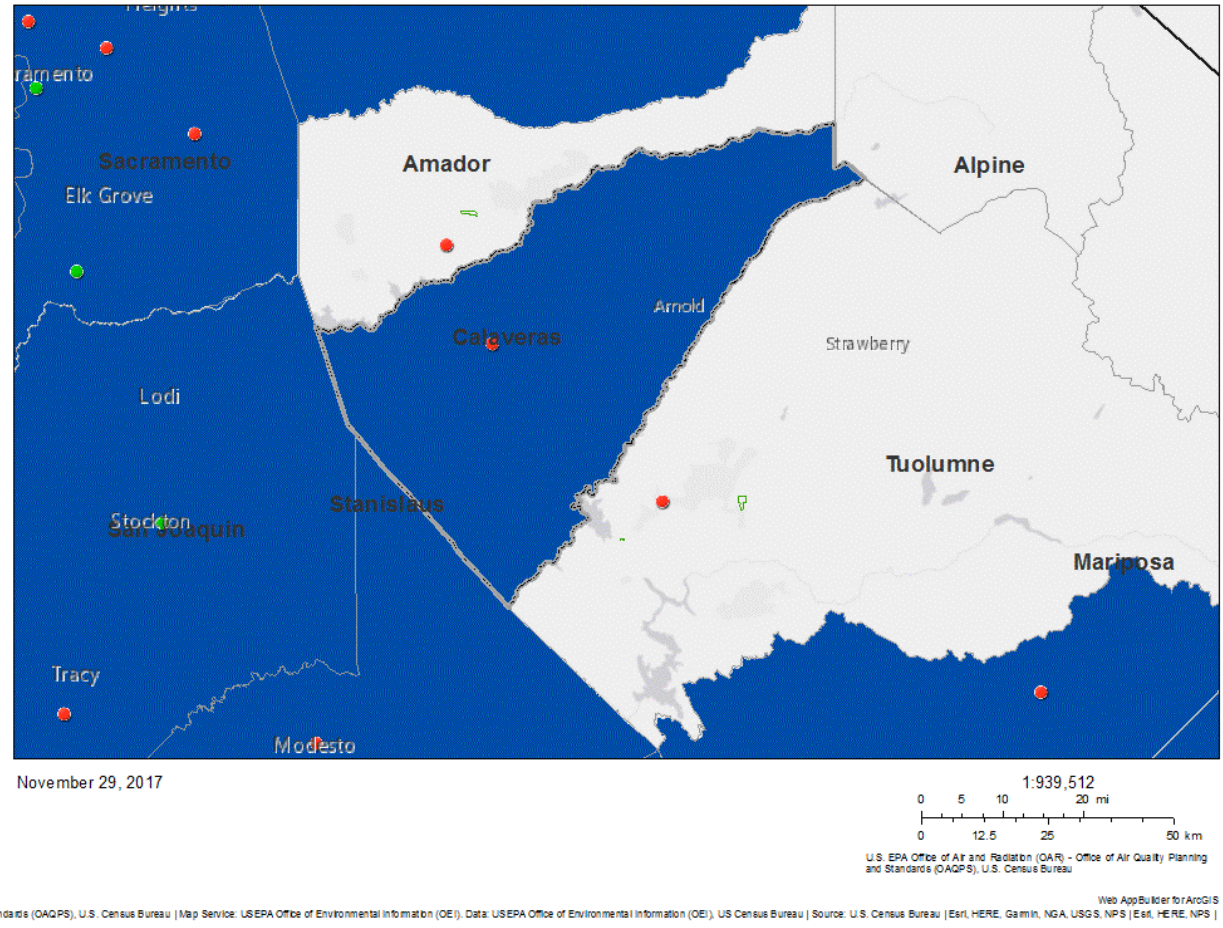


Figure 5.1 shows the EPA's nonattainment boundary for Calaveras County, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Calaveras County has a monitor in violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Calaveras County area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values. Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28,

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.

[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.

[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.

[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

2016, Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design value for the county in the area of analysis is shown in Table 5.2.

Table 5.2 Air Quality Data (all values in ppm).

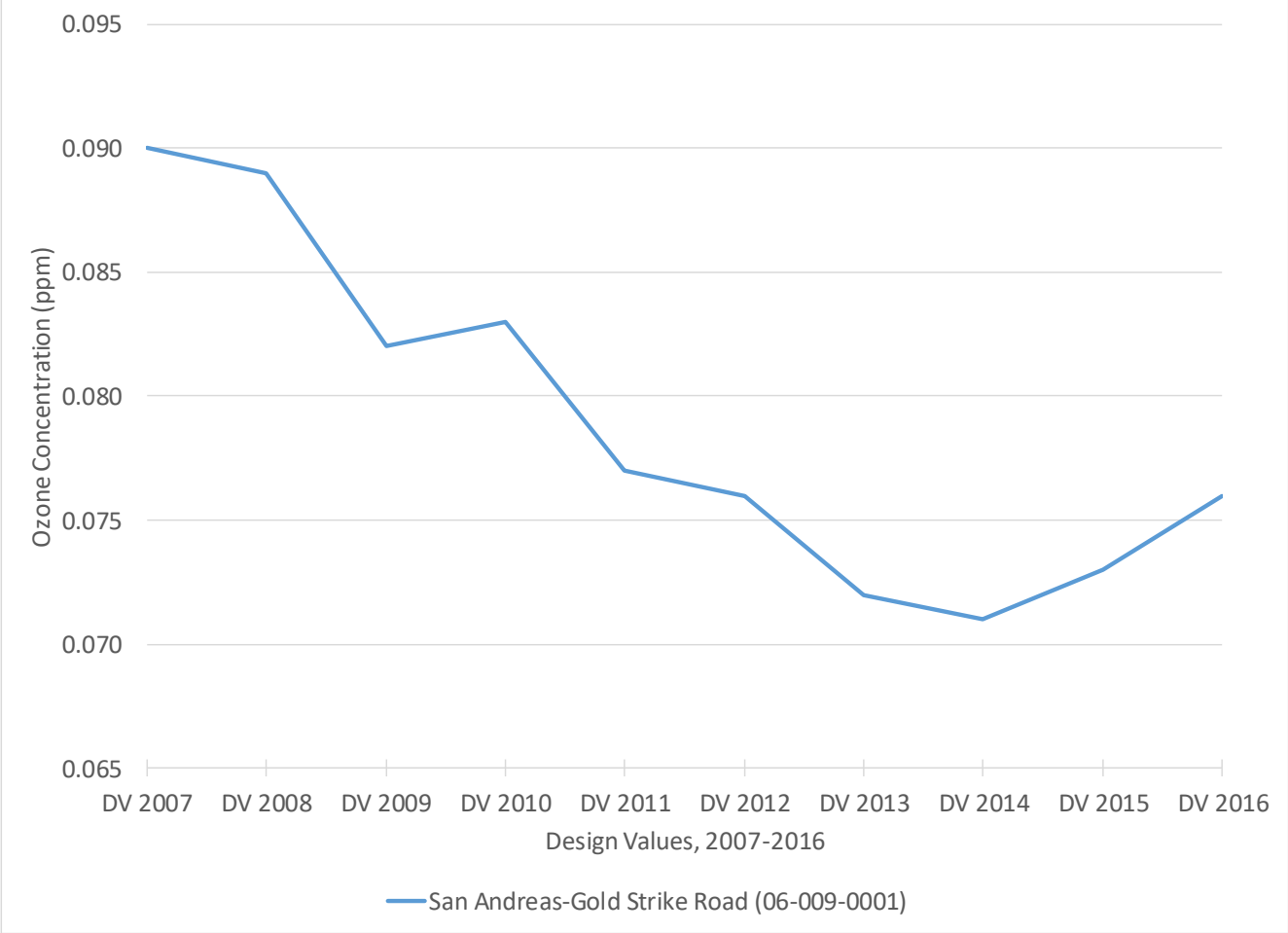
County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Calaveras, CA	Yes	06-009-0001	**0.076**	0.071	0.081	0.077

The highest design value in each county is indicated in bold type.

Calaveras County shows a violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 5.1, shown previously, identifies the Calaveras County nonattainment area and the violating monitors. Table 5.2 identifies the design values for all monitors in the area of analysis. Figure 5.2 shows the historical trend of design values for the violating monitors. As indicated on the map, there is one violating monitor in Calaveras County. The violating monitor is the San Andreas-Gold Strike Road ozone monitor (AQS ID 06-009-0001), located in the central portion of Calaveras County. The San Andreas-Gold Strike Road monitor has a valid 2016 DV of 0.076 ppm. As shown in Figure 5.2, the San Andreas-Gold Strike Road monitor's design values have been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally decreasing until 2014, but also show a modest increase in 2015 and 2016.

Figure 5.2. Three-Year Design Values for Violating Monitors (2007 – 2016).



Calaveras County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 5.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Calaveras County nonattainment area.

Table 5.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Calaveras, CA	Yes	1,011	4,299
	Area wide:	1,011	4,299

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown with orange icons in Figure 5.3 below. There are no large point sources in Calaveras county. The nonattainment boundary is also shown.

Figure 5.3 Large Point Sources in the Area of Analysis.

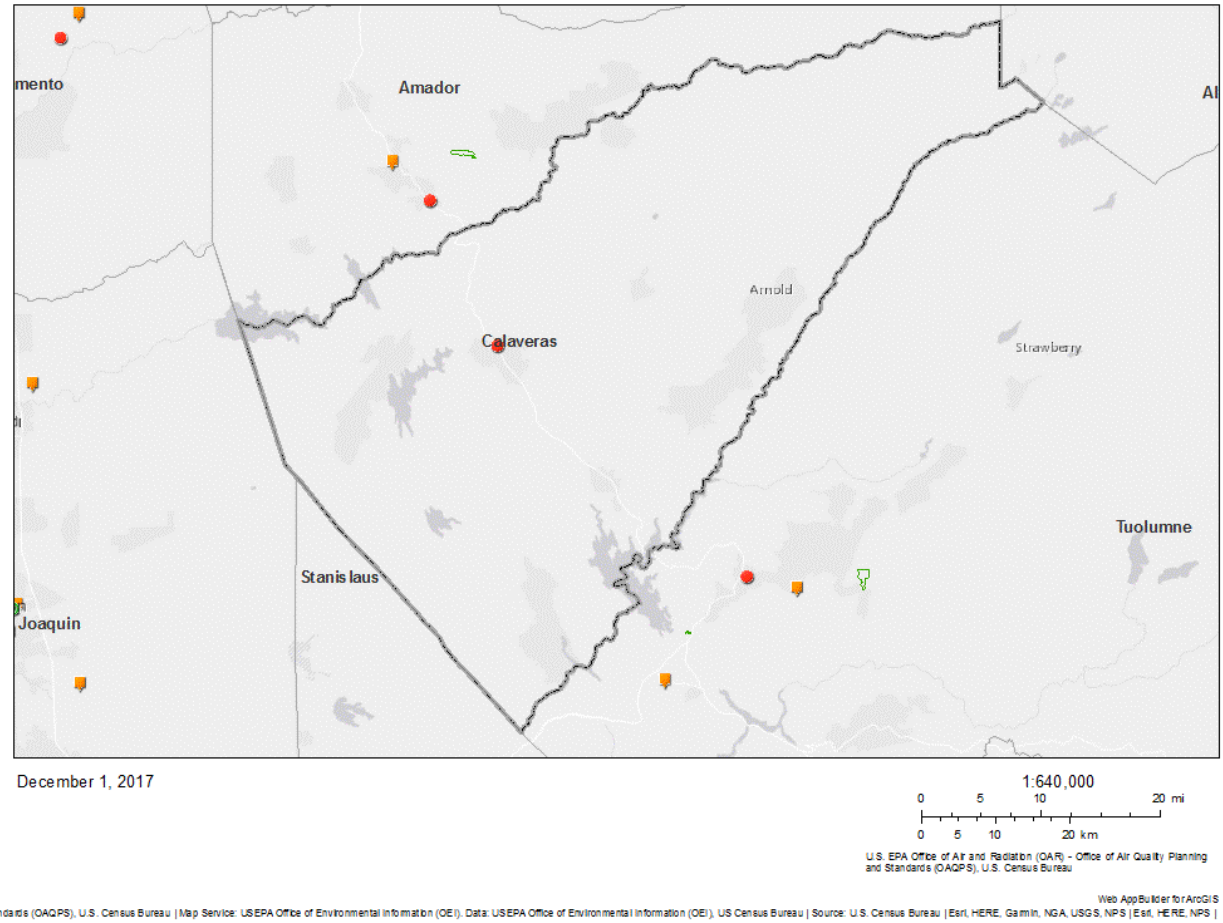


Figure 5.3 shows large point sources in the area of analysis for Calaveras County, CA as orange squares. The EPA's nonattainment boundary for Calaveras County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission showed that Calaveras County has emissions levels of 1,011 tpy of NO_x and 4,299 tpy of VOC within the area of analysis. Calaveras County does not contain any large point sources. Three

large point sources of ozone precursors are located outside of the nonattainment area boundary for Calaveras County in the neighboring counties of Amador County to the north and Tuolumne County to the south.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 5.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 5.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Calaveras, CA	Yes	45,578	44,828	44	-750	-2%
	Area wide:	45,578	44,828	44	-750	-2%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. www.census.gov/data.html.

Figure 5.4 shows the 2012 census tract-level population information for Calaveras County. Calaveras County had a 2015 population of approximately 45,000 people, with a 2% population decline during the 2010-2015 period. Calaveras County has no discrete population centers and the population density reflects that the county is generally rural. The western portion of Calaveras County, where the violating monitor is located, is more populated than the eastern portion of the county.

Figure 5.4 Census Tract-Level Population.

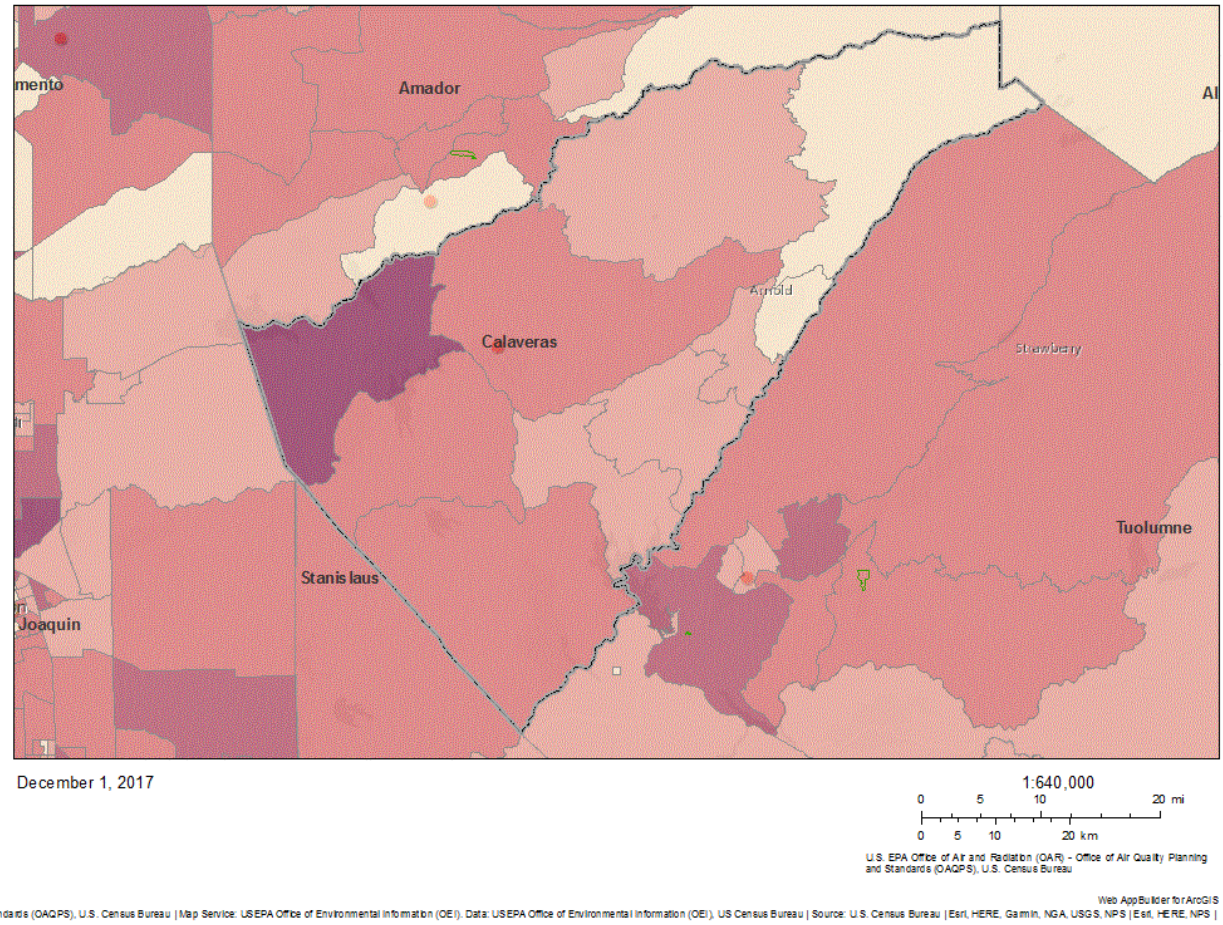


Figure 5.4 shows census tract population in the area of analysis for Calaveras County, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Calaveras County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 5.5 shows the traffic and commuting pattern data, including total VMT for Calaveras County, the number of residents who work in the county, number of residents that work in the county with a violating monitor, and the percent of residents working in the county with a violating monitor. The data in Table 5.5 are 2014 data.

Table 5.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis
Calaveras, CA	**Yes**	**366**	**20,989**	**4,953**	**23.6%**
	Total:	366	20,989	4,953	23.6%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 5.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 5.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

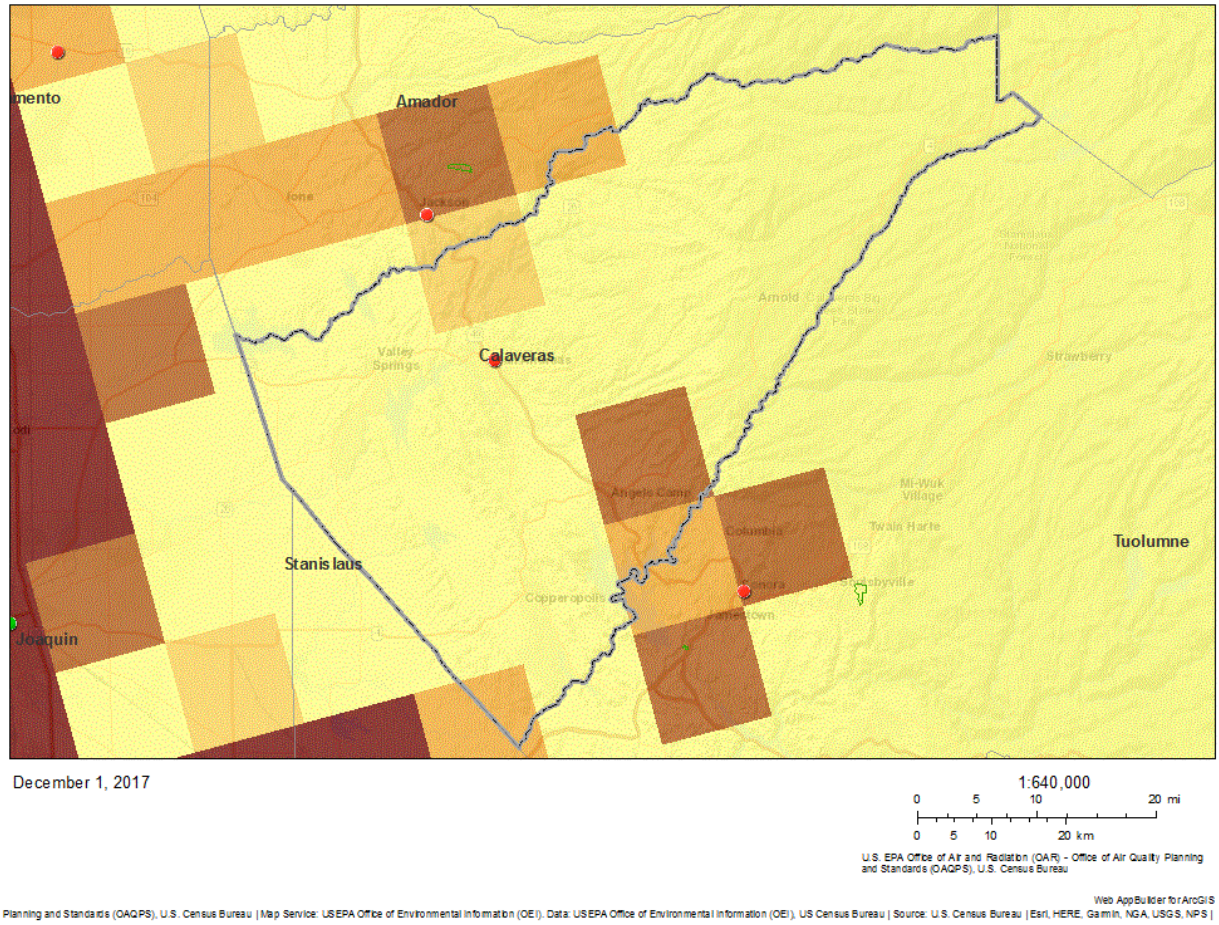


Figure 5.5 shows gridded VMT in the area of analysis for Calaveras County, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Calaveras County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on the 2014 NEI and On the Map data from the Census Bureau and shows that VMT levels in Calaveras County are consistent with an area

that is more rural than urban. The twelve-kilometer grid cell with the highest VMT in the county falls over the city of Angels Camp and near the city of Jackson in Amador County. The data also show that VMT levels in the southern portion of Calaveras County are higher in areas that include transportation arteries from within and outside the county, and lower in the remaining portions of the county.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 5.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8-hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

Figure 5.6 HYSPLIT Back Trajectories for the Violating Monitor.

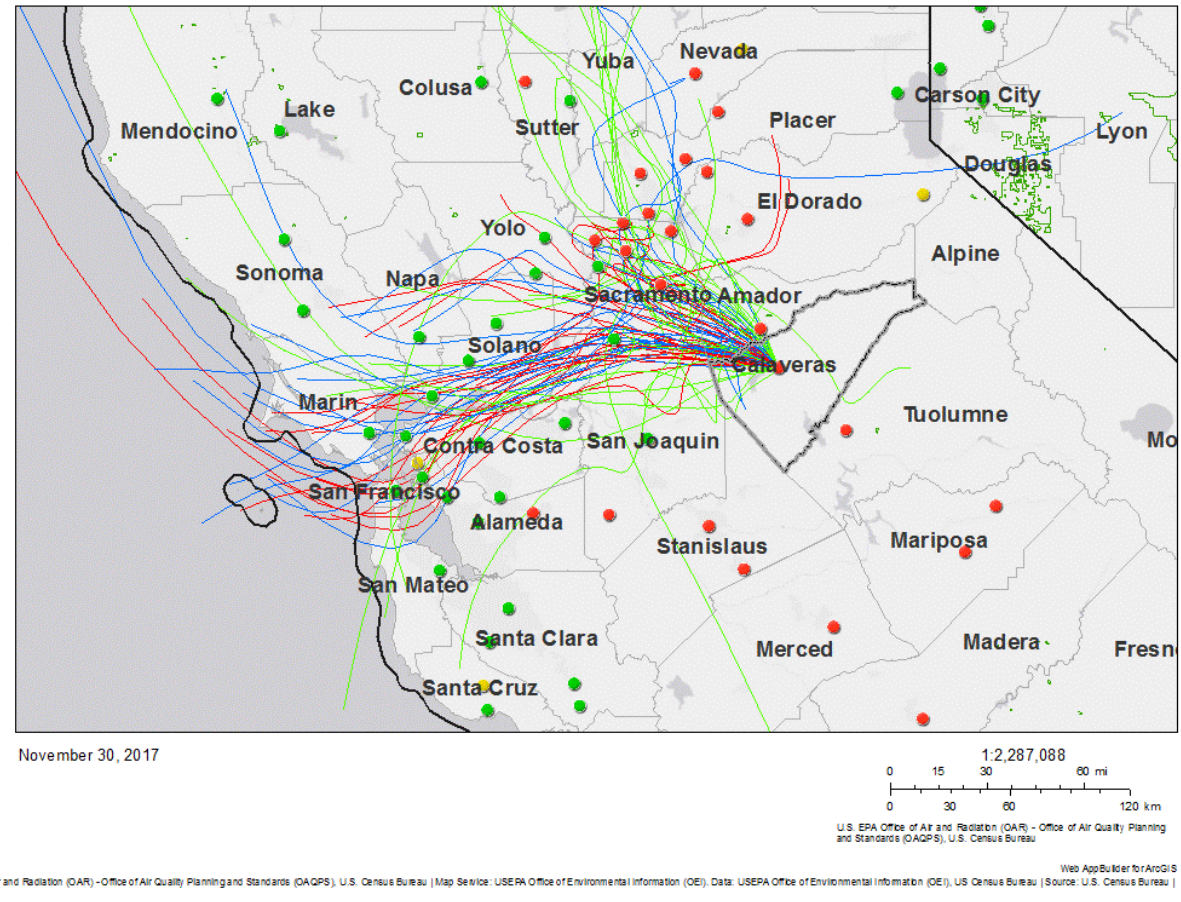


Figure 5.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Calaveras County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally flow from the west and northwest, suggesting emission transport primarily from the Sacramento and northern San Joaquin Valley areas and then through the western portion of Amador County. This is consistent with local topography.

Summers in Calaveras County are normally warm and dry. Winds are generally daytime upslope and nighttime downslope flows, caused by the differential heating or cooling of air near mountain ground surfaces relative to air at the same height over land at lower elevations.

Neighboring San Joaquin and Sacramento valleys can have temperature inversions from 2,000 to 2,500 feet (600 to 750 meters) above the valley floor to as high as 5,000 feet (1,500 meters). Ozone produced in the Sacramento and northern San Joaquin Valley and trapped under this inversion can reach fairly high into the mountain counties, or be advected there by daytime upslope flows. Previous assessments of transport by the California Air Resources Board have found a strong potential for ozone transport from the Sacramento and San Joaquin valleys up into the mountain counties.[6] Nighttime drainage flows reverse this, so some of this pollution, in combination with pollution generated in the mountain counties themselves, could be transported back into the valleys, with the potential for some carryover into subsequent days.

North-south flow between Amador and Calaveras counties is possible as there are fewer barriers to this transport pattern due to the weaker topographic relief in the western parts of both counties. The EPA is designating Amador County, the Sacramento Metro area, and the San Joaquin Valley as separate nonattainment areas for the 2015 ozone NAAQS.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. Topography impacts pollutant formation and transport in California, and thus plays an important role in assessing which areas are contributing to monitored violations of the NAAQS. Figure 5.7 shows a topographic illustration of the physical features around the Calaveras County area.

California has historically been divided into 15 distinct air basins. Calaveras County is located in the Mountain Counties Air Basin. This is not a "basin" in the sense of a single watershed or an area that is more or less surrounded by high terrain. Rather it is a group of rural and largely mountainous counties compared to the more polluted, flatter, and more populous areas to the west (the broad Sacramento and San Joaquin valleys of central California). Calaveras County is in the foothills and mountains of the Sierra Nevada mountain range. Elevations increase from about 200 feet (61 meters) above mean sea level in the west to over 8,000 feet (2400 meters) in the east.

[6] "Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California". California Environmental Protection Agency, Air Resources Board, March 2001. http://www.arb.ca.gov/aqd/transport/assessments/assessments.htm.

Air flow in the west-east direction is relatively unimpeded along the area's river valleys, which extend well east into the interior of the county. Eastward transport of pollutants from the more urbanized areas to the west such as the Sacramento Metro and northern San Joaquin Valley areas is thus possible during conditions of upslope flow. Conversely, westward transport of locally-generated pollution is possible during nighttime downslope flow.

Figure 5.7 Topographic Illustration of the Physical Features.

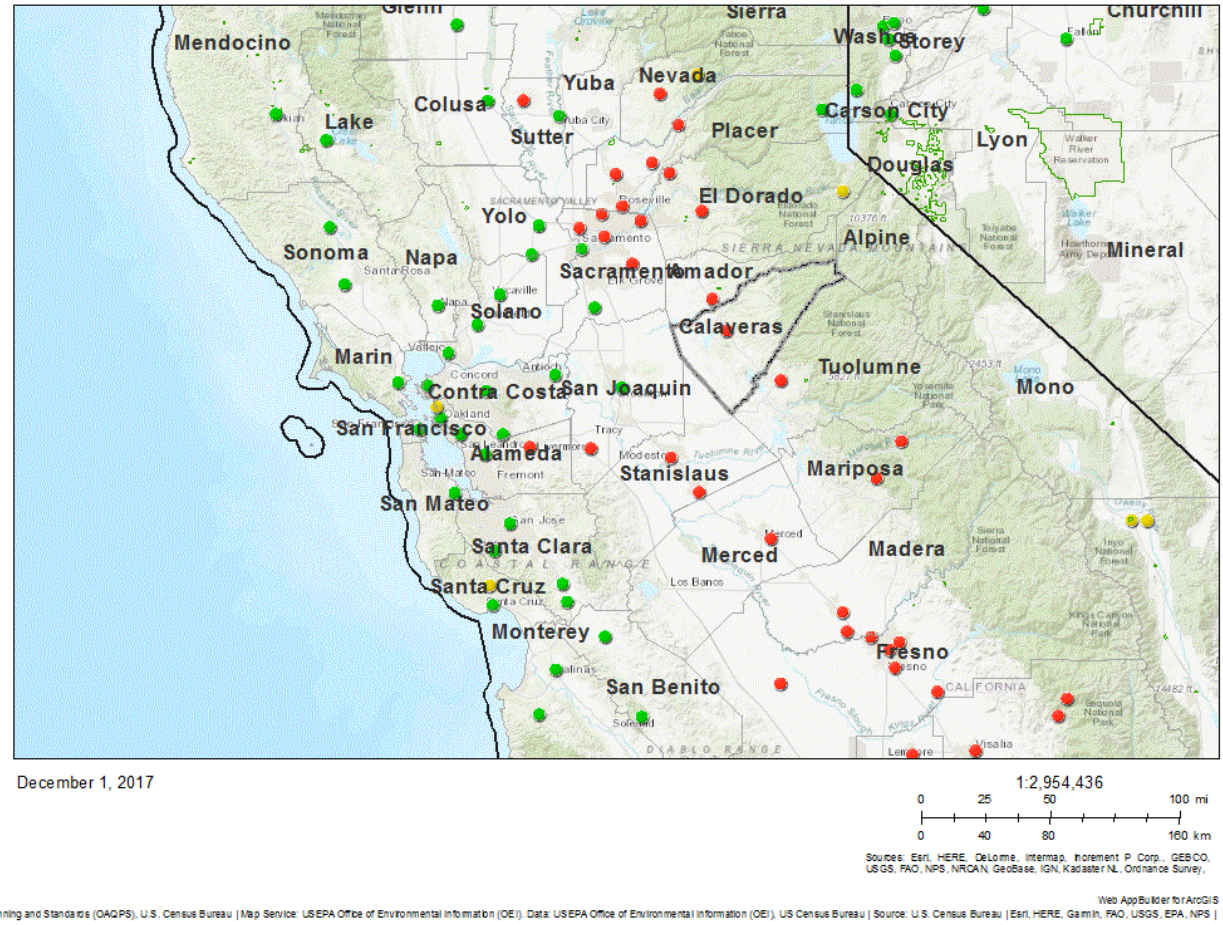


Figure 5.7 shows the topography in the area of analysis for Calaveras County, CA. The EPA's nonattainment boundary for Calaveras County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Calaveras County nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help

define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 5.8 shows the relevant jurisdictional boundaries for Calaveras County. The county to the immediate south of Calaveras County, Tuolumne County, is part of the Sonora CBSA. To the west is the Stockton-Lodi CBSA, the easternmost portion of the San Jose-San Francisco-Oakland CSA, and the Modesto CBSA, part of the Modesto-Merced CSA. As previously noted, to the north is Amador County which is not part of a CSA or CBSA, and to the east is Alpine County which also is not part of a CSA or CBSA.

Figure 5.8. Jurisdictional Boundaries.

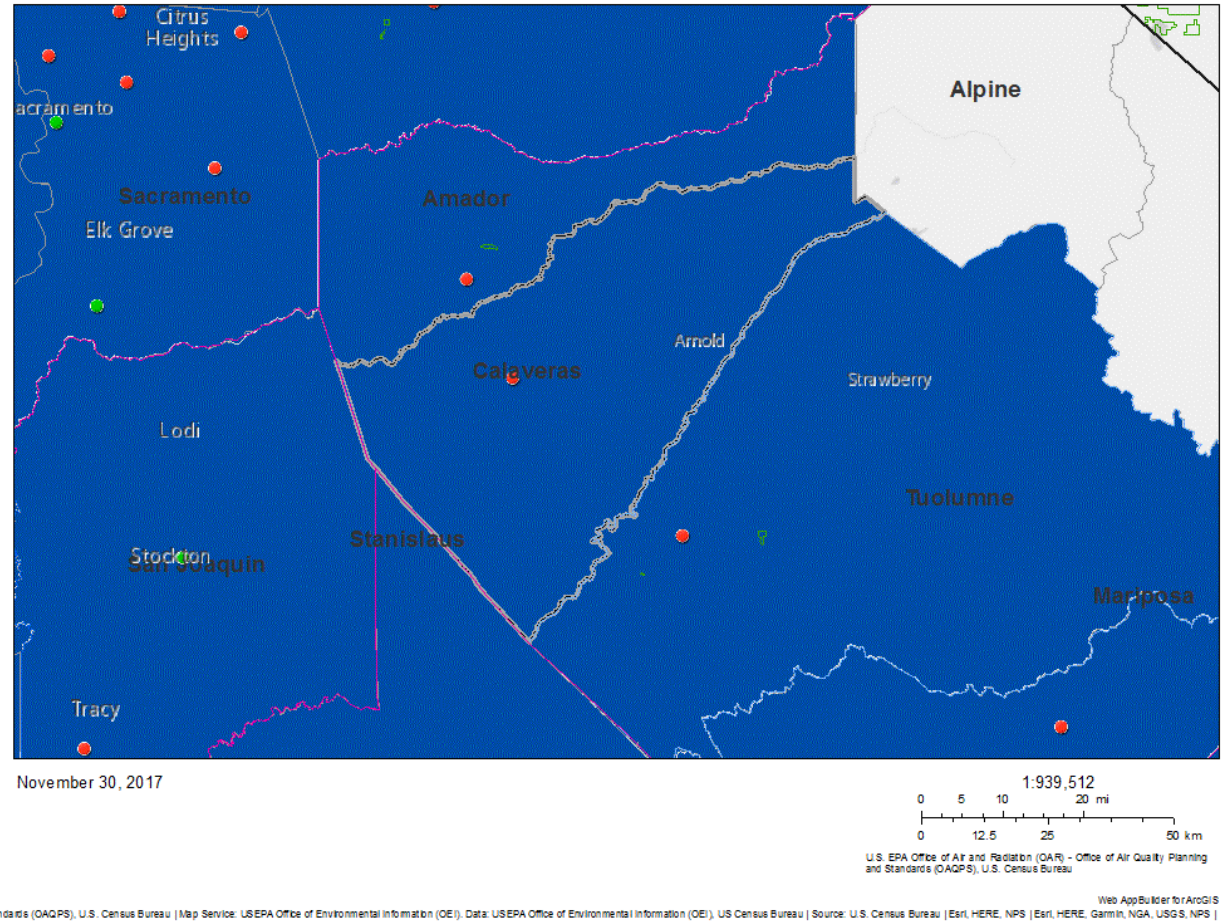


Figure 5.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines), in the area of analysis for Calaveras County, CA. The EPA's nonattainment boundary for Calaveras County, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

For the 1997 ozone NAAQS, Calaveras County and Amador County were designated together as one nonattainment area. For the 2008 ozone NAAQS, the areas were designated as separate areas, with Calaveras County being designated as nonattainment and Amador County being designated unclassifiable/attainment. Both counties have their own county governments as well as their own air pollution control districts (Calaveras County Air Pollution Control District (APCD) and Amador

APCD). Each county also has its own transportation planning agency. The adjacent San Joaquin Valley and Tuolumne nonattainment areas are also under different air quality planning and transportation planning jurisdictions than Calaveras County.

As mentioned above, Calaveras County also includes Indian country belonging to the California Valley Miwok Tribe. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries. The tribe did not submit a designation recommendation and the tribal areas within the county boundary have previously been included in the county designation.

Conclusion for Calaveras County, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to designate Calaveras County as the Calaveras County nonattainment area. This is the same county that is included in the Calaveras County nonattainment area for the 2008 ozone NAAQS.

The air quality monitor in Calaveras County indicates a violation of the 2015 ozone NAAQS based on the 2016 design value, therefore the EPA is including this county in the designated nonattainment area. Emissions and emission-related data show that Calaveras County has no large point sources, but some non-point sources (e.g., vehicles) from commuters within and outside the county. Meteorological data indicate the winds transporting ozone and ozone precursors during exceedance days are predominately from the west-northwest, suggesting emissions transport from the Sacramento Metro nonattainment area, and the northern portions of the San Joaquin Valley nonattainment area and also from Amador County. The complex topography and unimpeded air flow along the river valleys in Amador County may influence the fate and transport of emissions as well as the formation and distribution of higher ozone concentrations in this area. The jurisdictional factor supports a separate boundary for Calaveras County from the adjacent nonattainment areas (i.e., Amador County, Tuolumne County, and San Joaquin Valley), as the adjacent areas have separate air pollution control districts, with separate jurisdictional boards and authorities.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation and is designating Calaveras County, CA nonattainment for the 2015 ozone NAAQS.

6.0 Technical Analysis for Imperial County, CA

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area.

Table 6.1 identifies the area of analysis for the Imperial County, CA nonattainment area. The area of analysis includes all of Imperial County, which is the same area as the El Centro CBSA. There is no CSA associated with this area. The nonattainment area is identical to the existing 1997 and 2008 Imperial County nonattainment areas.

The nonattainment areas of Riverside County (Coachella Valley), CA to the northwest, San Diego County, CA to the west, and Yuma, AZ to the southeast are adjacent to the Imperial County nonattainment area. Information specific to the counties in those areas is contained in the associated Technical Analysis sections for those nonattainment areas. The Imperial County nonattainment area is bordered to the south by Mexico.

Table 6.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Imperial County, CA	Imperial County	El Centro CBSA	None

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

Figure 6.1 is a map of the EPA's nonattainment boundary for Imperial County. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries.

For purposes of the 1997 and 2008 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment areas for the 1997 and 2008 ozone NAAQS included all of Imperial County. The Imperial County area also includes Indian country of the following tribes: Quechan Tribe of the Fort Yuma Indian Reservation (Quechan Tribe) and Torres Martinez Desert Cahuilla Indians (Torres Martinez Tribe). The tribes did not submit a recommendation and the EPA is designating these tribal areas as part of the Imperial County designated nonattainment area. The EPA is not modifying the State's recommendation to designate Imperial County as nonattainment for the 2015 ozone NAAQS, with the same boundary as the Imperial County nonattainment areas for the 1997 ozone NAAQS and the 2008 ozone NAAQS.

Figure 6.1 The EPA's Nonattainment Boundaries for Imperial County, CA.

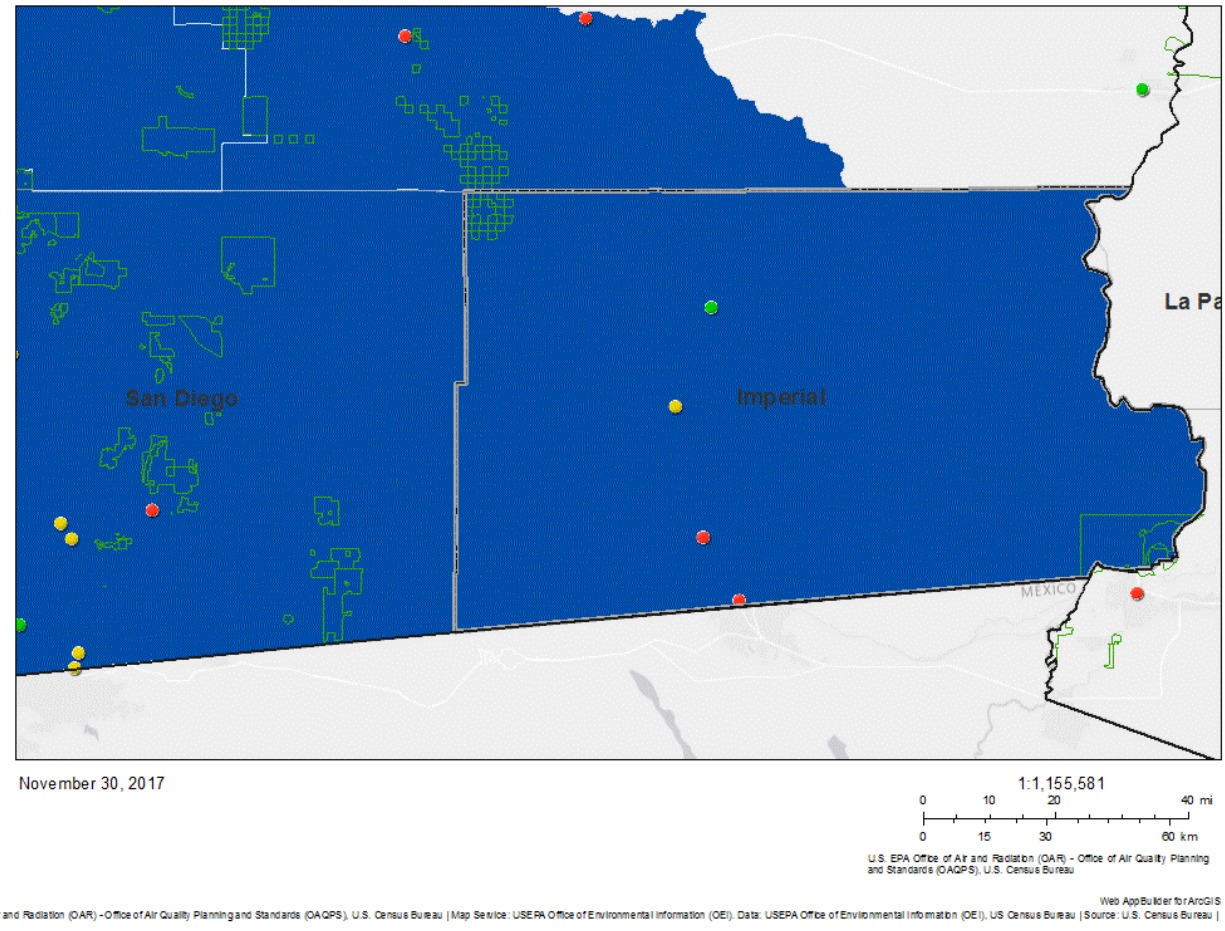


Figure 6.1 shows the EPA's nonattainment boundary for Imperial County, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Imperial County has two monitors in violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not

independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Imperial County area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 6.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 6.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Imperial, CA	Yes	06-025-0005	**0.076**	0.078	0.077	0.074
		06-025-1003	**0.076**	0.078	0.077	0.074
		06-025-4003	N/A	N/A	0.057	0.063
		06-025-4004	0.067	0.069	0.071	0.062

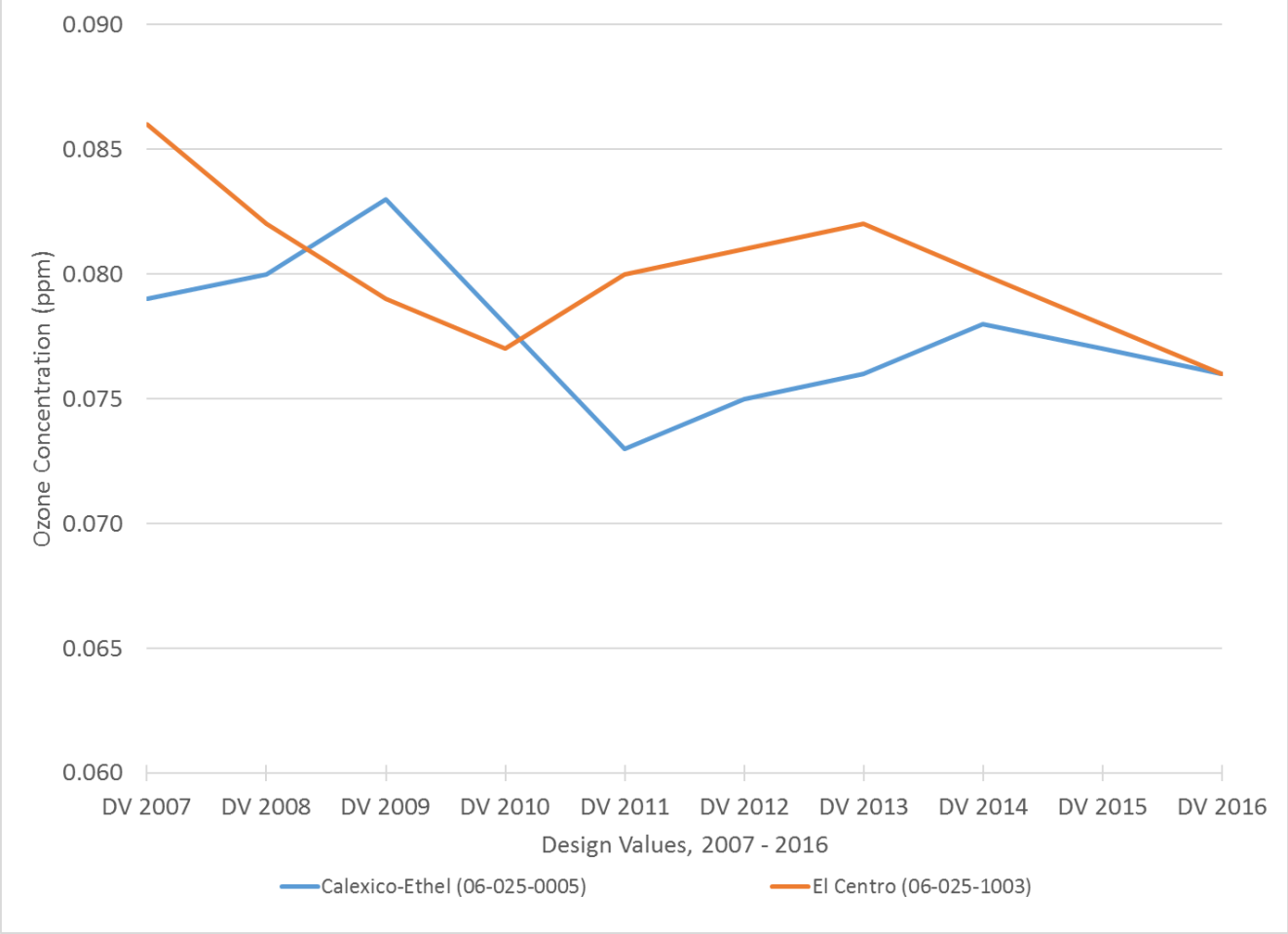
The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

Imperial County shows a violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 6.1, shown previously, identifies the Imperial County nonattainment area and the violating monitors. Table 6.2 identifies the design values for all monitors in the area of analysis. Figure 6.2 shows the historical trend of design values for violating monitors in the area of analysis. As indicated on the map, there are two violating monitors, the Calexico-Ethel monitor (AQS ID 06-025-0005) and the El Centro monitor (AQS ID 04-025-1003), which are located in the cities of Calexico and El Centro in the southern portion of Imperial County, respectively. The Niland monitor (AQS ID 06-025-4004) is attaining the 2015 ozone NAAQS and is located in the northern portion of Imperial County. The Westmoreland monitor (AQS ID 06-025-4003) is located in the central portion of the county and does not currently have a valid 2016 DV.

As shown in Figure 6.2, the trends for previous design values at monitoring sites located within the area of analysis show that the monitors in the southern portion of Imperial County have been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally trending down for the last 10 years, but also that the Calexico-Ethel and El Centro monitors show increases in ozone concentrations intermittently throughout the last 10 years.

Figure 6.2 Three-Year Design Values for Violating Monitors (2007 – 2016).



Imperial County has two monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. These violating monitors located in Imperial County were included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and small point sources and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 6.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Imperial County nonattainment area.

Table 6.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Imperial, CA	Yes	6,192	7,063
	Area wide:	6,192	7,063

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown as orange squares in Figure 6.3 below. The nonattainment boundary is also shown.

Figure 6.3 Large Point Sources in the Area of Analysis.

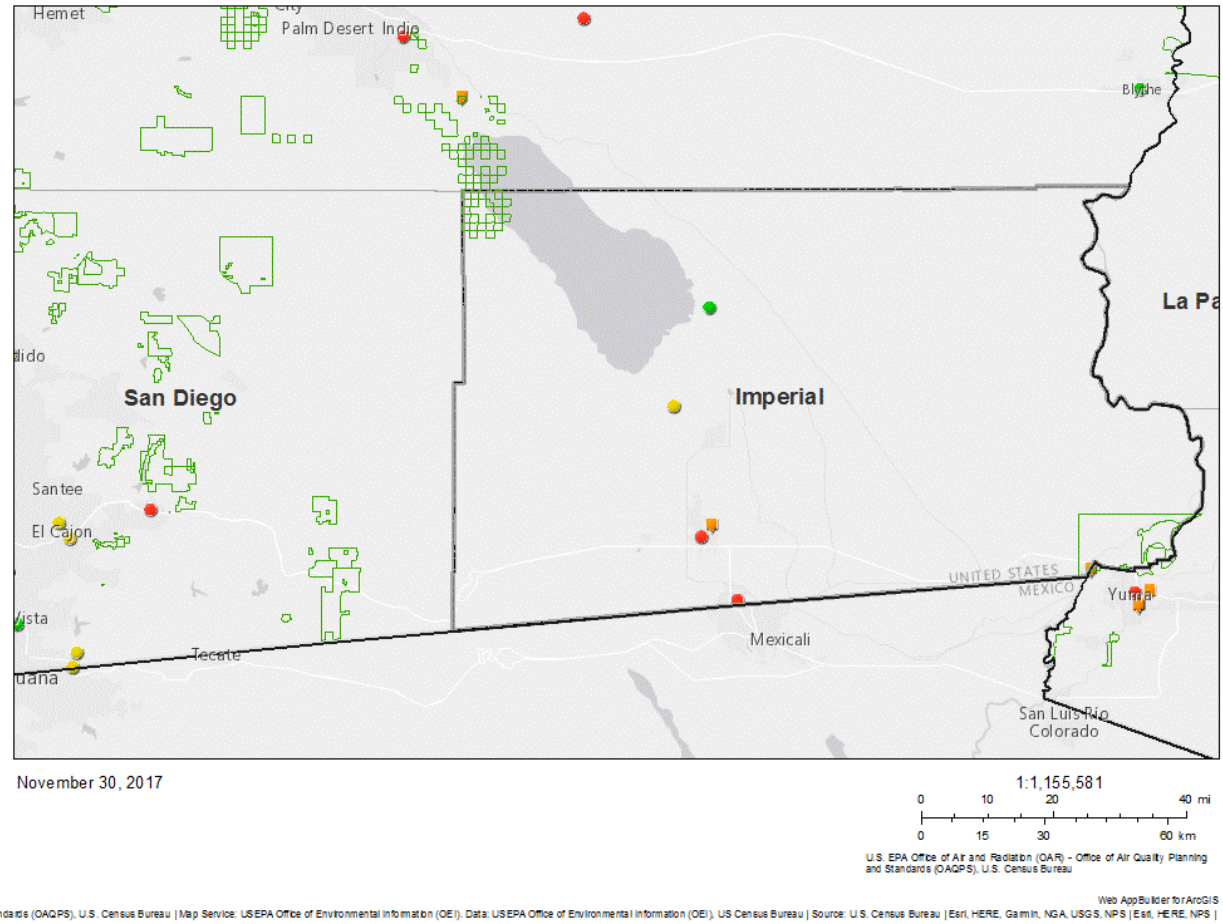


Figure 6.3 shows large point sources in the area of analysis for Imperial County, CA as orange squares. The EPA's nonattainment boundary for Imperial County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

In summary, the EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission showed that Imperial County has emission levels of 6,192 tpy of NO_x and 7,063 tpy

of VOC, based on the 2014 NEI. There is one large point source within the area of analysis, a small power plant that emitted just over 100 tpy of NOx according to the 2014 NEI, located in the southern portion of Imperial County in the city of El Centro.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 6.4 shows the population, population density, and population growth information for each county in the area of analysis. Figure 6.4 shows the 2012 census tract-level population information for Imperial County.

Table 6.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Imperial, CA	Yes	174,528	180,191	43	5,663	3%
	Area wide:	174,528	180,191	43	5,663	3%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 6.4 Census Tract-Level Population.

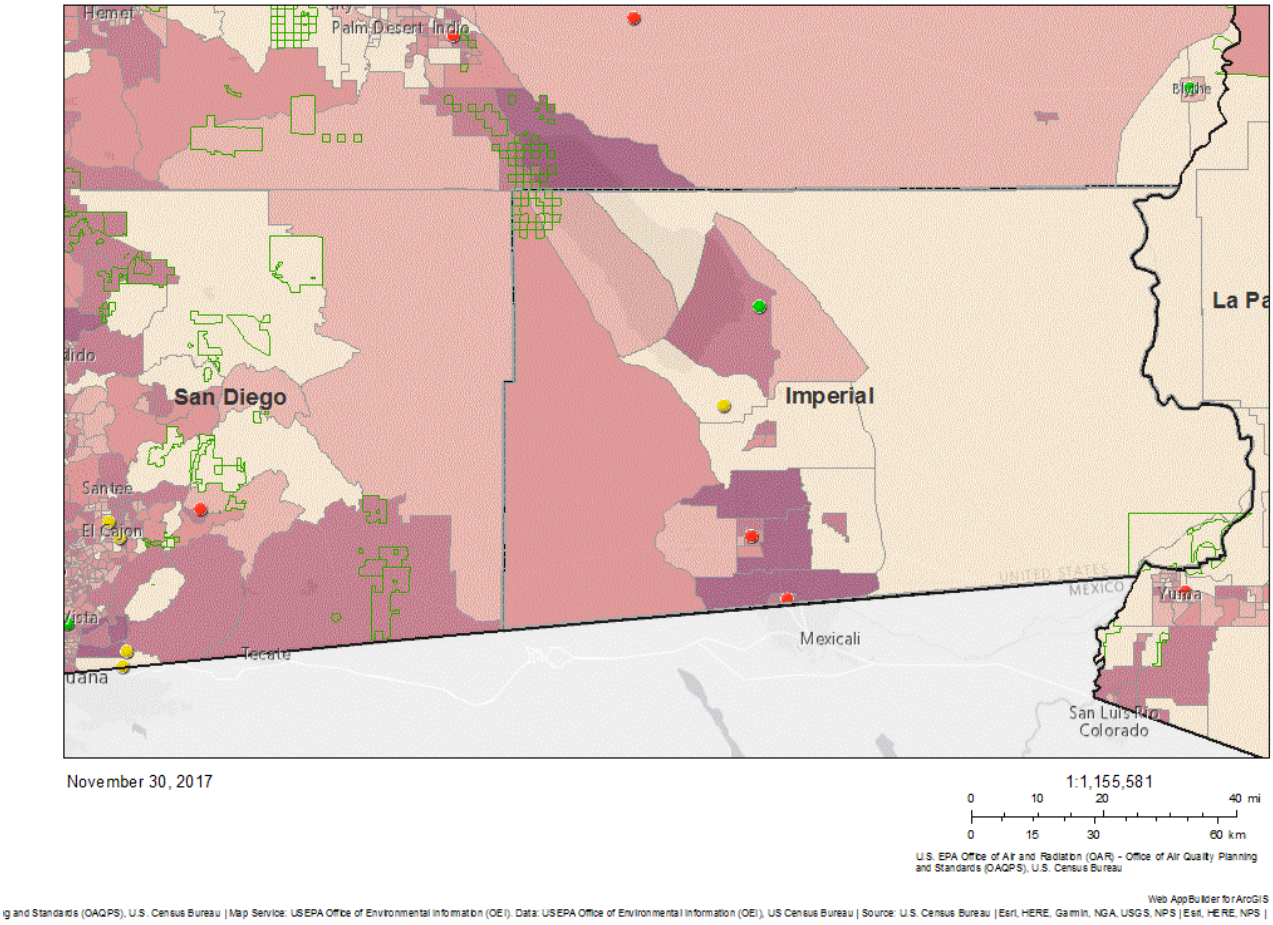


Figure 6.4 shows census tract population in the area of analysis for Imperial County, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Imperial County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Imperial County had a 2015 population of 180,191 people. Generally, Imperial County is less populated compared to neighboring counties in southern California with the higher population areas located in the south-central portion of the county around the cities of El Centro and Calexico.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 6.5 shows the traffic and commuting pattern data, including total VMT for Imperial county, number of

residents who work in the county with the violating monitor, and the percent of residents working in the county with the violating monitor. The data in Table 6.5 are 2014 data.

Table 6.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis
Imperial, CA	**Yes**	**2,590**	**69,414**	**46,581**	**61.7%**
	Total:	2,590	69,414	46,581	61.7%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 6.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 6.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

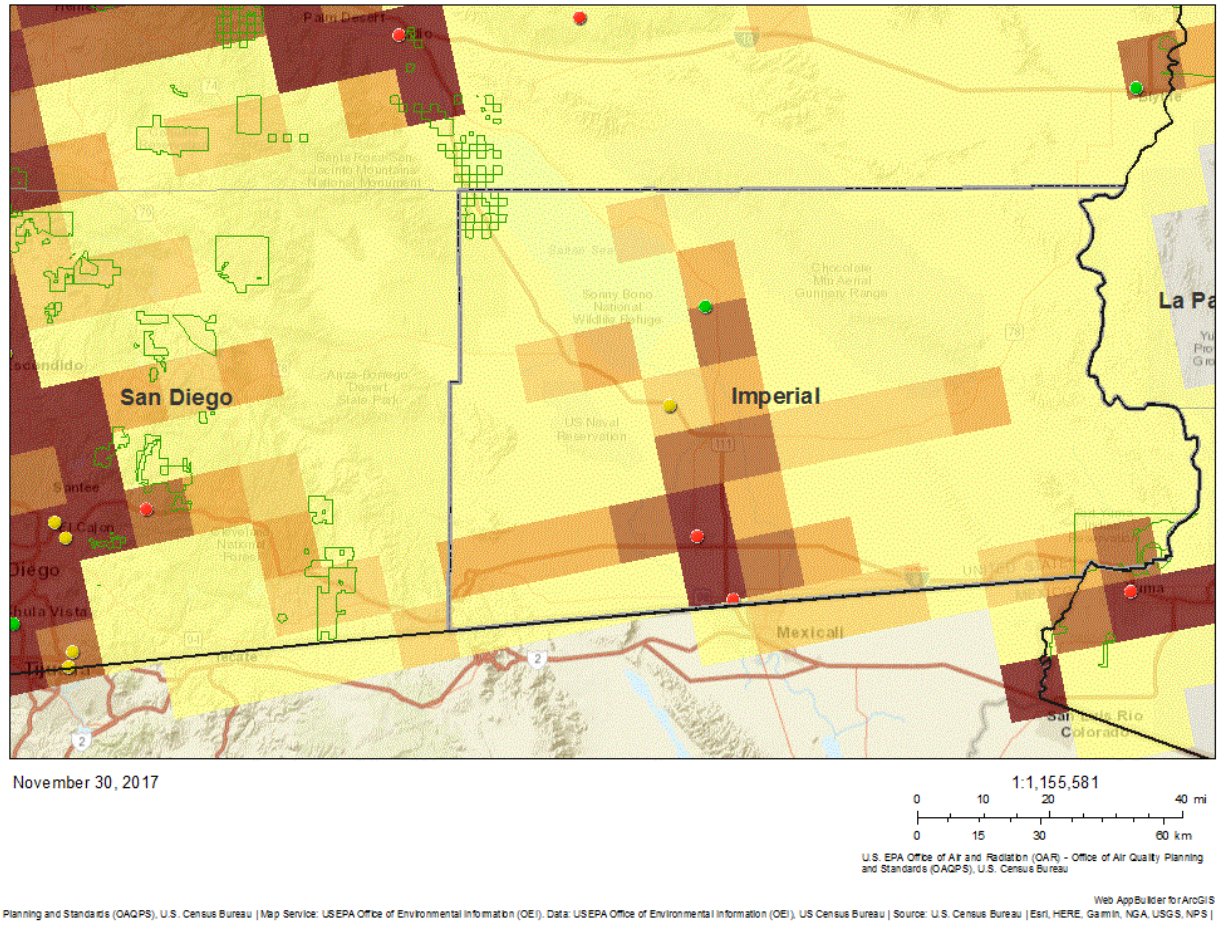


Figure 6.5 shows gridded VMT in the area of analysis for Imperial County, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of brown indicate areas with higher VMT. The EPA's nonattainment boundary for Imperial County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau,[6] and shows that the areas around the cities of El Centro and Calexico, the two darkest brown squares to the south, in Imperial County have the highest total VMT levels within the area of analysis. The map shows that areas adjacent to El Centro and Calexico also have relatively high VMT levels. There are also moderate VMT levels along the major transportation arteries: I-8 running east-west near the southern border of the county, California highway 78 running east-west across the center of the county, and California Highway 111 running north-south across the center of the county.

[6] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 6.6 shows the 24-hour HYSPLIT back trajectories for each exceedance (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating monitors.

Figure 6.6a HYSPLIT Back Trajectories for Calexico Ethel Street (06-025-0005).

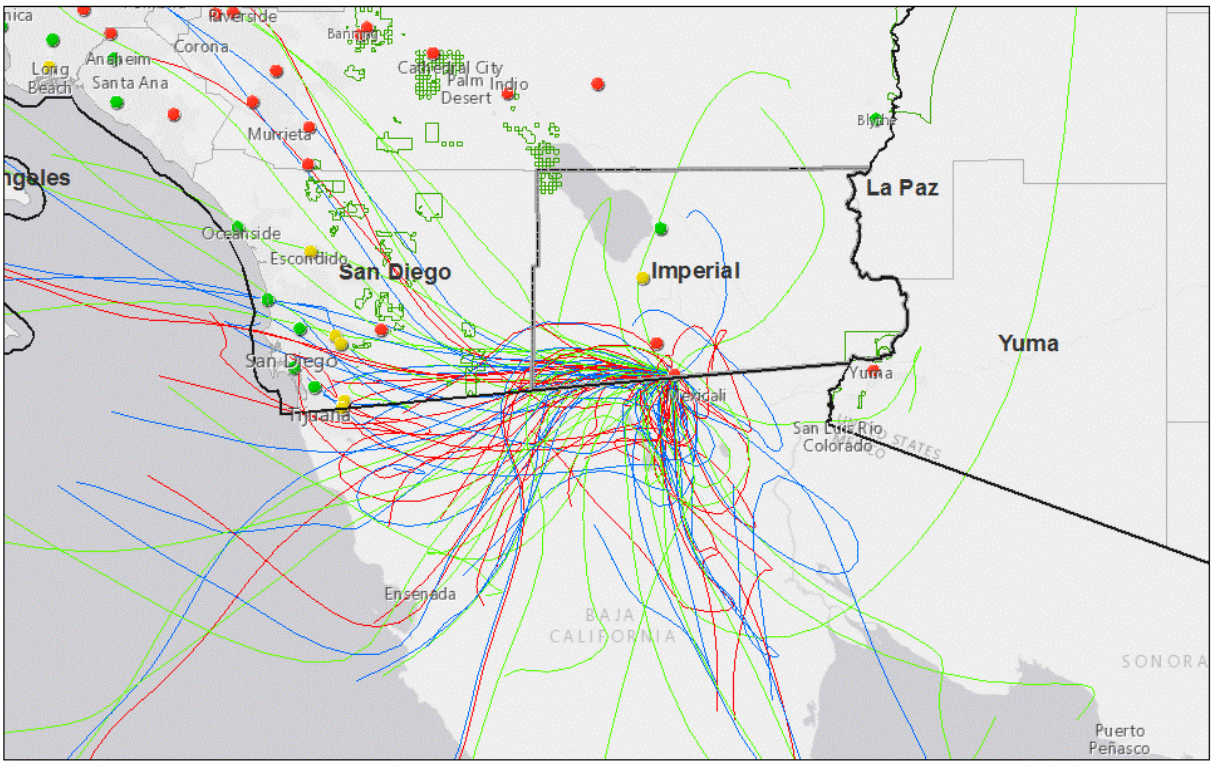
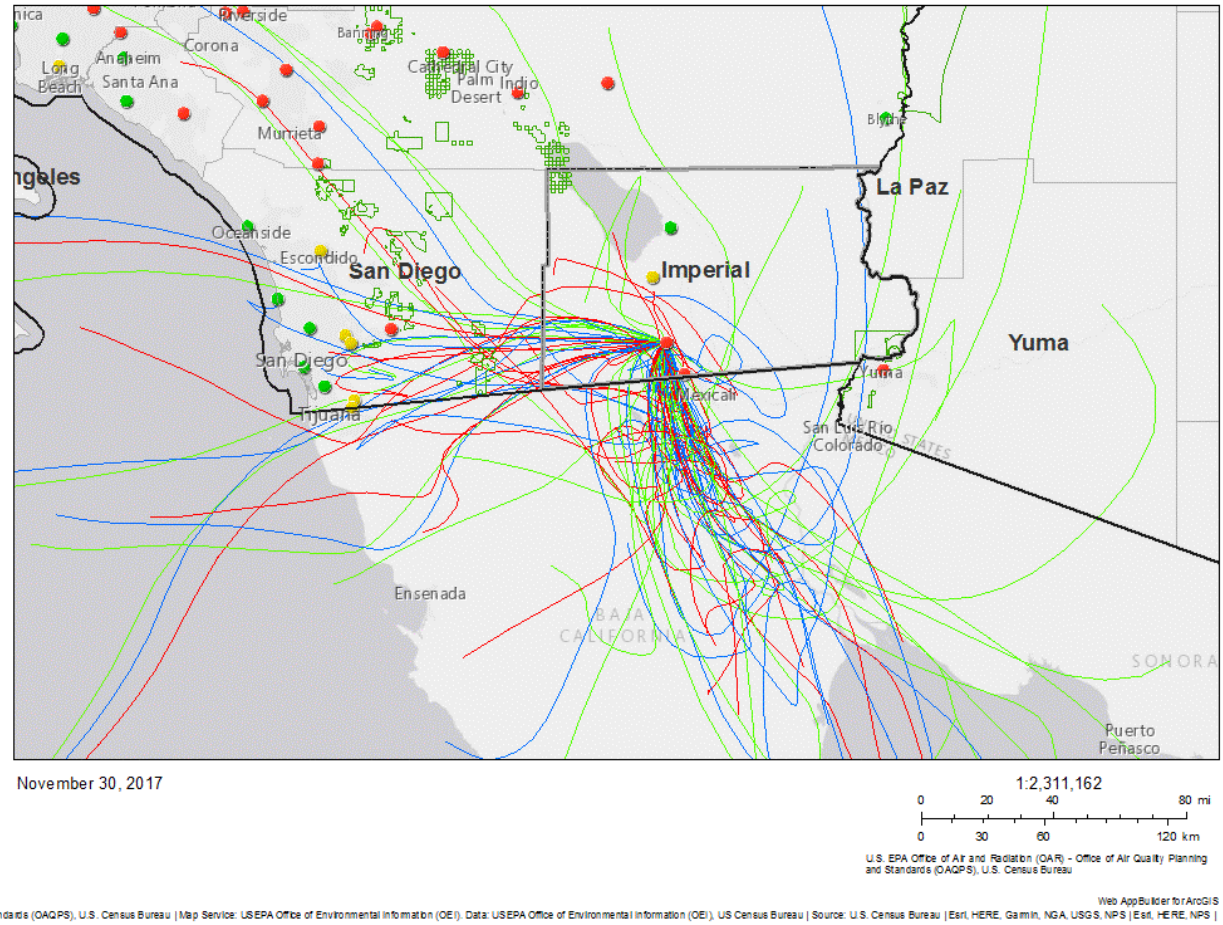


Figure 6.6b HYSPLIT Back Trajectories for El Centro (06-025-1003).



Figures 6.6 a & b show HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Imperial County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows that back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 are predominately from the south and the west. These trajectories originate in, or pass through, Mexico (Mexicali and Tijuana) and/or San Diego County as well as portions of Imperial County, particularly in the south and the west. A few trajectories also pass through the eastern and central portions of Riverside County (Coachella Valley) before traversing San Diego County and the traveling to the violating monitors in Imperial County.

As previously discussed, the EPA is designating Riverside County (Coachella Valley), CA, San Diego County, CA, and Yuma County, AZ as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for these areas.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such

geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

Unlike many areas of the eastern and central U.S., in the western U.S. topography can have a significant impact on pollutant formation and transport in California and thus can play an important role in assessing what areas are contributing to monitored violations of the NAAQS.

Figure 6.7 shows the topography for Imperial County. The Chocolate Mountains form the northeast boundary of the Salton Trough extending as a narrow range some 80 miles (130 km) southeast from the Orocopia Mountains to the Colorado River valley. The range reaches an elevation of 2,475 feet (754 m) at Mount Barrow, and serves as a drainage divide for the Salton Watershed to the west.

To the west the Vallecito Mountains are located in the Colorado Desert, in eastern San Diego County. They are about 28 miles (45 km) north of the U.S. border with Mexico. The range is approximately 15 miles (24 km) long, and reaches an elevation of 5,349 feet (1,630 m) above sea level.

Geography and topography show little variation within Imperial County except for the Chocolate mountains in the northeast portion of the county.

The complex topography surrounding Imperial County to the north has the potential to impact pollution flow into Imperial County. The relatively flat terrain within Imperial County to the south and east would be expected to allow transport of pollution throughout these areas.

Figure 6.7 Topographic Illustration of the Physical Features.

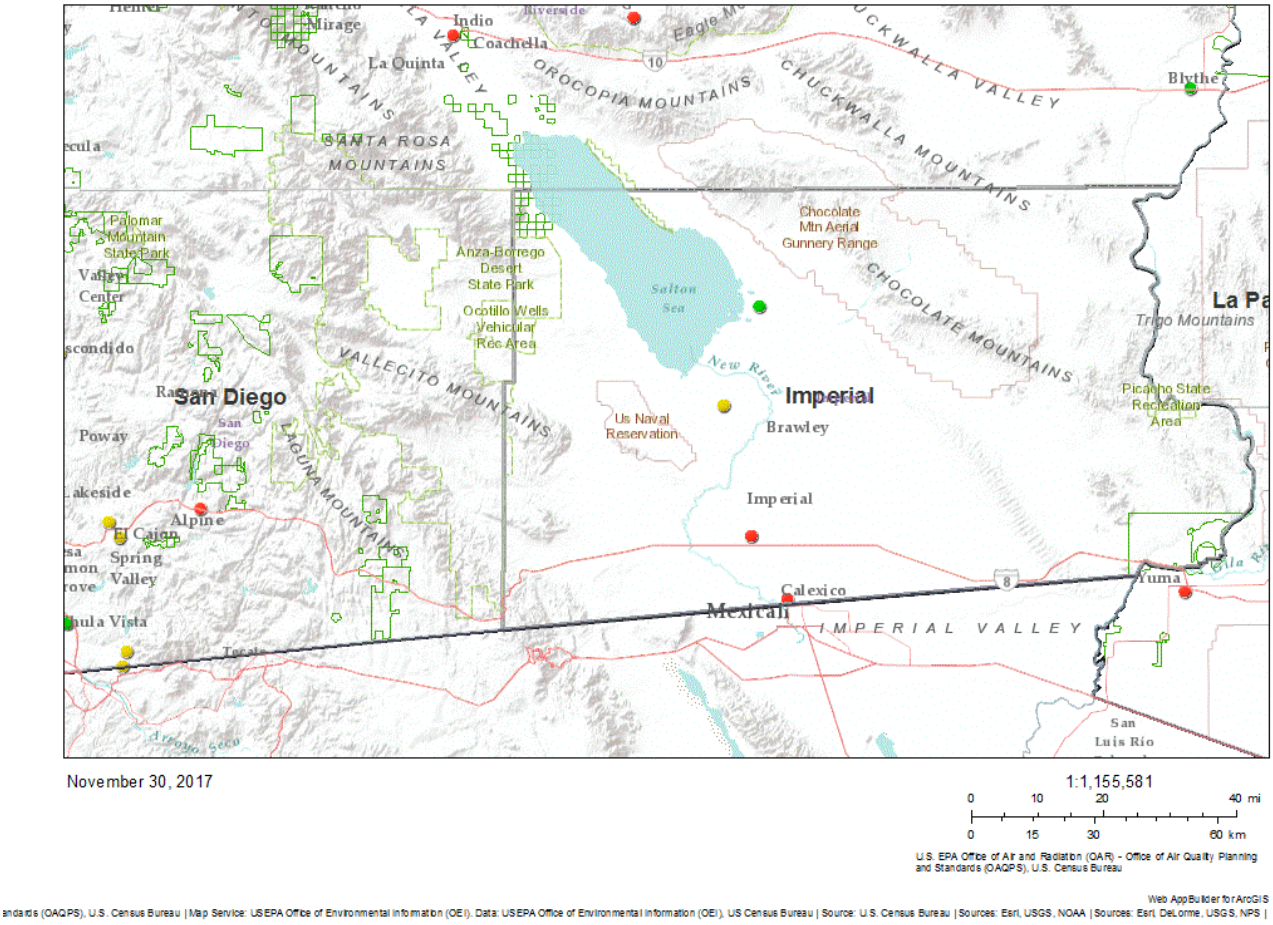


Figure 6.7 shows the topography in the area of analysis for Imperial County, CA. The EPA's nonattainment boundary for Imperial County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 6.8 shows the relevant jurisdictional boundaries for the Imperial County nonattainment area, including county and CBSA boundaries, and areas of Indian country. Imperial County is bounded by

San Diego County to the west, Riverside County to the north, the state of Arizona to the east, and Mexico to the south.

Figure 6.8 Jurisdictional Boundaries.

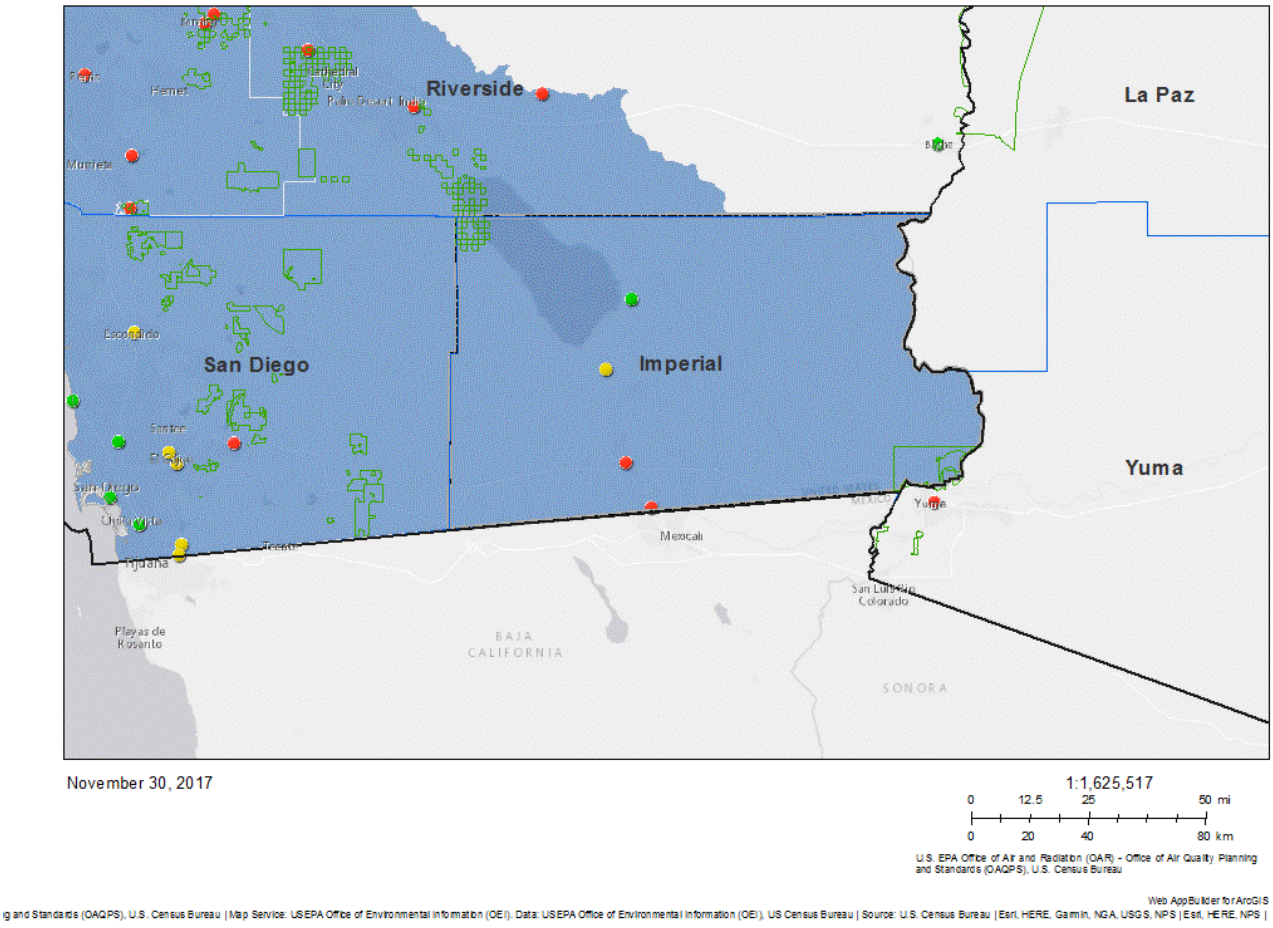


Figure 6.8 shows jurisdictional boundaries, including state boundaries (black lines) and metropolitan statistical areas (dark blue lines) in the area of analysis for Imperial County, CA. The EPA's nonattainment boundary for Imperial County, CA is shown as a gray line with a dashed black center. The nonattainment boundary for the 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Imperial County area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

As discussed earlier, Imperial County has the same boundary as the El Centro CBSA. To the south, the county line is also the international U.S.-Mexico border. Imperial County falls under the air quality management jurisdiction of the Imperial County Air Pollution Control District. Transportation planning in the county is performed by the Southern California Association of Governments, which also performs transportation planning for other counties in southern California.

The Imperial County area also includes portions of Indian country belonging to the following tribes: Quechan Tribe (Fort Yuma-Quechan reservation) and Torres Martinez Tribe. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within

the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

The Fort Yuma-Quechan reservation spans Imperial County, California and Yuma County, Arizona. Consistent with prior designations, we are designating the tribal lands with the surrounding areas. A majority of the reservation is located in Imperial County and will be designated as part of the Imperial County nonattainment area. The portion of the Fort Yuma reservation located within Yuma County is discussed in the Arizona Technical Support Document.

The Torres Martinez tribe has non-contiguous areas of Indian country in both the Imperial County and Riverside County (Coachella Valley) nonattainment area. We are designating the non-contiguous lands of the Torres Martinez tribe located in Imperial County as nonattainment as part of the Imperial County nonattainment area. As addressed in the Technical Support Document for Riverside County (Coachella Valley) we are designating the non-contiguous lands of the Torres Martinez tribe located in central Riverside County as nonattainment as part of the Riverside (Coachella Valley) nonattainment area.

Conclusion for Imperial County, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to designate Imperial County as the Imperial County nonattainment area for the 2015 ozone NAAQS. This is the same area that was included in the Imperial County nonattainment area for the 1997 and 2008 ozone NAAQS.

Two air quality monitors in Imperial County indicate violations of the 2015 ozone NAAQS based on the 2016 design values, therefore this county is included in the nonattainment area. Emissions and emissions-related data show that Imperial County contains one large point source in the city of El Centro. Compared to the rest of Imperial County, the highest population and VMT levels are located around the cities of Calexico and El Centro, Meteorology suggests that the violating monitors are influenced by winds from the south and the west. Consistent with the meteorology, geography and topography show little variation within Imperial County except for the Chocolate mountains in the northeast portion of the county. Imperial County is a single-county CBSA, and air management district. It was designated as a single-county nonattainment area for the 1997 and 2008 ozone NAAQS.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation and is designating Imperial County, CA as nonattainment for the 2015 ozone NAAQS.

7.0 Technical Analysis for Kern County (Eastern Kern), CA

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. The EPA evaluated this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

Table 7.1 identifies the area of analysis for the Kern County (Eastern Kern), CA nonattainment area. The area of analysis includes all of Kern County which is also the entirety of the Bakersfield CBSA. There is no CSA associated with this area. The nonattainment area is identical to the existing 1997 and 2008 ozone NAAQS Eastern Kern nonattainment areas.

Table 7.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Kern County (Eastern Kern), CA	Kern County	Bakersfield CBSA	None

The 2015 ozone NAAQS Eastern Kern, CA nonattainment area is adjacent to the San Joaquin Valley, CA nonattainment area to the north and west. The San Joaquin Valley, CA nonattainment area includes the western portion of Kern County. The Eastern Kern, CA area is adjacent to the Los Angeles-San Bernardino Counties (Western Mojave Desert), CA nonattainment area to the south and east. Information specific to these two adjacent areas is contained in the associated Technical Analysis section for those nonattainment areas.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 7.1 is a map of the EPA's nonattainment boundary for Eastern Kern. The map shows the location of the ambient air quality monitors, county boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries.

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

For purposes of the 1997 ozone NAAQS, Eastern Kern was designated nonattainment. The boundary for the nonattainment area for the 1997 ozone NAAQS included the eastern portion of Kern County, excluding the Indian Wells Valley northeast portion of the county. For purposes of the 2008 ozone NAAQS, the same area was designated nonattainment.

The EPA is not modifying the State's recommendation to designate the eastern portion of Kern County as nonattainment for the 2015 ozone NAAQS, with the same boundary as the Eastern Kern nonattainment areas for the 1997 ozone NAAQS and the 2008 ozone NAAQS. There are no areas of Indian Country located within the nonattainment area.

Figure 7.1 The EPA's Nonattainment Boundaries for Eastern Kern, CA.

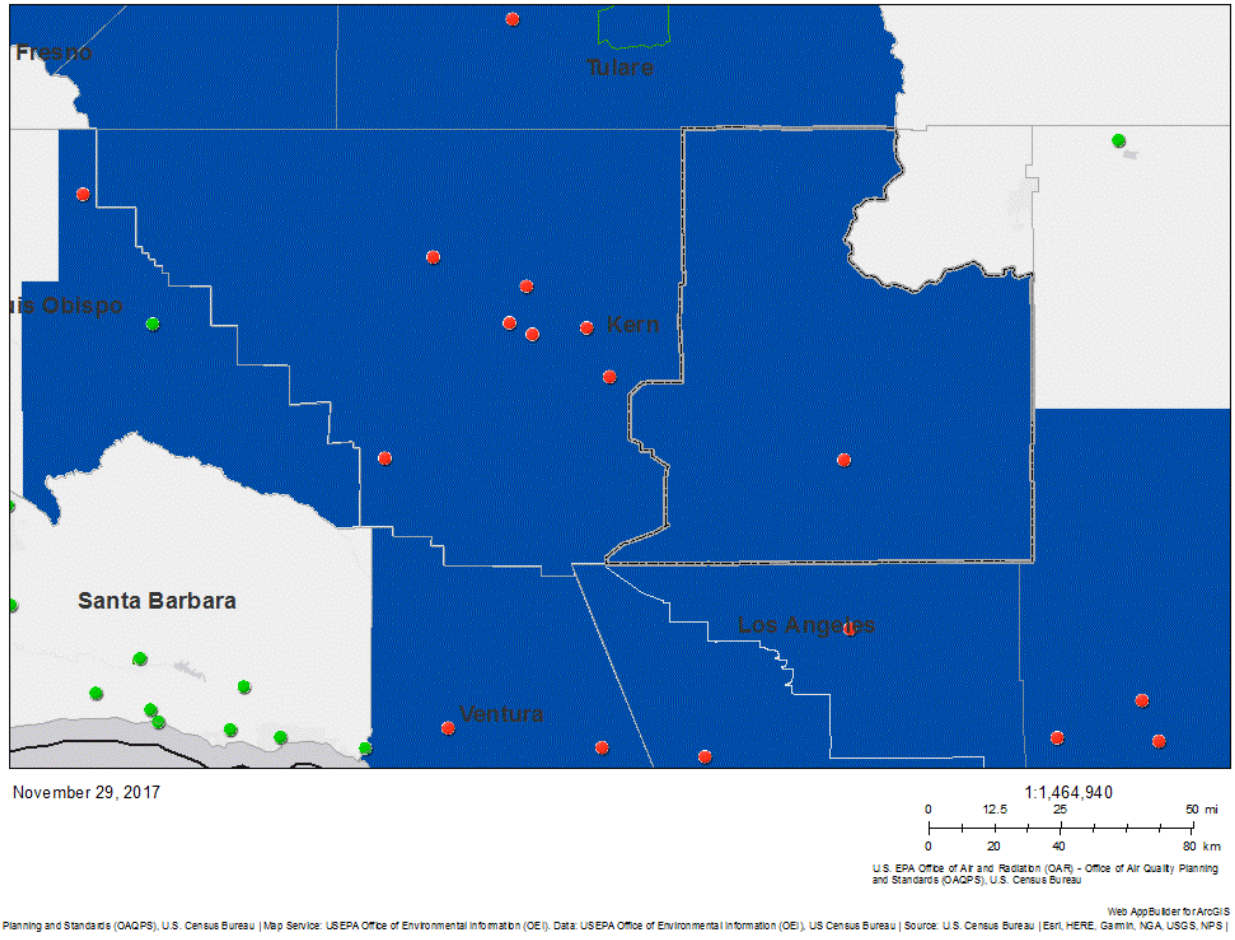


Figure 7.1 shows the EPA's nonattainment boundary for Eastern Kern, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. The eastern portion of Kern County has a monitor in violation of the 2015 ozone NAAQS, therefore this portion of the county is included in the Eastern Kern nonattainment area. An additional portion of Kern County with other violating monitors is included in the San Joaquin Valley nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the

dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in Kern County based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.

Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for the county in the area of analysis are shown in Table 7.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 7.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Kern, CA	Yes (partial)	06-029-0007	0.087	0.085	0.090	0.086
		06-029-0008	0.081	0.078	0.083	0.083
		06-029-0011	0.084	0.089	0.080	0.084
		06-029-0014	0.084	0.084	0.088	0.082
		06-029-0232	0.077	0.078	0.082	0.072
		06-029-2012	**0.090**	0.087	0.097	0.088
		06-029-5002	0.087	0.088	0.087	0.087
		06-029-6001	0.081	0.081	0.082	0.082

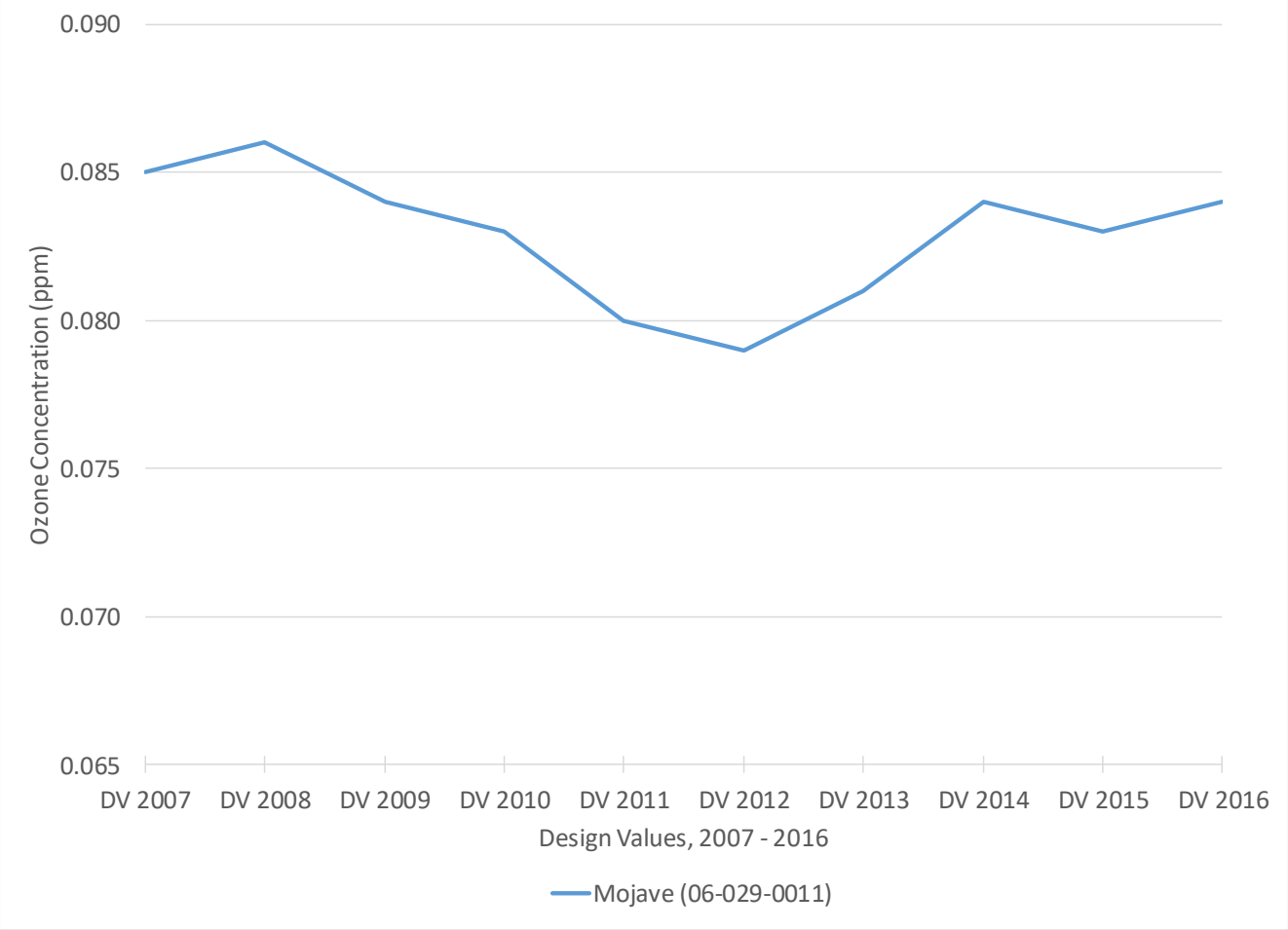
The highest design value in each county is indicated in bold type.

Kern County shows violations of the 2015 ozone NAAQS, therefore portions of this county are included in nonattainment areas. A portion of Kern County is included in the Eastern Kern nonattainment area, while an additional portion of Kern County is included in the San Joaquin Valley nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 7.1, shown previously, identifies the Eastern Kern nonattainment area and the violating monitors in Kern County. Table 7.2 identifies the design values for all monitors in the area of analysis. As indicated on the map in Figure 7.1, there is one violating monitor (located in the city of Mojave; AQS ID 06-029-001) in the Eastern Kern nonattainment area. The Mojave monitor has a valid 2016 DV of 0.084 ppm and is located in the southeastern portion of the county. Figure 7.2 shows the historical trend of design values for the Mojave monitor. There are no monitors within the Indian Wells Valley, the northeast corner of Kern County, which is not included in the nonattainment area. The seven remaining monitors in Kern County are located in the western portion of the county within the San Joaquin Valley nonattainment area. As previously noted, further discussion of this area is included in the Technical Analysis section for San Joaquin Valley.

As shown in Figure 7.2, the trend for previous design values at the Mojave monitor has been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show that the ozone concentrations generally trended down from 2008 to 2012, but have generally trended up since 2012, except for a slight decrease in 2015.

Figure 7.2 Three-Year Design Values for the Violating Monitor (2007 – 2016).



Kern County has eight monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. One of the violating monitors is located within the eastern portion of Kern County that was included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS. The seven remaining violating monitors in Kern County are included in the San Joaquin Valley nonattainment area.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 7.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis, which is Kern County.

Table 7.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Kern, CA	Yes (partial)	28,469	107,342
	Area wide:	28,469	107,342

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown with orange square icons in Figure 7.3 below. The nonattainment boundary is also shown.

Figure 7.3 Large Point Sources in the Area of Analysis.

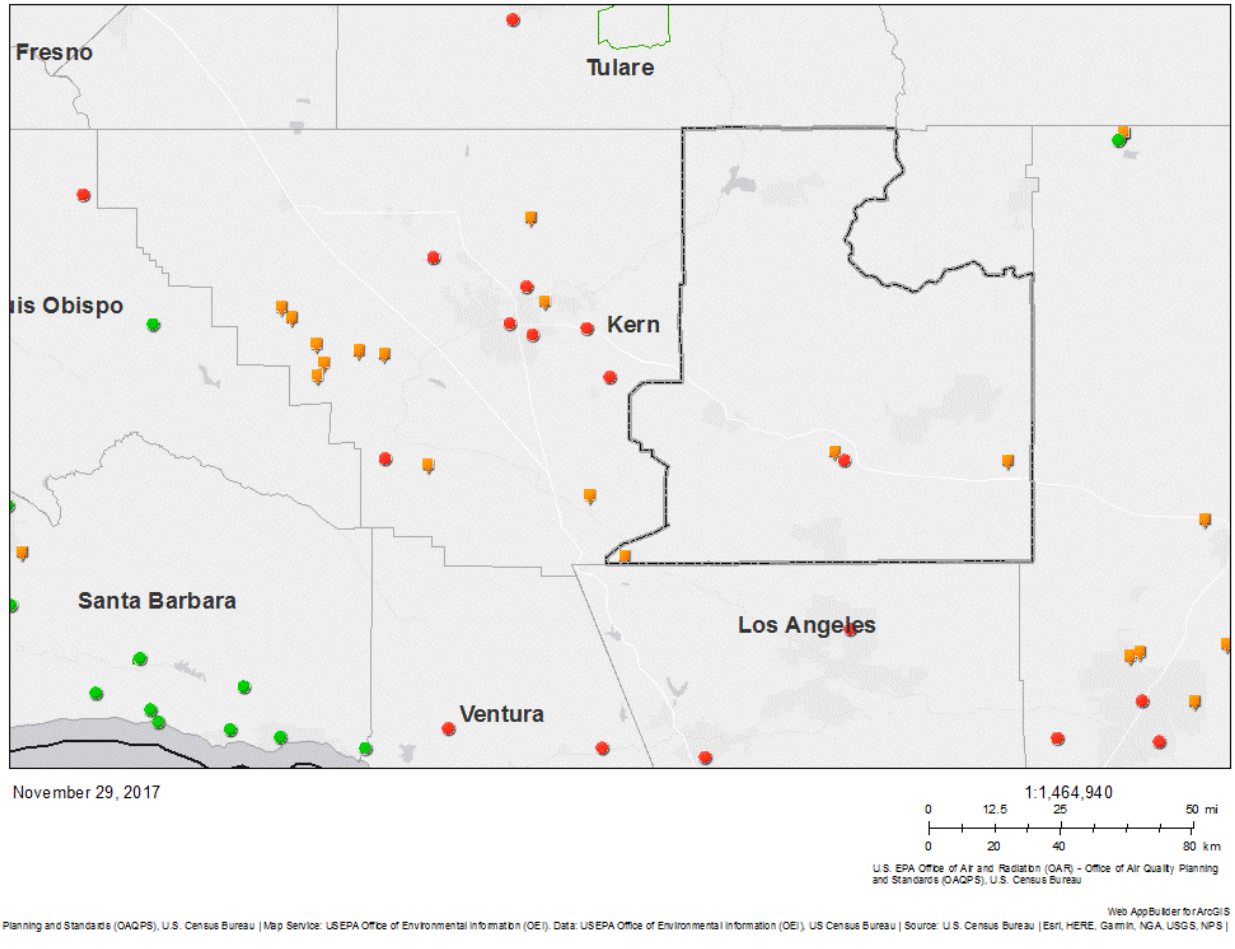


Figure 7.3 shows large point sources in the area of analysis for Eastern Kern, CA as orange squares. The EPA's nonattainment boundary for Eastern Kern, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission shows that Kern County has emissions levels of 28,469 tpy of total NO_x emissions, and 107,342 tpy of total VOC emissions. Most of the large point sources of ozone precursors are located in the western portion of the county, which is included in the San Joaquin Valley nonattainment area. Three large point sources of ozone precursors are located within the portion of the county that the state recommended be designated nonattainment as the Eastern Kern nonattainment area. There are no large point sources located in the Indian Wells Valley portion of the county.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 7.4 shows the population, population density, and population growth information for each county. in the area of analysis.

Table 7.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Kern, CA	Yes (partial)	839,631	882,176	108	42,545	5%
	Area wide:	839,631	882,176	108	42,545	5%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html

Figure 7.4 shows the 2012 census tract-level information for Kern County. Kern County has a 2015 population of 882,176, with a population density of 108 people per square mile. As shown in Figure 7.4, the majority of census tracts, including those with highest populations, are in the western portion of the county. There are some tracts of moderate population in the eastern portion of the county, including in the Indian Wells Valley in the northeast corner of Kern County; the most populous tracts in this area of the county are near the town of Ridgecrest.

Figure 7.4 Census Tract-Level Population.

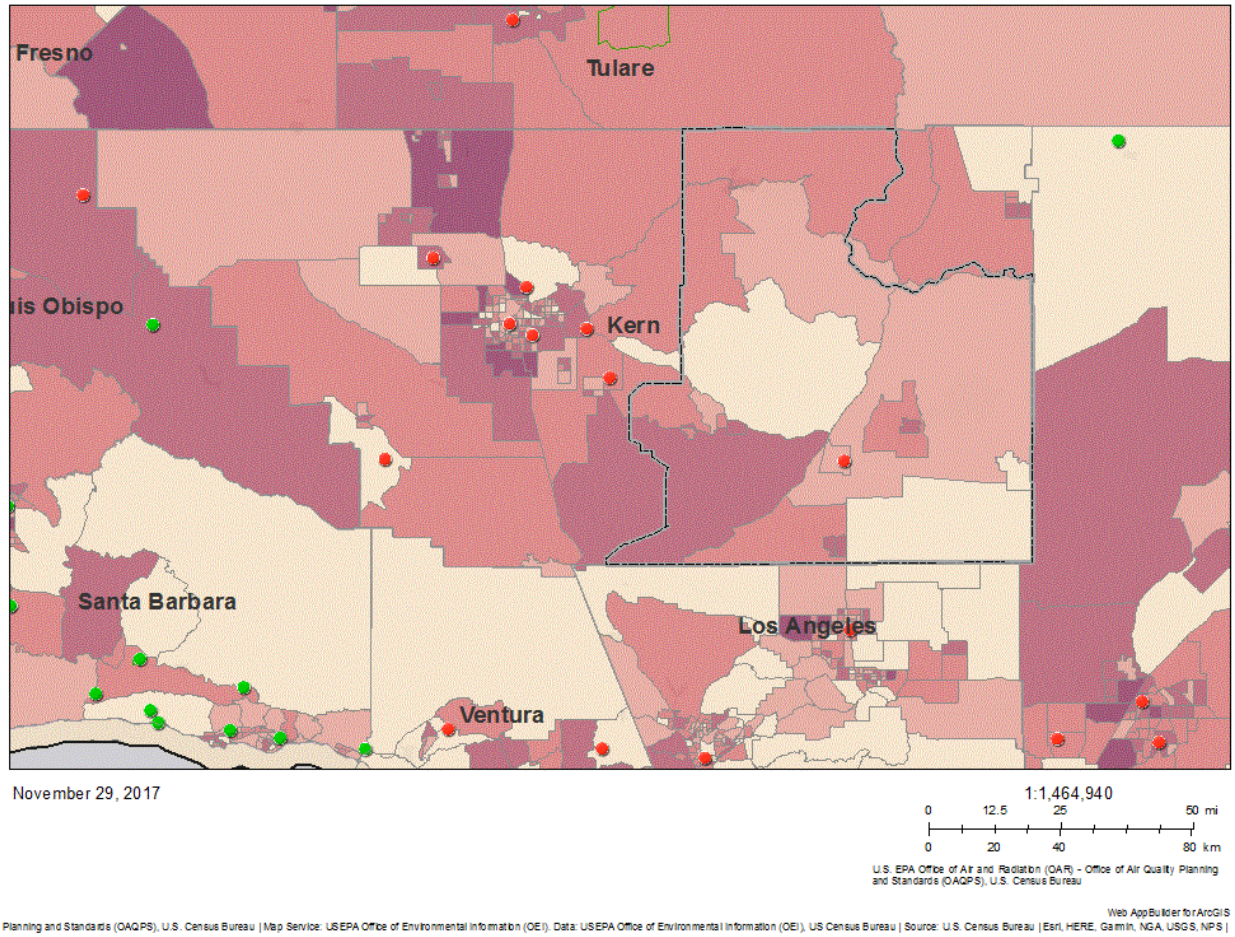


Figure 7.4 shows census tract population in the area of analysis for Eastern Kern, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Eastern Kern, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 7.5 shows the traffic and commuting pattern data, including total VMT for Kern county, number of residents who work in the county, number of residents that work in the county with the violating monitor, and the percent of residents working in the county with the violating monitor. The data in Table 7.5 are 2014 data.

Table 7.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis
Kern, CA	**Yes (partial)**	**8,060**	**288,501**	**204,173**	**70.8%**
	Total:	8,060	288,501	204,173	70.8%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 7.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 7.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

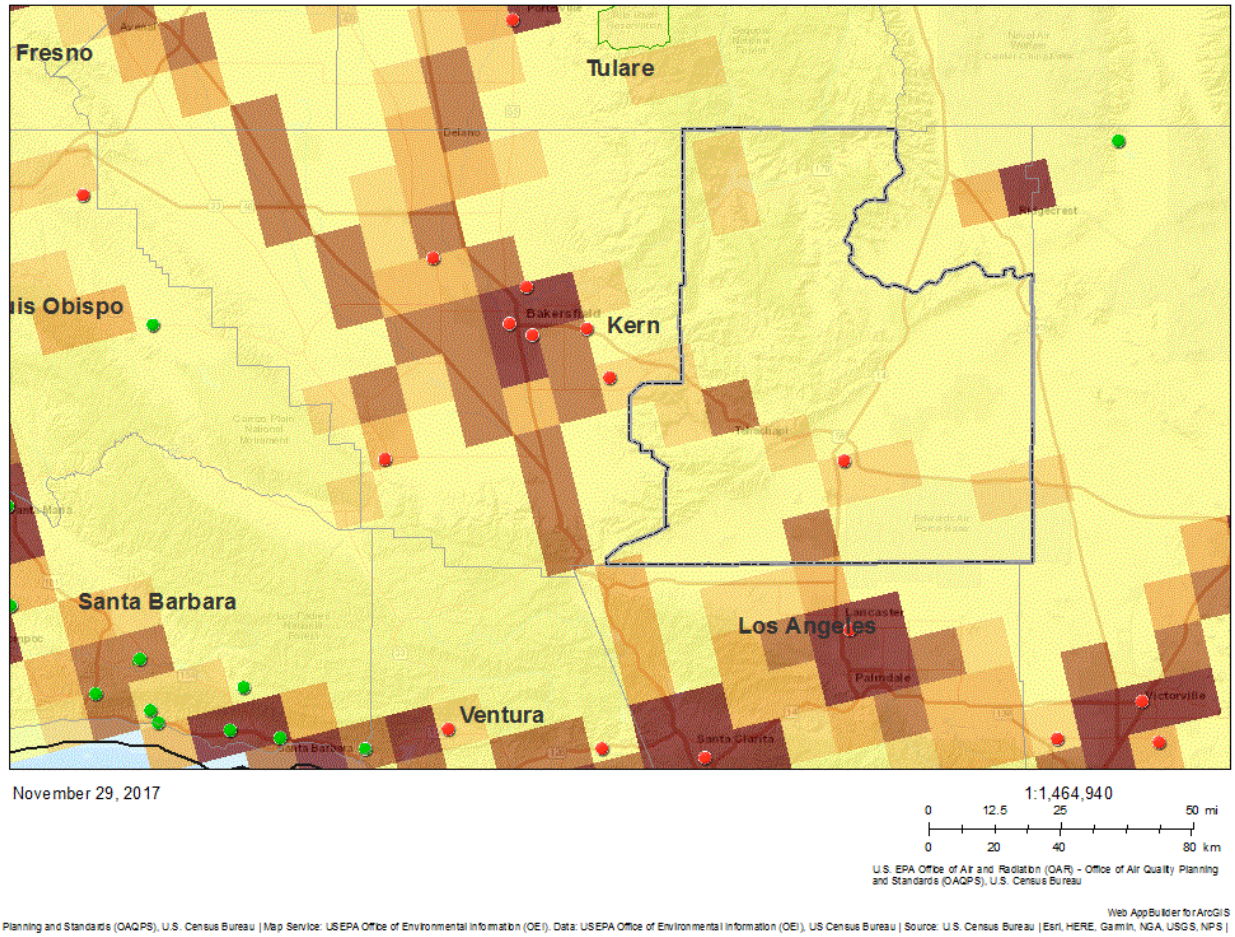


Figure 7.5 shows gridded VMT in the area of analysis for Eastern Kern, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Eastern Kern, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage and On the Map data from the Census Bureau, and shows that Kern County has a total 2014 VMT of 8,060 million miles. As shown in Figure 7.5, the majority of VMT occurs in the western portion of the county along major transportation arteries, with lower VMT occurring along California Highway 58 which runs east-west, and along California Highway 14, running north-south through the city of Mojave in the eastern portion of the county. There is also an area of higher VMT in the Indian Wells Valley portion of the county.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 7.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

Figure 7.6. HYSPLIT Back Trajectories for Mojave (AQS ID 06-29-0011).

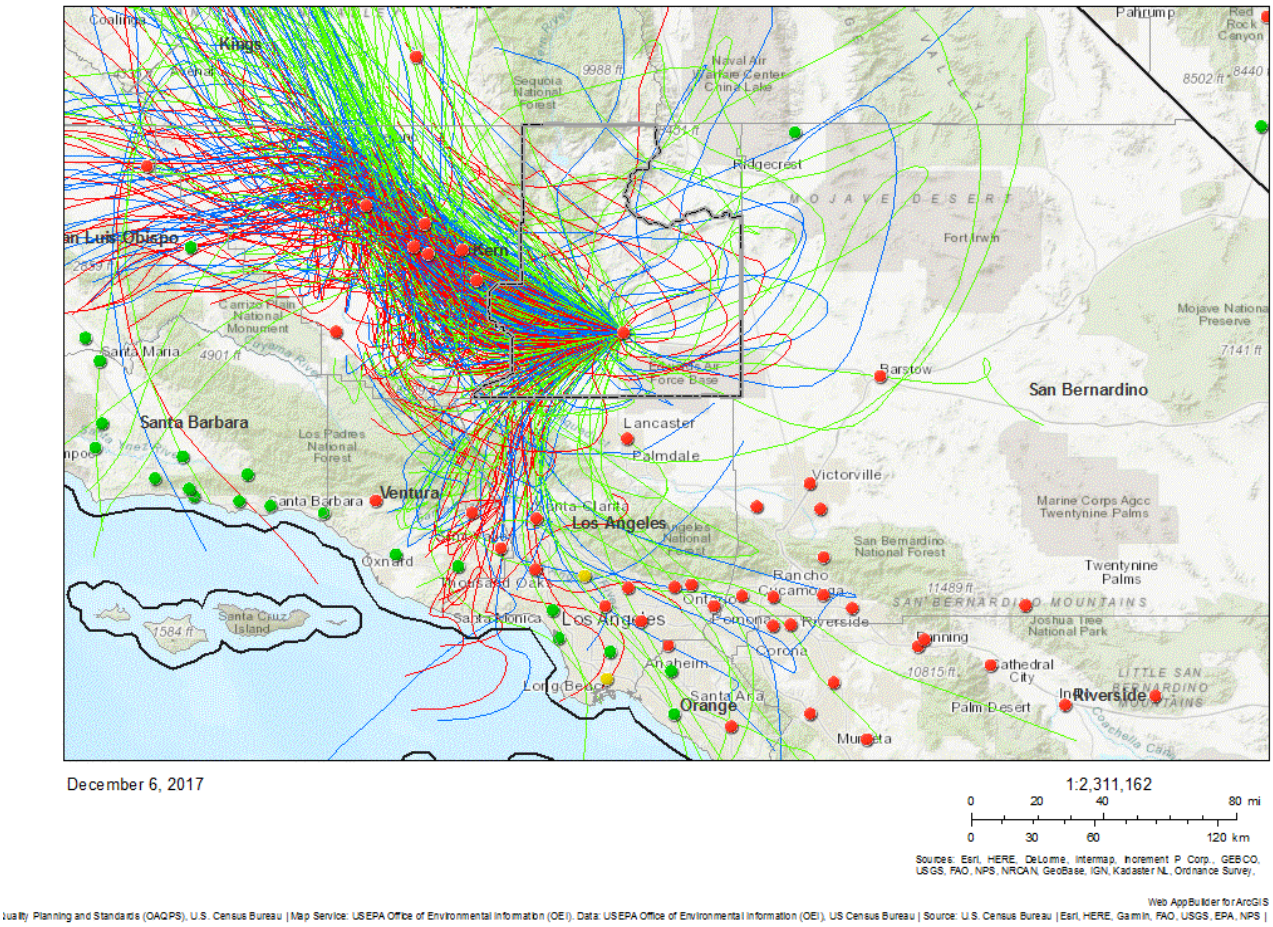


Figure 7.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Eastern Kern, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis back trajectories show that the winds during exceedance days are predominantly from the northwest and to a lesser extent the southwest. The trajectories are heaviest in the western portion of Kern, which we are designating as part of the San Joaquin Valley nonattainment area, and then into the western portion of the Eastern Kern County area that the State recommended be designated separately as the Eastern Kern County nonattainment area. There are less dense HYSPLIT trajectories throughout Eastern Kern County.

As previously discussed, the EPA is designating the adjacent San Joaquin Valley (including western Kern County) and Los Angeles-San Bernardino Counties (Western Mojave Desert) areas as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for the San Joaquin Valley and Los Angeles-San Bernardino Counties (Western Mojave Desert) areas.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. In the western U.S., topography can have a significant impact on pollutant formation and transport in California, and thus plays an important role in assessing which areas are contributing to monitored violations of the NAAQS.

Figure 7.7 shows the topography for the Eastern Kern nonattainment area. The Greenhorn Mountains are the main topographic feature between eastern and western Kern County. The Tehachapi Mountains to the northwest of the violating monitor also separate the eastern portion of Kern County, which is part of the West Mojave Air Basin, from the San Joaquin Valley Air Basin. The Tehachapi's crest varies in height from approximately 4,000–8,000 feet. The eastern portion of Kern County is bounded by the Antelope Valley to the south and the West Mojave Desert to the east. The Indian Wells Valley, located in the northeastern potion of the county, is separated from the rest of Kern County by mountain ranges: the peaks of the eastern slopes of the Sierra Nevada mountains are 6,000 to 7,000 feet in elevation along the western boundary of Indian Wells Valley; and to the south, the El Paso mountains rise to approximately 4,000 to 5,000 feet and the Rand mountains rise above 4,000 feet.

Figure 7.7 Topographic Illustration of the Physical Features.

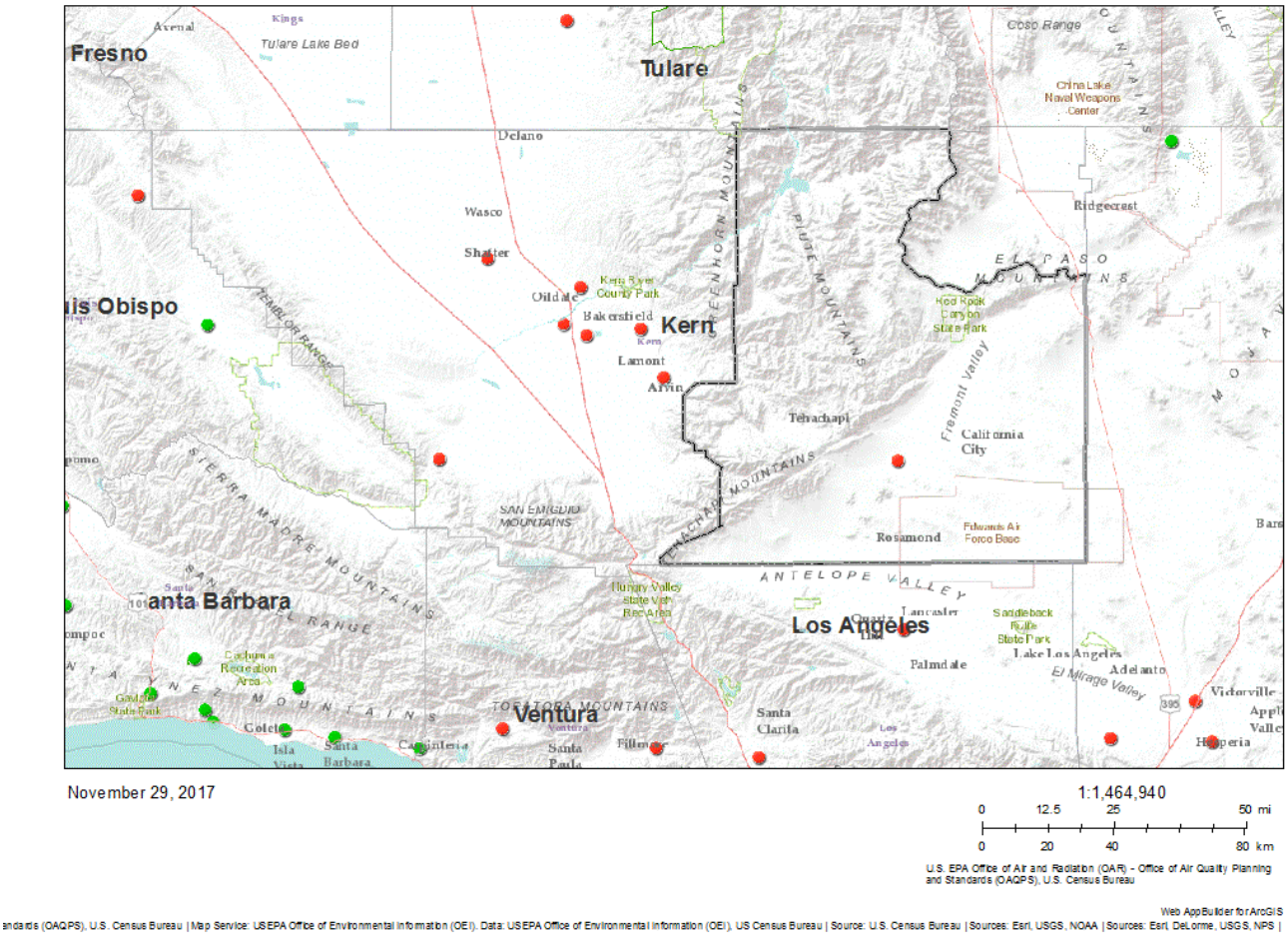


Figure 7.7 shows the topography in the area of analysis for Eastern Kern, CA. The EPA's nonattainment boundary for Eastern Kern, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 7.8 shows the relevant jurisdictional boundaries for Eastern Kern, including county and CBSA boundaries, and areas of Indian Country. Eastern Kern has previously established nonattainment

boundaries associated with both the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS as the existing boundary for both previous standards. Air quality is managed by the Eastern Kern Air Pollution Control District (APCD). The Eastern Kern APCD has jurisdiction over the eastern portion of the county, while the larger western portion of the county is under the jurisdiction of the San Joaquin Valley Air Pollution Control District. The entirety of Kern County is defined by OMB as the Bakersfield CBSA. The CBSA is not part of a larger CSA. The Kern Council of Governments is the MPO for the county. There are no areas of Indian Country located within the nonattainment area.

Figure 7.8 Jurisdictional Boundaries.

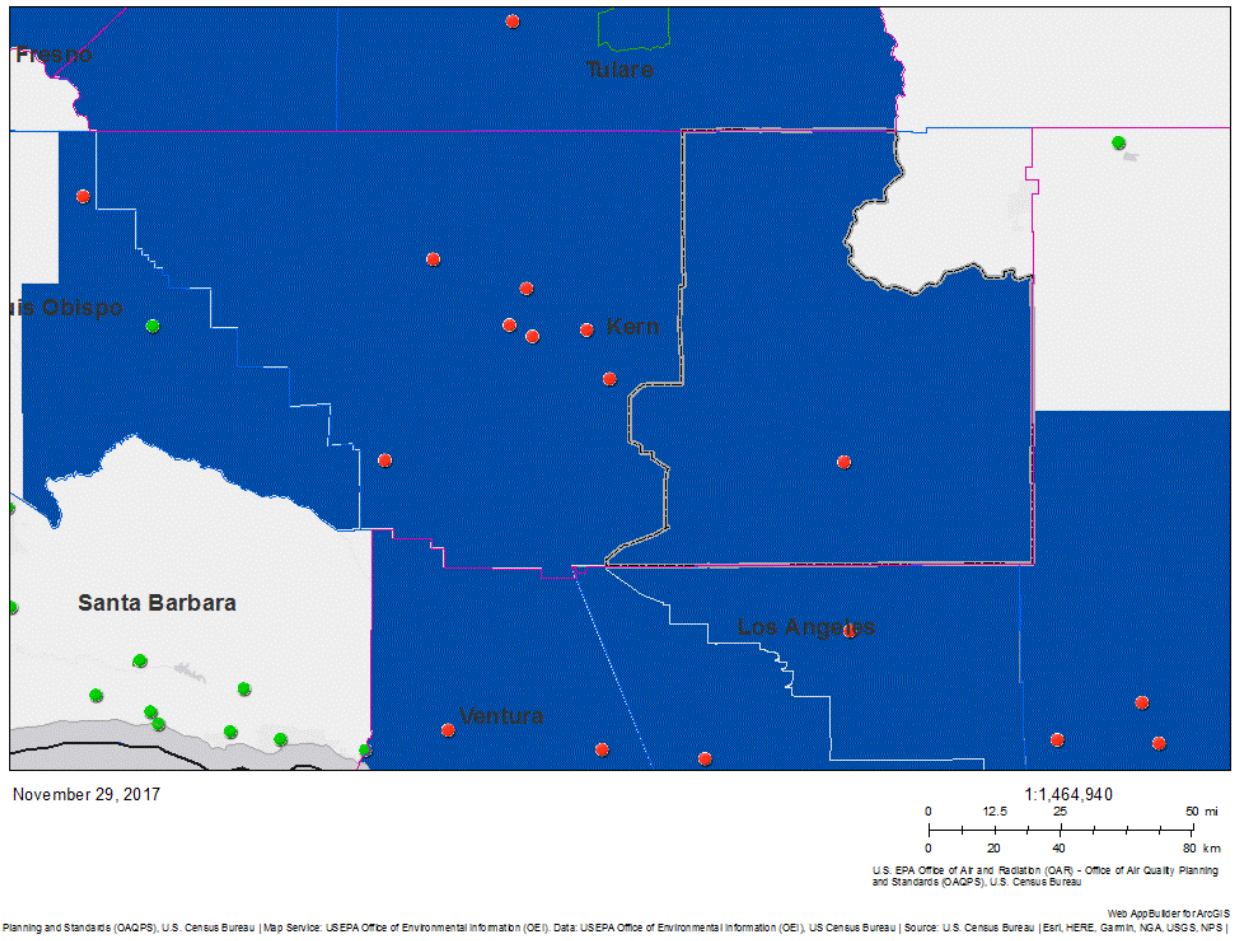


Figure 7.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for Eastern Kern, CA. The EPA's nonattainment boundary for Eastern Kern, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Conclusion for Eastern Kern, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to designate the eastern portion of Kern County, excluding the Indian Wells Valley area, as the Eastern Kern County (partial) nonattainment area for the 2015 ozone NAAQS. This is the same portion of Kern County that is included in the Eastern Kern nonattainment area for the 1997 and 2008 ozone NAAQS.

The air quality monitor in the eastern portion of Kern County shows a violation of the 2015 ozone NAAQS based on the 2016 design values, therefore this portion of Kern County is included in the nonattainment area. Evaluation of emissions and emission sources shows that sources of ozone precursor emissions are concentrated in the western portion of Kern County, which the EPA is designating as part of the San Joaquin Valley nonattainment area. The eastern portion of Kern County is distinguished from the western portion in that it has relatively few stationary sources and population centers, and fewer VMT. Meteorology and geography/topography show potential pollution transport from neighboring areas, which the EPA is designating as separate nonattainment areas. The Indian Wells Valley area in the northeastern corner of the county is separated from remainder of the county by the Sierra Nevada, El Paso and Rand Mountains. Although there are some parts of the Indian Wells Valley area than have higher population and VMT, there are few HYSPLIT trajectories through that area; the trajectories are overwhelmingly from the west, primarily the northwest and to a lesser extent the southwest. The Eastern Kern APCD has air quality planning jurisdiction over the eastern portion of the county, while the larger western portion of the county is under the jurisdiction of the San Joaquin Valley Air Pollution Control District.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation and is designating the eastern portion of Kern County, CA, excluding the Indian Wells Valley area as nonattainment for the 2015 ozone NAAQS.

8.0 Technical Analysis for Los Angeles-San Bernardino Counties (West Mojave Desert), CA

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area.

As shown in Table 8.1, for the Los Angeles-San Bernardino Counties (West Mojave Desert), CA nonattainment area, the area of analysis included the entirety of both Los Angeles and San Bernardino counties, in the Los Angeles-Long Beach-Anaheim CBSA and the Riverside-San Bernardino-Ontario CBSA, respectively. Along with the Oxnard-Thousand Oaks-Ventura CBSA, further to the west, these three CBSAs comprise the Los Angeles-Long Beach CSA. The entirety of the Los Angeles-Long Beach CSA is analyzed in this document; however, for convenience, some counties are analyzed in the technical analysis sections of adjacent nonattainment areas.

The nonattainment areas of Los Angeles-South Coast Air Basin, Riverside County (Coachella Valley) and Kern County (Eastern Kern) are adjacent to the West Mojave Desert nonattainment area. Information specific to the counties or the tribal land in those areas is contained in the associated Technical Analysis sections for those nonattainment areas.

The nonattainment area is identical to the existing 1997 and 2008 West Mojave Desert nonattainment area.

Table 8.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Los Angeles-San Bernardino Counties (West Mojave Desert), CA	Los Angeles County San Bernardino County	Los Angeles-Long Beach-Anaheim CBSA (partial)* Riverside-San Bernardino-Ontario CBSA (partial)*	Los Angeles-Long Beach CSA (partial)*

*The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 8.1 is a map of the EPA's nonattainment boundary for West Mojave Desert. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries.

For purposes of the 1997 and 2008 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 1997 and 2008 ozone NAAQS included the Antelope Valley portion of Los Angeles County, and the Mojave Desert Air Basin portion of San Bernardino County. The West Mojave Desert area also includes Indian Country belonging to the Twenty-Nine Palms Band of Mission Indians of California (Twenty-Nine Palms Band).

For the 2015 ozone NAAQS, the EPA is not modifying the State's recommendation. The State recommended and the EPA is designating the area with the same boundary established for the 1997 ozone NAAQS and for the 2008 ozone NAAQS.

Figure 8.1 The EPA's Nonattainment Boundaries for Los Angeles-San Bernardino Counties (West Mojave Desert), CA.

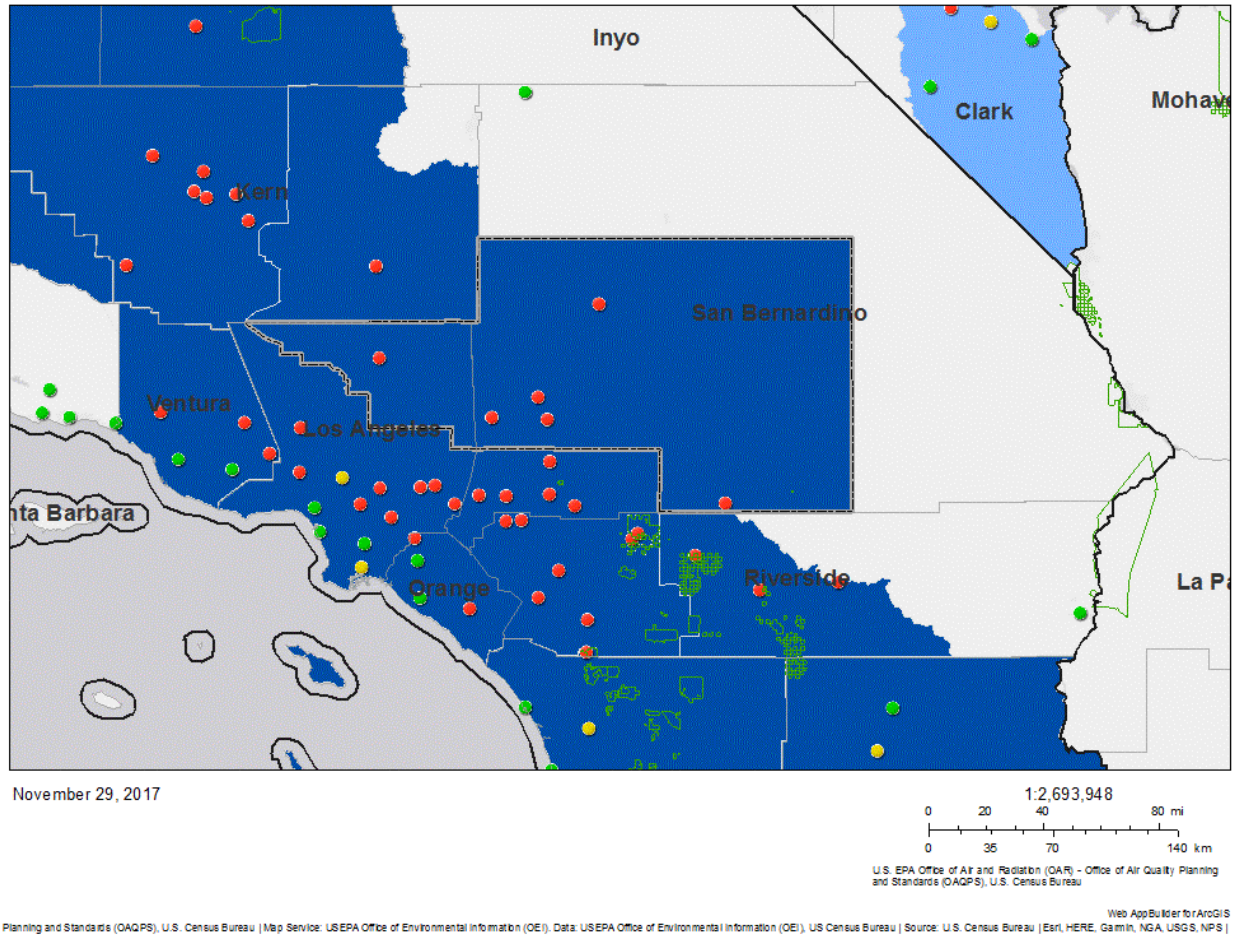


Figure 8.1 shows the EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Los Angeles and San Bernardino counties have monitors in violation of the 2015 ozone NAAQS, therefore portions of these counties are included in the nonattainment area. Other portions of these two counties are included in the Los Angeles-South Coast Air Basin nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the West Mojave Desert area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the

most recent three-year period with fully certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 8.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at:
https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 8.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Los Angeles, CA	Yes	06-037-0002	0.088	0.081	0.088	0.095
		06-037-0016	**0.096**	0.096	0.095	0.098
		06-037-0113	0.070	0.077	0.069	0.066
		06-037-1002	N/A	0.069	N/A	N/A
		06-037-1103	0.071	0.072	0.072	0.071
		06-037-1201	0.085	0.083	0.087	0.086
		06-037-1302	0.067	0.073	0.065	0.064
		06-037-1602	0.076	0.079	0.075	0.074
		06-037-1701	0.090	0.090	0.094	0.087
		06-037-2005	0.083	0.086	0.082	0.082
		06-037-4006	N/A	0.061	0.056	0.055
		06-037-5005	0.070	0.075	0.069	0.067
		06-037-6012	**0.096**	0.097	0.091	0.100
		06-037-9033	0.088	0.081	0.100	0.084
San Bernardino, CA	Yes (partial)	06-071-0001	0.080	0.084	0.077	0.080
		06-071-0005	**0.108**	0.102	0.107	0.116
		06-071-0012	0.091	0.093	0.086	0.094
		06-071-0306	0.086	0.084	0.093	0.081
		06-071-1004	0.101	0.093	0.101	0.110
		06-071-1234	0.069	0.068	0.068	0.073
		06-071-2002	0.097	0.093	0.100	0.098
		06-071-4001	0.090	0.087	0.093	0.092
		06-071-4003	0.101	0.099	0.102	0.103
		06-071-9002	0.086	0.090	0.085	0.084
		06-071-9004	0.104	0.095	0.105	0.114

The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

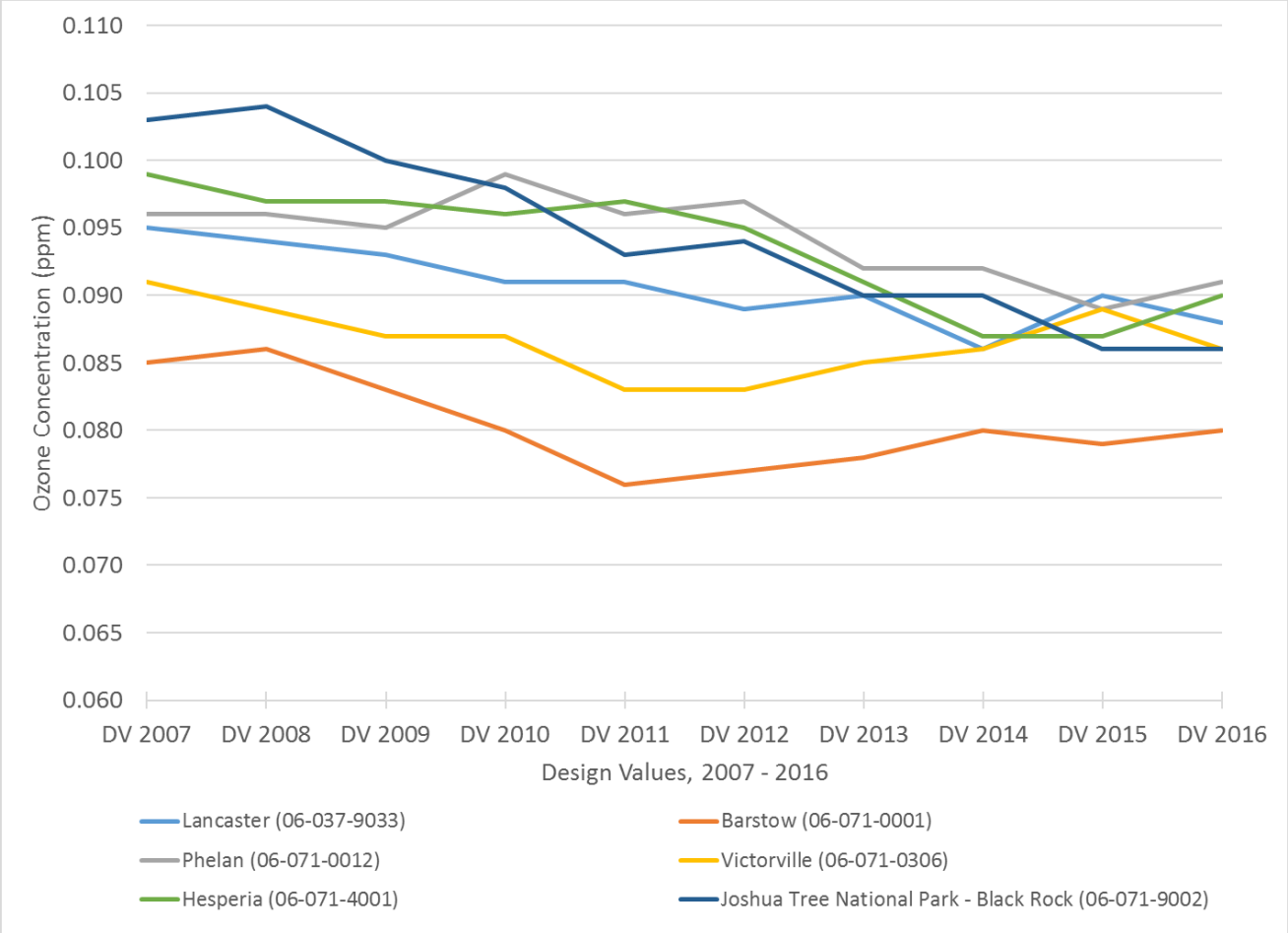
Los Angeles and San Bernardino counties show violations of the 2015 ozone NAAQS, therefore portions of these counties are included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 8.1, shown previously, identifies the West Mojave Desert nonattainment area and the violating monitors. Table 8.2 identifies the design values for all monitors in the area of analysis. As indicated on the map, there are fourteen monitors in Los Angeles County and eleven monitors in San Bernardino County. There is one monitor located in the portion of Los Angeles County that is in the West Mojave Desert nonattainment area which is violating the standard - the Lancaster monitor (AQS ID 06-037-9033) in the northeast Antelope Valley portion of Los Angeles County, located in the town of Lancaster, which has a violating 2016 DV of 0.088 ppm. There are five violating monitors located in the portion of San Bernardino County that are within the West Mojave Desert nonattainment area and include the Phelan (AQS ID 06-071-0012), Victorville (AQS ID 06-07-0306), Hesperia (06-071-4001), Barstow (06-071-0001) and Joshua Tree National Park – Black Rock (AQS ID 06-071-9002) monitors. There is one monitor located in the northern portion of San Bernardino County, Trona (AQS ID: 06-

071-1234), that is attaining the 2015 ozone NAAQS and not included in the West Mojave Desert nonattainment area. The remaining five monitors in San Bernardino County and the thirteen monitors in Los Angeles County are located within the adjacent Los Angeles-South Coast Air Basin nonattainment area.

Figure 8.2 shows the design value trends for the Lancaster monitor (located in Los Angeles County), as well as five monitors in the portion of San Bernardino County that is part of the West Mojave Desert nonattainment area: Phelan, the monitor with the highest 2016 DV; Barstow, the monitor furthest north; Hesperia and Victorville, the monitors located in the eastern portion of the county; and Joshua Tree National Park-Black Rock, the monitor furthest southeast. All five monitors have been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally trending down, except for increases at the Victorville and Barstow monitors starting in 2011. Hesperia and Phelan also increased slightly from 2015 to 2016.

Figure 8.2 Three-Year Design Values for Violating Monitors (2007-2016).



Los Angeles and San Bernardino counties have multiple monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. Violating monitors in the West Mojave nonattainment area are located within the portion of Los Angeles and San Bernardino counties that were included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS and the area the State has recommended for the 2015 ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 8.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the West Mojave Desert nonattainment area.

Table 8.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Los Angeles, CA	Yes	98,056	116,498
San Bernardino, CA	Yes (partial)	58,926	28,104
	Area wide:	156,982	144,602

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown with square orange icons in Figure 8.3 below. The nonattainment boundary is also shown.

Figure 8.3 Large Point Sources in the Area of Analysis.

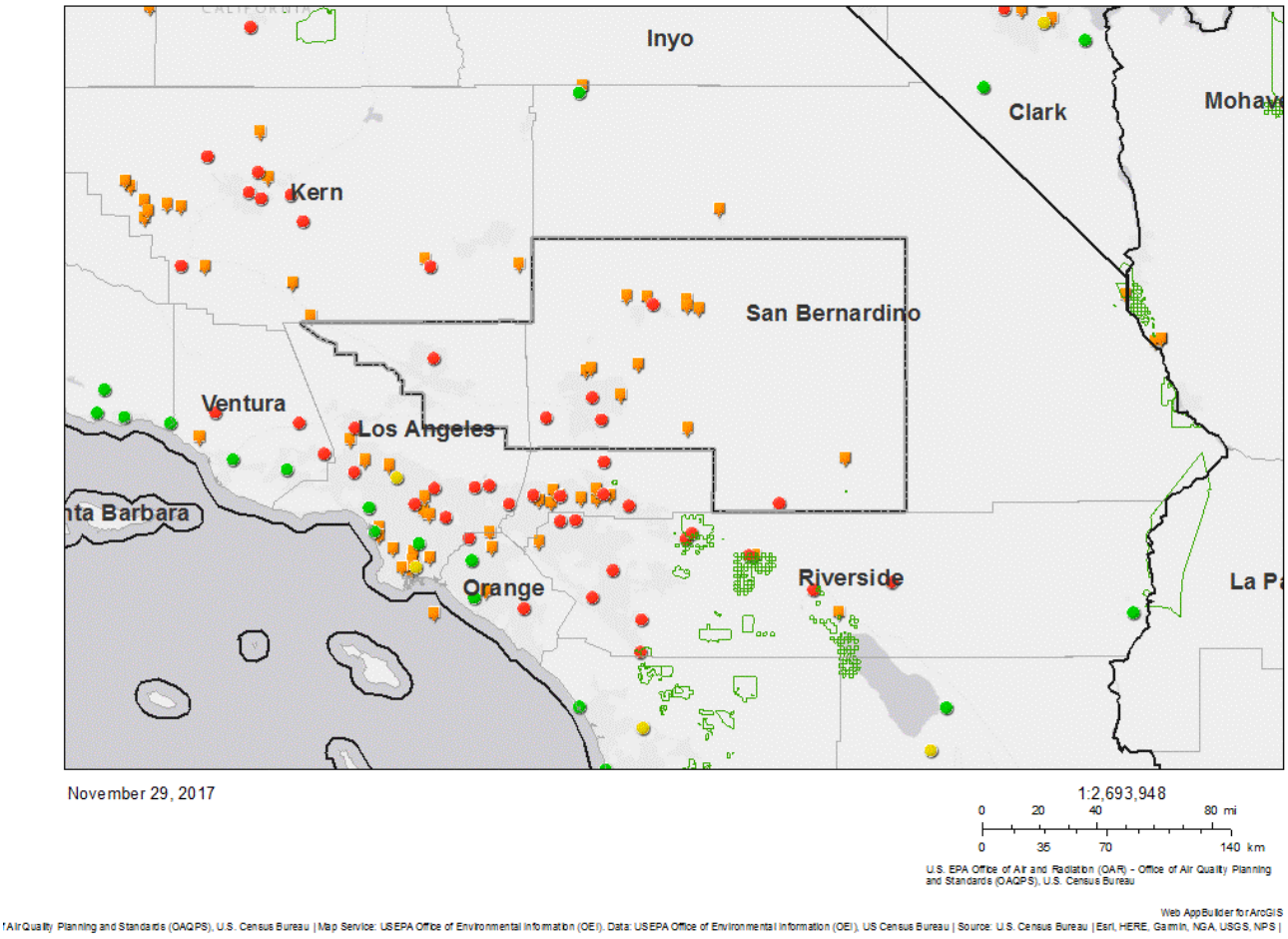


Figure 8.3 shows large point sources in the area of analysis for Los Angeles-San Bernardino Counties (West Mojave Desert), CA as orange squares. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Within the area recommended by the State for designation as the West Mojave Desert Area, most of the large point sources of ozone precursors are located in the central to southwestern portion of San Bernardino County. There are no large point sources of emissions in the portion of Los Angeles County within the area recommended by the State for inclusion in the West Mojave Desert nonattainment area.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 8.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 8.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Los Angeles, CA	Yes	9,818,605	10,170,292	2,506	351,687	4%
San Bernardino, CA	Yes (partial)	2,035,210	2,128,133	106	92,923	5%
	Area wide:	11,853,815	12,298,425	510	444,610	4%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html

Figure 8.4 shows the 2012 census tract-level population information for the area of analysis. Los Angeles County has the highest population and population density levels within the area of analysis, and is over 20 times more densely populated than San Bernardino County. The data show that the more populated census tracts within San Bernardino and Los Angeles counties occur in the south and southwestern portions of the counties within the Los Angeles-South Coast Air Basin nonattainment area. The remaining portions of the counties to the north and east are less populated.

Figure 8.4 Census Tract-Level Population.

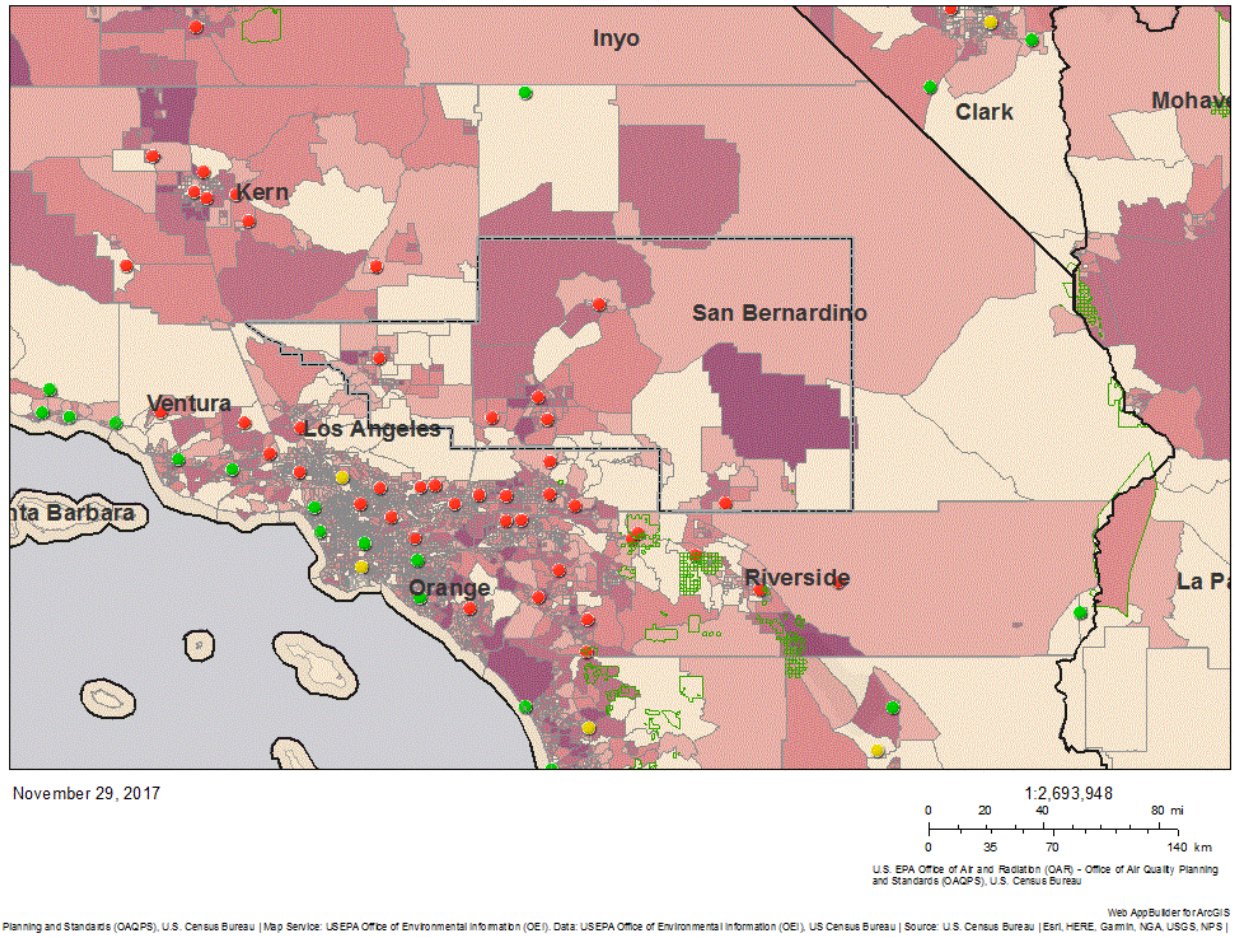


Figure 8.4 shows census tract population in the area of analysis for Los Angeles-San Bernardino Counties (West Mojave Desert), CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 8.5 shows the traffic and commuting pattern data, including total VMT for each county, number of residents who work in each county, number of residents that work in counties with violating monitor(s), and the percent of residents working in counties with violating monitor(s). The data in Table 8.5 are 2014 data.

Table 8.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis
Los Angeles, CA	**Yes**	**83,011**	**4,119,590**	**3,447,753**	**83.7%**
San Bernardino, CA	**Yes (partial)**	**21,573**	**764,867**	**545,229**	**71.3%**
	Total:	104,584	4,884,457	3,992,982	81.7%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 8.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 8.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

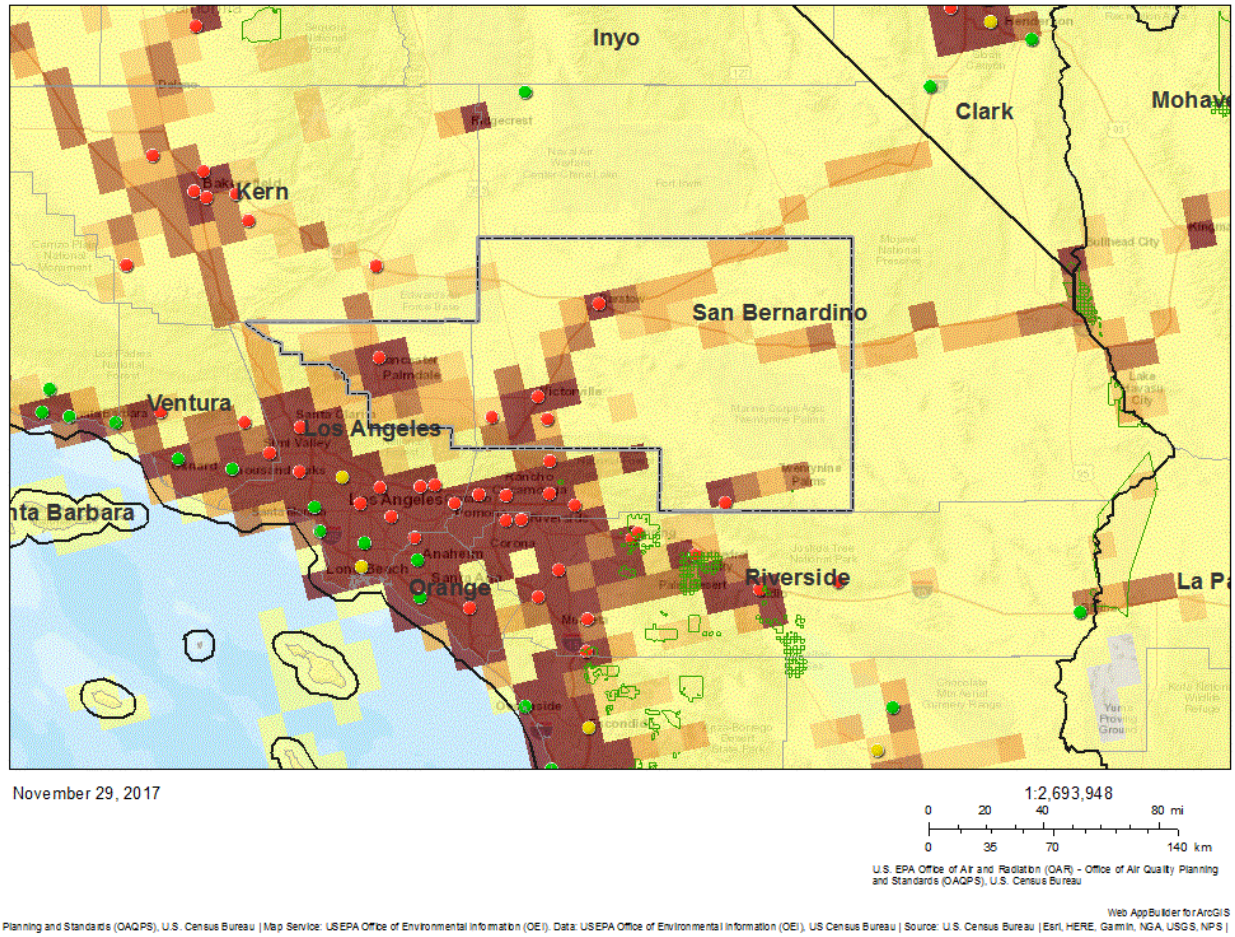


Figure 8.5 shows gridded VMT in the area of analysis for Los Angeles-San Bernardino Counties (West Mojave Desert), CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau,[6] and shows that Los Angeles County has the highest total VMT levels within the area of analysis. While San Bernardino County is five times larger in land mass than Los Angeles County, it has almost four times less VMT. The data show that Los Angeles County has over 83 percent and San Bernardino County has over 71 percent of workers commuting to or within counties with violating monitors in the area of analysis. The northern portion of Los Angeles county contains lower VMT compared to the rest of the county, with the highest VMT occurring in areas surrounding the city of Lancaster. Similarly, the northern and eastern portions of San Bernardino county contain lower VMT than the rest of the county, with the highest VMT occurring in the city of Victorville and along Interstates 10 and 40.

[6] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/ .

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figures 8.6a, b, c, and d. show the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the Lancaster, Hesperia, Barstow and Joshua Tree National Park monitoring sites. The Hesperia monitoring site is geographically close to, and adequately represents, the additional two monitoring sites with violations: Phelan and Victorville.

Figure 8.6a HYSPLIT Back Trajectories for Lancaster (AQS ID 06-037-9033).

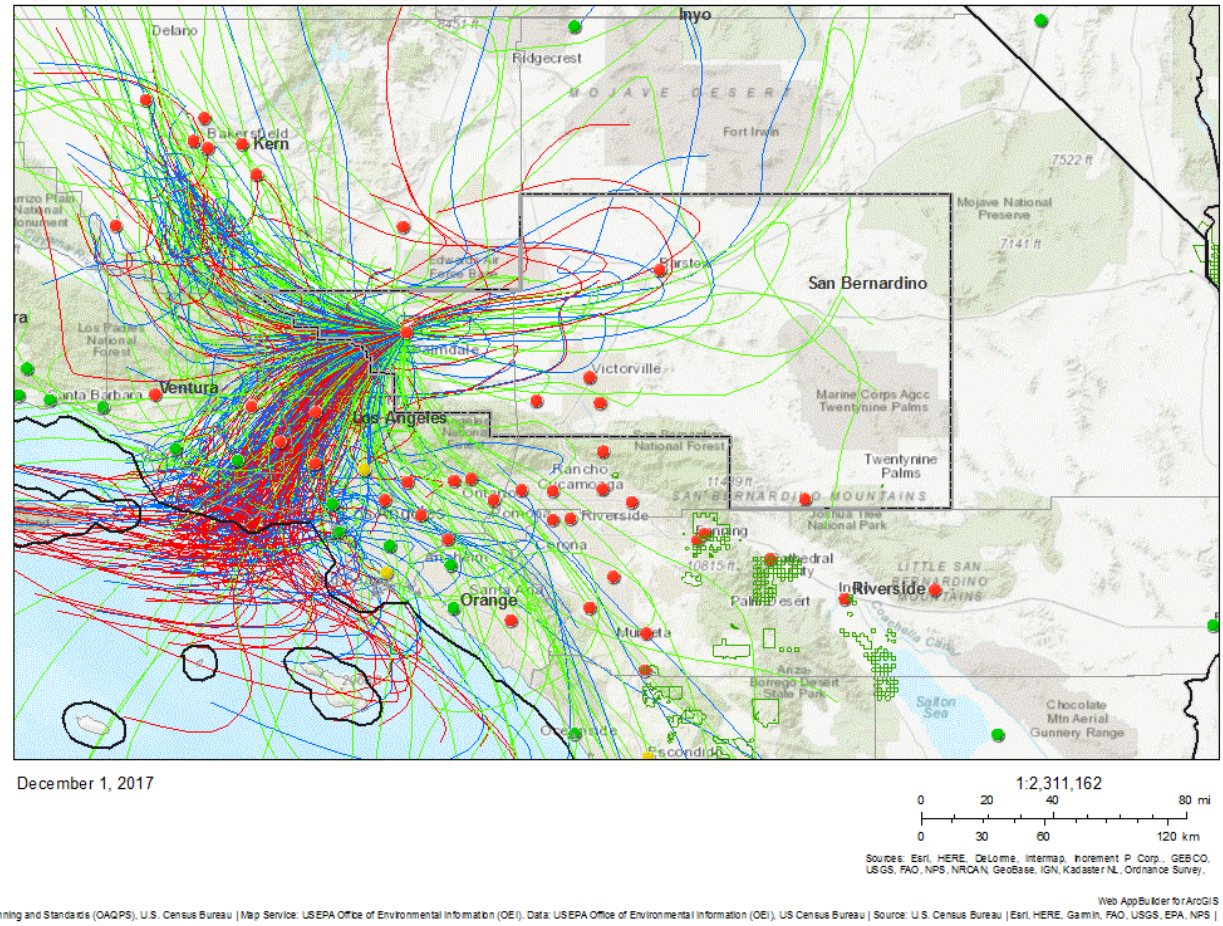


Figure 8.6a shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document

Figure 8.6b HYSPLIT Back Trajectories for Hesperia (AQS ID 06-071-4001).

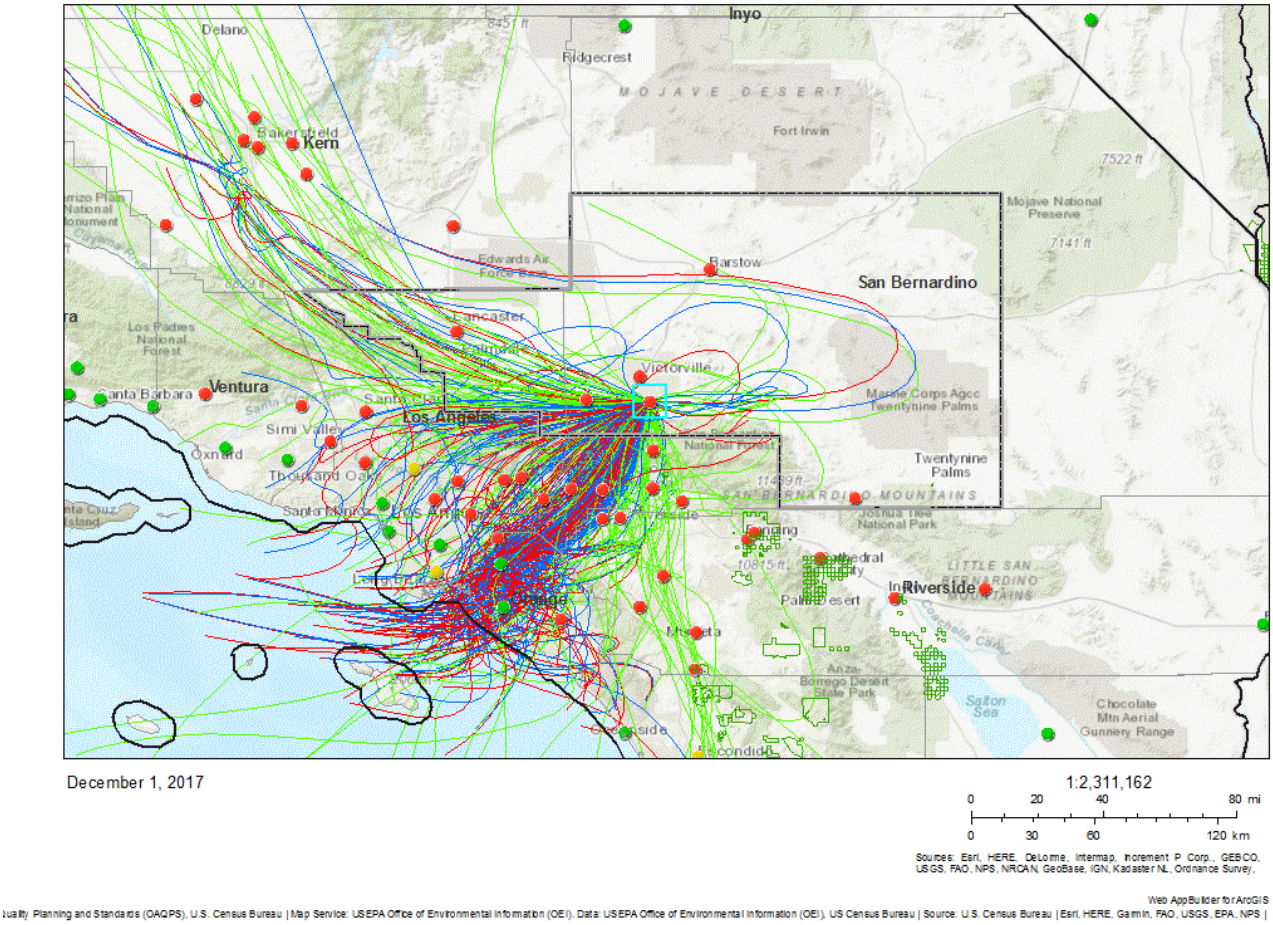


Figure 8.6b shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document

Figure 8.6c HYSPLIT Back Trajectories for Barstow (AQS ID 06-071-0001).

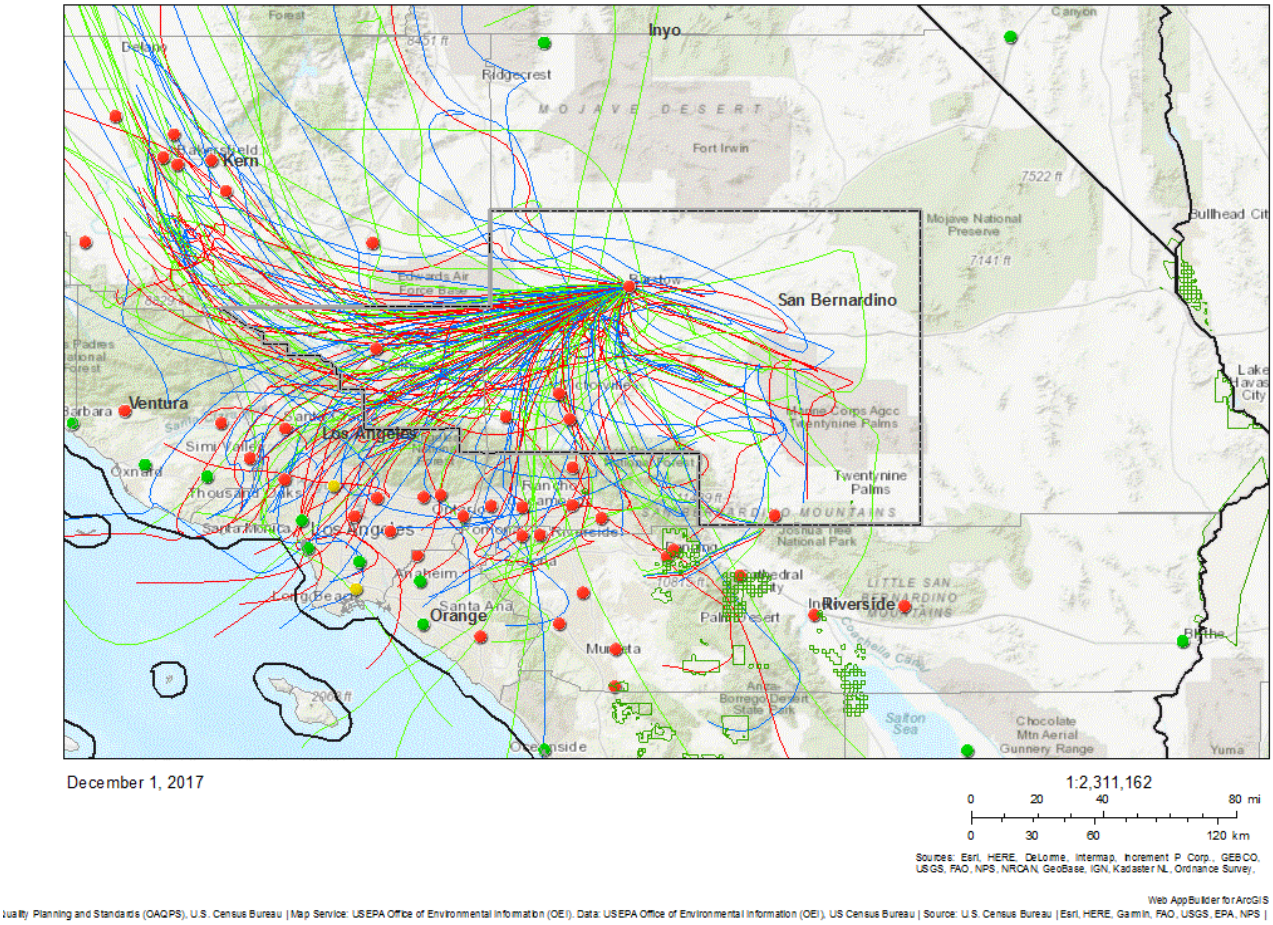


Figure 8.6c shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document

Figure 8.6d HYSPLIT Back Trajectories for Joshua Tree National Park (AQS ID 06-071-9002).

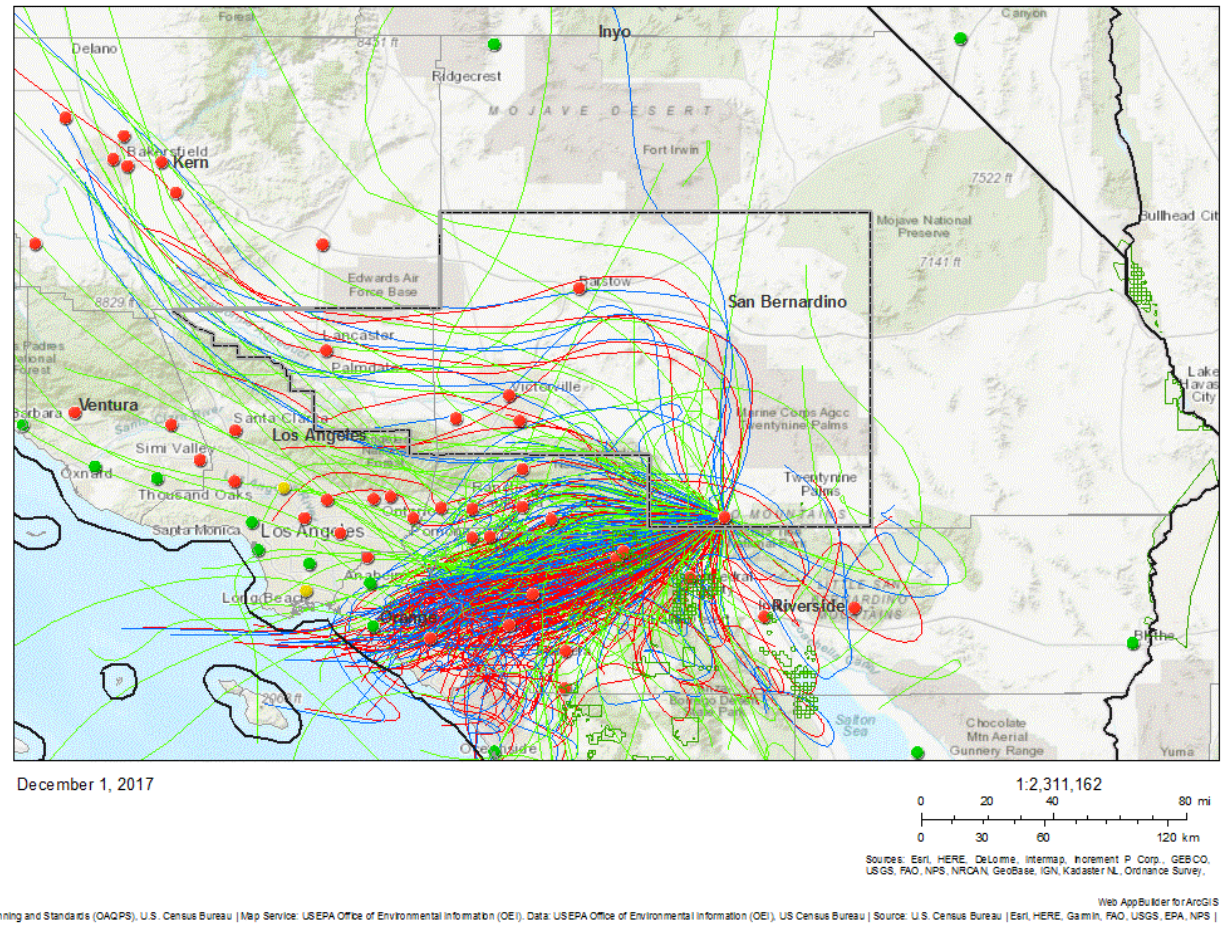


Figure 8.6d shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016. These back trajectories show that the winds during exceedance days are predominantly from the southwest for the Hesperia, Barstow and Joshua Tree National Park monitoring sites. The data show that the winds during exceedance days are predominantly from the southwest as well as the northwest for the Lancaster monitoring site.

The area to the southwest, which has the heaviest concentration of trajectories on exceedance days for each of the four monitors, has historically been designated nonattainment as the Los Angeles-South Coast area and, as explained elsewhere in this TSD, the EPA is designating the area as nonattainment for the 2015 NAAQS with the same boundaries as for the 2008 ozone NAAQS.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of

emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. Topography can have a significant impact on pollutant formation and transport in California, and thus can play an important role in assessing which areas are contributing to monitored violations of the NAAQS.

The West Mojave Desert nonattainment area is shown in Figures 8.7a. and 8.7b., below. The illustration is provided in two figures because of the size of the nonattainment area.

Figure 8.7a Western Topographic Illustration of the Physical Features.

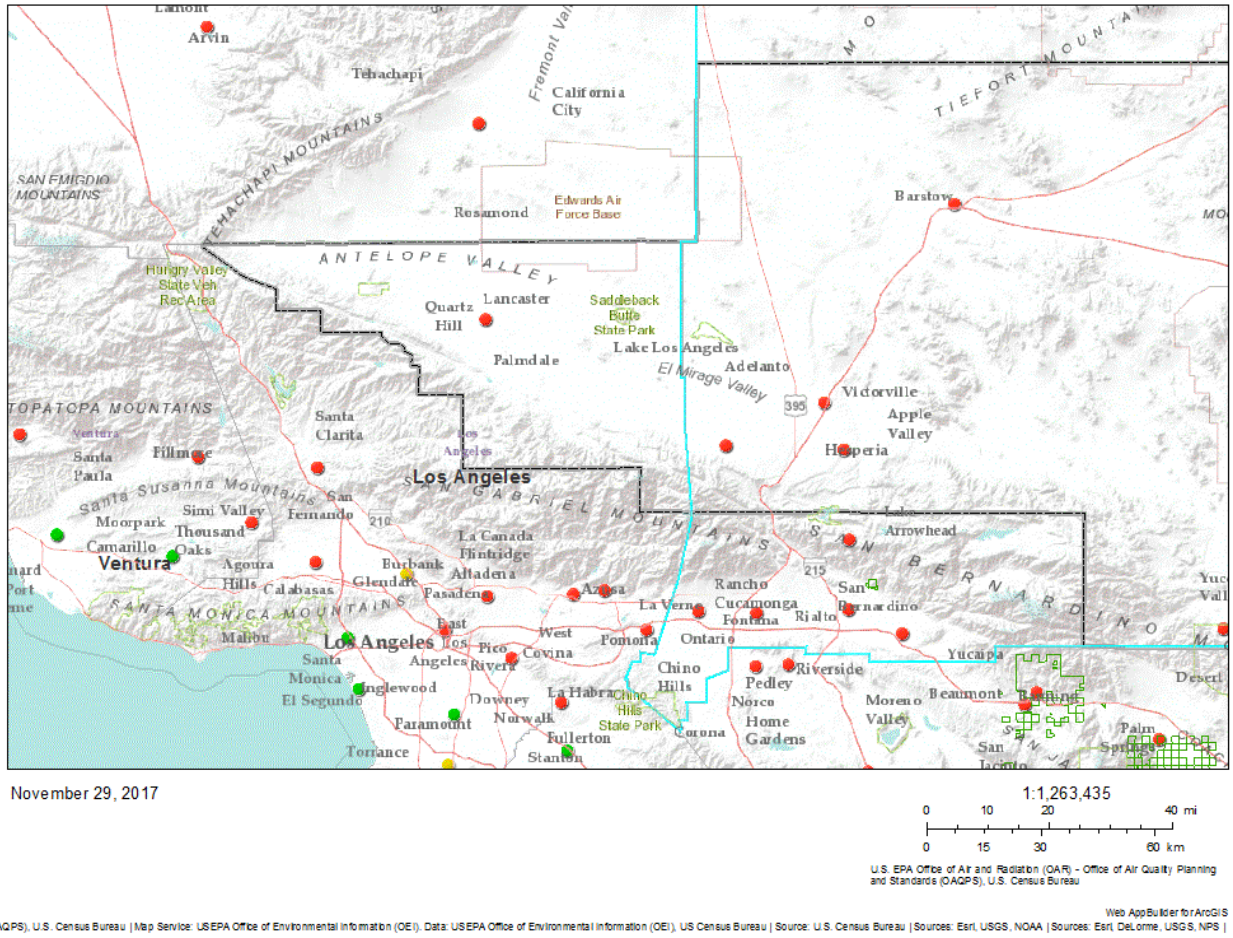


Figure 8.7a shows the topography in the area of analysis for the western part of the Los Angeles-San Bernardino Counties (West Mojave Desert), CA. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 8.7b Eastern Topographic Illustration of the Physical Features.

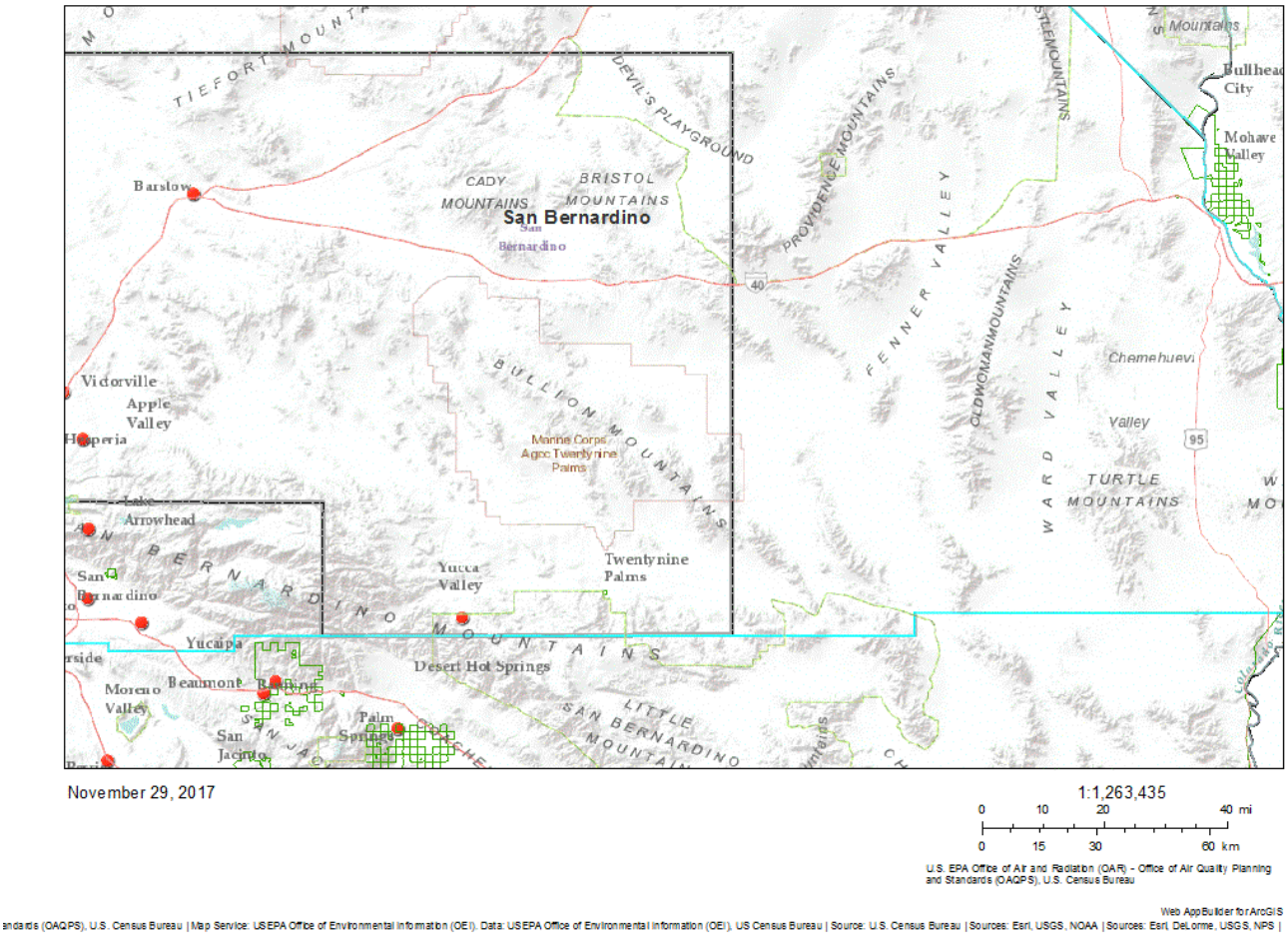


Figure 8.7b shows the topography in the area of analysis for the eastern part of the Los Angeles-San Bernardino Counties (West Mojave Desert), CA. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The West Mojave Desert area is a small portion of the complex greater Southern California airshed. The West Mojave Desert area extends about 90 miles north to south and 120 miles east to west. The Planning Area is classified as high desert with elevations ranging from 2,000 to 5,000 feet. The San Gabriel and San Bernardino mountains to the west separate the South Coast Air Basin from the Mojave Desert Air Basin. The Tehachapi Mountains to the northwest separate the San Joaquin Valley from the Mojave Desert Air Basin.

Although the area is separated from the South Coast and San Joaquin areas by mountains, several mountain passes provide transport routes into the West Mojave Desert. Soledad Canyon on the eastern edge of the San Gabriel Mountains and Cajon Pass between the San Gabriel and San Bernardino mountains are the two major transport corridors from the South Coast to the West Mojave Desert. A third transport corridor runs through the Tehachapi Pass in the Tehachapi Mountains and provides an outlet for emissions and pollutants from the southern San Joaquin Valley to the West Mojave Desert.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the West Mojave Desert nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 8.8 shows the relevant jurisdictional boundaries for the West Mojave Desert nonattainment area, including county, CSA, and CBSA boundaries, and areas of Indian country.

Figure 8.8 Jurisdictional Boundaries.

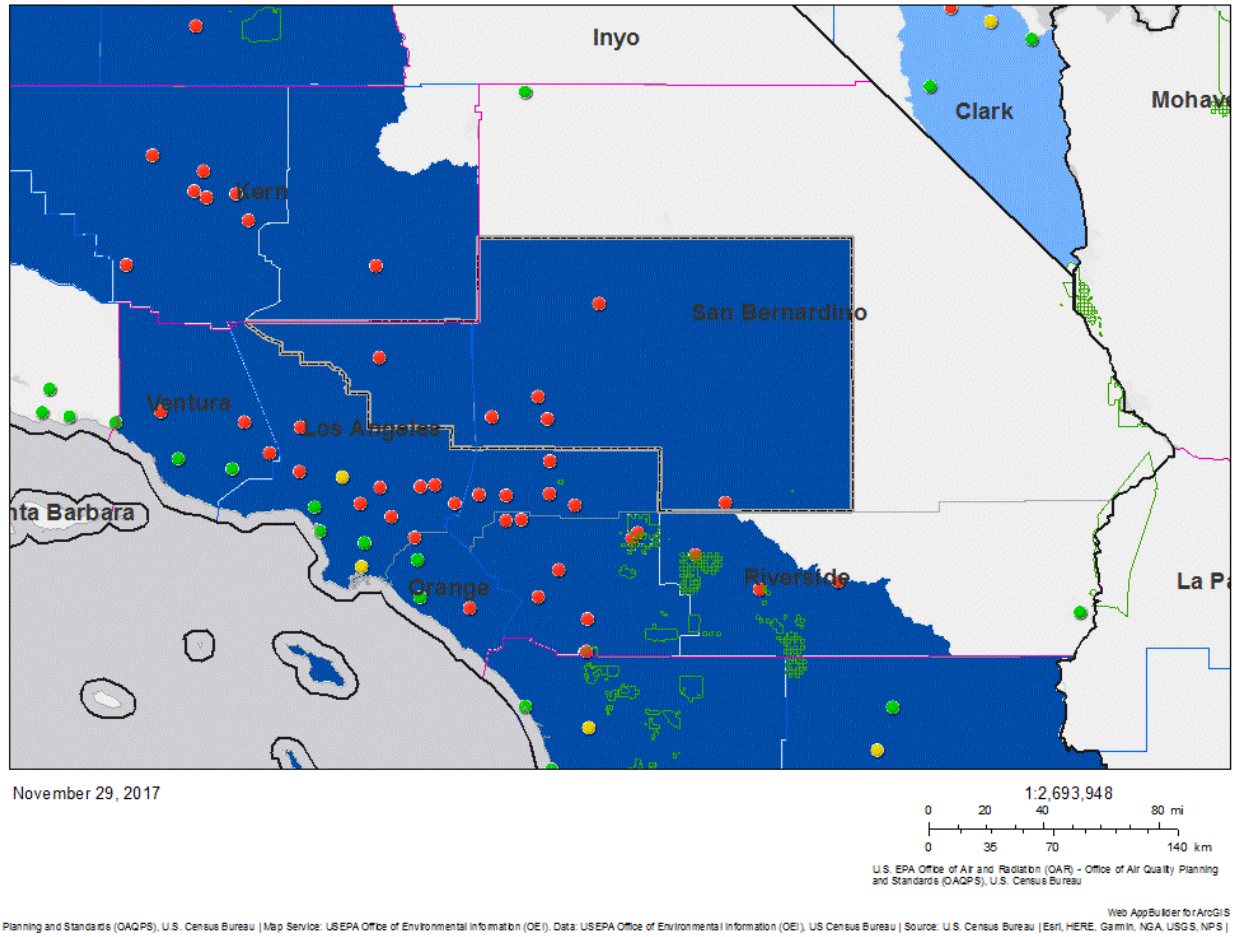


Figure 8.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for Los Angeles-San Bernardino Counties (West Mojave Desert), CA. The EPA's nonattainment boundary for Los Angeles-San Bernardino Counties (West Mojave Desert), CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The West Mojave Desert area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

The area of analysis for the West Mojave Desert area, which includes Los Angeles and San Bernardino counties, is located within the Mojave Desert and South Coast air basins. The eastern portion of San Bernardino County is in the Mojave Desert Air Basin and is under the air quality planning jurisdiction of the Mojave Desert Air Quality Management District (AQMD); the remainder of San Bernardino County is in the South Coast air basin and is managed by the South Coast AQMD. The northeastern portion of Los Angeles County is in the Mojave Desert Air Basin and is under the air quality planning jurisdiction of Antelope Valley AQMD; the remainder of Los Angeles County is in the South Coast Air Basin and is managed by the South Coast AQMD. The State recommended that the portions of Los Angeles and San Bernardino counties that are located in the South Coast Air Basin and are managed by the South Coast AQMD are designated as part of the South Coast nonattainment area, and that the remainder of Los Angeles County and a portion of the remainder of San Bernardino County, located in

the Mojave Desert Air Basin, are designated as the West Mojave Desert nonattainment area. As discussed above, the State's recommended West Mojave Desert nonattainment area is managed by the Antelope Valley AQMD and Mojave Desert AQMD; the Antelope Valley AQMD is operated and managed by Mojave Desert AQMD staff, and both areas have worked together to address the 1997 and 2008 ozone NAAQS.

The Southern California Association of Governments has jurisdiction over transportation planning in the Los Angeles-Long Beach CSA, including Los Angeles and San Bernardino counties.

The West Mojave Desert area also includes Indian county belonging to the Twenty-Nine Palms Band. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

The tribe has non-contiguous areas of Indian country in both the West Mojave Desert nonattainment area and Riverside County (Coachella Valley) nonattainment area. We are designating a portion of the Indian Country for the Twenty-Nine Palms Band as nonattainment as part of the West Mojave Desert nonattainment area, and a portion as nonattainment as part of the Coachella Valley nonattainment area.

Conclusion for West Mojave Desert, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation that portions of the following counties be designated as the West Mojave Desert nonattainment area: Los Angeles County (partial), and San Bernardino County (partial). These are the same portions of the counties that are included in the West Mojave Desert nonattainment area for the 1997 and 2008 ozone NAAQS. The air quality monitors in the portions of Los Angeles and San Bernardino counties that lie within the Mojave Desert Air Basin, indicate violations of the 2015 ozone NAAQS based on the 2016 design values, therefore these portions of the counties are included in the nonattainment area. Emissions and emissions-related data show that the Mojave Desert Air Basin portion of San Bernardino County contains a number of large point sources of ozone precursors. The portions of San Bernardino County and Los Angeles County in the Mojave Desert Air Basin have similar levels of population density, VMT, and total NO_x and VOC emissions. Meteorology suggests that the Mojave Desert Air Basin portion of San Bernardino County and Antelope Valley portion of Los Angeles County are affected by similar sources within the area and transport patterns from outside areas. Geography and topography show no topographical distinction between the Antelope Valley and Mojave Desert areas, and they are contained in the same air basin. Finally, jurisdiction also supports these boundaries, as both areas are part of the same air basin, and the air management districts which have jurisdiction over each county are closely intertwined.

Based on consideration of all five factors, the EPA is not modifying the State's recommendation to designate portions of San Bernardino and Los Angeles Counties as the West Mojave Desert nonattainment for the 2015 ozone NAAQS.

9.0 Technical Analysis for the Los Angeles-South Coast Air Basin, CA

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

Table 9.1 identifies the area of analysis for the Los Angeles-South Coast Air Basin nonattainment area. The area of analysis includes Los Angeles County, Orange County, Riverside County, and San Bernardino County. The area of analysis comprises all of the Los Angeles-Long Beach-Anaheim CBSA, portions of the Riverside-San Bernardino-Ontario CBSA, and portions of the Los Angeles-Long Beach CSA. The entirety of the Los Angeles-Long Beach CSA is analyzed in this document; however, for convenience, some counties are analyzed in the technical analysis sections of adjacent nonattainment areas.

The nonattainment areas of Los Angeles-San Bernardino Counties (West Mojave Desert), Riverside County (Coachella Valley), San Diego, San Joaquin Valley, and Ventura County are adjacent to the Los Angeles-South Coast Air Basin nonattainment area. Information specific to counties in those areas is contained in the associated Technical Analysis sections for those nonattainment areas.

The nonattainment area is identical to the existing 1997 and 2008 Los Angeles-South Coast Air Basin, CA nonattainment areas.

Table 9.1 Area of Analysis.

Final Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Los Angeles-South Coast Air Basin, CA	Los Angeles County Orange County Riverside County San Bernardino County	Los Angeles-Long Beach-Anaheim CBSA Riverside-San Bernardino-Ontario CBSA (partial)*	Los Angeles-Long Beach CSA (partial)*

*The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 9.1 is a map of the EPA's nonattainment boundary for the Los Angeles-South Coast Air Basin. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries.

For purposes of the 1997 and 2008 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 1997 and 2008 ozone NAAQS included all of Orange County and parts of Los Angeles, Riverside, and San Bernardino counties. The Los Angeles-South Coast Air Basin also includes Indian country of the following tribes: Cahuilla Band of Indians (Cahuilla Band), Pechanga Band of Luiseno Mission Indians (Pechanga Band), Ramona Band of Cahuilla (Ramona Band), San Manuel Band of Mission Indians (San Manuel Band), and Soboba Band of Luiseno Indians (Soboba Band). The Pechanga Band has non-contiguous areas of Indian country in Riverside County. The EPA is designating a portion of the Pechanga Indian country as part of the Los Angeles-South Coast Air Basin nonattainment area and a portion as part of the Pechanga Band of Luiseno Mission Indians nonattainment area. The Morongo Band of Mission Indians (Morongo Band) has areas of Indian country located within the boundaries of the Los Angeles-South Coast Air Basin and Riverside County (Coachella Valley) areas. The EPA is designating these areas of Indian country as a separate tribal nonattainment area consistent with previous designations. Additional information is contained in the associated Technical Analysis sections for those nonattainment areas.

The EPA is not modifying the State's recommendation, to establish the same boundary as for the 1997 ozone NAAQS and the boundary for the 2008 ozone NAAQS.

Figure 9.1 The EPA's Nonattainment Boundaries for Los Angeles-South Coast Air Basin, CA.

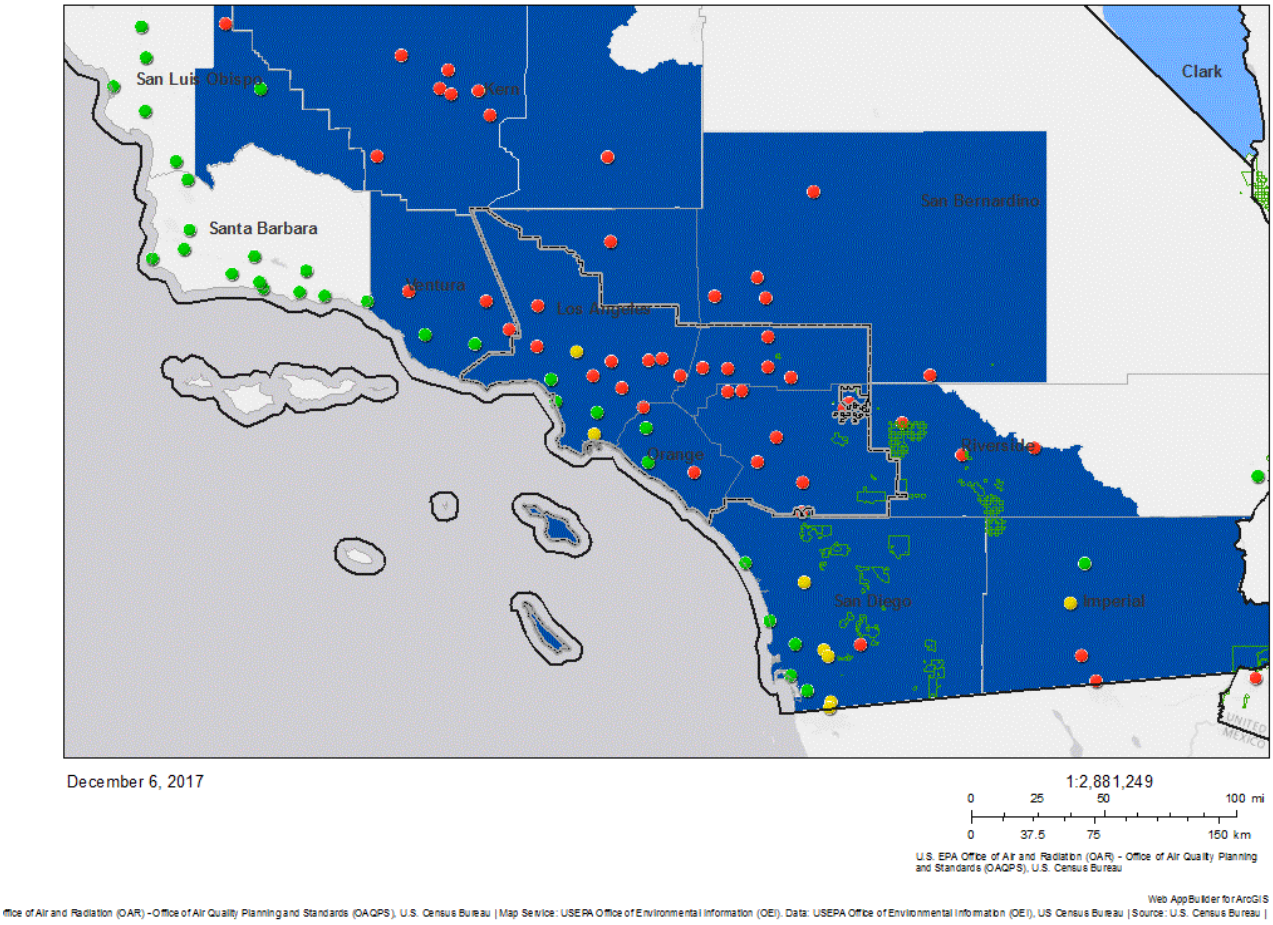


Figure 9.1 shows the EPA's nonattainment boundary Los Angeles-South Coast Air Basin, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Los Angeles, Orange, Riverside, and San Bernardino counties have monitors in violation of the 2015 ozone NAAQS, therefore all or portions of these counties are included in the nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Los Angeles-South Coast Air Basin area based on data for the 2014-2016 period (i.e., the 2016 design value, or

DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.

Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 9.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at:
https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 9.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Los Angeles, CA	Yes	06-037-0002	0.088	0.081	0.088	0.095
		06-037-0016	**0.096**	0.096	0.095	0.098
		06-037-0113	0.070	0.077	0.069	0.066
		06-037-1002	N/A	0.069	N/A	N/A
		06-037-1103	0.071	0.072	0.072	0.071
		06-037-1201	0.085	0.083	0.087	0.086
		06-037-1302	0.067	0.073	0.065	0.064
		06-037-1602	0.076	0.079	0.075	0.074
		06-037-1701	0.090	0.090	0.094	0.087
		06-037-2005	0.083	0.086	0.082	0.082
		06-037-4006	N/A	0.061	0.056	0.055
		06-037-5005	0.070	0.075	0.069	0.067
		06-037-6012	**0.096**	0.097	0.091	0.100
		06-037-9033	0.088	0.081	0.100	0.084
Orange, CA	Yes	06-059-0007	0.070	0.076	0.065	0.071
		06-059-1003	0.069	0.076	0.068	0.065
		06-059-2022	**0.077**	0.078	0.075	0.079
		06-059-5001	0.074	0.075	0.073	0.075
Riverside, CA	Yes (partial)	06-065-0008*	0.079	0.091	0.074	0.072
		06-065-0009	0.071	0.079	0.069	0.067
		06-065-0012	0.093	0.094	0.091	0.094
		06-065-0016	0.077	0.077	0.079	0.077
		06-065-1016	**0.097**	0.098	0.097	0.097
		06-065-2002	0.081	0.084	0.079	0.081
		06-065-5001	0.087	0.089	0.086	0.087
		06-065-6001	0.091	0.089	0.094	0.092
		06-065-8001	0.094	0.091	0.096	0.097
		06-065-8005	0.091	0.087	0.093	0.095
		06-065-9001	0.086	0.079	0.093	0.087
		06-065-9003	0.066	0.078	0.063	0.057
San Bernardino, CA	Yes (partial)	06-071-0001	0.080	0.084	0.077	0.080
		06-071-0005	**0.108**	0.102	0.107	0.116
		06-071-0012	0.091	0.093	0.086	0.094
		06-071-0306	0.086	0.084	0.093	0.081
		06-071-1004	0.101	0.093	0.101	0.110
		06-071-1234	0.069	0.068	0.068	0.073
		06-071-2002	0.097	0.093	0.100	0.098
		06-071-4001	0.090	0.087	0.093	0.092
		06-071-4003	0.101	0.099	0.102	0.103
		06-071-9002	0.086	0.090	0.085	0.084
		06-071-9004	0.104	0.095	0.105	0.114

The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.
*Other National Park Service monitors.

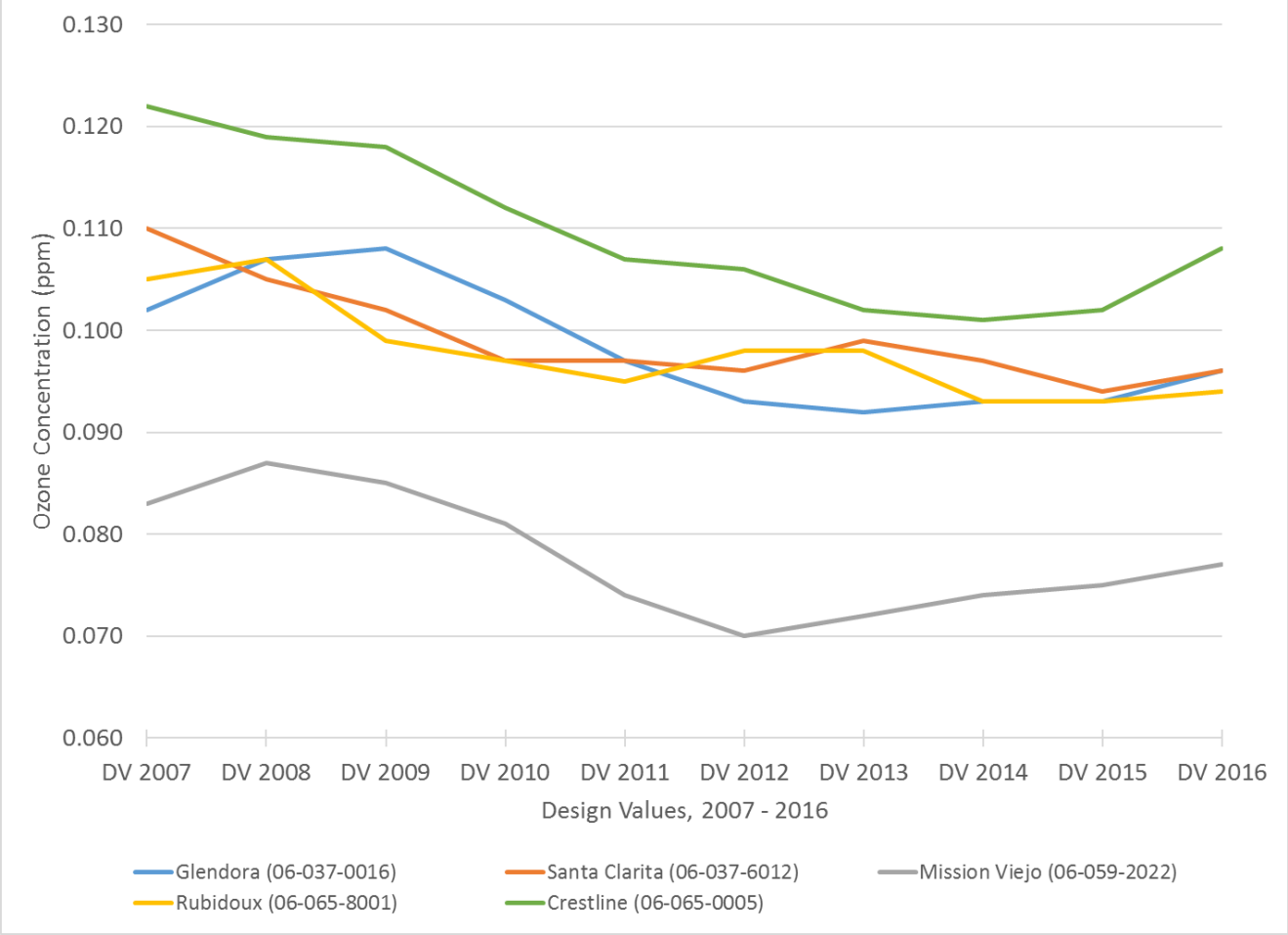
Monitors in Los Angeles, Orange, Riverside, and San Bernardino counties show violations of the 2015 ozone NAAQS, therefore these counties are included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 9.1, shown previously, identifies the Los Angeles-South Coast Air Basin nonattainment area and the violating monitors. Table 9.2 identifies the design values for all monitors in the area of analysis. Figure 9.2 shows the historical trend of design values for the violating monitors with the highest design values in counties within the area of analysis. As indicated on the map, there are 32 violating monitors that are located throughout Los Angeles, Orange, Riverside and San Bernardino counties. The violating monitors within the Los Angeles-South Coast Air Basin nonattainment area are generally located throughout central and eastern Los Angeles County, southern Orange County, western and central Riverside County, and central and southern San Bernardino County. Monitors that are attaining the 2015 ozone NAAQS are located in the western Los Angeles County, western Orange County, eastern Riverside County, and northern San Bernardino County. The highest 2016 design values in Los Angeles County are Glendora (AQS ID: 06-037-0016), which is located in eastern Los Angeles County, and Santa Clarita (AQS ID: 06-037-6012), which is located in the northwestern part of the county. The highest 2016 design value in Orange County is Mission Viejo (AQS ID: 06-059-2022), which is the southernmost monitor in Orange County. The highest design value in Riverside County is Morongo Air Monitoring Station (06-065-1016), but this monitor is located in the nonattainment area for the Morongo Band of Mission Indians. The next highest design value in Riverside County is Rubidoux (AQS ID: 06-065-8001), which is located in the northwestern portion of Riverside County. The highest 2016 design value in San Bernardino County is Crestline (AQS ID: 06-071-0005), which is located in southwestern San Bernardino County. The violating monitors located in the northern portion of Los Angeles and the northeastern portions of San Bernardino counties are included in the adjacent West Mojave Desert nonattainment area.

As shown in Figure 9.2, the trends for previous design values at the highest design value site[6] in each county within the area of analysis show that all of the highest monitors in each county have been consistently above the 2015 ozone NAAQS for the past 10 years. The data show that ozone concentrations have been generally trending down for the last 10 years, but also show moderate increases in ozone concentrations at some of the sites from 2012-2016.

[6] Figure 9.2 does not include trends for the Morongo monitor (AQS ID: 06-065-1016) operated by the Morongo Band of Mission Indians, which is the highest design value site for Riverside County. This monitor is located within the Morongo Band of Mission Indians nonattainment area and is discussed in the technical analysis for that area.

Figure 9.2 Three-Year Design Values for Violating Monitors (2007-2016).



Los Angeles, Orange, Riverside, and San Bernardino counties have one or more monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitors in the Los Angeles-South Coast Air Basin nonattainment area are located within the portions of Los Angeles, Orange, Riverside, and San Bernardino counties that were included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS and within the area the State has recommended as nonattainment for the 2015 ozone NAAQS,

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and small point sources and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and

fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 9.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Los Angeles-South Coast Air Basin nonattainment area.

Table 9.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Los Angeles, CA	Yes	98,056	116,498
San Bernardino, CA	Yes (partial)	58,926	28,104
Riverside, CA	Yes (partial)	29,792	21,313
Orange, CA	Yes	23,399	42,941
	Area wide:	210,173	208,857

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown with square orange icons in Figure 9.3 below. The nonattainment boundary is also shown.

Figure 9.3 Large Point Sources in the Area of Analysis.

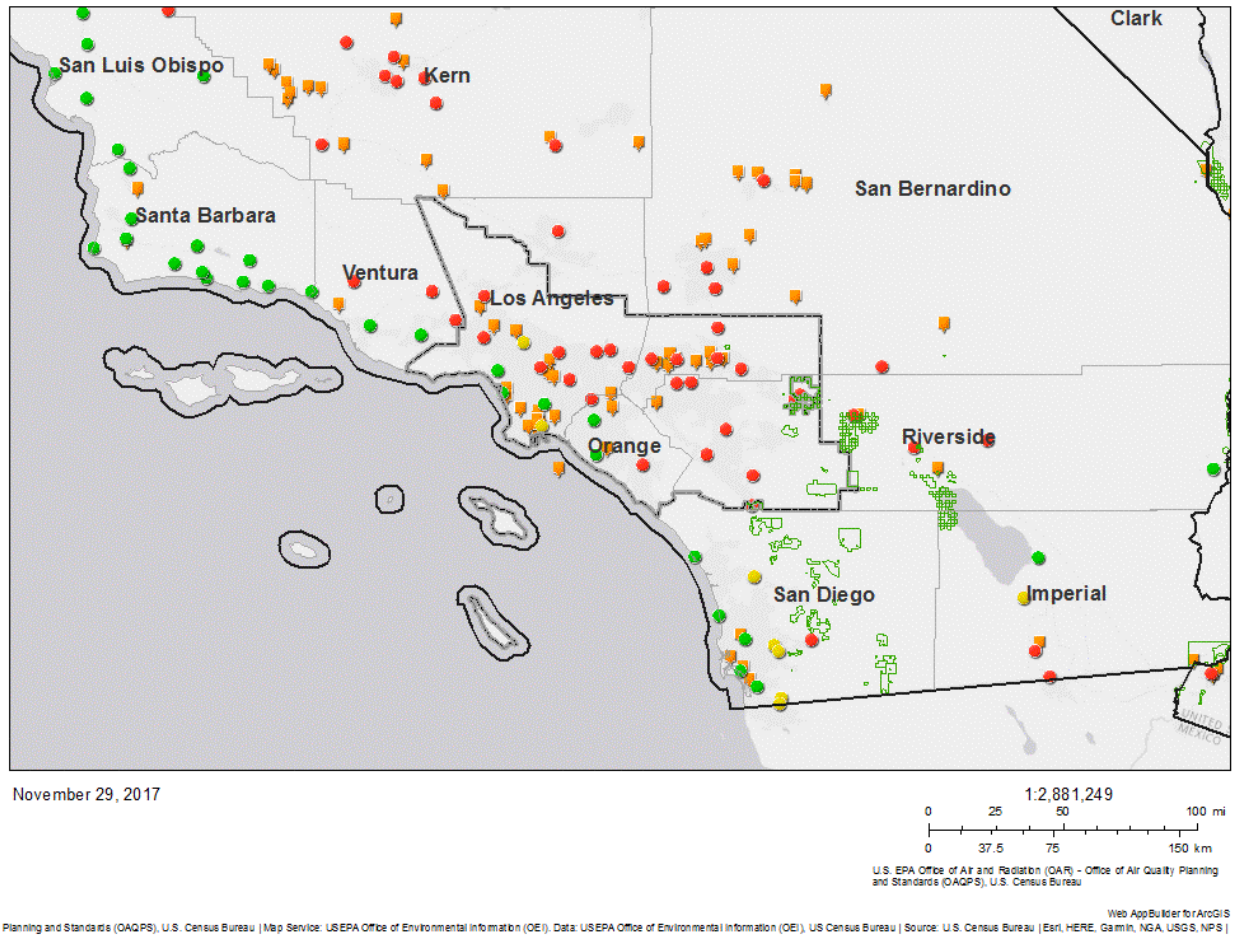


Figure 9.3 shows large point sources in the area of analysis for Los Angeles-South Coast Air Basin, CA as orange squares. The EPA's nonattainment boundary for Los Angeles-South Coast Air Basin, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission showed that Los Angeles County has the highest emissions levels of NO_x and VOCs within the area of analysis. Most of the large point sources of ozone precursors are located throughout Los Angeles County and in southwestern San Bernardino County. Additional sources are located in Orange County and the western portion of Riverside County. There are a number of sources in the northeastern portion of San Bernardino County and the eastern portion of Riverside County. These portions of San Bernardino and Riverside counties are located, respectively, within the adjacent West Mojave Desert and Riverside County (Coachella Valley) nonattainment areas.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 9.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 9.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Los Angeles, CA	Yes	9,818,605	10,170,292	2,506	351,687	4%
Orange, CA	Yes	3,010,232	3,169,776	4,009	159,544	5%
Riverside, CA	Yes (partial)	2,189,641	2,361,026	328	171,385	8%
San Bernardino, CA	Yes (partial)	2,035,210	2,128,133	106	92,923	5%
	Area wide:	17,053,688	17,829,227	555	775,539	5%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. www.census.gov/data.html.

Figure 9.4 shows the county-level population information for the area of analysis. All four counties have populations over 2 million. Los Angeles County has the highest population levels within the area of analysis while Riverside, San Bernardino, and Orange have less than 1 third of the population of Los Angeles County. Orange County is the most densely populated with a density of just over 4000. Los Angeles also has a relatively high density of about 2500. Riverside and San Bernardino are significantly less densely populated with densities, respectively, of 328 and 106. The population change for the four counties ranged from 4% (Los Angeles County) to 8% (Riverside County).

Figure 9.4 County-Level Population.

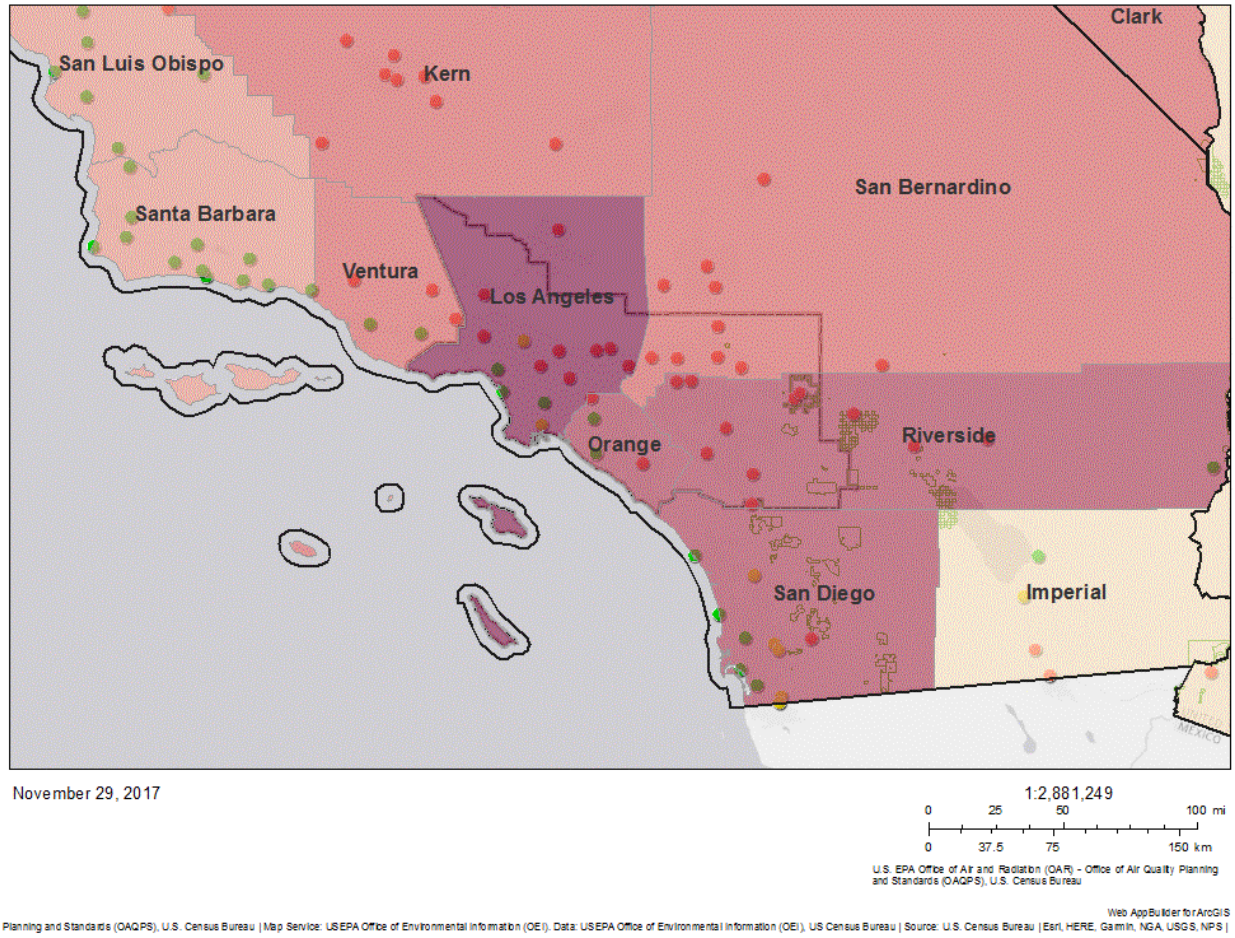


Figure 9.4 shows county-level population in the area of analysis for Los Angeles-South Coast Air Basin, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Los Angeles-South Coast Air Basin, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 9.5 shows the traffic and commuting pattern data, including total VMT for each county in the area of analysis, number of residents who work in each county, number of residents that work in counties with violating monitor(s), and the percent of residents working in counties with violating monitor(s). The data in Table 9.5 are 2014 data.

Table 9.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis
Los Angeles, CA	**Yes**	**83,011**	**4,119,590**	**3,818,154**	**92.7%**
Orange, CA	**Yes**	**27,683**	**1,377,486**	**1,271,149**	**92.3%**
San Bernardino, CA	**Yes (partial)**	**21,573**	**764,867**	**698,549**	**91.3%**
Riverside, CA	**Yes (partial)**	**20,049**	**824,037**	**714,798**	**86.7%**
	Total:	152,315	7,085,980	6,502,650	91.8%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 9.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 9.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

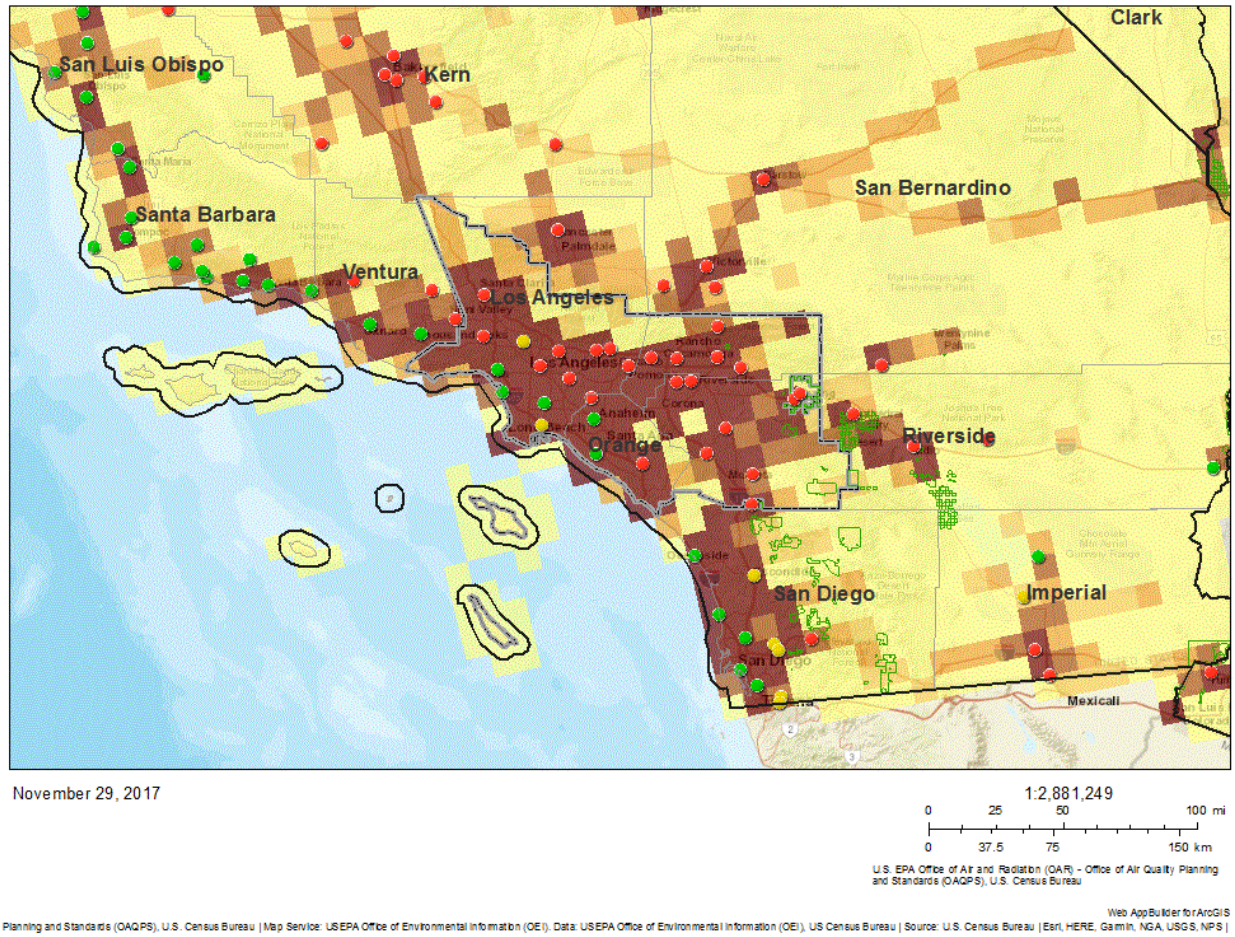


Figure 9.5 shows gridded VMT in the area of analysis for Los Angeles-South Coast Air Basin, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Los Angeles-South Coast Air Basin, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on the 2014 NEI and On the Map data from the Census Bureau and shows that Los Angeles County has the highest total VMT levels within the area of analysis and largest number of commuters to counties with violating monitors. Los Angeles, Orange, Riverside, and San Bernardino counties show over 91% of the residents who work commuting to or within counties with violating monitors in the area of analysis. The southern portion of Los Angeles county contains higher VMT compared to the rest of the county. Similarly, the western and southern portions of San Bernardino county contain higher VMT than the rest of the county. Areas of high VMT in the cities of Lancaster, Victorville, Palm Springs, Thousand Oaks, and Oxnard are located within the adjacent West Mojave Desert, Riverside County (Coachella Valley), and Ventura nonattainment areas.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In

order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figures 9.6a, b, c, and d show the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for one violating monitor in each of the four counties in the nonattainment area; Santa Clarita (Los Angeles), Mission Viejo (Orange), Crestline (San Bernardino), and Temecula (Riverside) to capture the spatial extent of ozone transport.

Figure 9.6a. HYSPLIT Back Trajectories for Santa Clarita (AQS ID 06-037-6012).

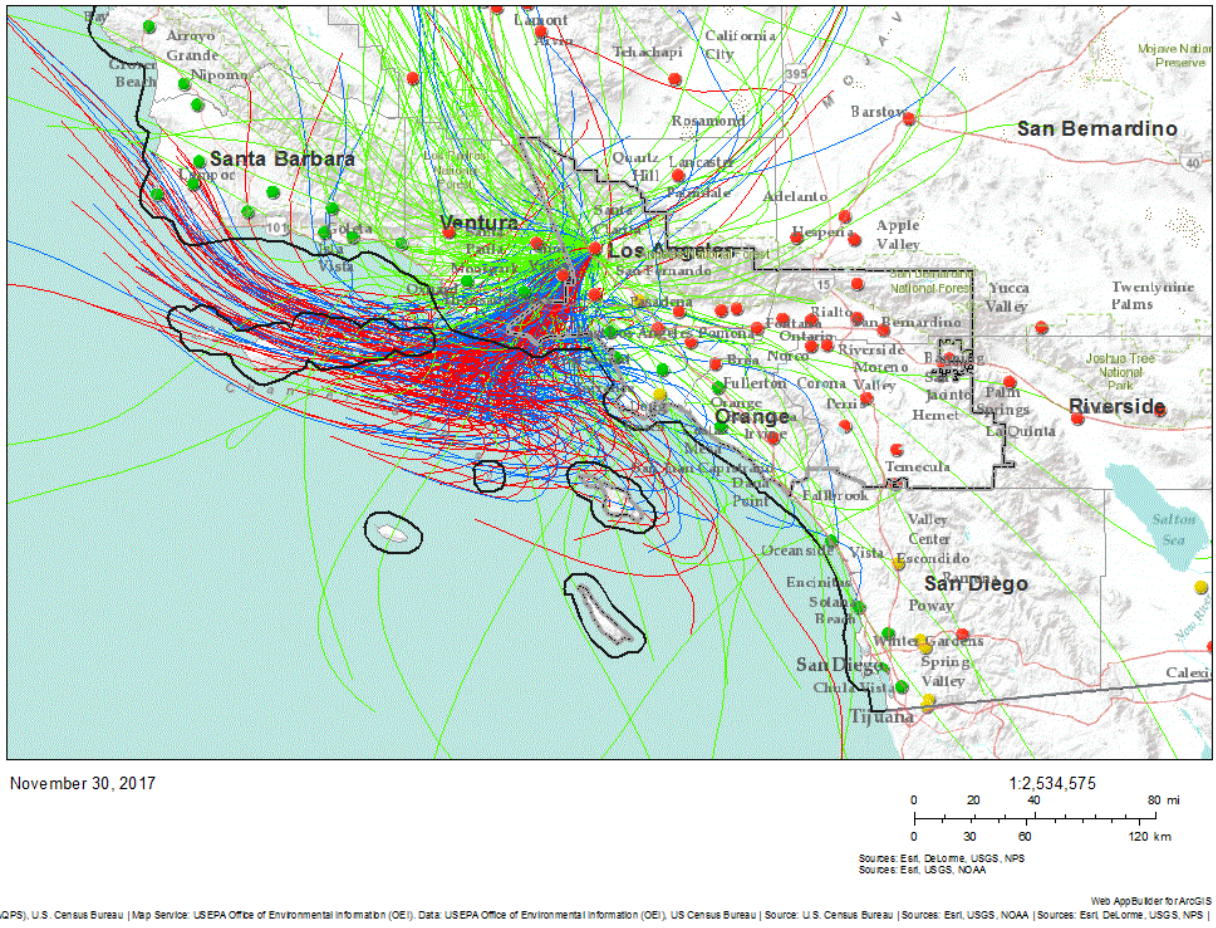


Figure 9.6a shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Los Angeles-South Coast Air Basin, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 9.6b. HYSPLIT Back Trajectories for Mission Viejo (AQS ID 06-59-2022).

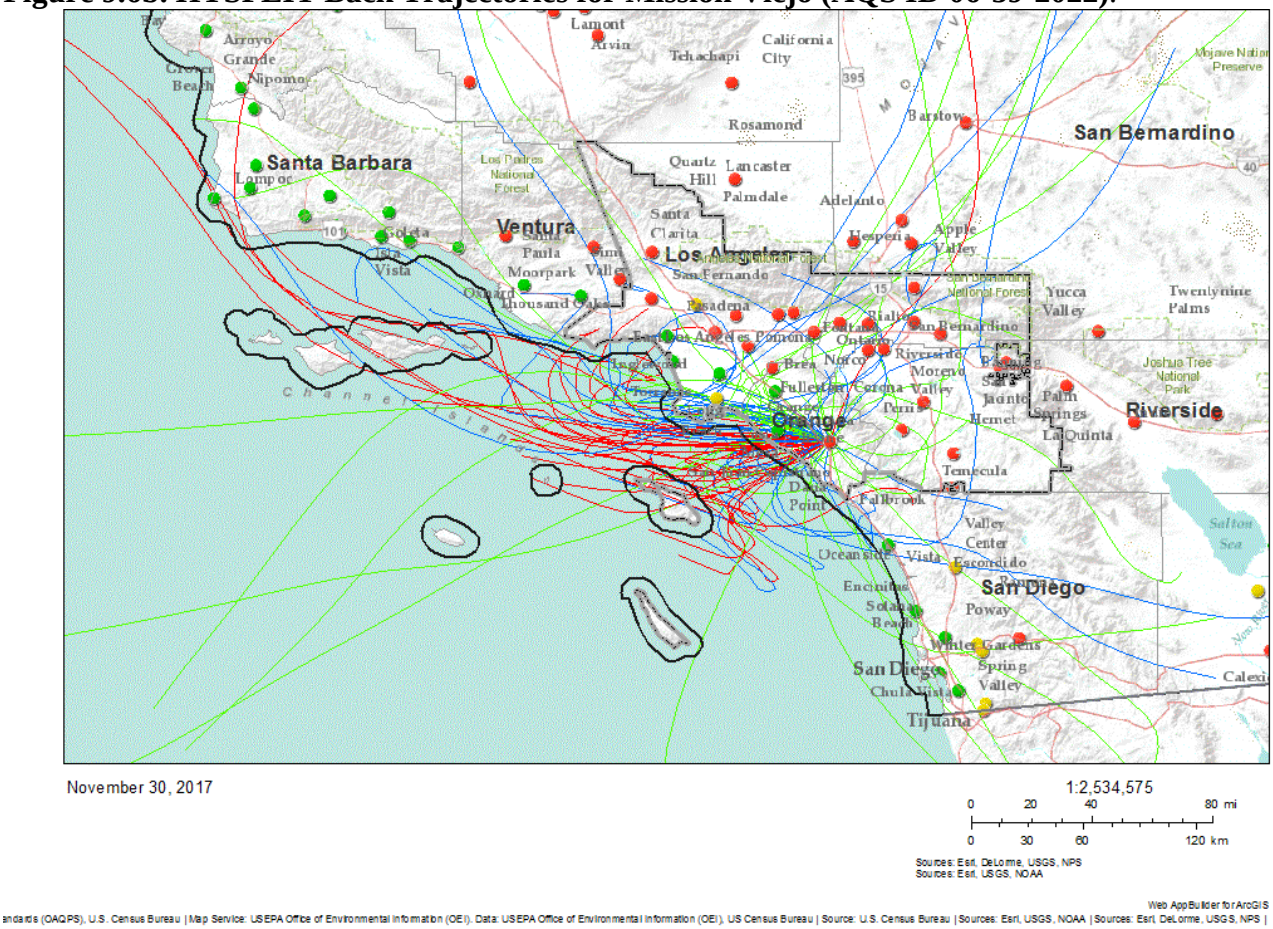


Figure 9.6b shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Los Angeles-South Coast Air Basin, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 9.6c. HYSPLIT Back Trajectories for Crestline (AQS ID 06-71-0005).

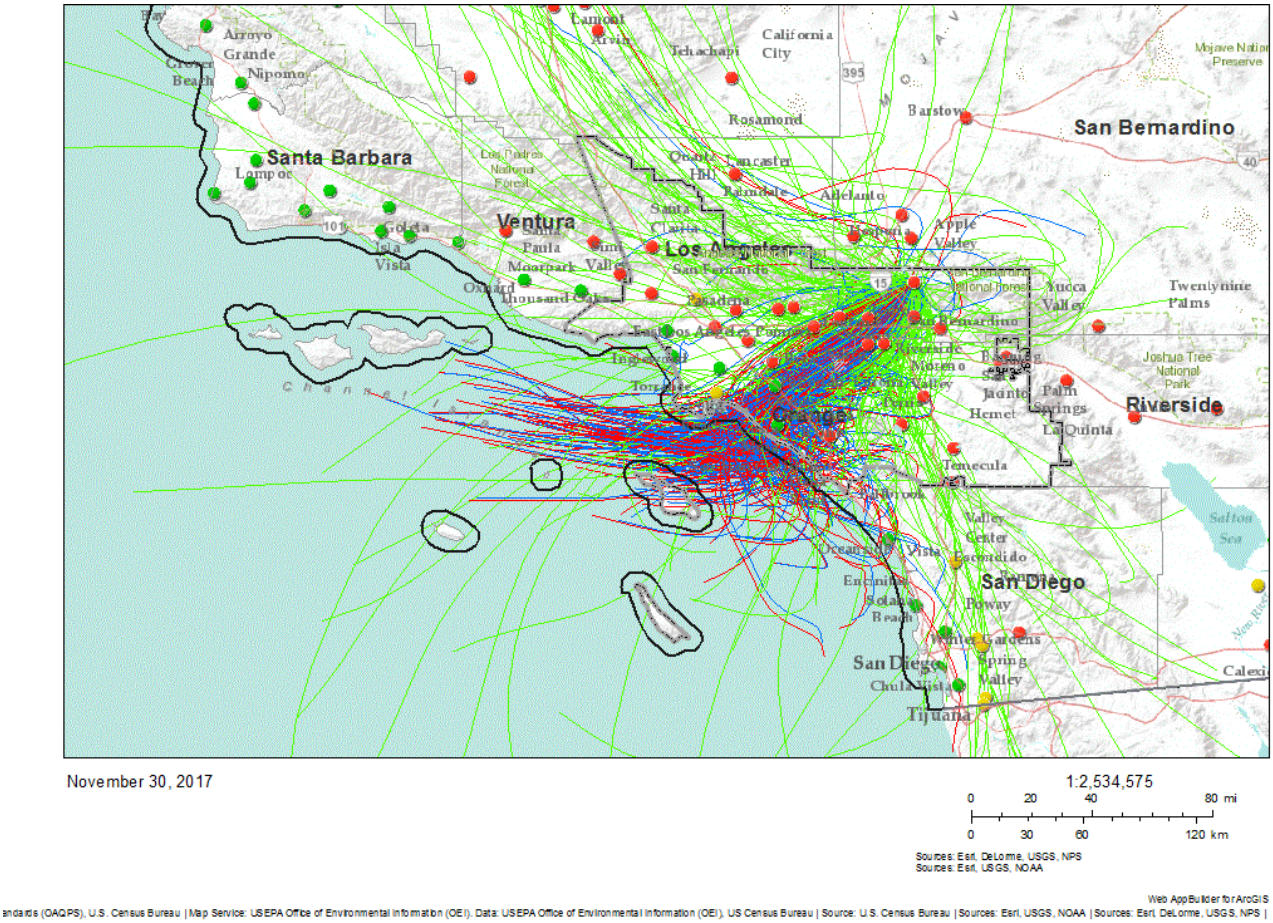


Figure 9.6c shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Los Angeles-South Coast Air Basin, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 9.6d. HYSPLIT Back Trajectories for Temecula (AQS ID 06-65-0016).

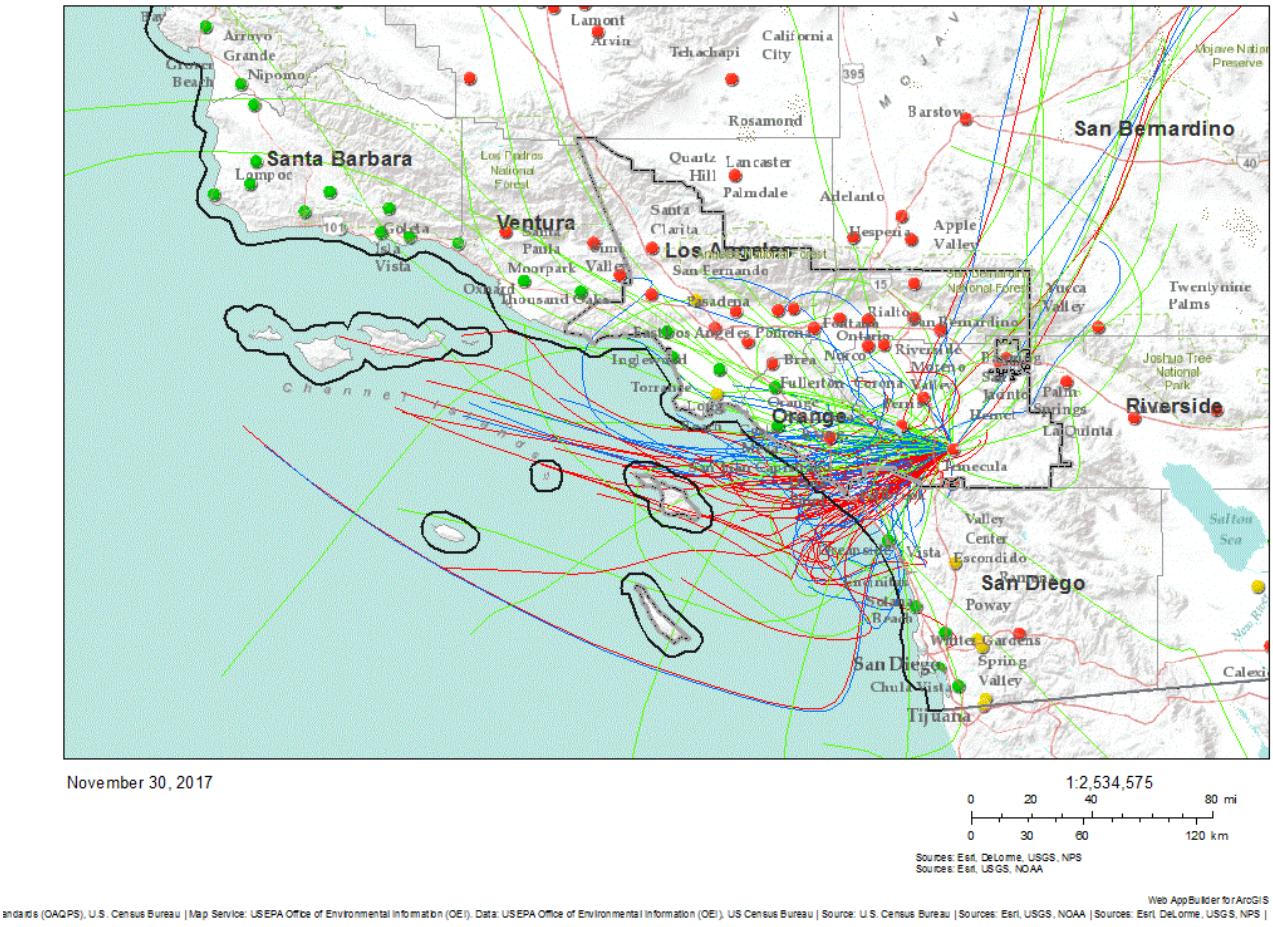


Figure 9.6d shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Los Angeles-San Coast Air Basin, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally pass through all areas included in the area of analysis but are predominately from the southwest. As previously discussed, the EPA is designating the adjacent West Mojave Desert, Riverside County (Coachella Valley) and Ventura County areas as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for these areas.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. In the western U.S., topography can have an impact on pollutant formation and transport in California, and thus can play an important role in assessing what areas are contributing to monitored violations of the NAAQS.

Figure 9.7 shows the topography for the area of analysis. California has historically been divided into 15 distinct air basins. The South Coast Air Basin is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto mountains to the north and east. It includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino counties.

Figure 9.7 Topographic Illustration of the Physical Features.

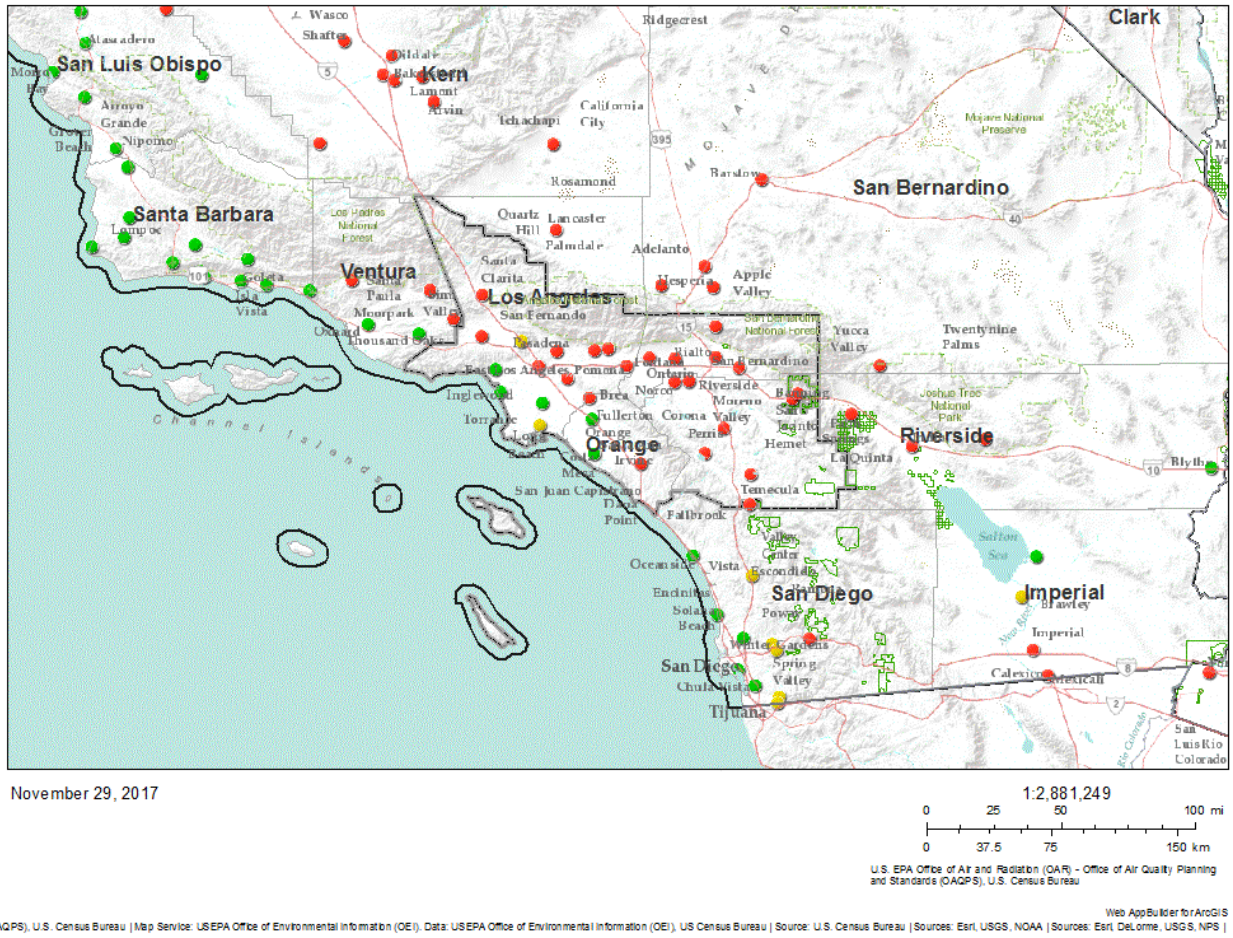


Figure 9.7 shows the topography in the area of analysis for Los Angeles-South Coast Air Basin, CA. The EPA's nonattainment boundary for Los Angeles-South Coast Air Basin, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Los Angeles-South Coast Air Basin

nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 9.8 shows the relevant jurisdictional boundaries for the Los Angeles-South Coast Air Basin nonattainment area, including county, CSA, and CBSA boundaries, and areas of Indian country.

Figure 9.8 Jurisdictional Boundaries.

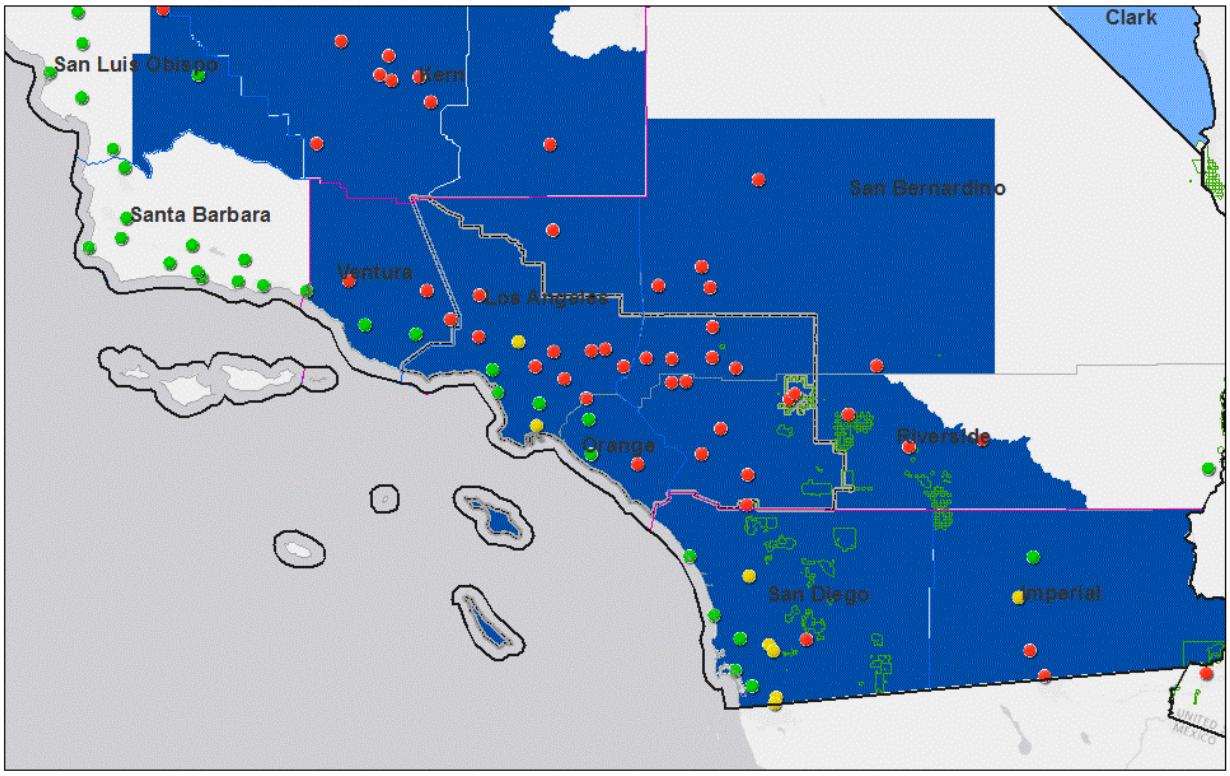


Figure 9.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for Los Angeles-South Coast Air Basin, CA. The EPA's nonattainment boundary for Los Angeles-South Coast Air Basin, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Los Angeles-South Coast Air Basin area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

The Los Angeles-South Coast Air Basin area has boundaries consistent with the South Coast Air Basin, which includes a large western portion of the larger Los Angeles-Long Beach CSA. The CSA includes the entirety of Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties. The South Coast Air Basin includes all of Orange County and portions of Los Angeles, Riverside, and San Bernardino counties. As discussed earlier, the EPA is designating the adjacent portions of these counties and Ventura County as separate nonattainment areas for the 2015 ozone NAAQS (Los Angeles-San Bernardino Counties (West Mojave Desert), Riverside County (Coachella Valley), and Ventura County).

The South Coast Air Quality Management District has jurisdiction over air quality planning in the Los Angeles-South Coast Air Basin nonattainment area. The district also has jurisdiction over the adjacent Coachella Valley (the Riverside County portion of the Salton Sea Air Basin). The South Coast Association of Governments has transportation planning jurisdiction over the Los Angeles-Long Beach CSA and thereby has jurisdiction over the Los Angeles-South Coast Air Basin nonattainment area.

The Los Angeles-South Coast Air Basin area also includes portions of Indian country of the following tribe(s): Cahuilla Band, Pechanga Band, Ramona Band, San Manuel Band, and Soboba Band. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

The Pechanga Band has areas of Indian country that the EPA is designating with the Los Angeles-South Coast Air Basin area. The Pechanga Band also has areas of Indian country located within the Los Angeles-South Coast Air Basin and San Diego County areas that the EPA is designating as a separate tribal nonattainment area consistent with previous designations. The EPA's technical analysis and designation is included in the technical support document for the Pechanga Band.

The Morongo Band has areas of Indian country located within the boundaries of the Los Angeles-South Coast Air Basin and Riverside County (Coachella Valley) areas. The EPA is designating these areas of Indian country as a separate tribal nonattainment area consistent with previous designations. The EPA's technical analysis and designation is included in the technical support document for the Morongo Band.

Conclusion for Los Angeles-South Coast Air Basin, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to include the following counties as the Los Angeles-South Coast Air Basin nonattainment area: Los Angeles County (partial), Orange County, Riverside County (partial), and San Bernardino County (partial). These same counties are included in the designated Los Angeles-South Coast Air Basin nonattainment area for the 1997 and 2008 ozone NAAQS. The air quality monitors in Los Angeles, Orange, Riverside, and San Bernardino counties indicate violations of the 2015 ozone NAAQS based on the 2016 design values, therefore these counties or portions of these counties are included in nonattainment areas. Emissions and emissions-related data show all four counties have

relatively high levels of precursor emissions. Meteorology suggests that the violating monitors in the South Coast Air Basin are influenced by winds from the southwest, generally transporting precursor emissions within the portions of the four counties the States has recommended for inclusion in the nonattainment area to the locations of the violating monitors. Geography and topography show that the area is bounded by the Pacific Ocean to the west and mountain ranges to the north and east, and these counties and partial counties are contained in the same air basin. Therefore, meteorology, geography and topography support the State's recommendation that these four counties and partial counties be designated as the same nonattainment area. Finally, jurisdiction supports this boundary, as these areas are part of the same CSA, air basin, and air management district.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation and is designating Los Angeles-South Coast Air Basin nonattainment for the 2015 ozone NAAQS.

10.0 Technical Analysis for Mariposa County, CA

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. The EPA evaluated this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information.

Table 10.1 identifies the area of analysis for the Mariposa County, CA final nonattainment area. The area of analysis includes all of Mariposa County. There is no CBSA or CSA associated with this area. The nonattainment area differs from the existing 1997 nonattainment area that included this county and is identical to the existing 2008 Mariposa County, CA nonattainment area.

Table 10.1 Area of Analysis.

Final Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Mariposa County, CA	Mariposa County	None	None

Mariposa County is adjacent to several nonattainment areas for the 2015 ozone NAAQS. To the north and east of Mariposa County is the Tuolumne County nonattainment area (Sonora CBSA); to the west is Merced County, which comprises the single-county Merced CBSA, part of the Modesto-Merced CSA, and also part of the San Joaquin Valley nonattainment area; and to the south is Madera County, which comprises the single-county Madera CBSA, part of the Fresno-Madera CSA, and also part of the San Joaquin Valley nonattainment area. Information specific to these adjacent areas is contained in the associated Technical Analysis sections for those nonattainment areas (Tuolumne County and San Joaquin Valley).

The EPA designated Mariposa County as its own nonattainment area for the 2008 ozone NAAQS. For the 1997 ozone NAAQS, Mariposa County was designated with Tuolumne County as the two-county Southern Mountain Counties nonattainment area.

In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 10.1 is a map of the EPA's nonattainment boundary for Mariposa County. The map shows the location of the ambient air quality monitors, county boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries. The EPA is not modifying the state's recommendation to designate Mariposa county as nonattainment with the same boundary as that of the county. There are no areas of Indian country located within the boundaries of Mariposa County.

Figure 10.1 The EPA's Nonattainment Boundaries for Mariposa County, CA

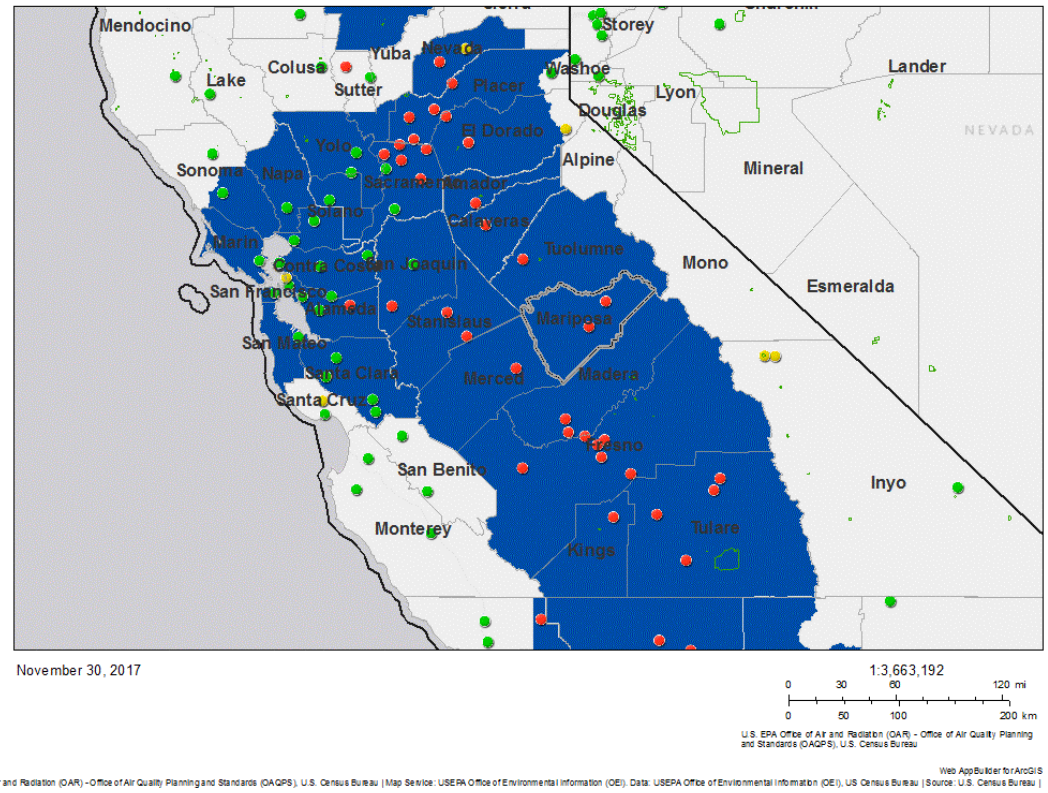


Figure 10.1 shows the EPA's nonattainment boundary for Mariposa County, CA as a gray line with dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Mariposa County has monitors in violation of the 2015 ozone NAAQS; therefore, this county is included in the nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Mariposa County area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 10.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at:
https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 10.2 Air Quality Data (all values in ppm).

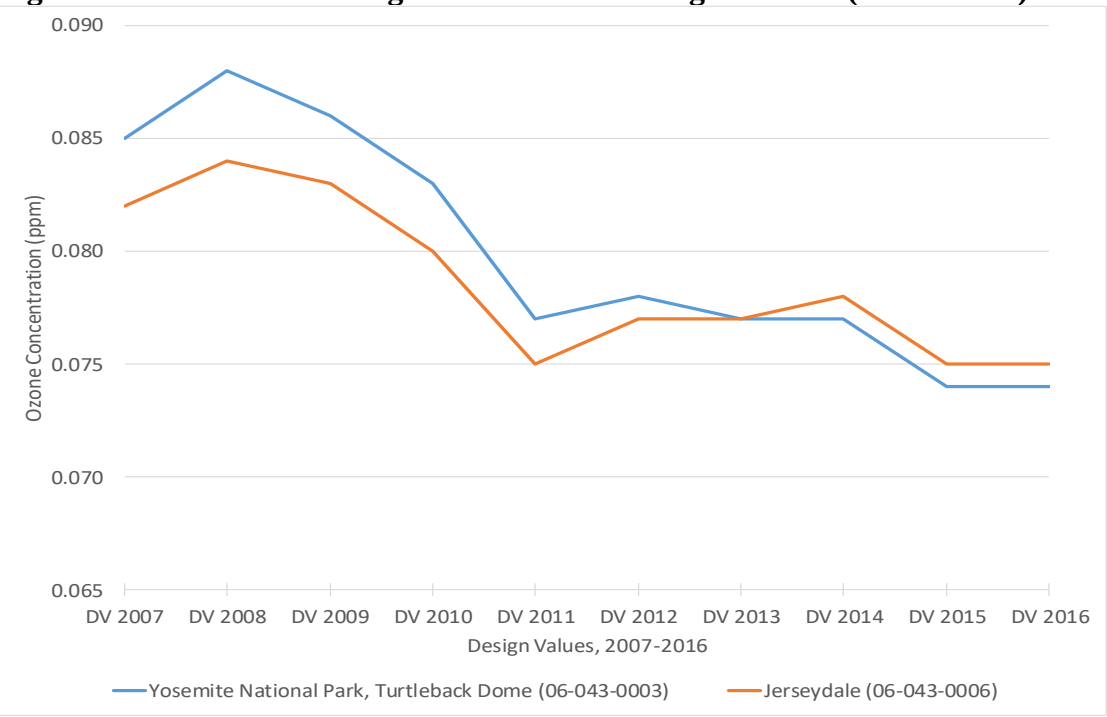
County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Mariposa, CA	Yes	06-043-0003	0.074	0.077	0.073	0.074
		06-043-0006	**0.075**	0.077	0.071	0.077

The highest design value in each county is indicated in bold type.

Mariposa County shows a violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 10.1, shown previously, identifies the Mariposa County nonattainment area and the violating monitors. Table 2 identifies the design values for all monitors in the area of analysis. Figure 10.2 shows the historical trend of design values for the violating monitors. As indicated on the map, there are two violating monitors that are located in the central and northeastern portions of Mariposa County. The Yosemite National Park, Turtleback Dome ozone monitor (AQS ID 06-043-0003), located in the northeastern portion of Mariposa County, has a valid 2016 DV of 0.074 ppm. The Jerseydale ozone monitor (AQS ID 06-043-0006), located in the central portion of Mariposa County, has a valid 2016 DV of 0.075 ppm. As shown in Figure 10.2, design values at monitoring sites located within the area of analysis showed that all monitors in the area have been consistently above the 2015 ozone NAAQS for the past 10 years. The data for both monitors also show that ozone concentrations have been generally decreasing for the last 10 years.

Figure 10.2 Three-Year Design Values for Violating Monitors (2007 – 2016).



Mariposa County has two monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and small point sources and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 10.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Mariposa County nonattainment area.

Table 10.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Mariposa, CA	Yes	1,286	22,686
	Area wide:	1,286	22,686

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown with orange icons in Figure 10.3 below. There are no large point sources in Mariposa County. The nonattainment boundary is also shown.

Figure 10.3 Large Point Sources in the Area of Analysis.

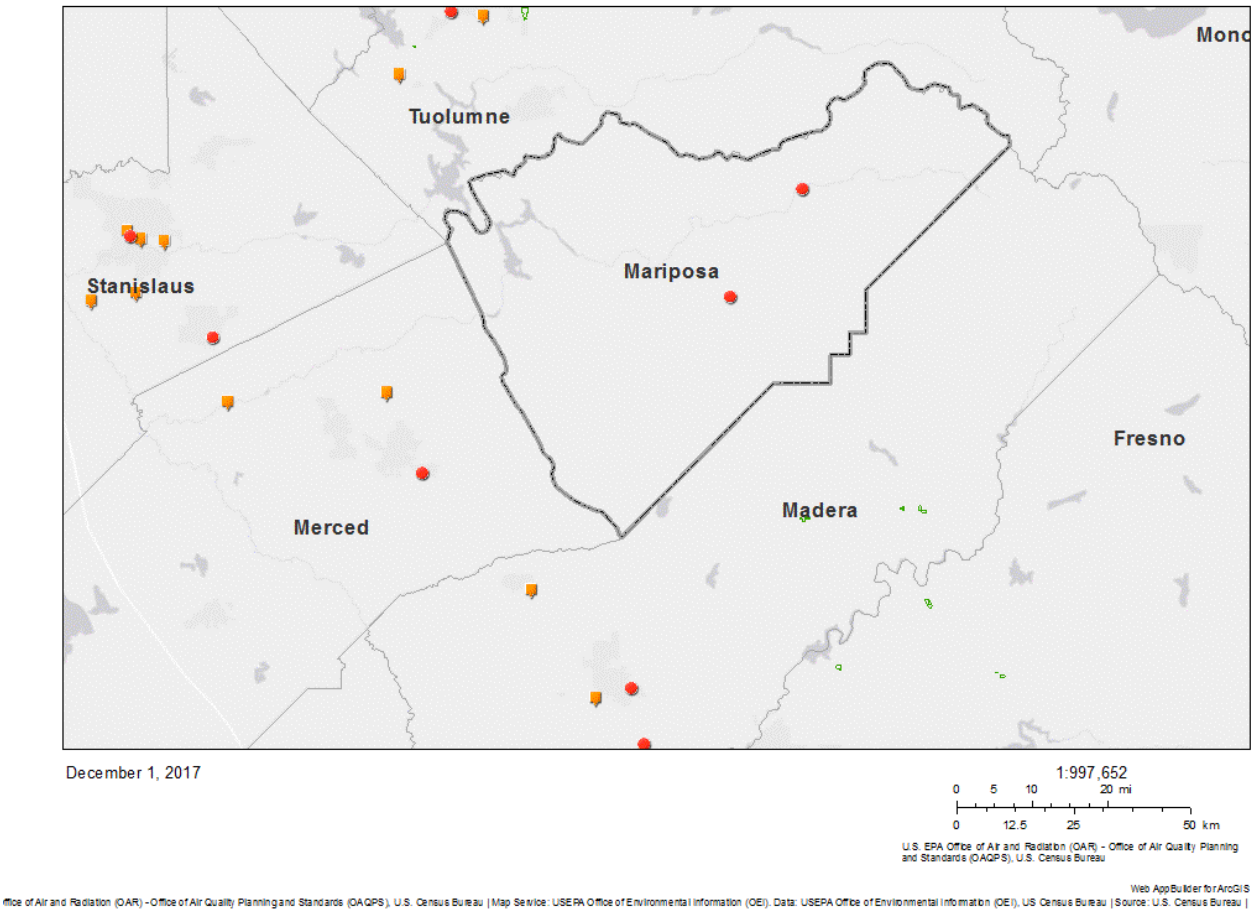


Figure 10.3 shows large point sources in the area of analysis for Mariposa County, CA as orange squares. The EPA's nonattainment boundary for Mariposa County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission showed that Mariposa County has emissions levels of 1,286 tpy of NO_x and 22,686 tpy of VOC within the area of analysis. No large point sources of ozone precursors are located within Mariposa County. Numerous large point sources are located outside of the nonattainment area boundary for Mariposa County, in the neighboring counties in the San Joaquin Valley nonattainment area (Stanislaus, Merced, and Madera counties) and the Tuolumne County nonattainment area.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 10.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 10.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Mariposa, CA	Yes	18,251	17,531	12	-720	-4%
	Area wide:	18,251	17,531	12	-720	-4%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 10.4 shows the 2012 census tract-level population information for Mariposa County. Mariposa County had a 2015 population of approximately 18,000 people, with a 4% population decline during the 2010-2015 period. Mariposa County has no discrete population centers and the population density reflects that the county is generally rural. The northeastern portion, where the violating monitors are located, and the southern portion of Mariposa County are more sparsely populated than other census tracts within the county.

Figure 10.4 Census Tract-Level Population.

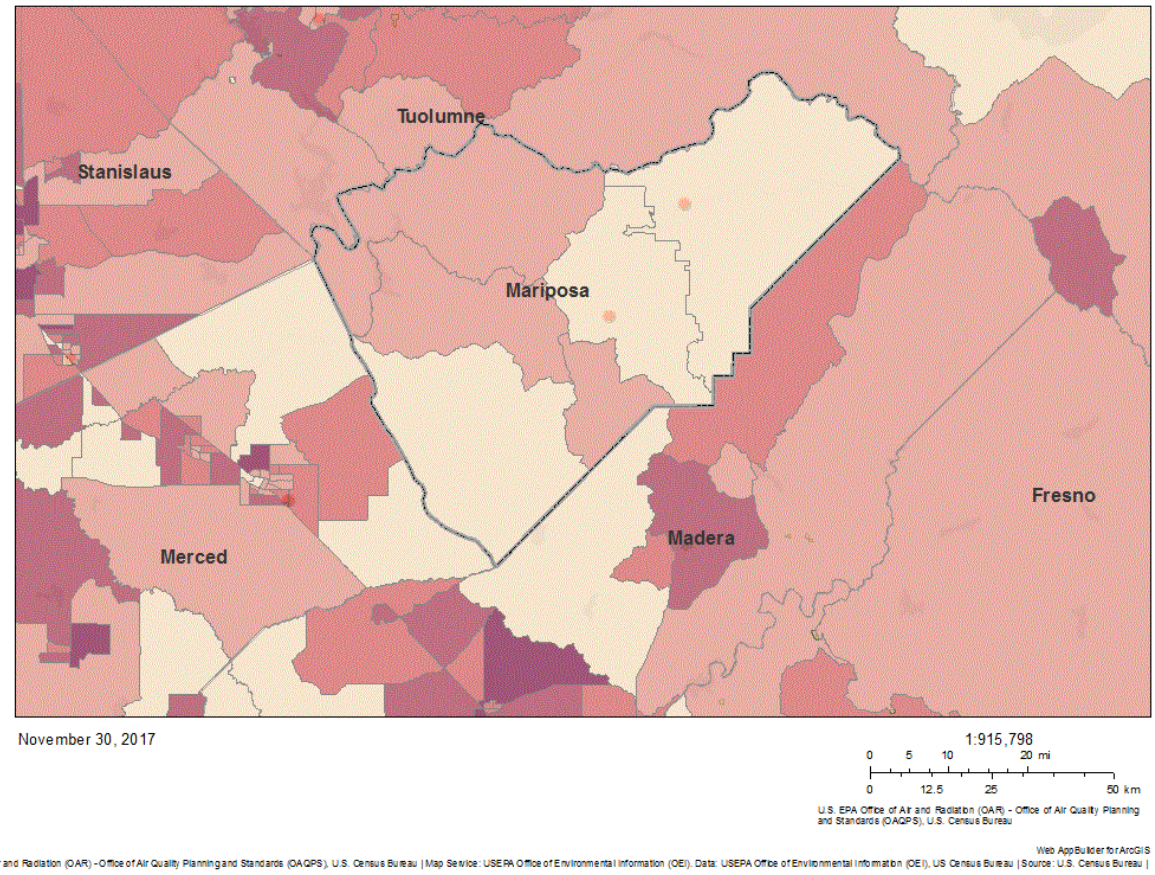


Figure 10.4 shows census tract population in the area of analysis for Mariposa County, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Mariposa County, CA is shown as a gray line with a dashed black center. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 10.5 shows the traffic and commuting pattern data, including total VMT for each county, number of residents who work in each county, number of residents that work in counties with violating monitor(s), and the percent of residents working in counties with violating monitor(s). The data in Table 10.5 are 2014 data.

Table 10.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment ?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis
Mariposa, CA	**Yes**	**142**	**10,428**	**2,855**	**27.4%**
	Total:	142	10,428	2,855	27.4%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 10.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 10.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

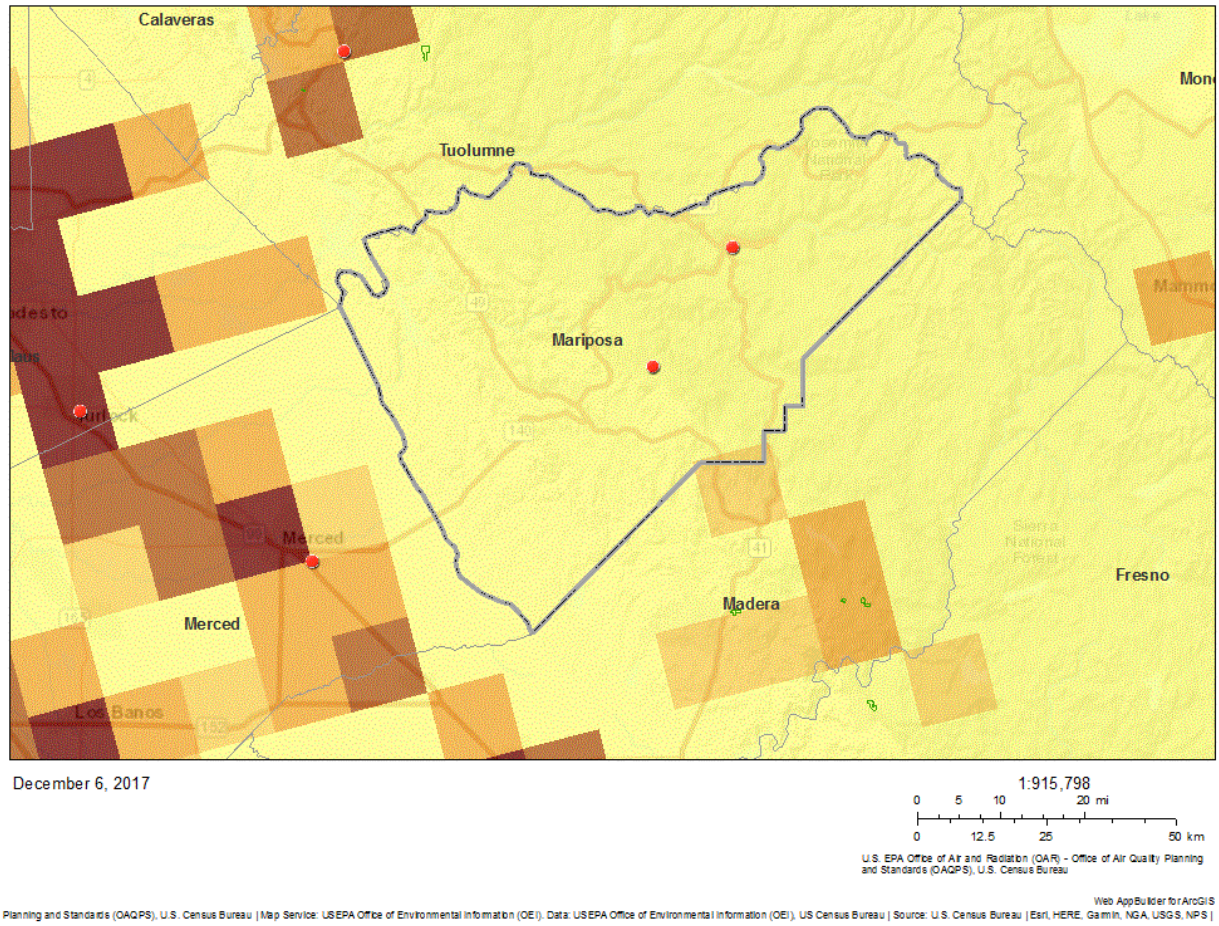


Figure 10.5 shows gridded VMT in the area of analysis for Mariposa County, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Mariposa County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on the 2014 NEI and On the Map data from the Census Bureau and shows that Mariposa County has the lowest category of VMT levels within the area of analysis.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figures 10.6a - b show the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating monitors.

Figure 10.6a HYSPLIT Back Trajectories for Yosemite NP Turtleback Dome (06-043-0003).

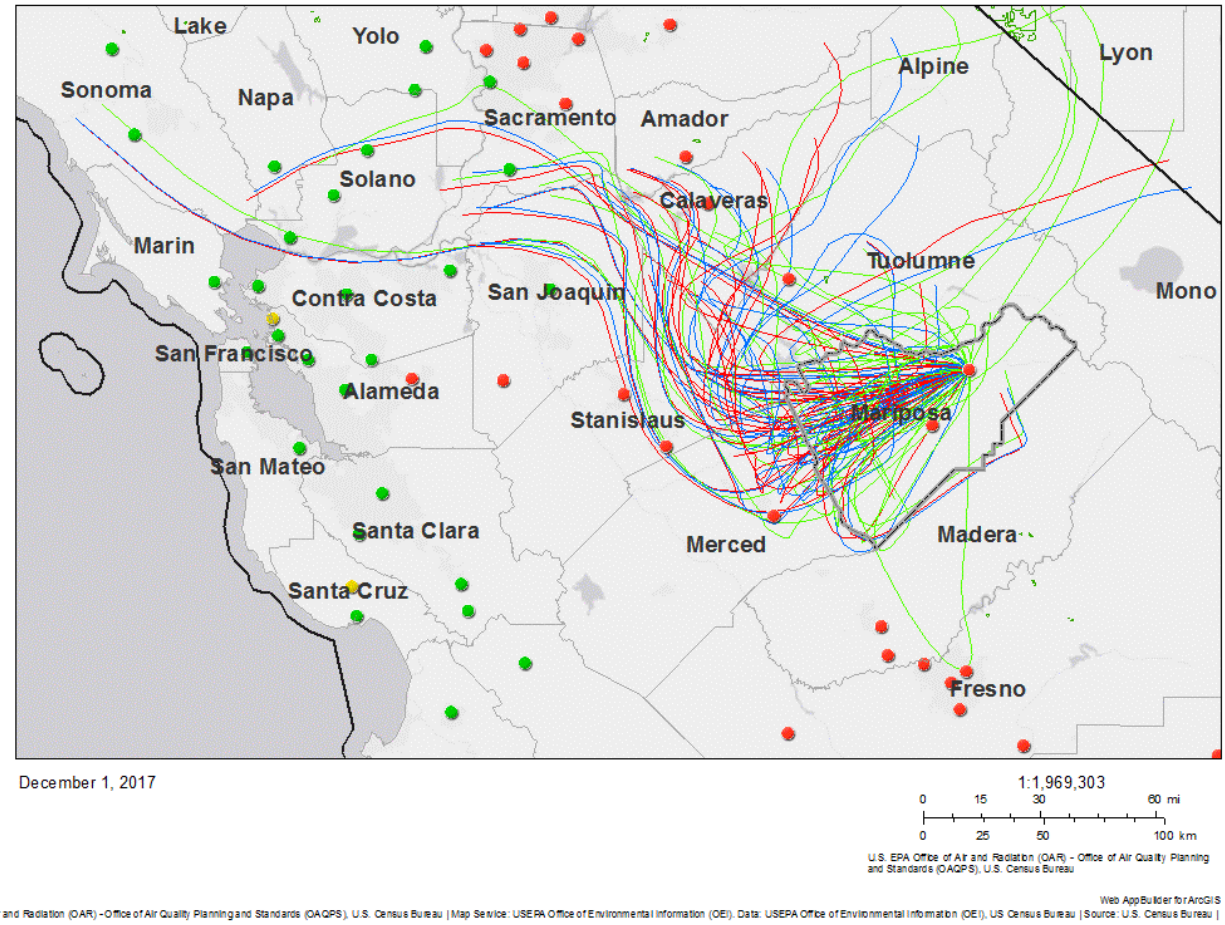


Figure 10.6a shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Mariposa County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 10.6b HYSPLIT Back Trajectories for Jerseydale (06-043-0006).

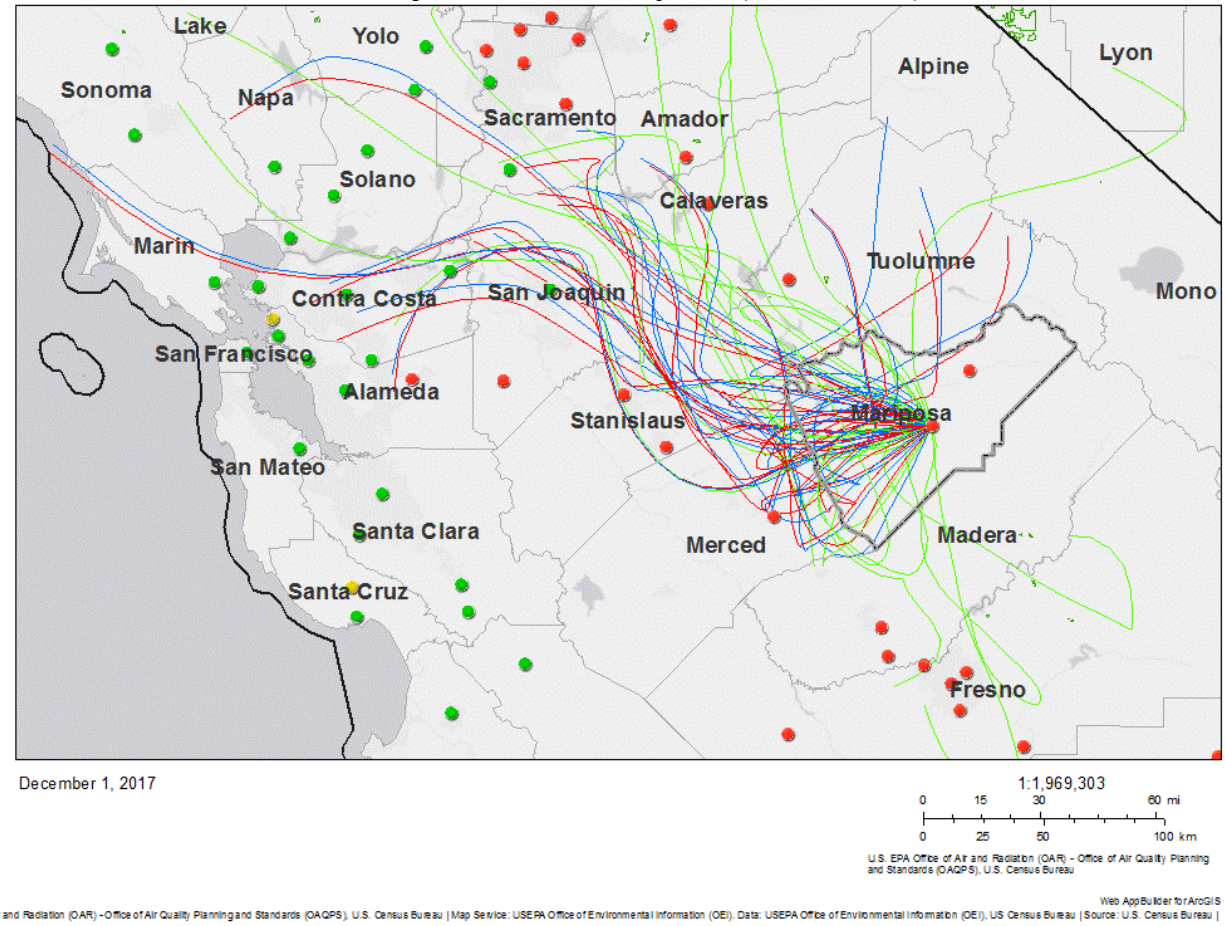


Figure 10.6b shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Mariposa County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 flow from the northwest, travel south-southeast, then turn east-northeast through Mariposa County, suggesting emissions transport from within Mariposa County and the northern San Joaquin Valley, consistent with local topography.

Summers in Mariposa County are normally warm and dry. Winds are generally daytime upslope and nighttime downslope flows, caused by the differential heating or cooling of air near mountain ground surfaces relative to air at the same height over land at lower elevations.

Neighboring San Joaquin Valley can have temperature inversions from 2,000 to 2,500 feet (600 to 750 meters) above the valley floor to as high as 5,000 feet (1,500 meters). Ozone produced in the San Joaquin Valley and trapped under this inversion can reach fairly high into the mountain counties, or be advected there by daytime upslope flows. Previous assessments of transport by the California Air Resources Board have found a strong potential for ozone transport from the Sacramento and San Joaquin valleys up into the mountain counties.[6] Nighttime drainage flows reverse this transport pattern, so some of this pollution, in combination with pollution generated in the mountain counties themselves, could be transported back into the valleys, with the potential for some carryover into subsequent days.

North-south flow between Mariposa and Tuolumne counties is possible as there are fewer barriers to this transport pattern due to the weaker topographic relief in the western parts of both counties. There is likely some transport of pollutants between these two counties, as well as transport from the San Joaquin Valley nonattainment area. The EPA is designating Tuolumne County and the San Joaquin Valley as their own nonattainment areas for the 2015 ozone NAAQS.

Factor 4: Geography/topography

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. Topography impacts pollutant formation and transport in California, and thus plays an important role in assessing which areas are contributing to monitored violations of the NAAQS. Figure 10.7 shows a topographic illustration of the physical features around the Mariposa County area.

California has historically been divided into 15 distinct air basins. Mariposa County is the southernmost county of the Mountain Counties Air Basin. This is not a "basin" in the sense of a single watershed or an area that is more or less surrounded by high terrain. Rather it is a group of rural and largely mountainous counties compared to the more polluted, flatter, and more populous areas to the west (the broad Sacramento and San Joaquin valleys of central California). Mariposa County is in the foothills and mountains of the Sierra Nevada mountain range. Elevations increase from about 200 feet (61 meters) above mean sea level in the west to over 12,000 feet (3,650 meters) in the east.

[6] "Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California". California Environmental Protection Agency, Air Resources Board, March 2001. http://www.arb.ca.gov/aqd/transport/assessments/assessments.htm

Air flow in the west-east direction is relatively unimpeded along the area's river valleys, which extend well east into the interior of the county. Eastward transport of pollutants from the more urbanized areas to the west such as the San Joaquin Valley area is thus possible during conditions of upslope flow. Conversely, westward transport of locally-generated pollution is possible during nighttime downslope flow.

Figure 10.7 Topographic Illustration of the Physical Features

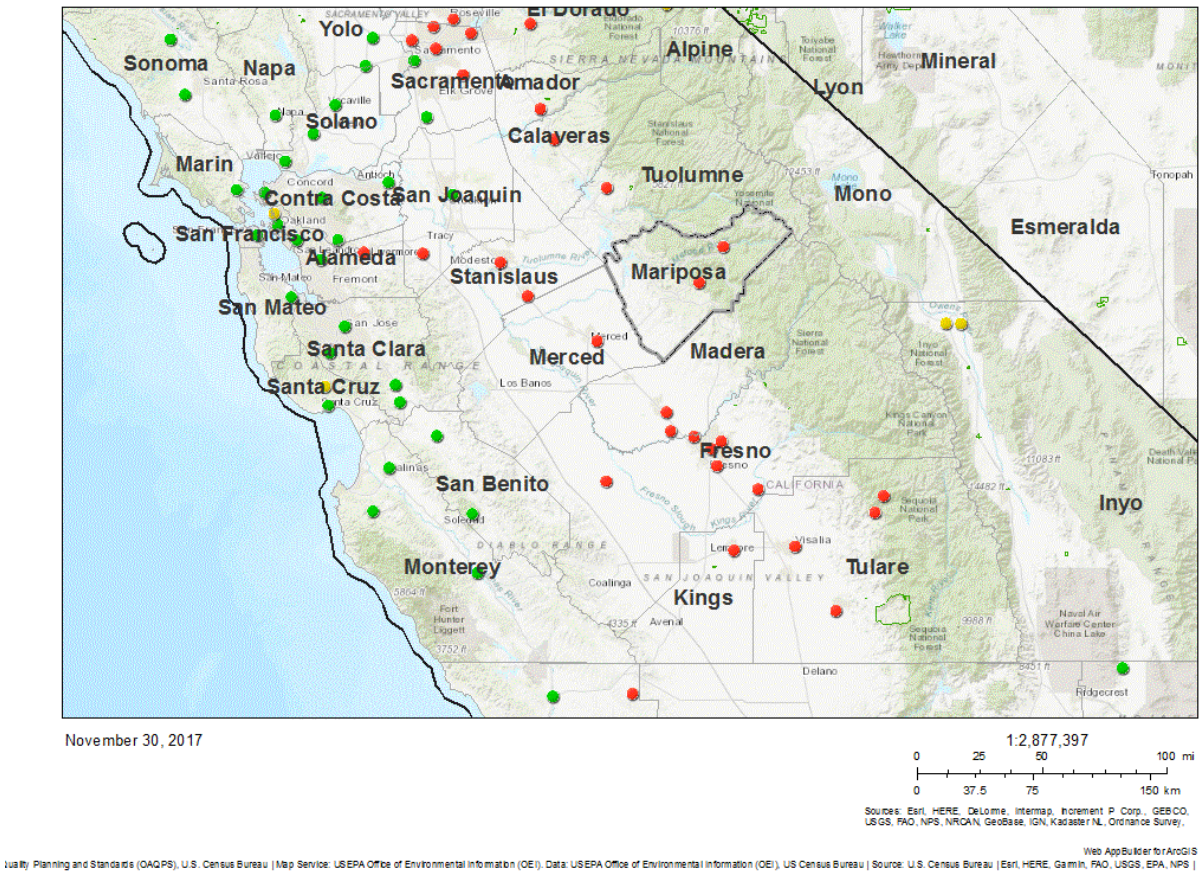


Figure 10.7 shows the topography in the area of analysis for Mariposa County, CA. The EPA's nonattainment boundary for Mariposa County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Mariposa County nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to

describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 10.8 shows the relevant jurisdictional boundaries for Mariposa County. While these jurisdictional boundaries do not include a CSA or CBSA, they follow county, air district, transportation planning agency, and former ozone nonattainment area boundaries.

Figure 10.8 Jurisdictional Boundaries

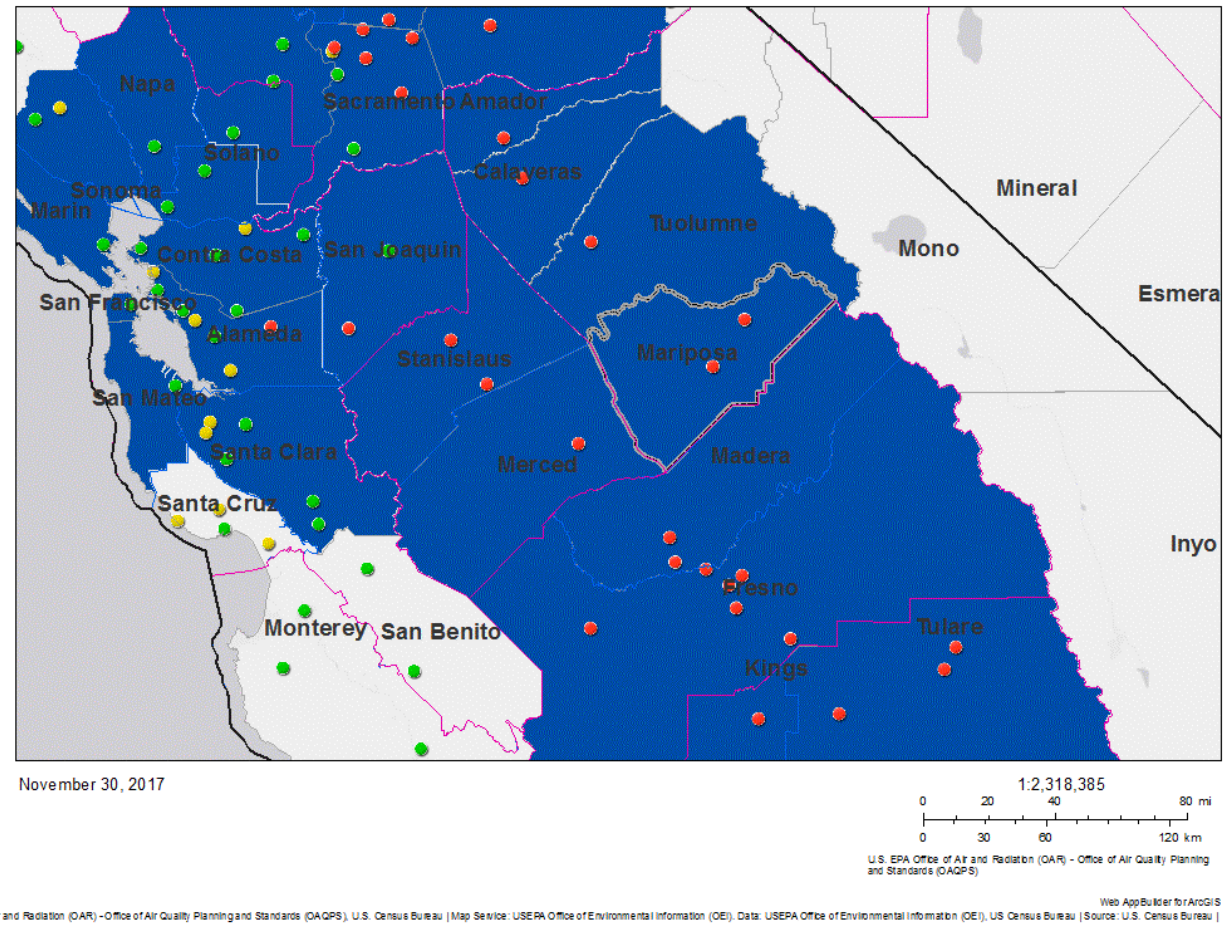


Figure 10.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for Mariposa County, CA. The EPA's nonattainment boundary for Mariposa County, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Mariposa County area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS as it recommended for the 2008 ozone NAAQS.

The Mariposa County nonattainment area for the 2015 ozone NAAQS is the same as the boundary for the 2008 ozone NAAQS. However, the boundaries for the Mariposa County nonattainment area for the 2015 ozone NAAQS differ from the existing Southern Mountain Counties nonattainment area for the 1997 ozone NAAQS in that the mountain counties area was a two-county area (the other being Tuolumne County), while in this analysis the EPA is designating the two counties separately as their own nonattainment areas. The EPA considered the State's recommendation to designate the two

counties separately as well as several other jurisdictional considerations. The two counties were also designated as separate areas (Tuolumne County unclassifiable/attainment, Mariposa County nonattainment) for the 2008 ozone NAAQS. Both counties have their own county governments as well as their own air pollution control districts (Mariposa County Air Pollution Control District (APCD) and Tuolumne County APCD). Each county also has its own transportation planning agency, the Mariposa County Local Transportation Commission and the Tuolumne County Transportation Council. The adjacent San Joaquin Valley nonattainment area is also under different air quality planning and transportation planning jurisdictions than Mariposa County.

Conclusion for Mariposa County, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to designate Mariposa County as the Mariposa County nonattainment area for the 2015 ozone NAAQS. This is the same county that is included in the Mariposa County nonattainment area for the 2008 ozone NAAQS.

The air quality monitors in Mariposa County indicate violations of the 2015 ozone NAAQS based on the 2016 design values, therefore this county is included in the nonattainment area. Emissions and emission-related data show that Mariposa County is sparsely populated, has relatively low emissions of ozone precursors, and no large point sources of ozone precursors, although several point sources are located outside of the nonattainment area boundary for Mariposa County in the neighboring counties in the San Joaquin Valley nonattainment area (Stanislaus, Merced, and Madera counties) and the Tuolumne County nonattainment area. Meteorological data indicate the transport pathways for ozone and ozone precursors during exceedance days are predominantly from the west-southwest and then turning north, suggesting emission transport from within the Mariposa County nonattainment area and the northern portions of the San Joaquin Valley nonattainment area, consistent with local topography. The complex topography and unimpeded air flow along the river valleys in Mariposa County may influence the fate and transport of emissions as well as the formation and distribution of higher ozone concentrations in the higher elevation, violating monitor locations (1,135 meters and 1,605 meters). The jurisdictional factor supports a separate boundary for Mariposa County from the adjacent nonattainment areas (i.e., Tuolumne County and San Joaquin Valley), as the adjacent areas have separate air pollution control districts, with separate jurisdictional boards and authorities.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation and is designating Mariposa County, CA nonattainment for the 2015 ozone NAAQS.

11.0 Technical Analysis for Nevada County (Western part), CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. The EPA evaluated this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

Table 11.1 identifies the area of analysis for the Nevada County (Western part), CA nonattainment area. The area of analysis includes all of Nevada County, which also comprises all of the Truckee-Grass Valley CBSA. This CBSA is a portion of the Sacramento-Roseville CSA. The nonattainment area is identical to the existing 1997 and 2008 Nevada County, CA nonattainment areas.

The Nevada County 1997 and 2008 ozone NAAQS nonattainment areas include only the western part of Nevada County. The 2015 ozone NAAQS Nevada County nonattainment area is identical to the nonattainment areas in Nevada County that were designated for the 1997 and the 2008 ozone NAAQS. The 2015 ozone NAAQS Nevada County nonattainment area is adjacent to the Sacramento Metro nonattainment area. Information specific to the counties in that area is contained in the associated Technical Analysis section for the Sacramento Metro nonattainment area.

Table 11.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Nevada County (Western part), CA	Nevada County	Truckee-Grass Valley CBSA	Sacramento-Roseville CSA (partial)*

*The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

Figure 11.1 is a map of the EPA's nonattainment boundary for Nevada County. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, existing 1997 and 2008 ozone NAAQS nonattainment boundaries in solid blue, and the EPA's nonattainment boundary for Nevada County in red outline.

For purposes of the 1997 and 2008 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 1997 and 2008 ozone NAAQS includes parts of Nevada County. The EPA is not modifying the State's recommendation to designate the western portion of Nevada County as nonattainment for the 2015 ozone NAAQS, with the same boundary as the Nevada County nonattainment areas for the 1997 ozone NAAQS and the 2008 ozone NAAQS. EPA is not modifying the State's recommendation to designate the eastern portion of Nevada County as attainment/unclassifiable.

Figure 11.1 The EPA's Nonattainment Boundaries for Nevada County, CA.

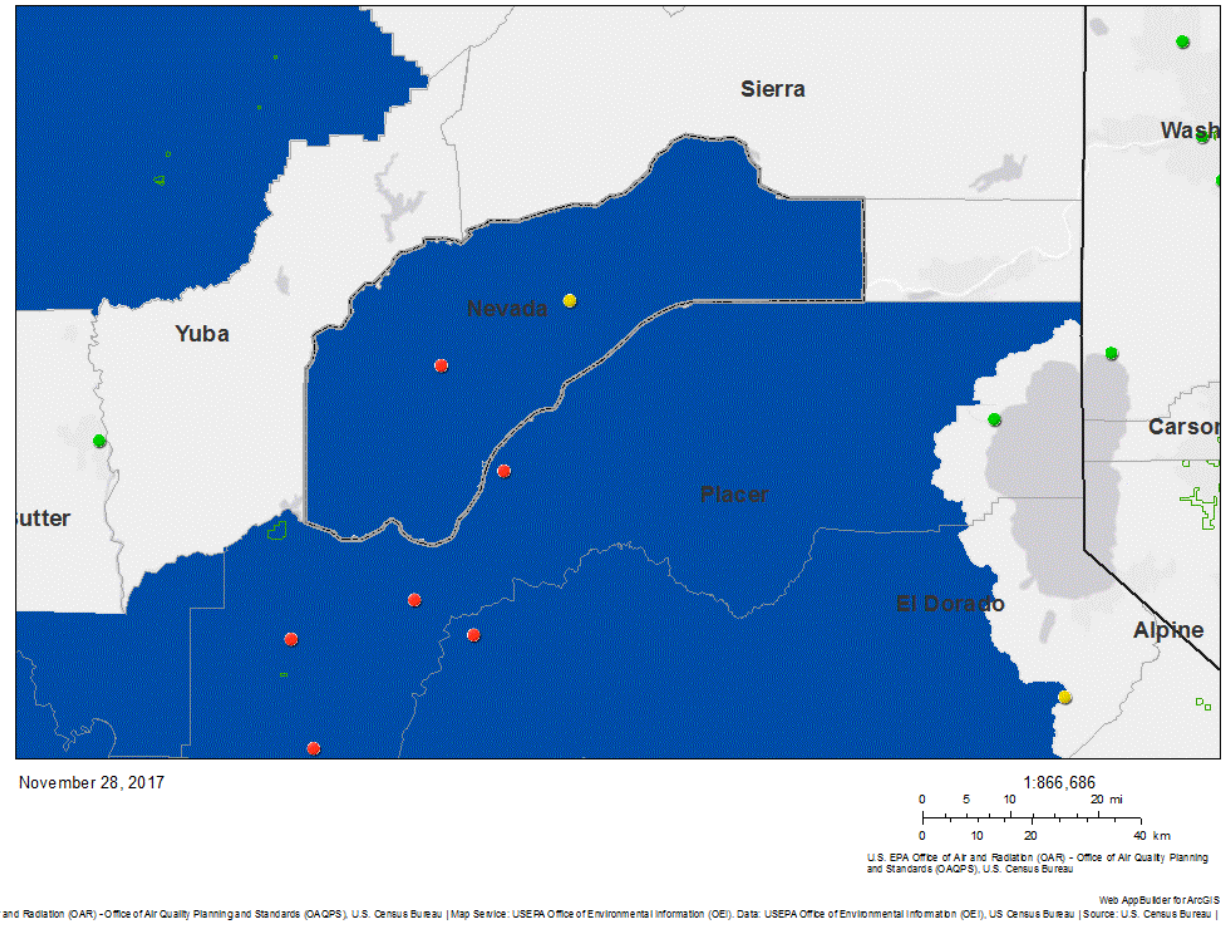


Figure 11.1 shows the EPA's nonattainment boundary for Nevada County, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Nevada County has a monitor in violation of the 2015 ozone NAAQS, therefore, a portion of this county is included in the final nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among

the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in Nevada County, CA based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values. Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for the county in the area of analysis are shown in Table 11.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 11.2 Air Quality Data (all values in ppm).

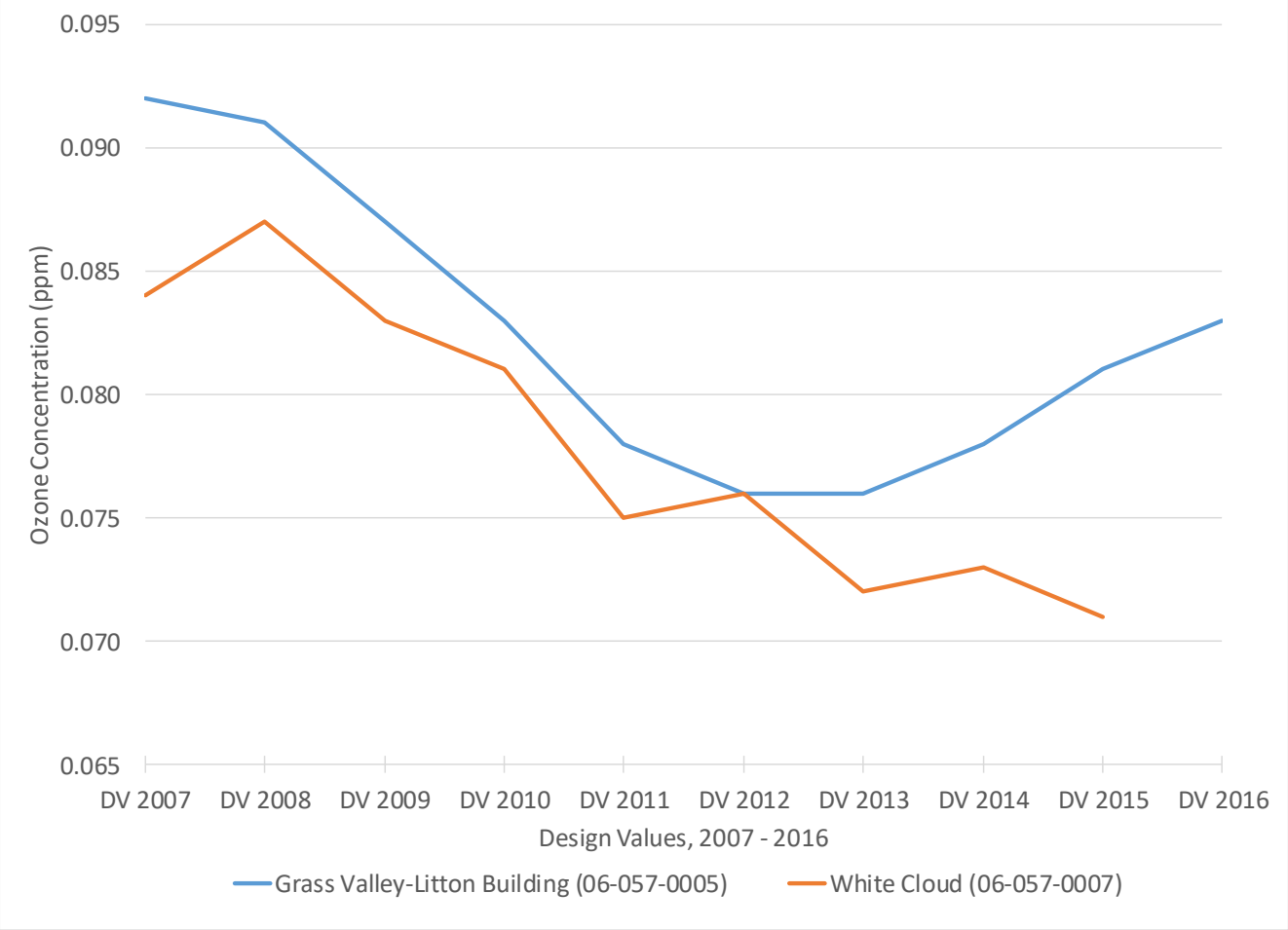
County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Nevada, CA	Yes (partial)	06-057-0005	**0.083**	0.081	0.084	0.086
		06-057-0007	N/A	0.078	0.072	N/A

The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

Nevada County shows a violation of the 2015 ozone NAAQS, therefore a portion of this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 11.1, shown previously, identifies the Nevada County nonattainment area and the violating monitor. Table 11.2 identifies the design values for the two monitors in the area of analysis. Figure 11.2 shows the historical trend of design values for the two monitors in the area of analysis. As indicated on the map, there is one violating monitor, the Grass Valley monitor (AQS ID 06-057-0005), that is located in the city of Grass Valley, in the western portion of the county. The other monitor in the county, the White Cloud monitor (AQS ID 06-057-0007), is located further east, in Tahoe National Forest. The White Cloud monitor is a seasonal ozone monitor operated by the California Air Resources Board. This monitor had a valid 2015 DV of 0.071 ppm. As shown in Figure 11.2, the trends for previous design values at the two monitoring sites located within the area of analysis show that both monitors have been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally trending down at the White Cloud monitor over the past 10 years, but have been trending up at the Grass Valley monitor since 2013.

Figure 11.2 Three-Year Design Values for Monitors in the Area of Analysis (2007 – 2016).



Nevada County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitor, as well as the incomplete monitor, are located within the portion of Nevada County that was included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year), small sources, and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 11.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Nevada County nonattainment area.

Table 11.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Nevada, CA	Yes (partial)	2,405	3,604
	Area wide:	2,405	3,604

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown as orange squares, and small point sources as yellow stars, in Figure 11.3 below. The nonattainment boundary is also shown.

Figure 11.3 Large and Small Point Sources in the Area of Analysis.

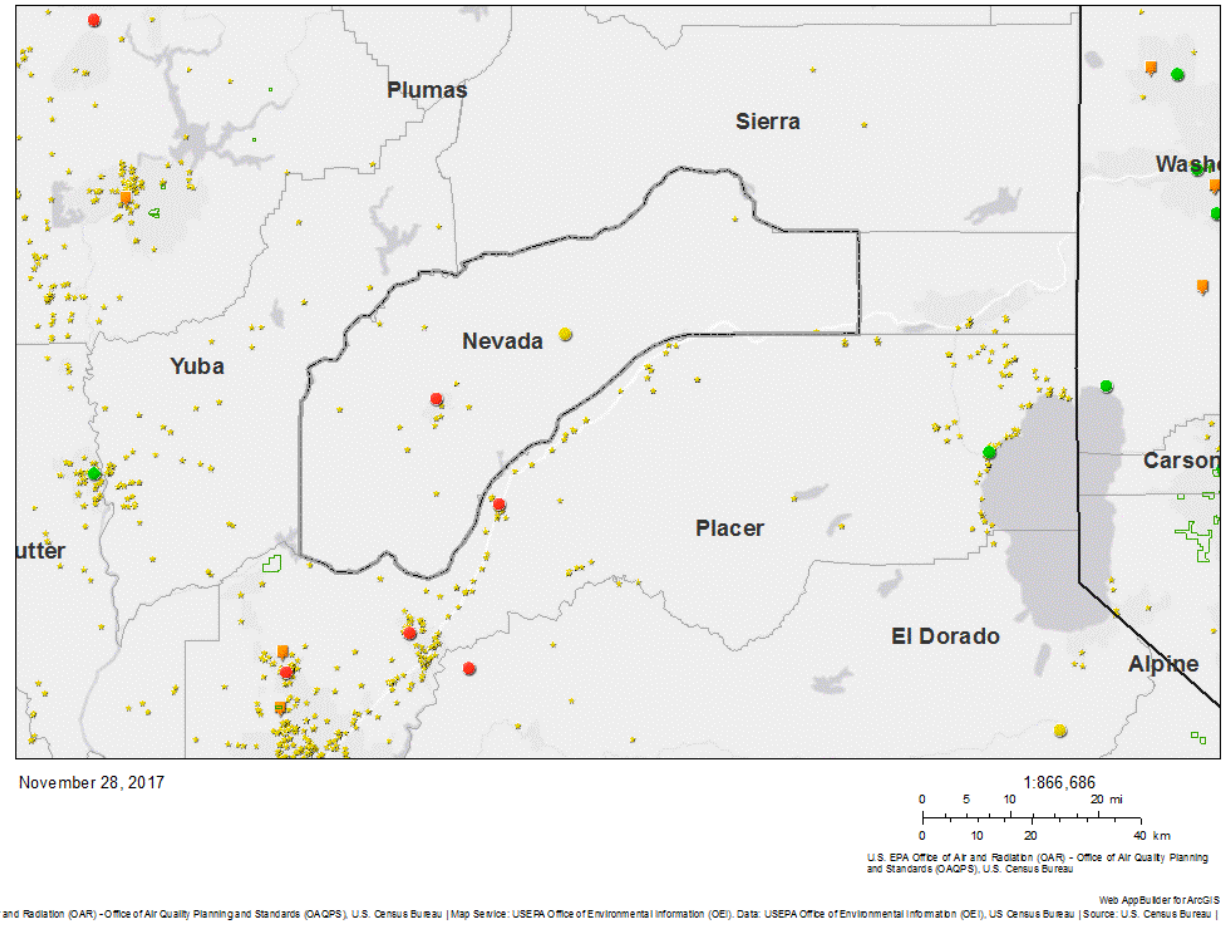


Figure 11.3 shows small point sources in the area of analysis for Nevada County, CA as yellow stars. There are no large point sources in the area of analysis. The EPA's nonattainment boundary for Nevada County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

In summary, the EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emissions showed that Nevada County has emission levels of approximately 2,400 tpy of NO_x emissions and 3,600 tpy of VOC emissions based on the 2014 NEI. There are no large point sources of ozone precursors located within the area of analysis (i.e., Nevada County). A few small point sources of ozone precursors are located in the western part of the county.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 11.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 11.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Nevada, CA	Yes (partial)	98,764	98,877	103	113	0%
	Area wide:	98,764	98,877	103	113	0%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 11.4 shows the 2012 census tract-level information for Nevada County. Nevada County had a 2010 population of 98,764 and a 2015 population of 98,877 people. As shown in Figure 11.4, the county population is centered in the southern portion of the county.

Figure 11.4 Census Tract-Level Population.

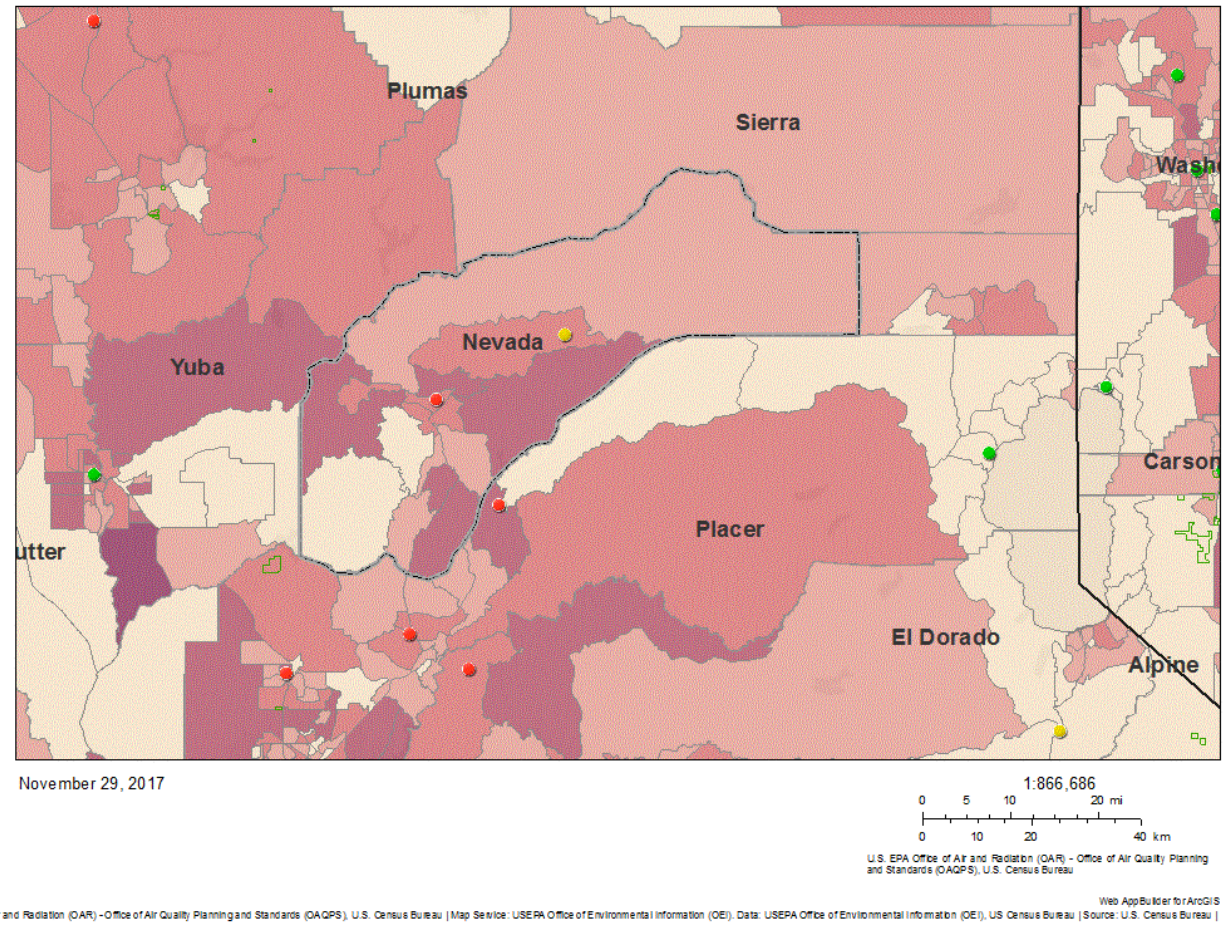


Figure 11.4 shows census tract population in the area of analysis for Nevada County, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Nevada County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 11.5 shows the traffic and commuting pattern data, including total VMT for Nevada county, number of residents who work in the county, number of residents that work the county with a violating monitor, and the percent of residents working the county with a violating monitor. The data in Table 11.5 are 2014 data.

Table 11.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis
Nevada, CA	**Yes (partial)**	**997**	**34,768**	**16,648**	**47.9%**
	Total:	**997**	**34,768**	**16,648**	**47.9%**

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 11.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 11.5 Twelve Kilometer Gridded VMT (Miles) with Transportation Arteries.

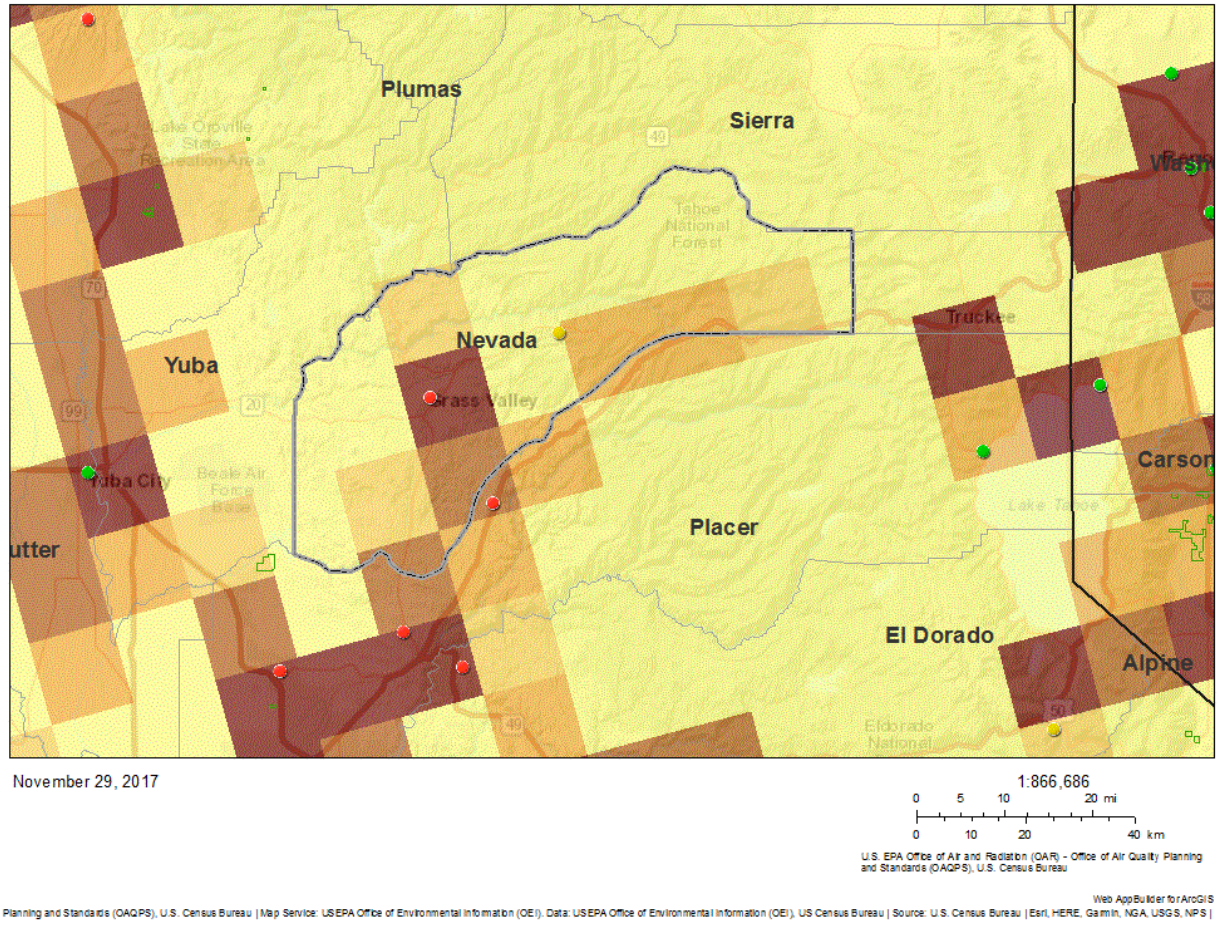


Figure 11.5 shows gridded VMT in the area of analysis for Nevada County, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Nevada County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau,[6] and shows that Nevada County has a 2014 total VMT of 997 million miles. As shown in Figure 11.5, the higher VMT occurs around Grass Valley and along I-80 which travels between the Sacramento area and Reno, NV, passing through the southern portion of Nevada County. Part of a higher VMT twelve-kilometer grid cell associated with Truckee also overlaps with a portion of the eastern part of Nevada County.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 11.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8-hour values that exceed the 2015 ozone NAAQS) for the violating Grass Valley (AQS ID 06-057-0005) monitor.

[6] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/.

Figure 11.6 HYSPLIT Back Trajectories for Violating Monitor(s).

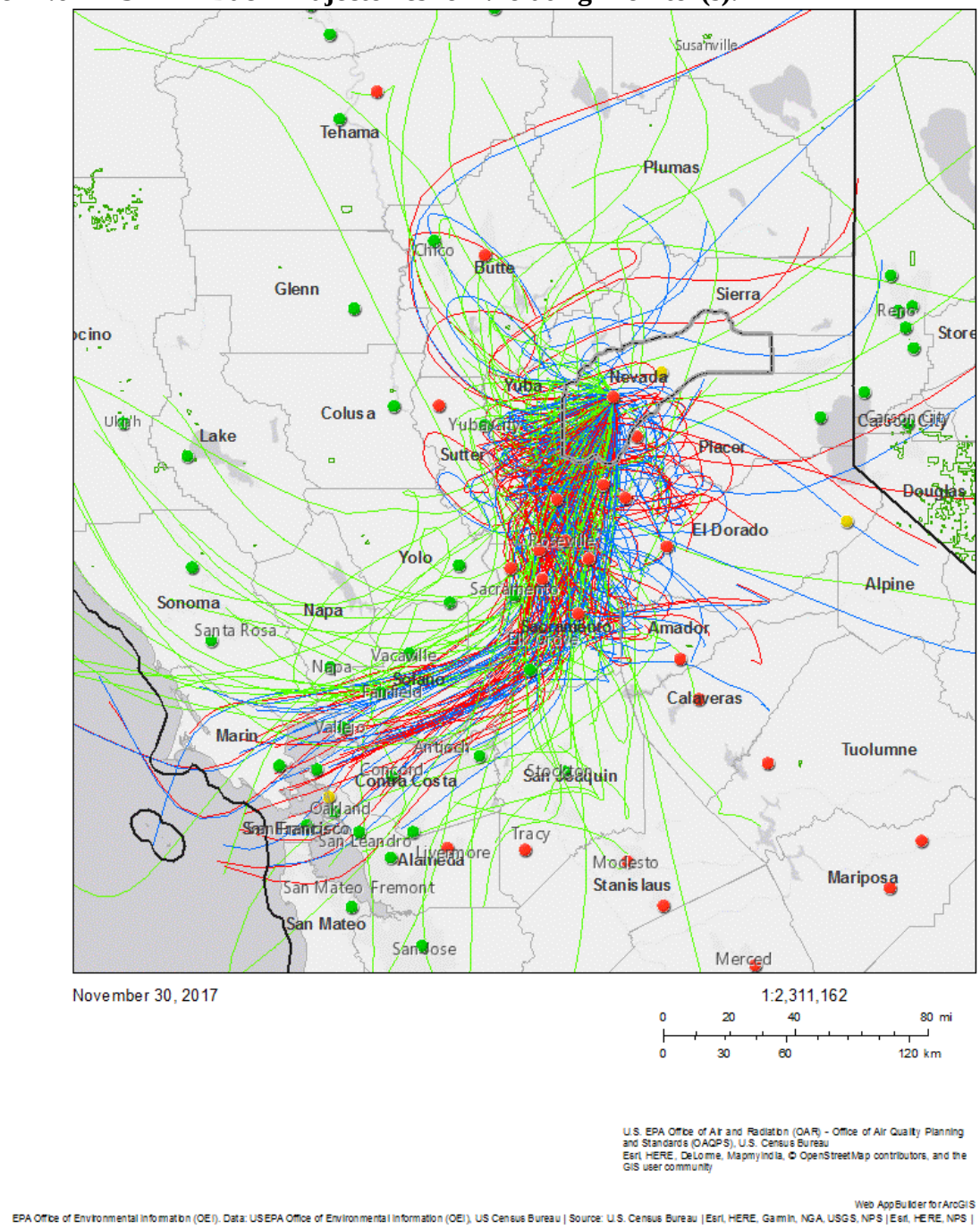


Figure 11.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Nevada County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally pass through some areas of Nevada County, which indicates that sources previously discussed in Factor 2 in Nevada County may be contributing to exceedances or violations of the 2015 ozone NAAQS.

The trajectories point to transport mostly from the areas to the south (Sacramento and San Francisco regions), with comparatively little transport from within Nevada county and almost no transport from the eastern half of the county. Many trajectories start in the Sierra foothills to the north or to the southeast, head west-southwest, and then east-northeast to end at the violating monitor. This is consistent with downslope flow in the evening preceding the exceedances, followed by upslope flow on the day of the exceedance, and may indicate recirculation of pollutants, possibly transported to Nevada County on the preceding day. This suggests that pollution may be transported from the south to Nevada County. The data also show that the winds during exceedance days are predominantly from the south.

The wind patterns indicate that local emissions within the western portion of Nevada County may be contributing to NAAQS exceedances or violations, and there also may be contribution from transport of pollutants from areas further south.

As previously discussed, the EPA is designating the adjacent Sacramento Metro area, as well as the San Francisco Bay area, as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis section for the Sacramento Metro area and the San Francisco Bay area.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

In the western U.S., topography impacts pollutant formation and transport in California, and thus plays an important role in assessing what areas are contributing to monitored violations of the NAAQS. California has historically been divided into fifteen distinct air basins. Nevada County is located in the Mountain Counties Air Basin, which includes the counties of Amador, Calaveras, Mariposa, Nevada, Plumas, Sierra, Tuolumne, and parts of El Dorado and Placer counties. This is not a "basin" in the sense of a single watershed or an area that is more or less surrounded by high terrain. Rather, it is a group of rural and largely mountainous counties that are similar in air quality, more pronounced topography, and rural character as compared to the more polluted, flatter, and more populous areas to the west.

Nevada County is in the foothills and mountains of the Sierra Nevada mountain range. Elevations within the county increase from roughly 100 m (300 ft) above mean sea level in the west to over 2,700

m (9,000 ft) in the east (the eastern edge of the proposed nonattainment area is some 30 km (19 mi) from the Sierra Nevada crest).

Nevada County is characterized by river valleys running roughly east-northeast to west-southwest, separated by mountain ridges. This tends to inhibit north-south air flow, but to allow east-west upslope and downslope flow. The western portion of the county is defined as the area that lies to the west of the crest of the Sierra Nevada mountain range. This ridgeline also represents the hydrographic boundary between the Lake Tahoe watershed and the watersheds to the west. The eastern portion of the county would not be expected to be influenced regularly by conditions in or transport from the Sacramento Valley or even the western portion of Nevada County itself, since it is on the other side of the crest of the Sierra Nevada mountain range, which is 4,200 m (14,000 ft) in elevation.

Figure 11.7 Topographic Illustration of the Physical Features.

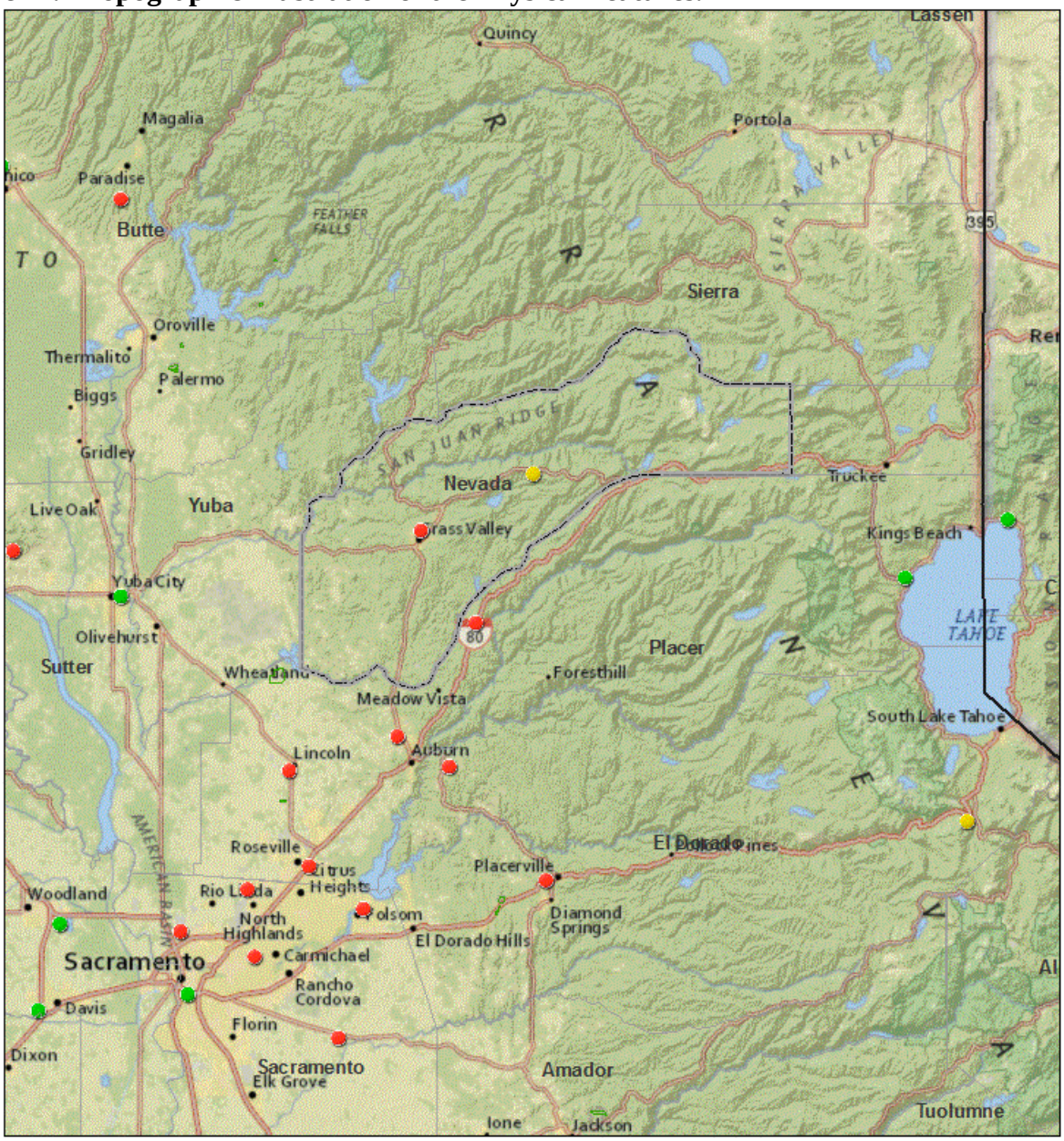


Figure 11.7 shows the topography in the area of analysis for Nevada County, CA. The EPA's nonattainment boundary for Nevada County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Nevada County nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations (MPOs), and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 11.8 shows the relevant jurisdictional boundaries for Nevada County, including county boundaries, existing 1997 and 2008 ozone NAAQS nonattainment areas, and areas of Indian country.

Figure 11.8 Jurisdictional Boundaries.

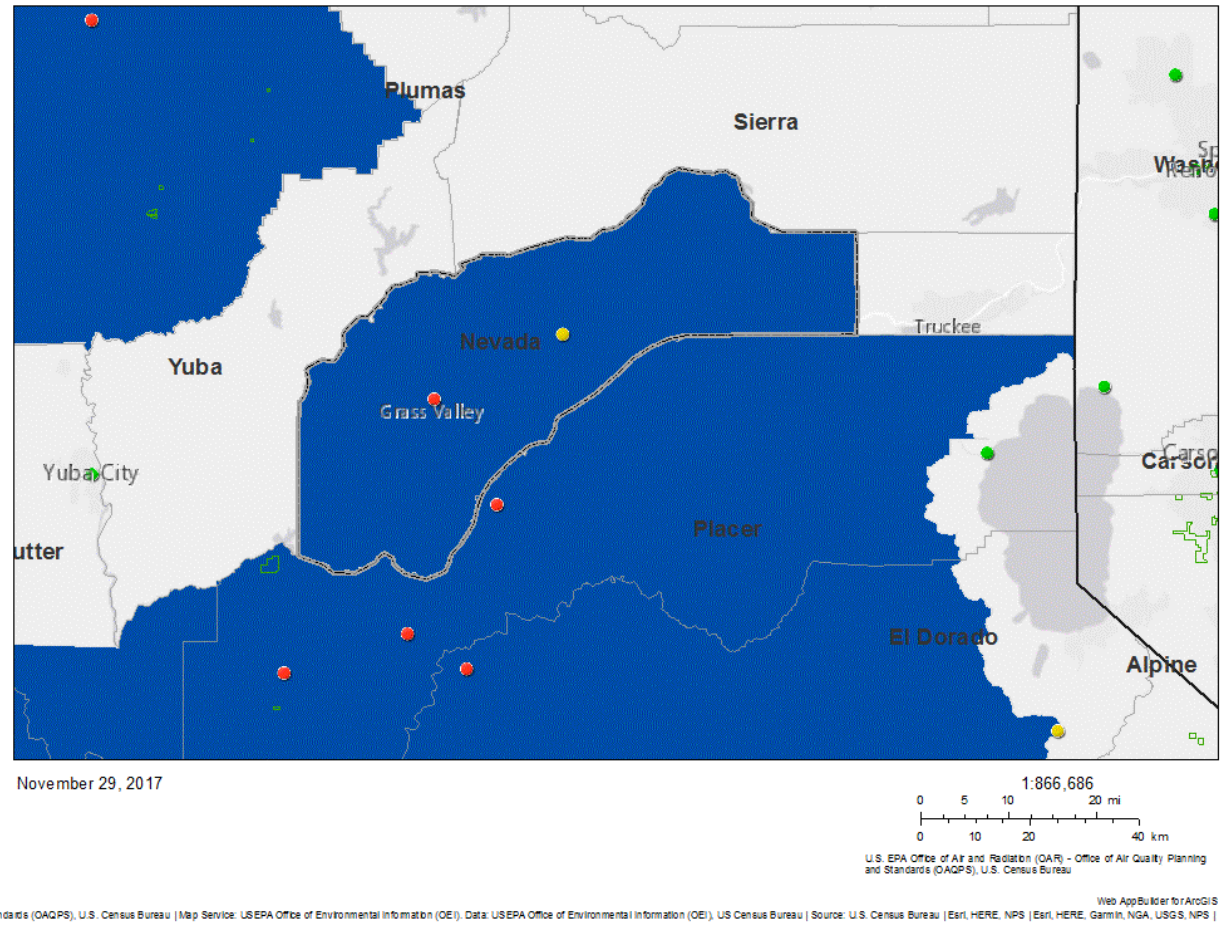


Figure 11.8 shows jurisdictional boundaries, including state boundaries (black lines), in the area of analysis for Nevada County, CA. The EPA's nonattainment boundary for Nevada County, CA is shown as a gray line with a dashed black center. The nonattainment boundary(ies) for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as

red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Nevada County area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS. The entire county is under the jurisdiction of the Northern Sierra Air Quality Management District, along with Plumas and Sierra counties to the north. Nevada County is identical to the Truckee-Grass Valley CBSA, a Micropolitan Statistical Area within the Sacramento-Roseville Combined Statistical Area (CSA). Nevada County is not part of the Sacramento Area Council of Governments (SACOG) transportation planning agency and MPO that has jurisdiction within the Sacramento Metro area. As such, Nevada County is in a regulatory regime different from the Sacramento Metro area with respect to transportation planning. The county does not have its own MPO. This fact formed part of the basis for the EPA accepting the State's request to designate the western portion of Nevada County separately from the Sacramento Metro area in designations for the 1997 ozone NAAQS and the 2008 ozone NAAQS.

Conclusion for Nevada County, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to designate the western portion of Nevada County as the Nevada County nonattainment area for the 2015 ozone NAAQS. This is the same area that was included in the Nevada County nonattainment area for the 1997 and 2008 ozone NAAQS.

The Grass Valley air quality monitor in Nevada County indicates a violation of the 2015 ozone NAAQS based on the 2016 design values. The White Cloud monitor further east in the county has a violating 2015 DV, but does not have a valid 2016 DV. Both monitors are included in the nonattainment area. Emissions and emissions-related data show that there are no large point sources within the area of analysis, and a few small point sources of ozone precursors in the western portion of Nevada County. Population density and degree of urbanization data indicate that the more densely-populated census tracks occur in the southern part of the county. Traffic and vehicle miles travelled data indicate that the higher VMT occurs along roads around Grass Valley and leading toward the Sacramento metropolitan area to the south of Nevada county. Meteorological data show that winds during exceedance days come predominantly from the south. The EPA's HYSPLIT analysis indicate that sources discussed in the Factor 2 analysis may be contributing to exceedances or violations of the 2015 ozone NAAQS, and that pollution may be transported from the southern regions around Sacramento and San Francisco to Nevada county. Geography and topography data show a distinction between the western and eastern parts of the county due to the Sierra Nevada mountain range. Nevada County is in the Truckee-Grass Valley CBSA, is under the air quality management jurisdiction of the Northern Sierra AQMD, is not part of the Sacramento Metro area MPO, and was previously designated nonattainment for the 1997 and 2008 ozone NAAQS. The EPA believes this jurisdictional difference is still relevant for the 2015 ozone NAAQS.

Based on consideration of all five factors, the EPA is not modifying the State's recommendation and is designating the western portion of Nevada County, CA as nonattainment for the 2015 ozone NAAQS.

12.0 Technical Analysis for Riverside County (Coachella Valley), CA

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area.

For the Riverside County (Coachella Valley), CA nonattainment area, which is the central portion of Riverside County, the area of analysis included all of Riverside County. Riverside County is at the southern end of the Riverside-San Bernardino-Ontario CBSA, which itself is the easternmost of three CBSAs that comprise the Los Angeles-Long Beach CSA. The entirety of the Los Angeles-Long Beach CSA is analyzed in this technical support document for California; however, adjacent counties that are part of other nonattainment areas are analyzed in the technical analysis sections of those nonattainment areas.

The nonattainment areas of Imperial County, Los Angeles-San Bernardino Counties (West Mojave Desert), Los Angeles-South Coast Air Basin, San Diego County, and lands of the Morongo Band of Mission Indians are adjacent to the Coachella Valley nonattainment area and the Los Angeles-South Coast Air Basin nonattainment area includes the western portion of Riverside County. Information specific to the counties or the tribal land in those areas is contained in the associated Technical Analysis sections for those nonattainment areas.

Table 12.1 identifies the area of analysis for the Coachella Valley nonattainment area. The nonattainment area is identical to the existing 1997 and 2008 Coachella Valley nonattainment area boundaries.

Table 12.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Riverside County (partial) (Coachella Valley), CA	Riverside County	Riverside-San Bernardino-Ontario CBSA (partial)*	Los Angeles-Long Beach CSA (partial)*

*The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 12.1 is a map of the EPA's nonattainment boundary for the Coachella Valley. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries.

For purposes of the 1997 and 2008 ozone NAAQS, the central portion of Riverside County was designated nonattainment with the same boundary as recommended by the State for the 2015 ozone NAAQS. The Coachella Valley area also includes Indian country of the following tribes: Agua Caliente Band of Cahuilla Indians (Agua Caliente Band), Augustine Band of Cahuilla Indians (Augustine Band), Cabazon Band of Mission Indians (Cabazon Band), Santa Rosa Band of Cahuilla Indians (Santa Rosa Band), Torres Martinez Desert Cahuilla Indians (Torres Martinez), and Twenty-Nine Palms Band of Mission Indians of California (Twenty-Nine Palms Band). The Morongo Band of Mission Indians (Morongo Band) has land within Riverside County, at the western edge of the Coachella area, and we have designated the Morongo reservation as its own nonattainment area. The other tribes did not submit a recommendation and EPA has designated these tribal areas as part of the designated nonattainment area.

The EPA has not modified the State's recommendation to designate the central portion of Riverside County (the Coachella Valley) as nonattainment for the 2015 ozone NAAQS, with the same boundary as the Coachella Valley nonattainment areas for the 1997 ozone NAAQS and the 2008 ozone NAAQS. The western portion of Riverside County is included in the Los Angeles-South Coast Air Basin nonattainment area. EPA has not modified the State's recommendation to designate the eastern portion of Riverside County as attainment/unclassifiable.

Figure 12.1 The EPA's Nonattainment Boundaries for Riverside County (Coachella Valley), CA.

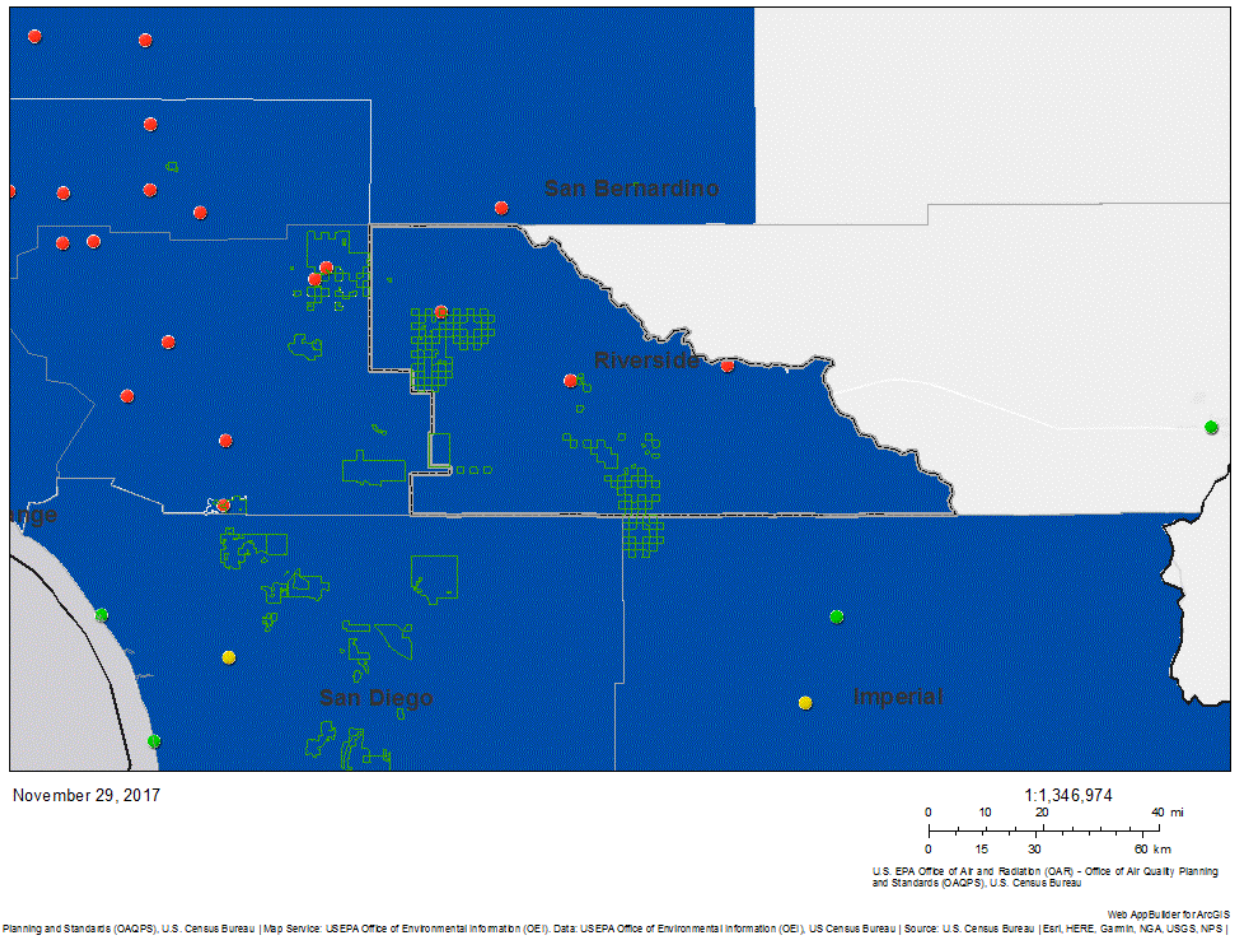


Figure 12.1 shows the EPA's nonattainment boundary for Riverside County (Coachella Valley), CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Riverside County has several monitors in violation of the 2015 ozone NAAQS, therefore portions of this county are included in one or more nonattainment areas. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in Riverside County, CA based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent

three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 12.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 12.2 Air Quality Data (all values in ppm).

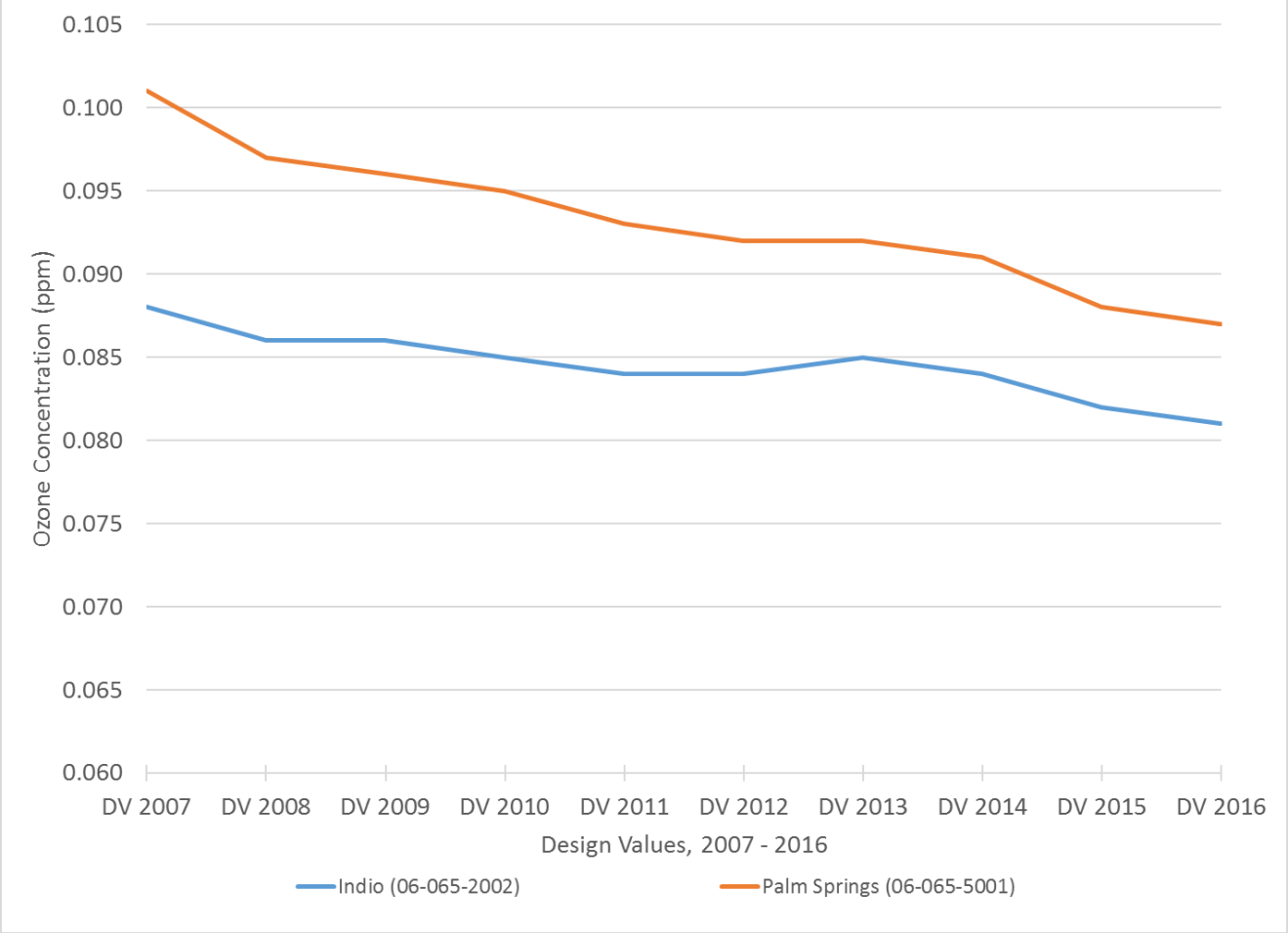
County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Riverside, CA	Yes (partial)	06-065-0008*	0.079	0.091	0.074	0.072
		06-065-0009	0.071	0.079	0.069	0.067
		06-065-0012	0.093	0.094	0.091	0.094
		06-065-0016	0.077	0.077	0.079	0.077
		06-065-1016	**0.097**	0.098	0.097	0.097
		06-065-2002	0.081	0.084	0.079	0.081
		06-065-5001	0.087	0.089	0.086	0.087
		06-065-6001	0.091	0.089	0.094	0.092
		06-065-8001	0.094	0.091	0.096	0.097
		06-065-8005	0.091	0.087	0.093	0.095
		06-065-9001	0.086	0.079	0.093	0.087
		06-065-9003	0.066	0.078	0.063	0.057

The highest design value in each county is indicated in bold type.
*Monitor operated by the National Park Service.

Eleven monitors in Riverside County show violations of the 2015 ozone NAAQS, therefore a portion of this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 12.1, shown previously, identifies the Coachella Valley nonattainment area and the violating monitors. Table 12.2 identifies the design values for all monitors in the area of analysis. Figure 12.2 shows the historical trend of design values for the violating monitors. As indicated on the map, eleven violating monitors are located in the western and central portions of Riverside County. Six violating monitors in the western portion of Riverside County are included in the Los Angeles-South Coast Air Basin nonattainment area. One violating monitor in the western portion of the County is the Pechanga tribal monitor (AQS ID: 06-065-0009) which is located on tribal land that EPA is designating separately as the Pechanga tribal nonattainment area. Another violating monitor is the Morongo Air Monitoring Station (AQS ID: 06-065-1016), which has the highest 2016 design value identified in Table 12.2. This monitor is located at the western edge of the Coachella Valley on Morongo tribal land which EPA is designating separately as the Morongo tribal nonattainment area. The three violating monitors not located on tribal land in the central portion of Riverside County are included in the Coachella Valley nonattainment area. The highest 2016 design value in the Coachella Valley area is at the Palm Springs monitor (AQS ID: 06-065-5001), which is located in the city of Palm Springs. The Indio monitor (AQS ID: 06-065-2002), which is located near the center of the nonattainment area is also violating. A third violating monitor in the Coachella Valley area, Joshua Tree National Park (AQS ID: 06-065-0008), is located in the eastern portion of the area and is operated by the National Park Service. The monitor on the eastern edge of Riverside County near the city of Blythe (AQS ID 06-065-9003), which is outside the Coachella Valley area, is attaining the 2015 ozone NAAQS. As shown in Figure 12.2, the trends for previous design values at monitoring sites located within the Coachella Valley nonattainment area show that monitors in the area have been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally trending down for the last 10 years.

Figure 12.2 Three-Year Design Values for Violating Monitors (2007 – 2016).



Riverside County has eleven monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. Therefore, these portions of Riverside County must be designated as nonattainment for the 2015 ozone NAAQS. The three violating monitors located in the Coachella Valley portion of Riverside County are located within the portion of Riverside County that was included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and small point sources and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 12.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Coachella Valley nonattainment area.

Table 12.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Riverside, CA	Yes (partial)	29,792	21,313
	Area wide:	29,792	21,313

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown with square orange icons in Figure 12.3 below. The nonattainment boundary is also shown.

Figure 12.3 Large Point Sources in the Area of Analysis.

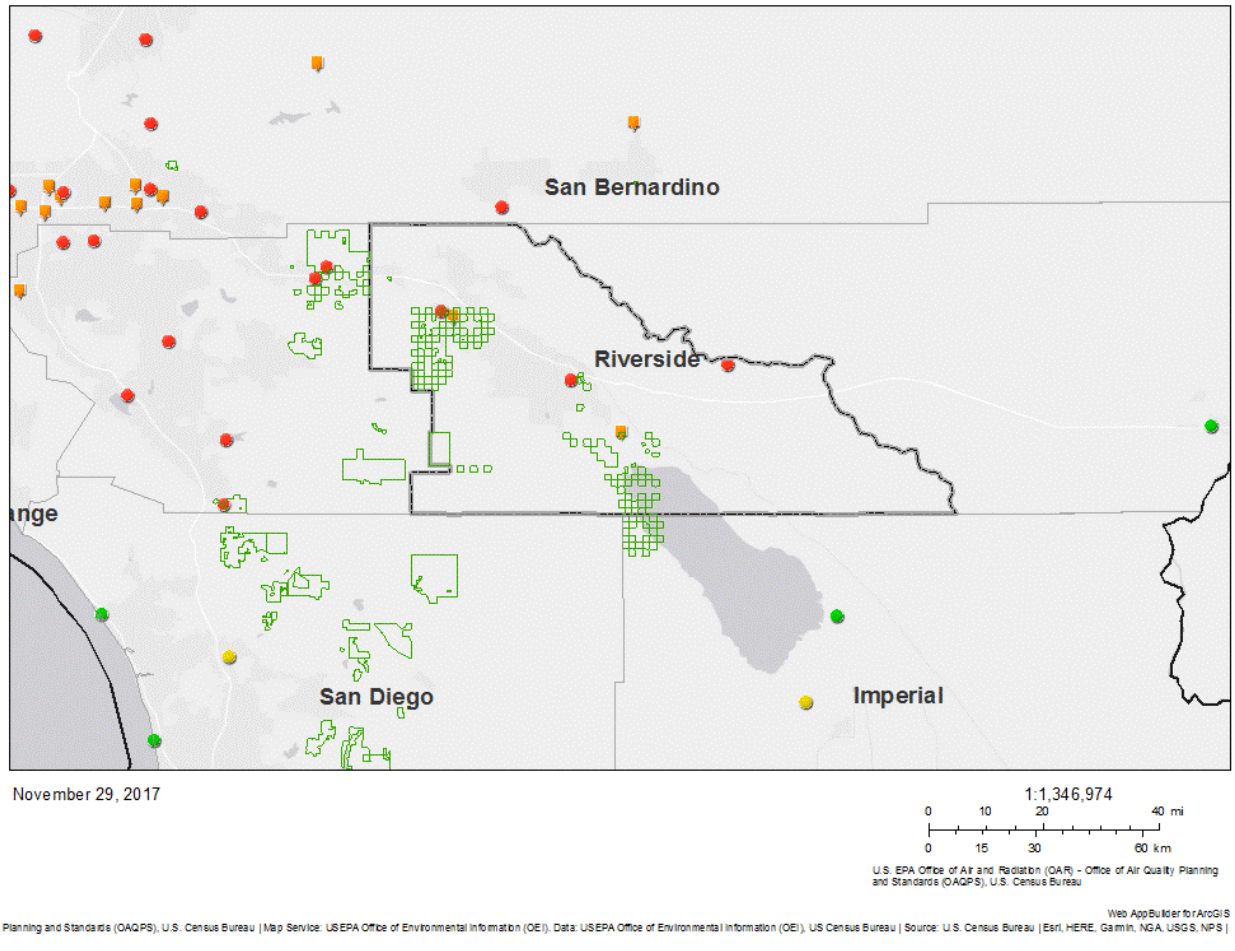


Figure 12.3 shows large point sources in the area of analysis for Coachella Valley, CA as orange squares. The EPA's nonattainment boundary for Coachella Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission showed that Riverside County has emissions levels of 29,792 tpy of NO_x and 21,313 tpy of VOC, based on the 2014 NEI. There are three large point sources within the area of analysis (Riverside County). One large point source is located in the western portion of the County that EPA is designating as part of the Los Angeles-South Coast Air Basin nonattainment area. The remaining two large point sources are the Palm Springs International Airport, and a small power plant located in the south central portion of Coachella Valley.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 12.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 12.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Riverside, CA	Yes (partial)	2,189,641	2,361,026	328	171,385	8%
Area Wide:		2,189,641	2,361,026	328	171,385	8%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html

Figure 12.4 shows the 2012 census tract-level population information for Riverside County. Generally, Riverside County's highest population areas are located in the western portion with moderate population levels in the central portion and low population levels in the eastern portion of the county. The western portion of Riverside County, which shows the most highly populated census tracts, is included in the Los Angeles-South Coast Air Basin nonattainment area. The central portion of the county which the State has recommended as the Coachella Valley nonattainment area also has numerous more heavily populated census tracts. The eastern portion of the county has low population compared to other portions of the county.

Figure 12.4 Census Tract-Level Population.

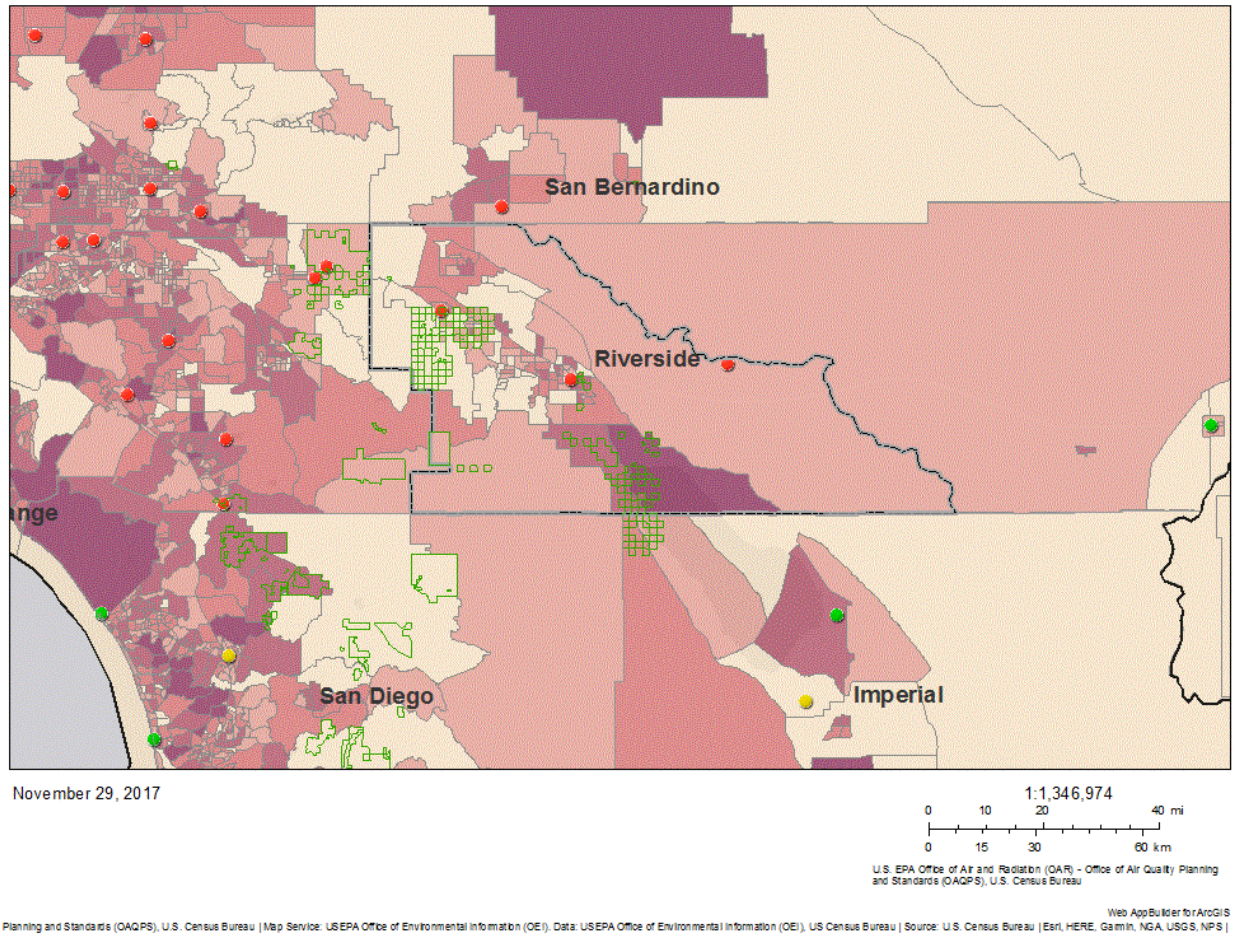


Figure 12.4 shows census tract population in the area of analysis for Coachella Valley, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Coachella Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 12.5 shows the traffic and commuting pattern data, including total VMT for each county, number of residents who work in Riverside County, number of residents that work in the county with a violating monitor, and the percent of residents working in the county with a violating monitor. The data in Table 12.5 are 2014 data.

Table 12.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis
Riverside, CA	**Yes (partial)**	**20,049**	**824,037**	**386,714**	**46.9%**
	Total:	20,049	824,037	386,714	46.9%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 12.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 12.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

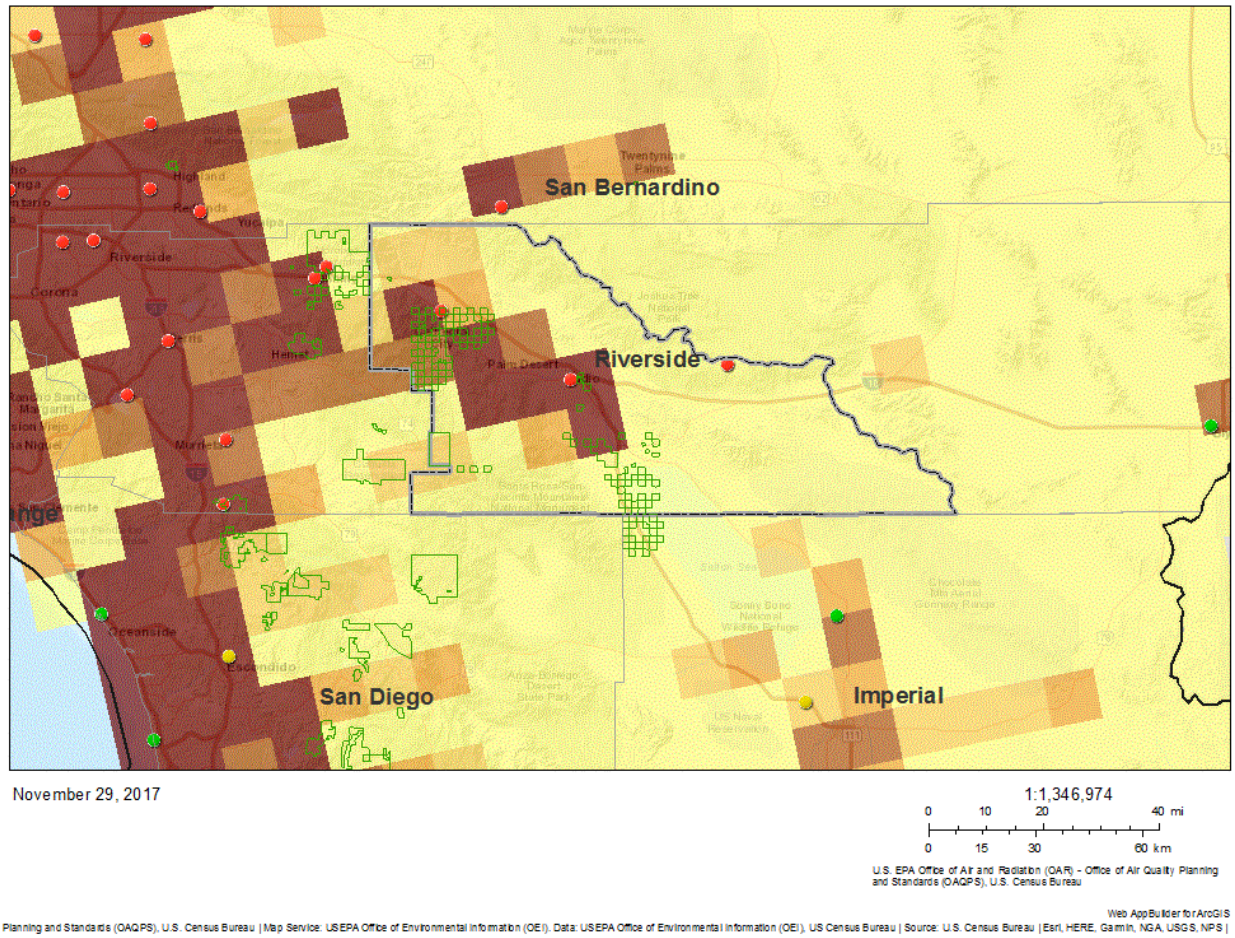


Figure 12.5 shows gridded VMT in the area of analysis for Coachella Valley, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Coachella Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on the 2014 NEI and On the Map data from the Census Bureau and shows that western and central portions of Riverside County have the highest total VMT levels within the area of analysis. The western area, which is included in the Los Angeles-South Coast Air Basin nonattainment area, has the highest VMT in the County. The relatively higher gridded VMT in the central portion of Riverside County occurs along Interstate Highway 10, especially in the vicinity of the Palm Springs and Indio communities. These portions of Riverside County were recommended by the State for inclusion in the Coachella Valley nonattainment area. The eastern portion of the county contains areas of relatively lower VMT, except for the area around Blythe at the eastern edge of the County.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 12.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the two violating monitors.

Figure 12.6a. HYSPLIT Back Trajectories for Palm Springs (AQS ID 06-65-5001).

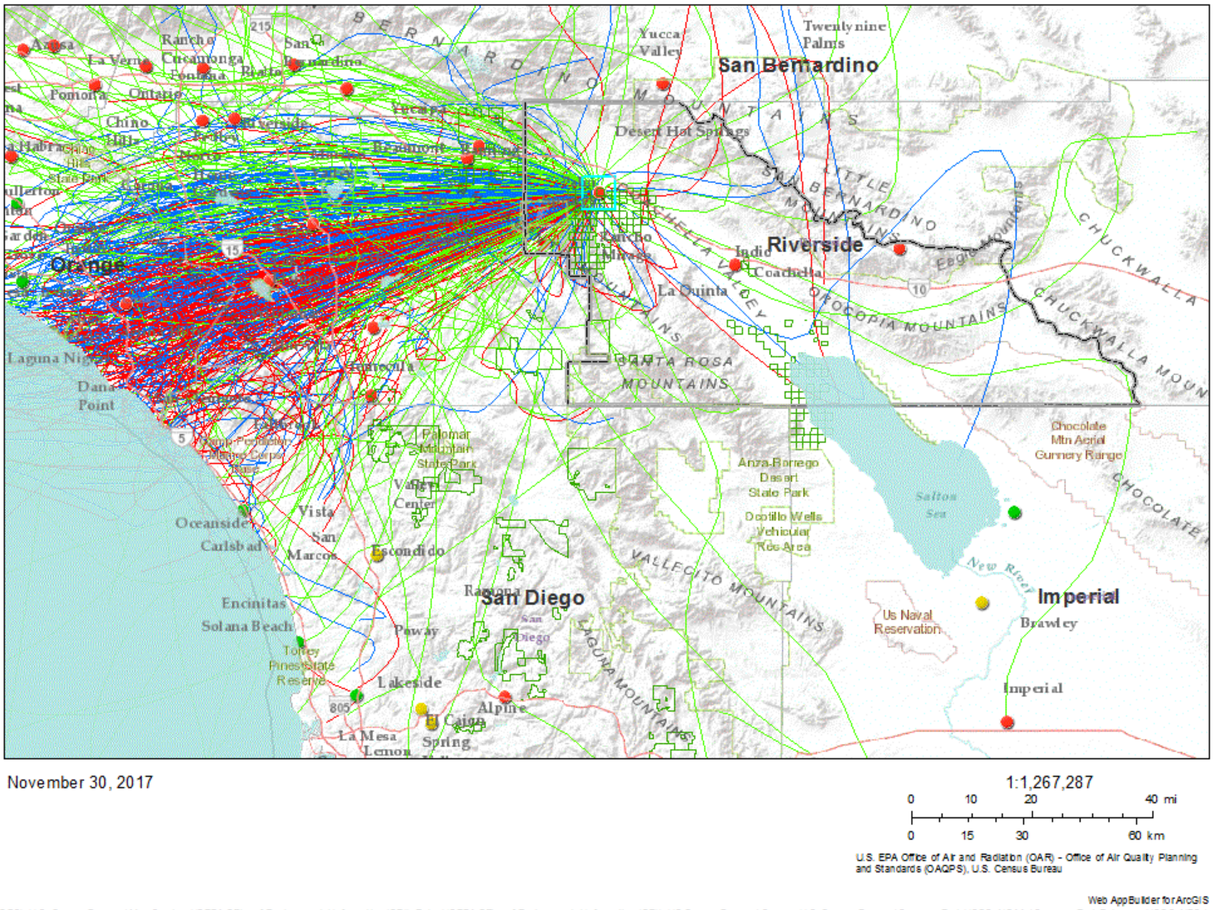


Figure 12.6a shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Coachella Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 12.6b. HYSPLIT Back Trajectories for Indio (AQS ID 06-65-2002).

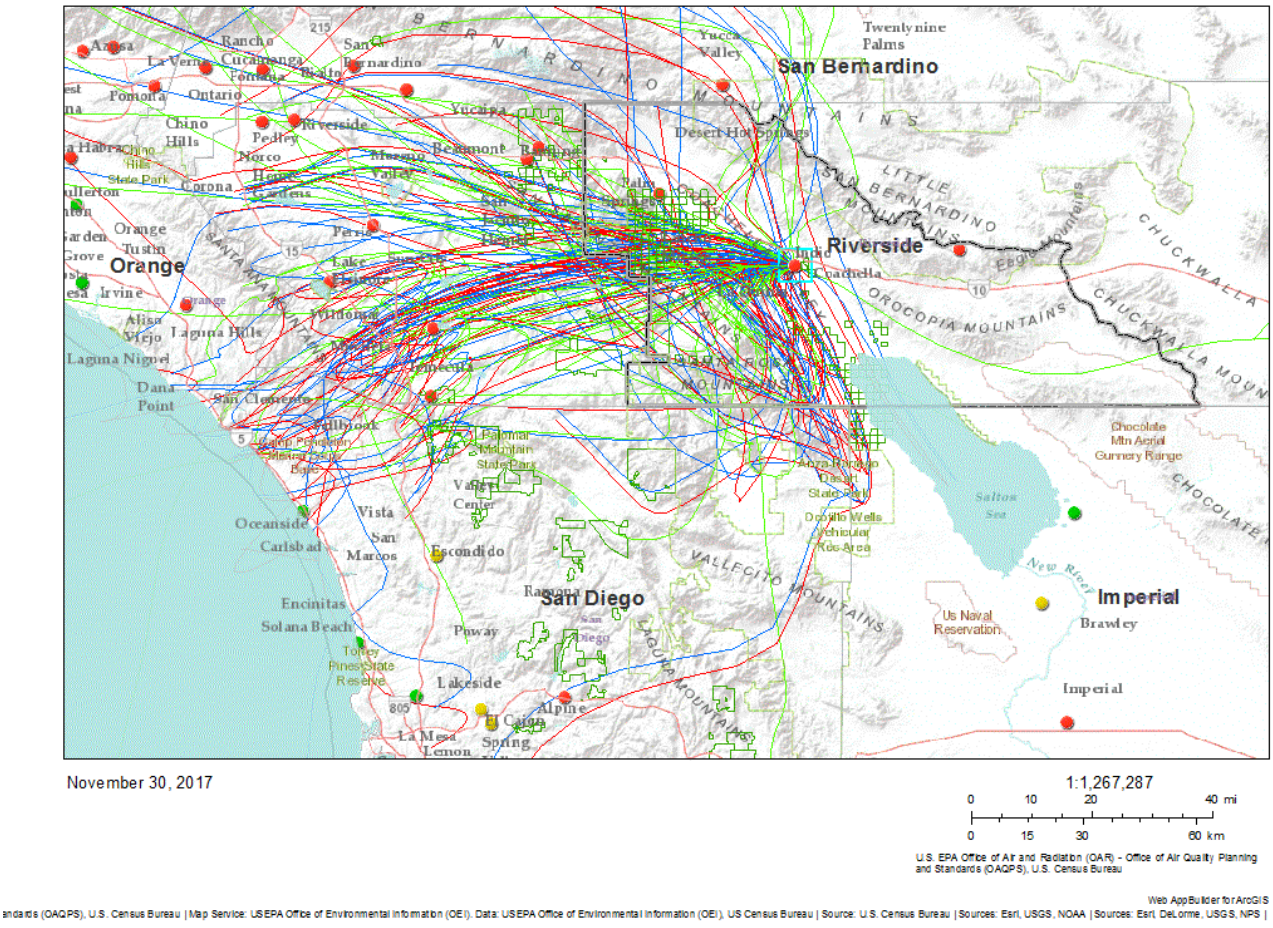


Figure 12.6b shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Coachella Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 12.6c. HYSPLIT Back Trajectories for Joshua Tree National Park (AQS ID 06-65-0008).

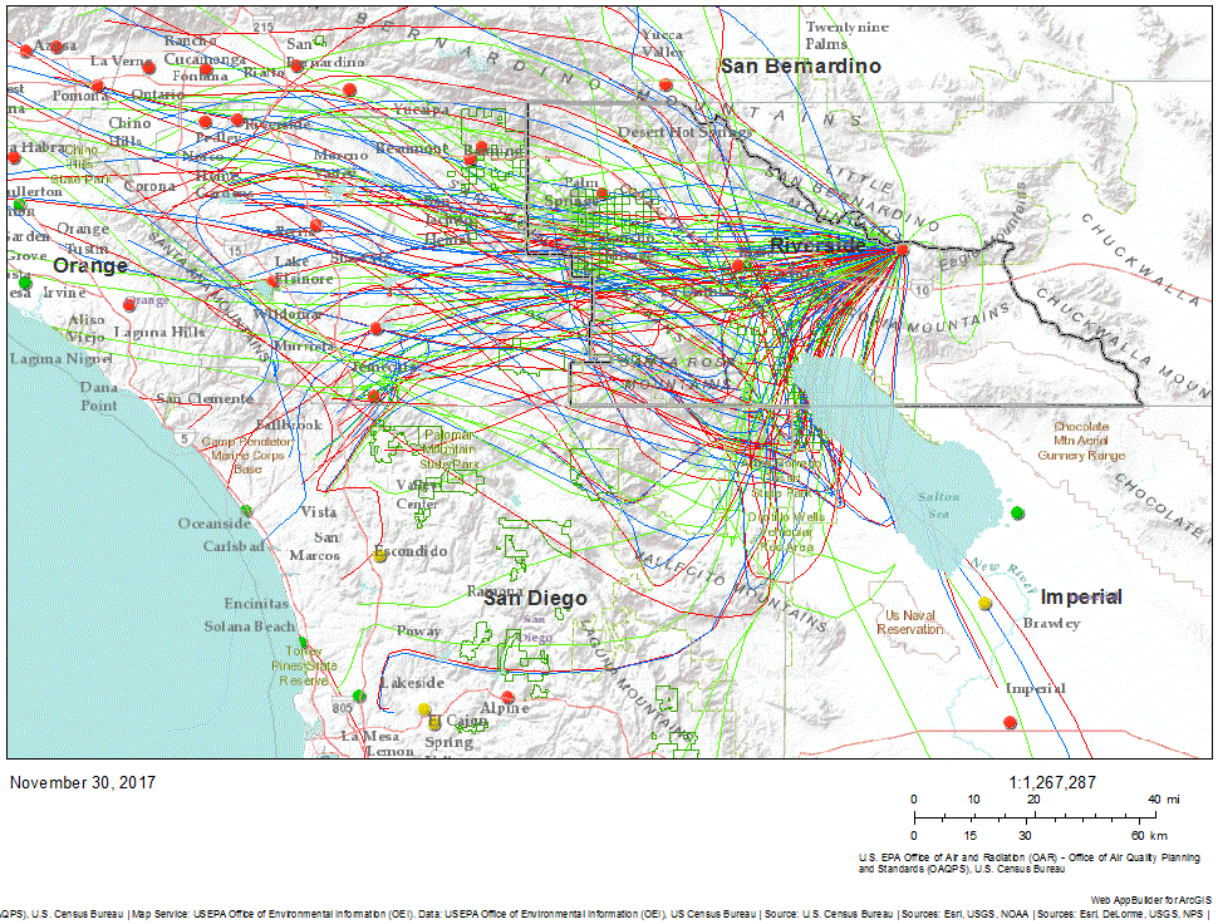


Figure 12.6c shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Coachella Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016. The trajectories show that the winds during exceedance days are predominantly from the west, primarily from the Los Angeles-South Coast Air Basin. As provided in other sections of this TSD, the EPA is designating the adjacent Los Angeles-South Coast Air Basin, Los Angeles-San Bernardino Counties (West Mojave Desert), and Morongo Band of Mission Indians areas as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for these areas.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. In the western U.S., topography impacts pollutant formation and transport, and thus plays an important role in assessing which areas are contributing to monitored violations of the NAAQS.

Figure 12.7 shows the topography for the Riverside County (Coachella Valley) nonattainment area. The Coachella Valley consists of the northern portion of the Salton Sea Air Basin. The Coachella Valley Planning Area is a sub-region of Riverside County and the Salton Sea Air Basin that is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east. There is only one major pass, San Gorgonio Pass, connecting the Los Angeles Basin and the Colorado (low) Desert. The northern wall of the pass is the foothills and lower ridges of the San Bernardino Mountains which build up to Mount San Gorgonio (11,502 ft. above mean sea level (MSL)). The southern wall rises abruptly toward Mount San Jacinto (10,805 ft. MSL) in the San Jacinto Mountains. The floor of the pass begins about two miles west of Banning (about 2,300 ft. MSL) and slopes downward at about 80 feet per mile to its eastern end about two miles east of Whitewater (about 1000 ft. MSL).

Figure 12.7 Topographic Illustration of the Physical Features.

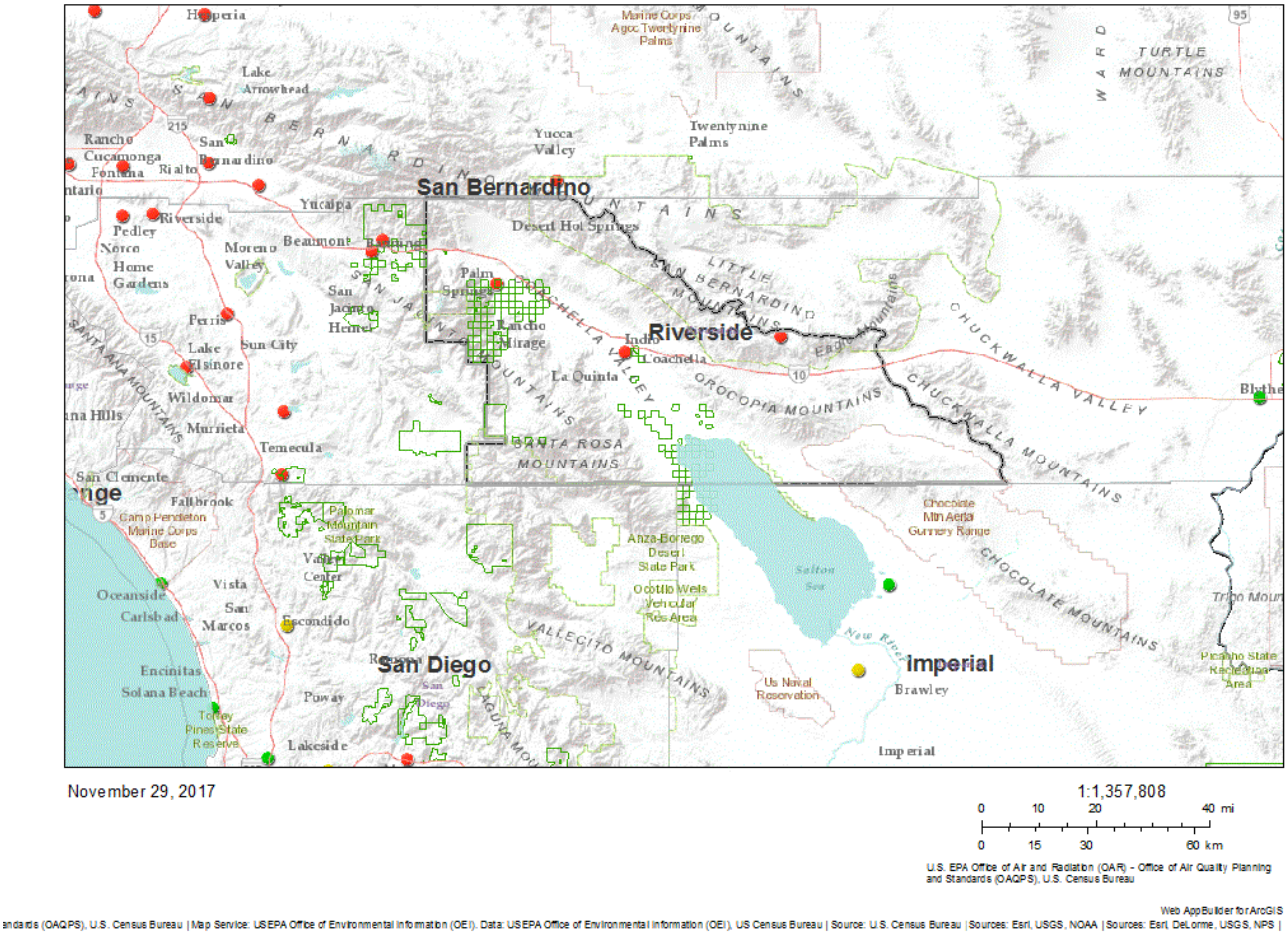


Figure 12.7 shows the topography in the area of analysis for Coachella Valley, CA. The EPA's nonattainment boundary for Coachella Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 12.8 shows the relevant jurisdictional boundaries for the Coachella Valley nonattainment area, including county and CBSA boundaries, and areas of Indian country.

Figure 12.8 Jurisdictional Boundaries.

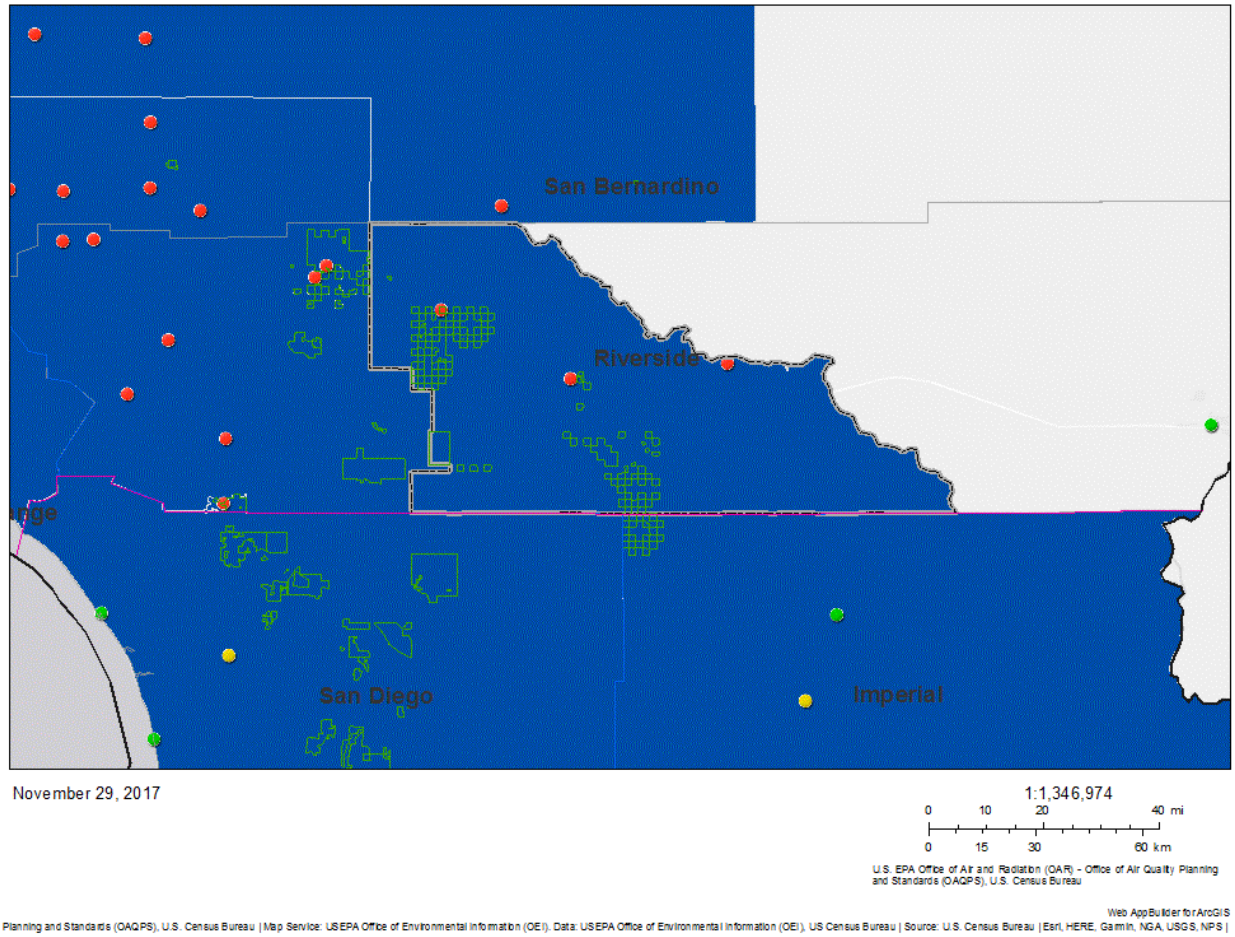


Figure 12.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines)] in the area of analysis for Coachella Valley, CA. The EPA's nonattainment boundary for Coachella Valley, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Coachella Valley area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

The Coachella Valley area is located in the Salton Sea Air Basin. The South Coast Air Quality Management District has air quality planning jurisdiction over the Coachella Valley nonattainment area. The remaining portion of the Salton Sea Air Basin consists of all of Imperial County. Imperial County is under the air quality planning jurisdiction of the Imperial County Air Pollution Control District and the EPA is designating a portion of Imperial County as a separate nonattainment area.

The Southern California Association of Governments is the metropolitan planning organization responsible for transportation planning in the Los Angeles-Long Beach CSA, including all of the Coachella Valley nonattainment area.

The Coachella Valley area also includes portions of Indian country of the following tribes: Agua Caliente Band, Augustine Band, Cabazon Band, Santa Rosa Band, Torres Martinez, and Twenty-Nine Palms Band. There are also lands of the Morongo Band of Mission Indians in the Coachella Valley area of Riverside County but we are designating those lands as a separate nonattainment area. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

The Santa Rosa Band has contiguous areas of Indian country in both the Los Angeles-South Coast Air Basin and Riverside County (Coachella Valley) area. We are designating all of Santa Rosa Band area as nonattainment as part of the Coachella Valley nonattainment area.

The Twenty-Nine Palms tribe has non-contiguous areas of Indian country in both the Coachella Valley and West Mojave Desert area. We are designating the lands of the Twenty-Nine Palms Band located in Riverside County as part of the Coachella Valley nonattainment area and the land located in San Bernardino County as part of the West Mojave Desert nonattainment area. We are designating Indian country of the Morongo Band of Mission Indians as a separate nonattainment area.

Conclusion for Riverside County (Coachella Valley), CA

The EPA is not modifying the State's recommendation to designate the central portion of Riverside County as the Coachella Valley nonattainment area for the 2015 ozone NAAQS. This is the same area that was included in the Coachella Valley nonattainment area for the 1997 and 2008 ozone NAAQS.

Eleven air quality monitors in Riverside County indicate violations of the 2015 ozone NAAQS based on the 2016 design values. Three of those monitors are located in the Coachella Valley on non-tribal land, therefore these portions of the county are included in the nonattainment area. Emissions and emissions-related data show that Riverside County contains three large point sources of ozone precursors, two of which are located in Coachella Valley. The other large point source is located in the western portion of the County which EPA is designating as part of the Los Angeles-South Coast Air Basin nonattainment area. The majority of population and VMT levels in Riverside County are also in the western portion of the County in the Los Angeles-South Coast Air Basin nonattainment area. The portion of Riverside County to the east of the Coachella Valley is sparsely populated with relatively low population and VMT. The central portion of the County – the Coachella Valley – has moderate levels of population and VMT as compared to the western and eastern portions of the County. Meteorology suggests that the violating monitors are impacted by winds primarily from the west. Geography and topography show significant variation within Riverside County. The Coachella Valley portion of Riverside County is bounded by mountain ranges to the east and to the west though a mountain pass allows winds to flow into the Coachella Valley from the west, and the nonattainment areas along the southern California coast. Therefore, meteorology, geography, and topography support the State's recommend boundary for the Coachella Valley nonattainment area. Finally, jurisdiction supports this boundary, as the entirety of the area is part of a separate air basin from the rest of the CSA.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation to designate Riverside County (Coachella Valley), CA as nonattainment for the 2015 ozone NAAQS. As noted, the EPA is designating the western portion of Riverside County as part of the Los Angeles-South Coast Air Basin nonattainment area. Further, EPA is not modifying the State's recommendation to designate the eastern portion of Riverside County as attainment/unclassifiable for the 2015 ozone NAAQS.

13.0 Technical Analysis for Sacramento Metro, CA

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. The EPA evaluated this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

Table 13.1 identifies the area of analysis for the Sacramento Metro, CA nonattainment area. The area of analysis includes all of El Dorado, Placer, Sacramento, Solano, Sutter, Yolo, and Yuba Counties. The area of analysis comprises all of the Sacramento—Roseville—Arden-Arcade, Yuba City, and Vallejo-Fairfield core-based statistical areas (CBSAs). These three CBSAs comprise a portion of two larger combined statistical areas (CSAs), the San Jose-San Francisco-Oakland CSA and Sacramento-Roseville CSA. The nonattainment area is identical to the existing 1997 and 2008 Sacramento Metro nonattainment areas.

The nonattainment areas of Amador County, Nevada County (Western part), San Francisco Bay Area, and San Joaquin Valley are adjacent to the Sacramento Metro nonattainment area. Information specific to counties in those areas is contained in the associated Technical Analysis sections for those nonattainment areas. Given the adjacency of these other nonattainment areas, the nonattainment area boundaries largely follow established jurisdictions in the State of California, while the areas of analysis are more expansive.

Table 13.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSAs	Associated CSAs
Sacramento Metro, CA	El Dorado County Placer County Sacramento County Solano County Sutter County Yolo County Yuba County	Sacramento--Roseville--Arden-Arcade CBSA Yuba City CBSA Vallejo-Fairfield CBSA	San Jose-San Francisco-Oakland CSA(partial)* Sacramento-Roseville CSA (partial)*

*The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 13.1 is a map of the EPA's nonattainment boundary for Sacramento Metro. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries.

For purposes of the 1997 and 2008 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 1997 and 2008 ozone NAAQS included the entire counties of Sacramento and Yolo, and parts of El Dorado, Placer, Solano, and Sutter counties. The Sacramento Metro area also includes portions of Indian country of the following tribes: Shingle Springs Band of Miwok Indians, Shingle Springs Rancheria (Shingle Springs Band), United Auburn Indian Community of the Auburn Rancheria of California (Auburn Rancheria), Wilton Rancheria, and Yocha Dehe Wintun Nation.

The EPA is not modifying the State's recommendation for the Sacramento, CA nonattainment area for the 2015 ozone NAAQS, which is the same as the boundary for the 1997 ozone NAAQS and the boundary for the 2008 ozone NAAQS.

Figure 13.1 The EPA's Nonattainment Boundaries for Sacramento Metro, CA.

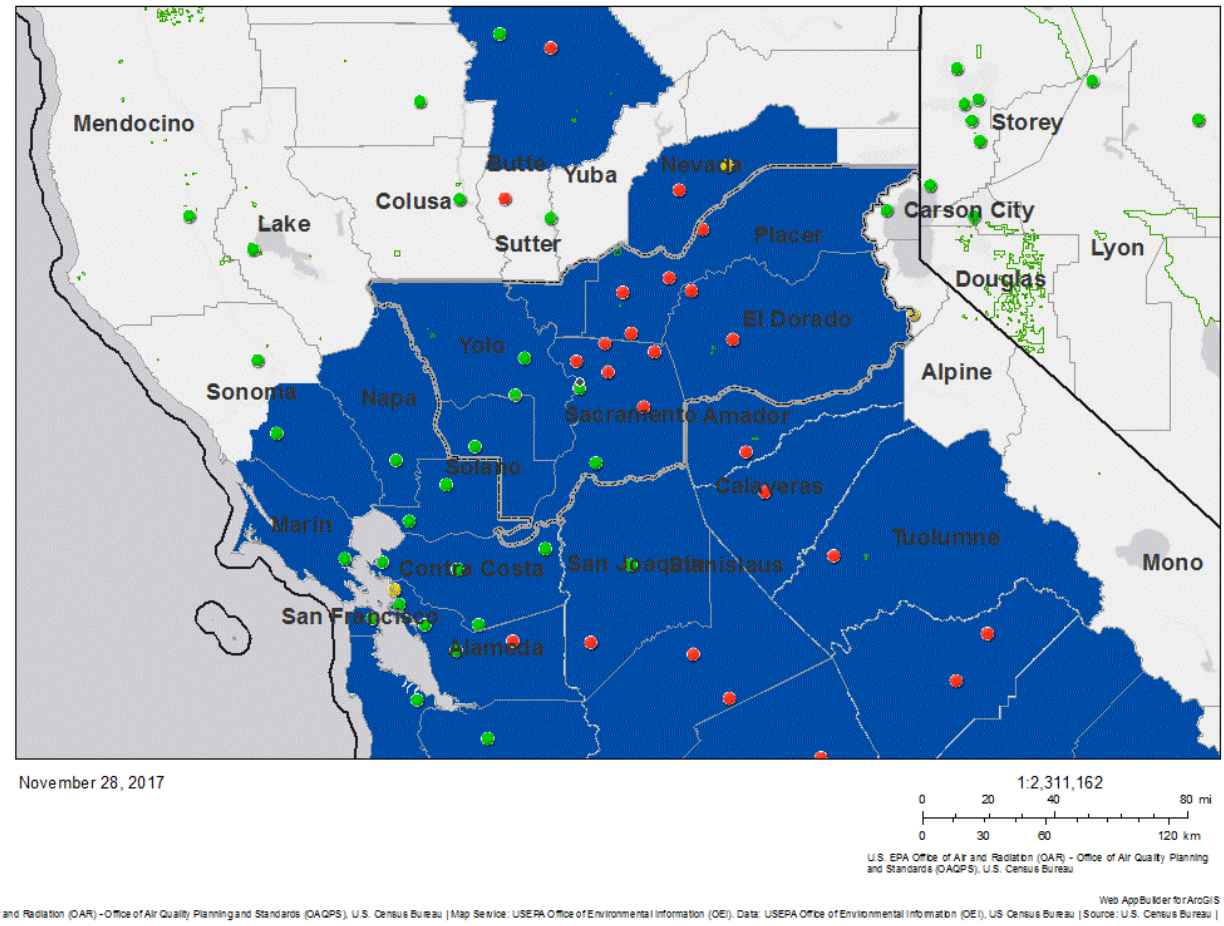


Figure 13.1 shows the EPA's nonattainment boundary for Sacramento Metro, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. El Dorado, Placer, Sutter, and Sacramento counties have monitors in violation of the 2015 ozone NAAQS, therefore these counties or portions of these counties are included in final nonattainment areas. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Sacramento Metro area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the

most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 13.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017, and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance.

Table 13.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
El Dorado, CA	Yes (partial)	06-017-0010	**0.085**	0.082	0.080	0.093
		06-017-0012	N/A	0.068	N/A	0.070
		06-017-0020	0.082	0.083	0.080	0.084
Placer, CA	Yes (partial)	06-061-0003	**0.083**	0.081	0.085	0.085
		06-061-0004	0.076	0.073	0.075	0.081
		06-061-0006	0.080	0.083	0.073	0.084
		06-061-1004	0.064	0.062	0.066	0.066
		06-061-2002	0.074	0.070	0.071	0.081
Sacramento, CA	Yes	06-067-0002	0.077	0.075	0.075	0.081
		06-067-0006	0.077	0.075	0.079	0.079
		06-067-0010	0.069	0.070	0.071	0.066
		06-067-0011	0.068	0.069	0.069	0.067
		06-067-0012	**0.083**	0.081	0.081	0.088
		06-067-0014	0.071	0.070	0.071	0.074
		06-067-5003	0.079	0.076	0.079	0.082
Solano, CA	Yes	06-095-0004	0.063	0.064	0.064	0.061
		06-095-0005	0.064	0.063	0.067	0.064
		06-095-3003	**0.067**	0.066	0.068	0.067
Sutter, CA	Yes (partial)	06-101-0003	0.065	0.069	0.064	0.063
		06-101-0004	**0.075**	0.075	0.072	0.080
Yolo, CA	Yes	06-113-0004	0.064	0.065	0.065	0.064
		06-113-1003	**0.069**	0.066	0.070	0.071
Yuba, CA	No	No monitor	N/A			

The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

El Dorado, Placer, Sacramento, and Sutter counties show violations of the 2015 ozone NAAQS, therefore these counties are included in nonattainment areas. All four counties are included, in part or in whole, in the Sacramento Metro nonattainment area. An additional area in the northern portion of Sutter County around the Sutter Buttes monitor (AQS ID 06-101-0004) is included in the Sutter Buttes nonattainment area, and the southwestern portion of Solano County is included in the San Francisco Bay Area nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 13.1, shown previously, identifies the Sacramento Metro nonattainment area and the violating monitors. Table 13.2 identifies the design values for all monitors in the area of analysis. As indicated on the map, there are 12 violating monitors that are located within the area of analysis. There is one violating monitor within the area of analysis, the Sutter Buttes monitor, that is included within the Sutter Buttes nonattainment area and further discussed in the Sutter Buttes technical analysis section of this document.

The violating monitors within the nonattainment area are generally located to the north and east of the center of the city of Sacramento. There are two counties in the eastern portion of the area of analysis:

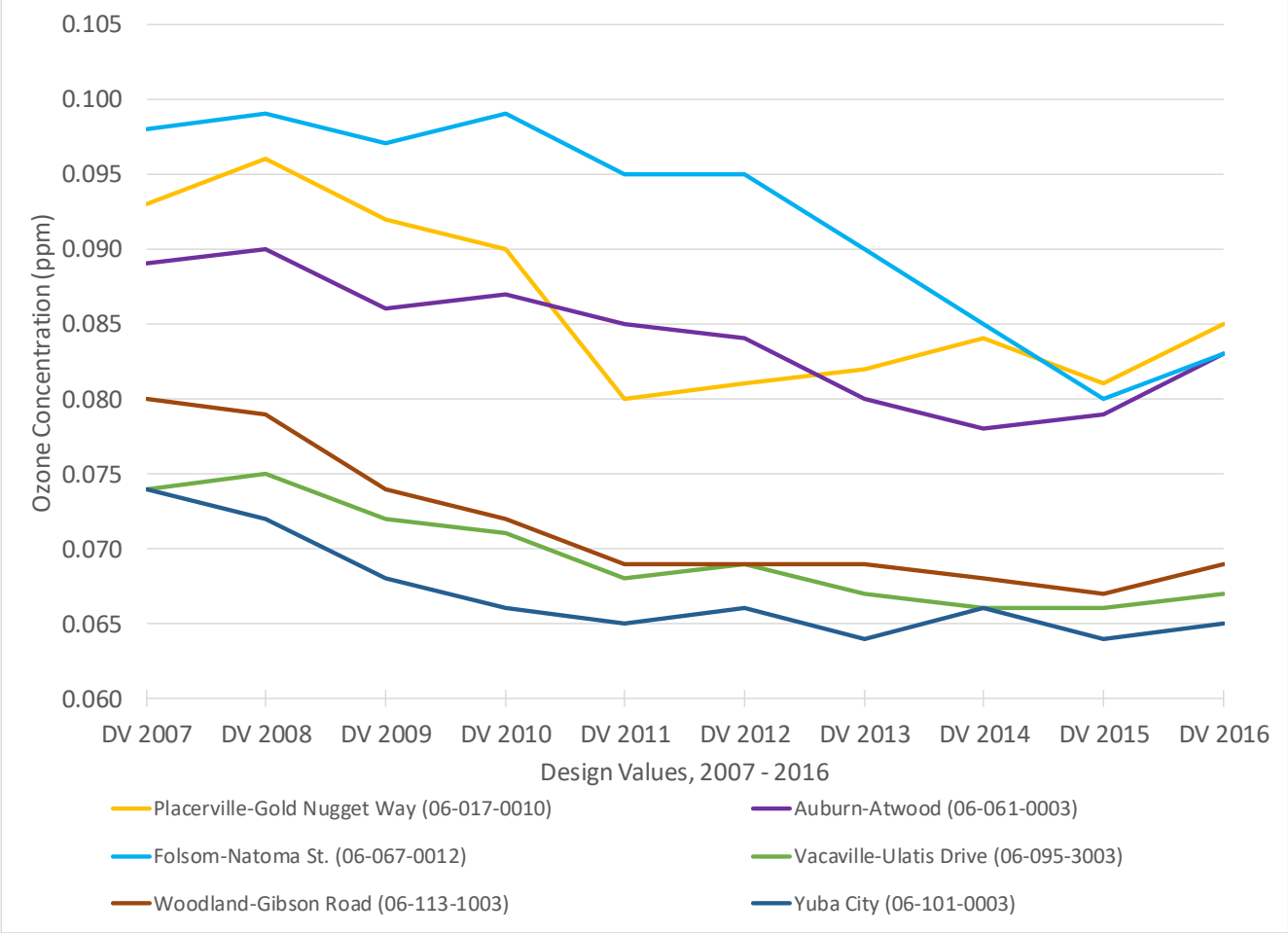
Placer and El Dorado. There is an attaining monitor in that easternmost portion of Placer County, the Tahoe City monitor (AQS ID 06-061-1004), with a valid 2016 DV of 0.064 ppm. Similarly, there is a monitor with an incomplete design value on the eastern edge of El Dorado County, the Echo Summit monitor (AQS ID 06-017-0012). The Echo Summit monitor's most recent valid DV was an attaining 2014 DV of 0.069 ppm. All other monitors within Placer and El Dorado counties are in the central or western portions of the counties and are violating the 2015 ozone NAAQS.

Five monitors with valid 2016 DVs within Sacramento County, the county in the middle of the area of analysis, are violating. Two other monitors in Sacramento County, the Sacramento-1309 T Street monitor (AQS ID 06-067-0010) and the Elk Grove-Bruceville monitor (AQS ID 06-067-0011), have valid, attaining 2016 DVs. The violating monitors in Sacramento County are generally located to the east and north of the attaining monitors in the county. Sutter County and Yuba County are the northern counties within the area of analysis. Yuba County does not have any monitors. Sutter County has one monitor in Yuba City (AQS ID 06-101-0003), located in the northern portion of the county, which has a valid attaining 2016 DV of 0.065 ppm. As previously mentioned, there is also a violating monitor in Sutter County, the Sutter Buttes monitor, that is included within the Sutter Buttes nonattainment area and further discussed in the Sutter Buttes technical analysis section of this document. Finally, on the western side of the area of analysis, are Yolo and Solano counties. Yolo County has two monitors with attaining 2016 DVs, while Solano County has three monitors with attaining 2016 DVs. The monitor with the highest 2016 DV in Yolo County is the Woodland-Gibson Road monitor (AQS ID 06-113-1003), which has a 2016 DV of 0.069 ppm. The monitor with the highest 2016 DV in Solano County is the Vacaville-Ulatis Drive monitor (AQS ID 06-095-3003), which has a 2016 DV of 0.067 ppm and is located in the northern portion of the county. Additional monitors located in the southern and eastern portions of Solano County are included within the San Francisco Bay Area nonattainment area and further discussed in the San Francisco Bay Area technical analysis section of this document.

Figure 13.2 shows the trends for previous design values at six monitoring sites located within the area of analysis. These six monitors were selected in order to be able to assess long-term trends for all counties in the area of analysis, not just those with violating monitors. The monitors with the highest 2016 DVs in each county, with the exception of Sutter County, are shown (El Dorado: Placerville-Gold Nugget Way (AQS ID 06-017-0010); Placer: Auburn-Atwood (AQS ID 06-061-0003); Sacramento: Folsom-Natoma St. (AQS ID 06-067-0012); Solano: Vacaville-Ulatis Drive; Yolo: Woodland-Gibson Road). For Sutter County, the Yuba City monitor is shown instead of the Sutter Buttes monitor, as it is closer to the Sacramento Metro nonattainment area boundary and is not included in a separate nonattainment area.

The Sacramento County, El Dorado County, and Placer County monitors shown in Figure 13.2 have been consistently above the 2015 ozone NAAQS for the past 10 years, while the monitors in Solano, Yolo, and Sutter counties have been consistently below the 2015 ozone NAAQS since 2011. The data also show that ozone concentrations have been generally trending down over the past 10 years, with moderate increases in ozone concentrations in 2016 at the three highest sites.

Figure 13.2 Three-Year Design Values for Select Monitors in the Area of Analysis (2007 – 2016).



El Dorado, Placer, Sacramento, and Sutter counties have one or more monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitors in El Dorado, Placer, and Sacramento counties are located within the portion of the counties that were included as part of the designated Sacramento Metro nonattainment area for the 1997 and 2008 ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 13.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Sacramento Metro nonattainment area.

Table 13.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Sacramento, CA	Yes	14,339	16,432
Placer, CA	Yes (partial)	9,007	32,825
Solano, CA	Yes	7,095	8,735
El Dorado, CA	Yes (partial)	7,041	97,307
Yolo, CA	Yes	4,517	4,267
Sutter, CA	Yes (partial)	3,370	2,545
Yuba, CA	No	1,517	2,262
	Area wide:	46,886	164,376

*For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown as square orange icons in Figure 13.3 below. The nonattainment boundary is also shown.

Figure 13.3 Large Point Sources in the Area of Analysis.

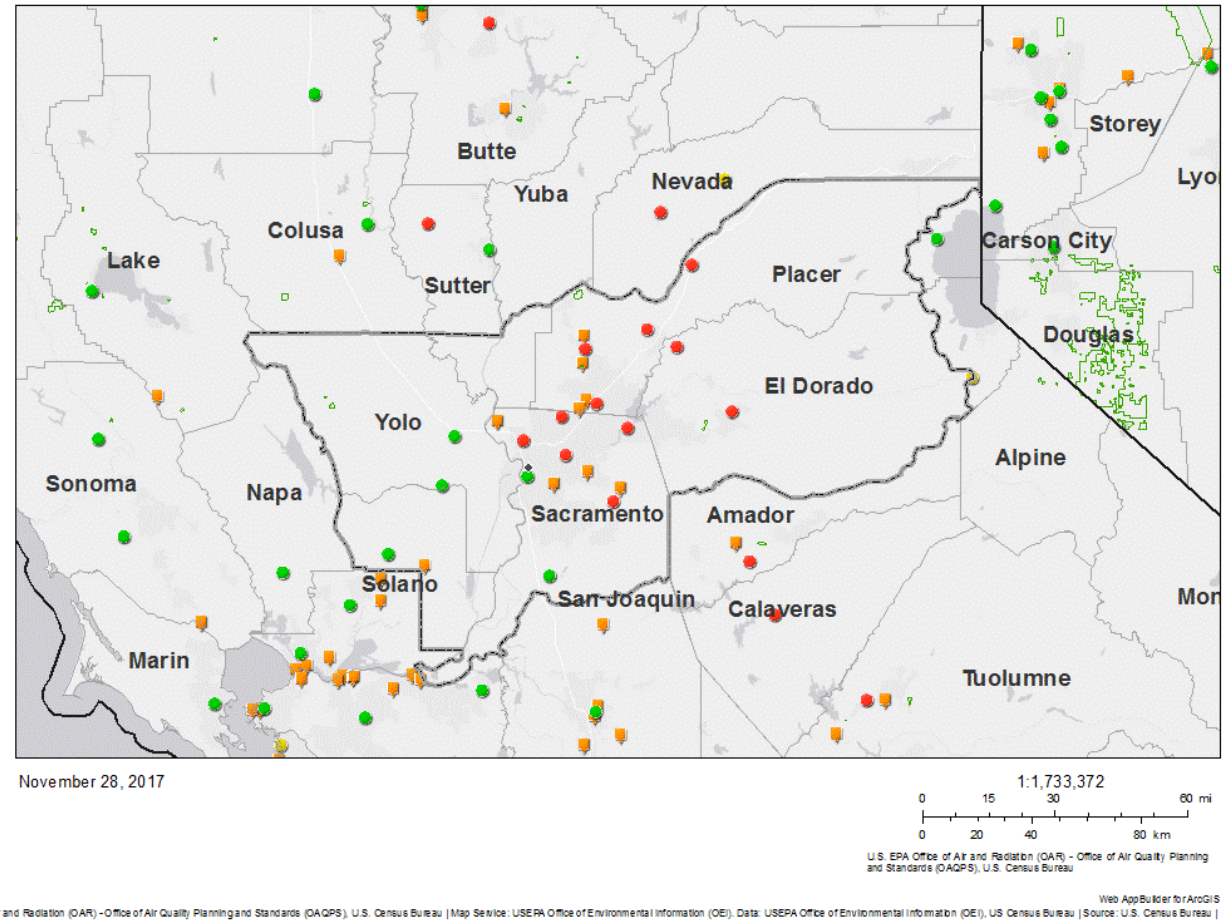


Figure 13.3 shows large point sources in the area of analysis for Sacramento Metro, CA as orange squares. The EPA's nonattainment boundary for Sacramento Metro, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission shows that Sacramento County has the highest NO_x emission levels (just over 14,300 tpy) within the area of analysis, while Placer, Solano and El Dorado have NO_x emissions around 7,000 to 9,000 tpy. Yolo County (around 4,500 tpy), Sutter County (around 3,400 tpy) and Yuba County (around 1,500 tpy) have the lowest NO_x emissions. El Dorado County, with just over 97,000 tpy, has the highest VOC emission levels within the area of analysis; total VOC emissions in El Dorado County are almost 3 times that in the Placer County, which has the next highest level of VOC emissions (around 32,800 tpy), and almost 6 times that in Sacramento County (around 16,400 tpy). Solano County has approximately 8,700 tpy while Yolo County (4,300), Sutter County (2,500) and Yuba County (2,300) have the lowest VOC emissions. There are no large point sources of ozone precursors within Yolo County, Yuba County, Sutter County, or within the eastern portions of Placer or El Dorado counties. There are a few large point sources located in southern Solano County, which are included in the San Francisco Bay Area nonattainment area. Most of the large point sources of ozone precursors are centralized around the urban core of the Sacramento Metro area in Sacramento County and western Placer County.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 13.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 13.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Sacramento, CA	Yes	1,418,788	1,501,335	1,556	82,547	6%
Solano, CA	Yes	413,344	436,092	531	22,748	6%
Placer, CA	Yes (partial)	348,432	375,391	267	26,959	8%
Yolo, CA	Yes	200,849	213,016	210	12,167	6%
El Dorado, CA	Yes (partial)	181,058	184,452	108	3,394	2%
Sutter, CA	Yes (partial)	94,737	96,463	160	1,726	2%
Yuba, CA	No	72,155	74,492	118	2,337	3%
	Area wide:	2,729,363	2,881,241	403	151,878	6%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 13.4 shows the county-level population density for the area of analysis. Sacramento County has the highest population and population density levels within the area of analysis – both population and population density in Sacramento County are approximately 3 times that of Solano County. Placer, Yolo, and El Dorado counties have populations between 184,000 and 376,000. Placer and Yolo Counties have population densities above 200 while El Dorado is the least densely populated county in the area of analysis with a density of 108. Sutter, and Yuba counties have the smallest populations, each less than 100,000 and, other than El Dorado, are the least densely populated.

Figure 13.4 County-Level Population.

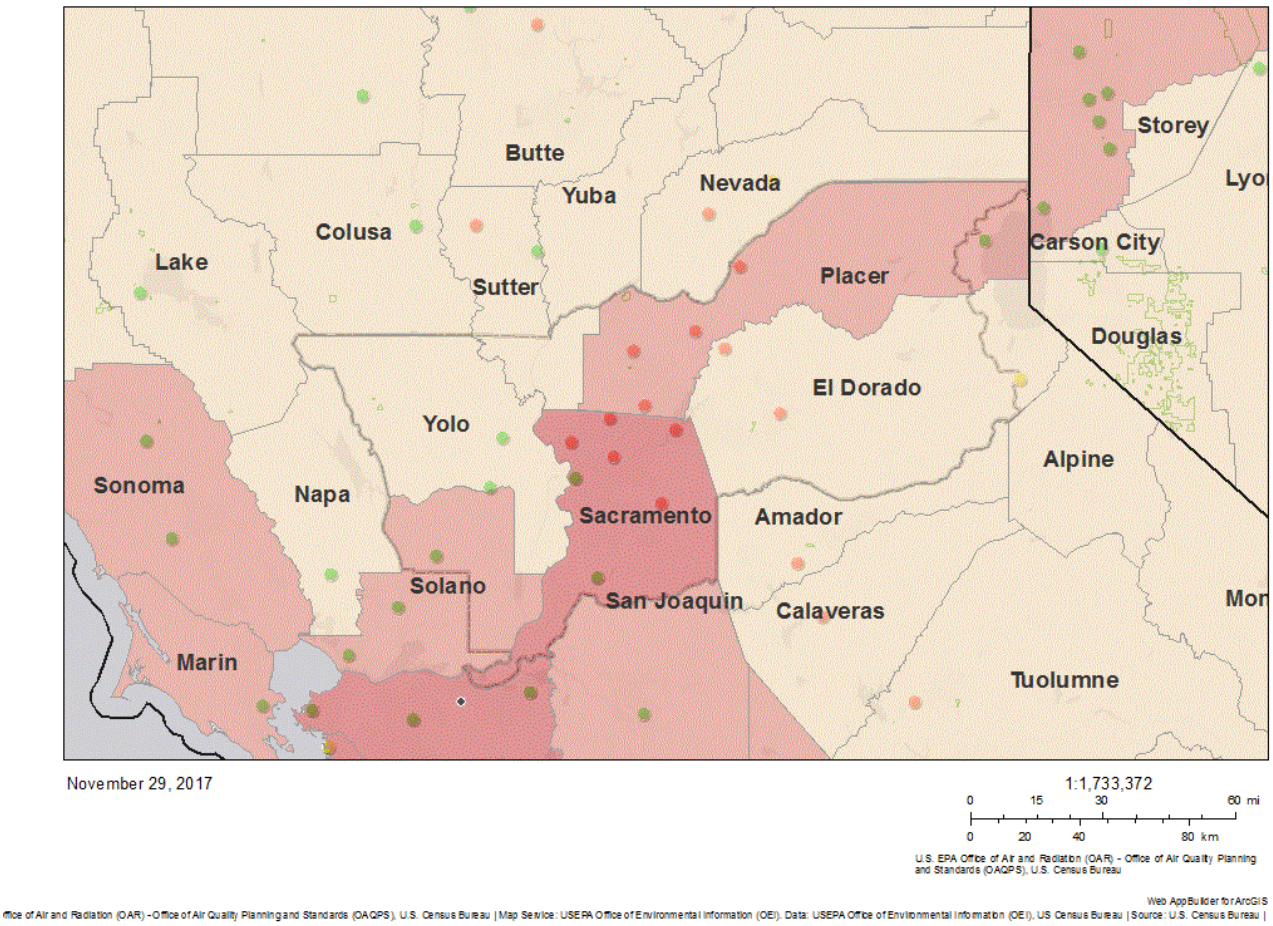


Figure 13.4 shows county-level population in the area of analysis for Sacramento Metro, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Sacramento Metro, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 13.5 shows the traffic and commuting pattern data, including total VMT for each county in the area of analysis, number of residents who work in each county, number of residents that work in counties with violating monitor(s), and the percent of residents working in counties with violating monitor(s). The data in Table 13.5 are 2014 data.

Table 13.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting to or Within Counties with Violating Monitor(s) within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis
Sacramento, CA	**Yes**	**11,526**	**586,073**	**418,249**	**71.4%**
Solano, CA	Yes	4,756	179,598	15,012	8.3%
Placer, CA	**Yes (partial)**	**3,503**	**144,549**	**103,595**	**71.7%**
Yolo, CA	Yes	1,995	80,542	28,723	35.7%
El Dorado, CA	**Yes (partial)**	**1,543**	**73,540**	**51,152**	**69.6%**
Sutter, CA	**Yes (partial)**	**830**	**36,280**	**20,102**	**55.4%**
Yuba, CA	No	606	23,728	10,062	42.4%
	Total:	24,759	1,124,310	646,895	57.5%

*For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 13.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 13.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

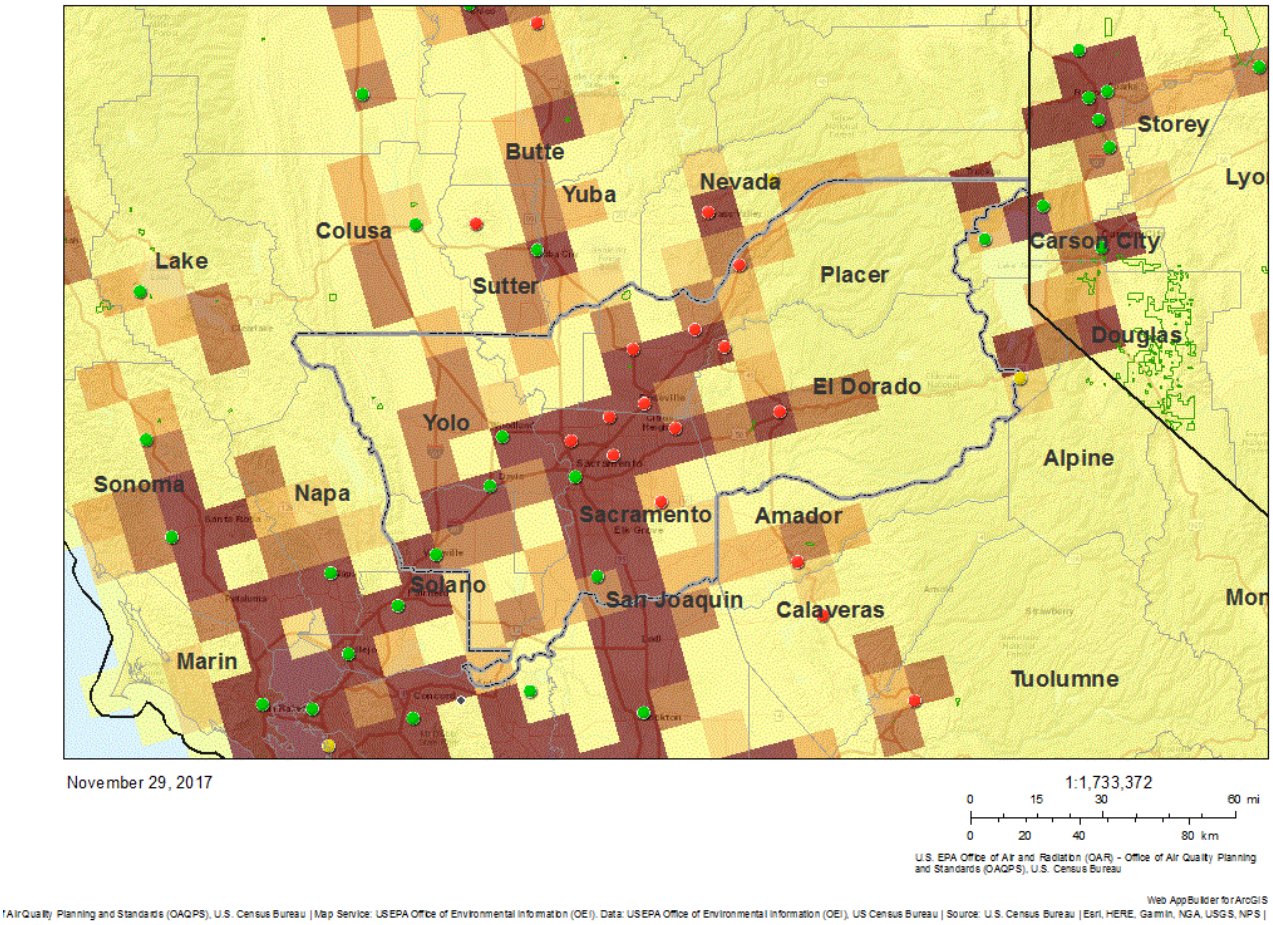


Figure 13.5 shows gridded VMT in the area of analysis for Sacramento Metro, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Sacramento Metro, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau[6], and shows that Sacramento County has the highest total VMT levels within the area of analysis, more than double that of the next highest county's VMT. The data also show that Sacramento, Placer, El Dorado, and Yolo counties contain the largest number of commuters to or within counties with violating monitor(s) within the area of analysis. Sutter and Yuba counties contain relatively fewer commuters to counties with violating monitor(s), but due to these two counties' relatively lower number of residents who work, the percentages of commuters to counties with violating monitor(s) for Sutter and Yuba counties is still over 40%. For Solano County, both the number and the percentage of commuters to counties with violating monitor(s) in the area of analysis is relatively small as compared to other counties in the area of analysis. Figure 13.5 shows that the highest VMT grid cells fall where the major transportation arteries run. The majority of these transportation arteries in the area of analysis converge in the city of Sacramento.

[6] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/ .

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figures 13.6a, b, and c show the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8-hour values that exceed the 2015 ozone NAAQS) for one violating monitor in each of the three counties that have violating monitors in the nonattainment area (see Factor 1): El Dorado (Figure 13.6a, Placerville-Gold Nugget Way monitor), Placer (Figure 13.6b, Colfax monitor), and Sacramento (Figure 13.6c, Folsom-Natoma St. monitor).

Figure 13.6a HYSPLIT Back Trajectories for Placerville (06-017-0010).

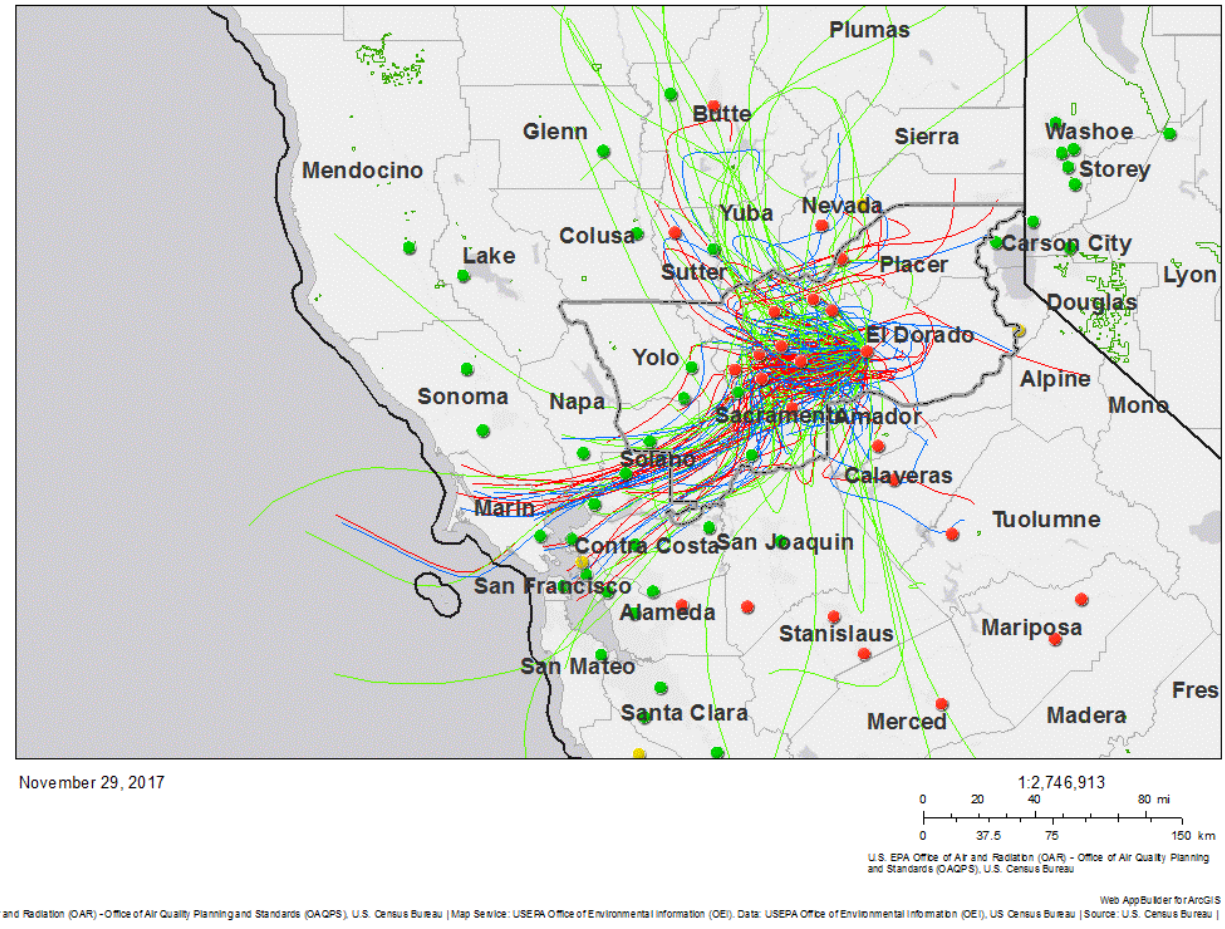


Figure 13.6a shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Sacramento Metro, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 13.6b HYSPLIT Back Trajectories for Colfax (06-061-0004).

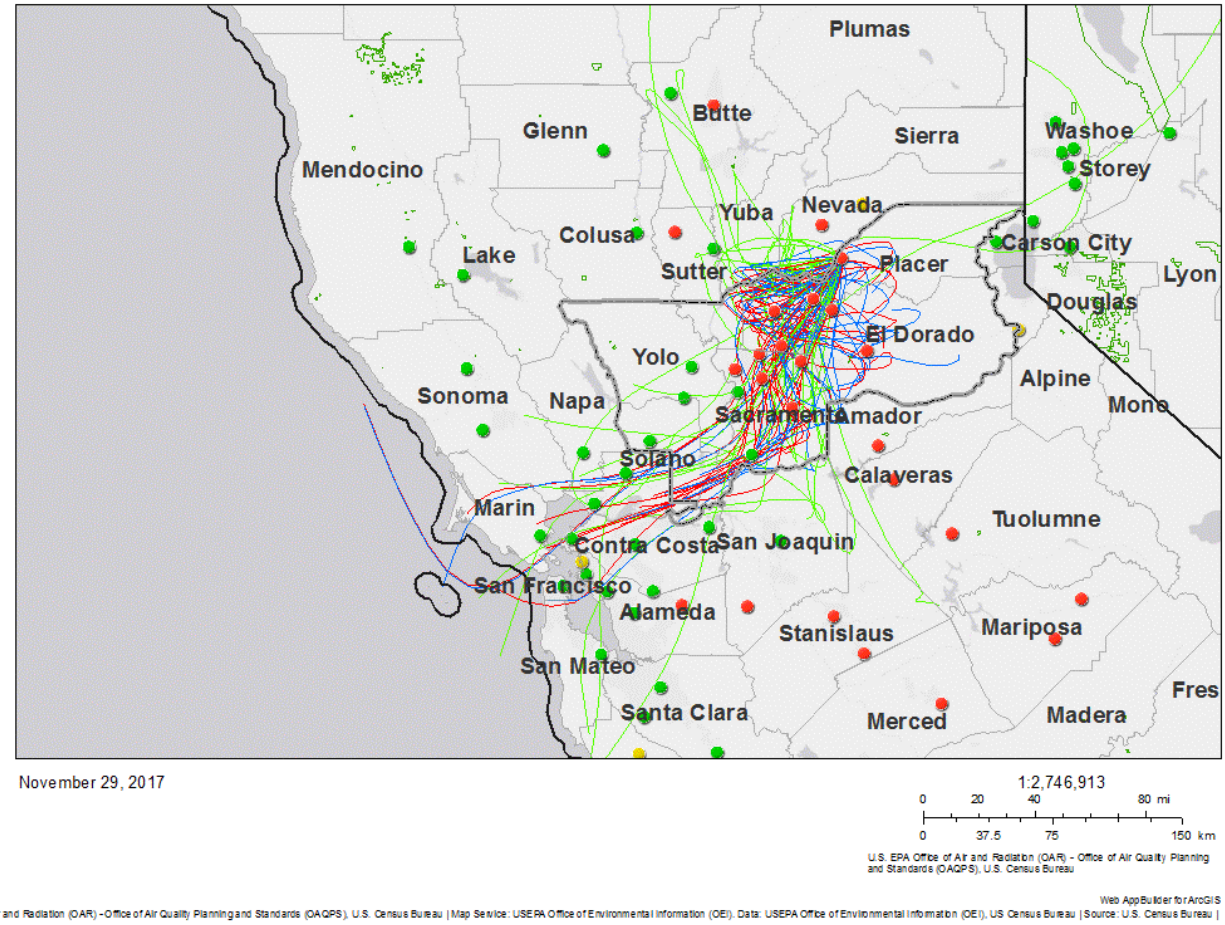


Figure 13.6b shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Sacramento Metro, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 13.6c HYSPLIT Back Trajectories for Folsom (06-067-0012).

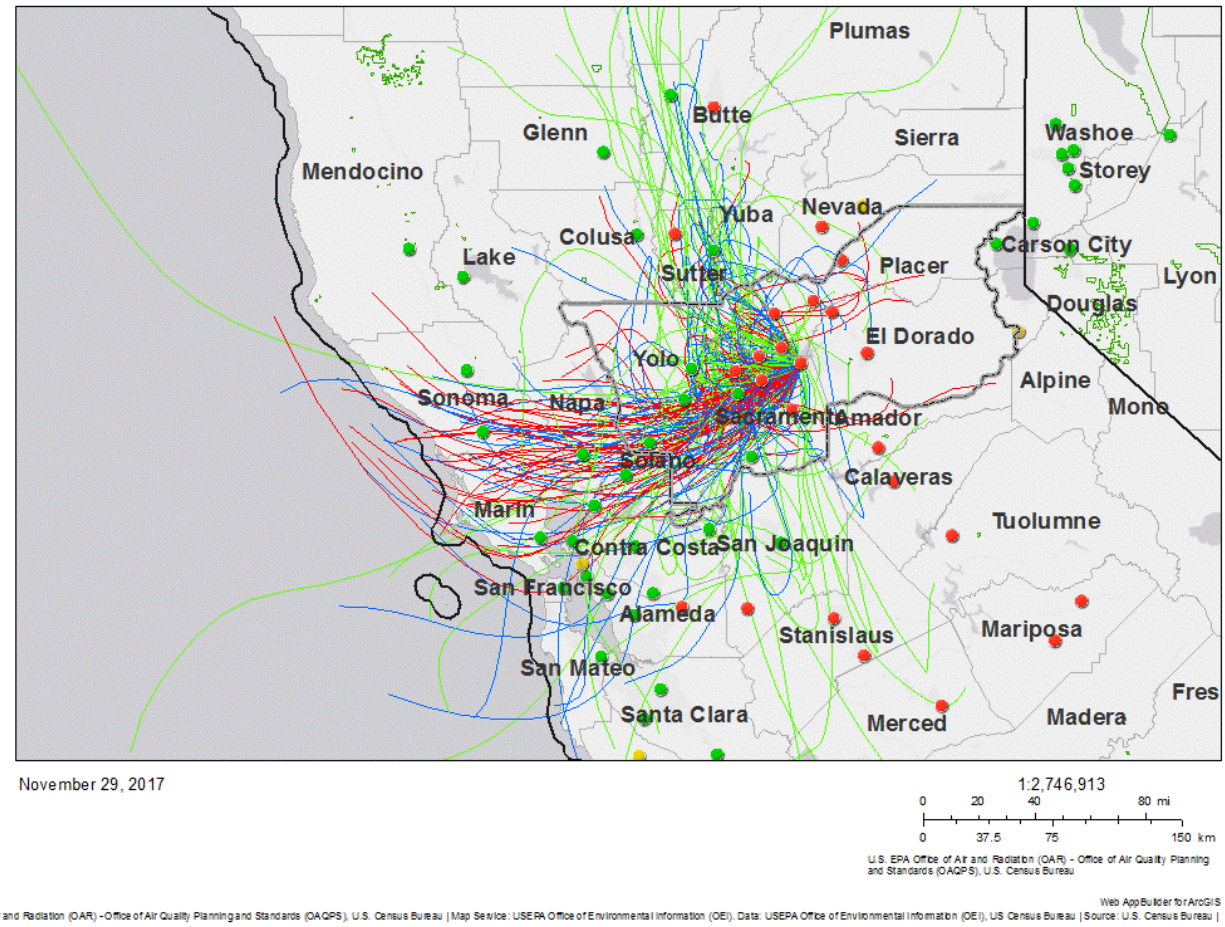


Figure 13.6c shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Sacramento Metro, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 are predominately from the south-southwest. The trajectories generally pass through Sacramento and Solano Counties prior to reaching the violating monitors. While not as dense as those from the south-southwest, multiple trajectories also pass through the Sutter, Yolo, Yuba and the western portions of El Dorado and Placer for some or all of the monitors.

This south-southwest wind flow is consistent with the position of the area with respect to the Golden Gate, the coastal entrance to the San Francisco Bay. This is the key route for air flow between the Pacific Ocean and the Central Valley of California (the northern half of which is the Sacramento Valley, which includes the Sacramento Metro area and areas farther north). It is also consistent with the orientation of the river valleys extending northeast of Sacramento into the foothills and ranges of the Sierra Nevada mountain range.

The Sacramento Metro area is part of the Central Valley, which experiences hot, dry summers that are conducive to ozone formation. There is no topographic feature between the Sacramento Valley and the San Joaquin Valley to the south, but generally the air flow from the Pacific Ocean through the

Golden Gate toward the east tends to bifurcate where the two valleys meet, providing some degree of separation between the two valleys much of the time.

While transport between adjacent areas can occur, the most important flow during ozone episodes within the Sacramento Metro area is toward the northeast and the foothills within the Sacramento Metro area itself. As previously discussed, the EPA is designating the adjacent San Francisco Bay Area, San Joaquin Valley, Amador County, and Nevada County areas as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for these areas.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. In the western U.S., topography has a significant impact on pollutant formation and transport, and thus plays an important role in assessing which areas are contributing to monitored violations of the NAAQS.

Figure 13.7 shows the topography for the area of analysis. California has historically been divided into fifteen distinct air basins. The Sacramento Metro nonattainment area is primarily located in the Sacramento Valley Air Basin, which consists of Shasta, Tehama, Glenn, Butte, Colusa, Yuba, Sutter, Placer (partial), Yolo, Solano (partial), and Sacramento counties. Placer County is included in three air basins: the western portion of the county is in the Sacramento Valley Air Basin, the central portion in the Mountain Counties Air Basin, and the easternmost portion in the Lake Tahoe Air Basin. El Dorado County is also divided between the Mountain Counties Air Basin and the Lake Tahoe Air Basin. The northern portion of Solano County is included in the Sacramento Valley Air Basin, while the southern portion is included in the San Francisco Bay Air Basin. The Sacramento Metro nonattainment area includes the Sacramento Valley Air Basin portion of Solano County, and all portions of Placer and El Dorado counties except those within the Lake Tahoe Air Basin.

The Sacramento Metro nonattainment area is at the southern end of the Sacramento Valley, the name for the northern half of California's broad, flat Central Valley. Two-thirds of the nonattainment area is flat, while the eastern third, composed of El Dorado County and the eastern portion of Placer County, is in the foothills and mountains of the Sierra Nevada range. These two counties include the range crest at over 2,500 meters (8,000 feet) elevation, which bounds the Sacramento Metro nonattainment area on the eastern side.

The area is bounded on the west by California's Coast Range, except for the gap leading to the Golden Gate. Air flows between the Pacific Ocean and the Central Valley of California through the gap.

The California Coast Range topographically separates the Sacramento Metro area from the San Francisco Bay area. The two areas have different topography, with the Sacramento Metro area being

mainly flat, and a part of the Central Valley, and the San Francisco Bay area being hillier, and a part of the Pacific coast.

As previously mentioned, while there is no topographic feature between the Sacramento Valley and the San Joaquin Valley to the south, generally the air flow from the Pacific Ocean through the Golden Gate toward the east tends to bifurcate where the two valleys meet, providing some degree of separation between the two valleys much of the time.

As previously discussed, the EPA is designating the adjacent San Francisco Bay Area, San Joaquin Valley, Amador County, and Nevada County areas as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for these areas.

Figure 13.7 Topographic Illustration of the Physical Features.

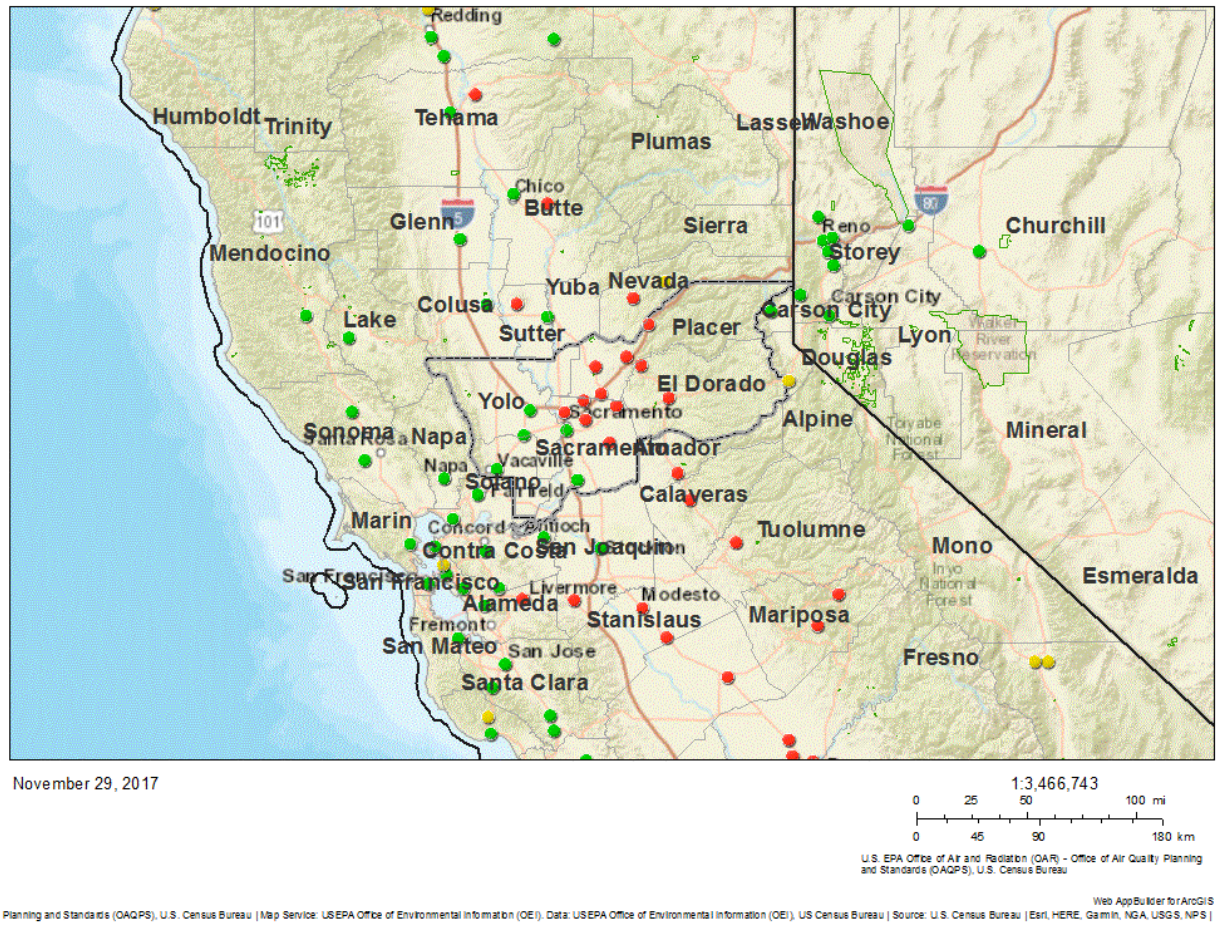


Figure 13.7 shows the topography in the area of analysis for Sacramento Metro, CA. The EPA's nonattainment boundary for Sacramento Metro, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for

nonattainment areas. In defining the boundaries of the Sacramento Metro nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 13.8 shows the relevant jurisdictional boundaries for the Sacramento Metro nonattainment area, including county, CSA, and CBSA boundaries, and areas of Indian country.

Figure 13.8 Jurisdictional Boundaries.

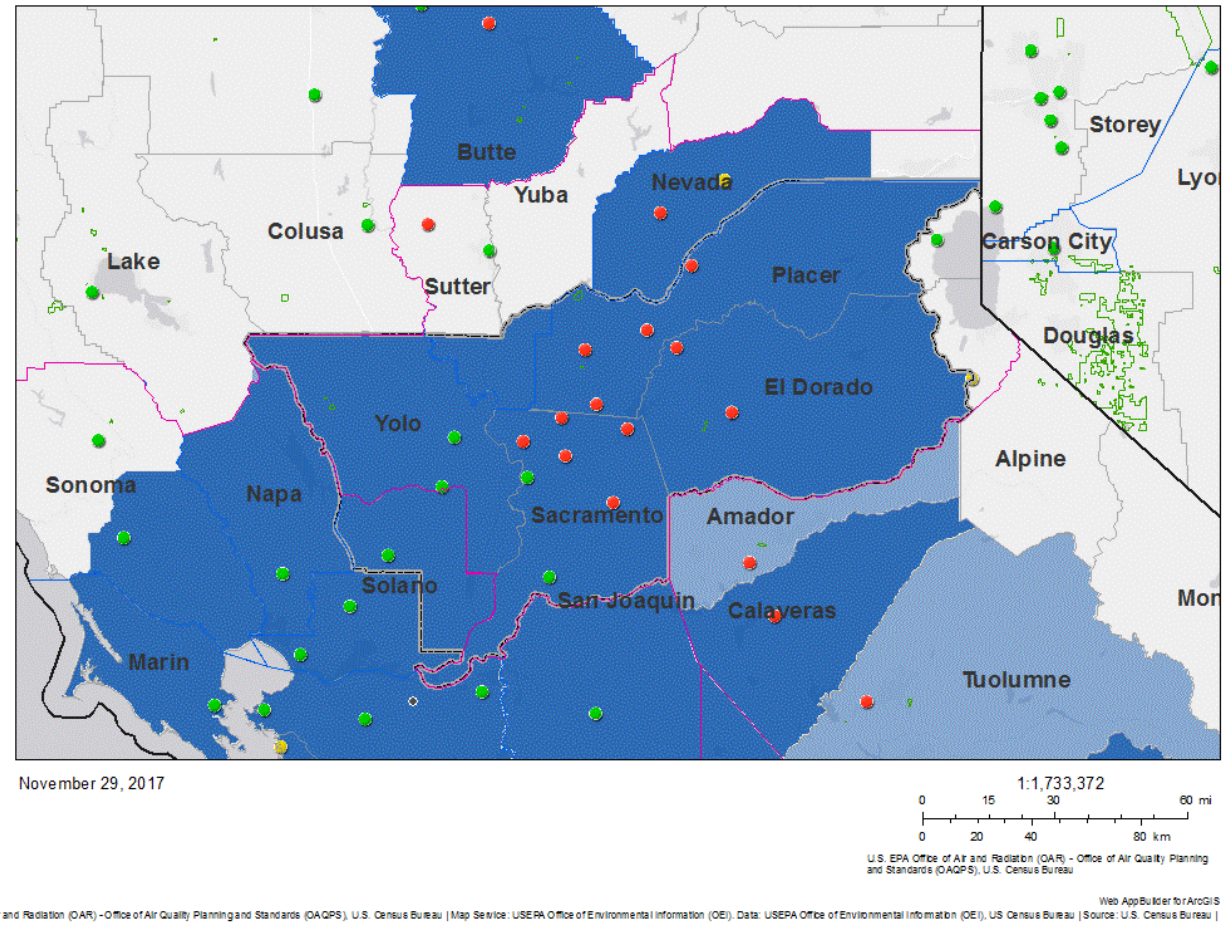


Figure 13.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for Sacramento Metro, CA. The EPA's nonattainment boundary for Sacramento Metro, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Sacramento Metro area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

The Sacramento Metro nonattainment area overlaps with the Office of Management and Budget's Sacramento-Roseville CSA. The CSA includes two MSAs (Sacramento-Roseville-Arden-Arcade and Yuba City) and one micropolitan statistical area (Truckee-Grass Valley). All of the counties in the CSA, with the exception of Nevada County were included in the area of analysis. While not included in the Sacramento Metro analysis, Nevada County is analyzed in the technical analysis section for the Nevada County (Western part), and the EPA is designating the western portion of Nevada County nonattainment. In addition, the area of analysis includes one county, Solano County, which is not part of the Sacramento-Roseville CSA. Solano County is part of the San Jose-San Francisco-Oakland CSA, and is discussed in both this analysis for the Sacramento Metro area and in the technical analysis for the San Francisco Bay Area nonattainment area. For previous ozone designations, and as described in these nonattainment area designations, Solano County has been split along air district boundaries between the Sacramento Metro and San Francisco Bay Area nonattainment areas.

The transportation planning agency with jurisdiction in the Sacramento Metro nonattainment area is the Sacramento Area Council of Governments metropolitan planning organization. Air quality planning is led by the largest air pollution control district in the area, the Sacramento Metro Air Quality Management District. Four other air districts participate in air planning and management in the area. The Yolo-Solano Air Quality Management District has jurisdiction over Yolo County and the Sacramento Metro nonattainment area portion of Solano County. Feather River Air Quality Management District has jurisdiction over Sutter and Yuba counties, including the southern Sutter County portion included in the Sacramento Metro nonattainment area. Placer County Air Pollution Control District has jurisdiction over Placer County, and El Dorado County Air Quality Management District has jurisdiction over El Dorado County.

As mentioned above, the Sacramento Metro area also includes portions of Indian country of the following tribes: Shingle Springs Band, Auburn Rancheria, Wilton Rancheria, and Yocha Dehe Wintun Nation. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

Conclusion for Sacramento Metro, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to include the following counties in the Sacramento Metro nonattainment area for the 2015 ozone NAAQS: El Dorado (partial), Placer (partial), Sacramento, Solano (partial), Sutter (partial), and Yolo counties. These are the same counties that are included in the Sacramento Metro nonattainment area for the 1997 and 2008 ozone NAAQS. The air quality monitors in El Dorado, Placer, Sacramento, and Sutter counties indicate violations of the 2015 ozone NAAQS based on the 2016 design values, therefore these counties or portions of these counties are included in nonattainment areas. All of the violating monitors in El Dorado, Placer, and Sacramento counties are included in the Sacramento Metro nonattainment area. The violating monitor in Sutter County, which is located in the northern part of the county, is included in the Sutter Buttes nonattainment area. The southern portion of Sutter Buttes County is included in the Sacramento Metro nonattainment area.

Solano and Yolo are nearby counties that do not have violating monitors. Solano County is one of the most populous and densely populated counties in the area of analysis and has moderately high levels of precursor emissions considering the counties in the area of analysis. Yolo County has among the lowest emissions and population of the counties in the area of analysis. HYSPLIT trajectories that show winds during exceedance days coming predominantly from the south-southwest, through Solano County. While there are fewer trajectories coming from the north-northwest, through Yolo County, they are moderately dense in particular for the Folsom monitor. The easternmost monitors in El Dorado and Placer counties have attaining design values, and clear topographical boundaries that support inclusion of only the western portions of El Dorado and Placer counties. There are also topographical boundaries that separate the Sacramento Metro area from the San Francisco Bay area. As previously noted, the EPA is designating Amador County, Nevada County (Western part), Sutter Buttes, San Francisco Bay, and San Joaquin Valley as separate nonattainment areas.

The EPA is not modifying the State's recommendation to designate Yuba County as attainment/unclassifiable for the 2015 ozone NAAQS. Yuba County has the lowest emissions of all of the counties in the area of analysis and ranks at or near the bottom for both population and traffic.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation to include the identified portions of the Sacramento Metro area within the nonattainment boundary for the 2015 ozone NAAQS.

14.0 Technical Analysis for San Diego County, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. The EPA evaluated this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

For the EPA's nonattainment boundary for San Diego County, the area of analysis includes the San Diego-Carlsbad CBSA which is the same as the existing 2008 ozone NAAQS nonattainment area and 1997 ozone NAAQS maintenance area boundaries. The San Diego-Carlsbad CBSA has the same boundary as San Diego County. The Imperial County nonattainment area is adjacent to the eastern border of San Diego County, while the northern border of the county is adjacent to the Los Angeles-South Coast Air Basin, Pechanga Band of Luiseno Mission Indians (Pechanga Band), and Riverside County (Coachella Valley) nonattainment areas. Information specific to the counties in those areas is contained in the associated Technical Analysis sections for those nonattainment areas. The San Diego County nonattainment area is bordered to the south by Mexico. Although there may be potential impacts to air quality in the San Diego County nonattainment area from sources in Mexico, because these sources lie outside of the U.S., the EPA did not include any portion of Mexico in the area of analysis.

Table 14.1 identifies the area of analysis for the San Diego County nonattainment area. The area of analysis includes all of San Diego County. The area of analysis comprises all of the San Diego-Carlsbad CBSA. There is no CSA associated with this area. The nonattainment area is identical to the existing 2008 ozone NAAQS nonattainment area and 1997 ozone NAAQS maintenance areas.

Table 14.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
San Diego County, CA	San Diego County	San Diego-Carlsbad CBSA	None

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 14.1 is a map of the EPA's nonattainment boundary for San Diego County. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment area boundaries.

For purposes of the 1997 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 1997 ozone NAAQS included the entirety of San Diego County. The area has since been redesignated to attainment/maintenance for the 1997 ozone NAAQS. For purposes of the 2008 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 2008 ozone NAAQS also included the entirety of San Diego County. The San Diego County area also includes Indian country of the following tribes: Barona Group of Capitan Grande Band of Mission Indians (Barona Band), Campo Band of Diegueno Mission Indians (Campo Band), Capitan Grande Band of Diegueno Mission Indians of California (Capitan Grande Band), Ewiiaapaayp Band of Kumeyaay Indians (Ewiiaapaayp Band), Iipay Nation of Santa Ysabel (Iipay Nation), Inaja Band of Diegueno Mission Indians of the Inaja and Cosmit Reservation (Inaja-Cosmit Band), Jamul Indian Village of California (Jamul Tribe), La Jolla Band of Luiseno Indians (La Jolla Band), La Posta Band of Diegueno Mission Indians (La Posta Band), Los Coyotes Band of Cahuilla and Cupeno Indians (Los Coyotes Band of Indians), Manzanita Band of Diegueno Mission Indians (Manzanita Band), Mesa Grande Band of Diegueno Mission Indians (Mesa Grande Band), Pala Band of Mission Indians (Pala Band), Pauma Band of Luiseno Mission Indians of the Pauma and Yuima Reservation (Pauma Band), Rincon Band of Luiseno Mission Indians (Rincon Band), San Pasqual Band of Diegueno Mission Indians of California (San Pasqual Band), Sycuan Band of the Kumeyaay Nation (Sycuan Band), and Viejas (Baron Long) Group of Capitan Grande Band of Mission Indians (Viejas Band).

The EPA is not modifying the State's recommendation to include San Diego County as the EPA's boundary for the 2015 ozone NAAQS and this is the same as the boundary for the 2008 ozone NAAQS and the 1997 ozone NAAQS.

Figure 14.1 EPA's Nonattainment Boundaries for San Diego County, CA.

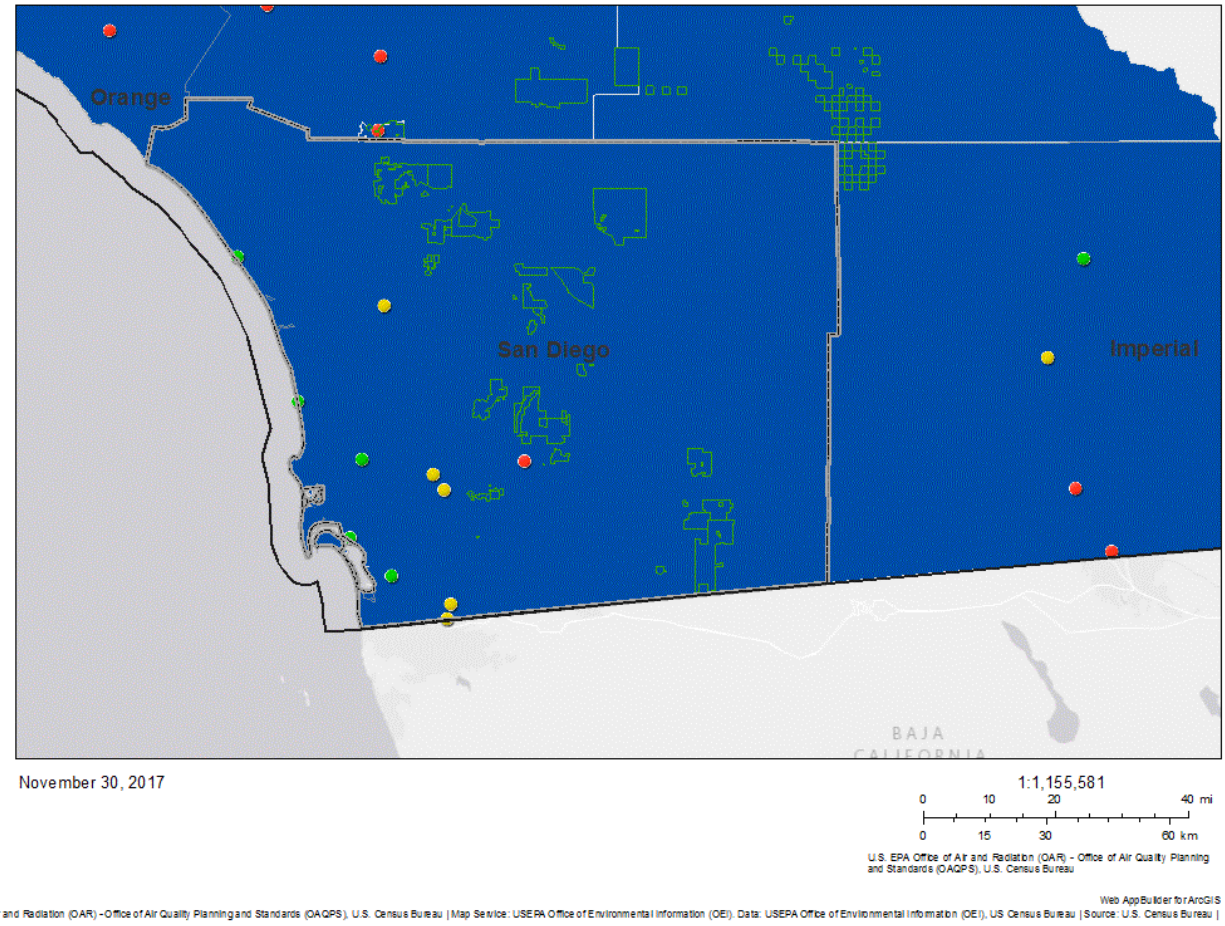


Figure 14.1 shows the EPA's nonattainment boundary for San Diego County, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. San Diego County has a monitor in violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the San Diego County area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the

most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values. Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 14.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 14.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
San Diego, CA	Yes	06-073-0001	0.061	0.063	0.061	0.061
		06-073-1001	0.067	0.073	0.064	0.064
		06-073-1002	N/A	0.076	0.069	N/A
		06-073-1006	**0.081**	0.080	0.079	0.084
		06-073-1008	0.070	0.071	0.068	0.071
		06-073-1010	0.062	0.068	0.061	0.058
		06-073-1014	N/A	0.063	0.069	0.071
		06-073-1016	0.068	0.071	0.067	0.068
		06-073-1018	N/A	0.067	0.065	0.070
		06-073-1022	N/A	N/A	N/A	0.065
		06-073-2007	N/A	0.049	N/A	N/A

The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

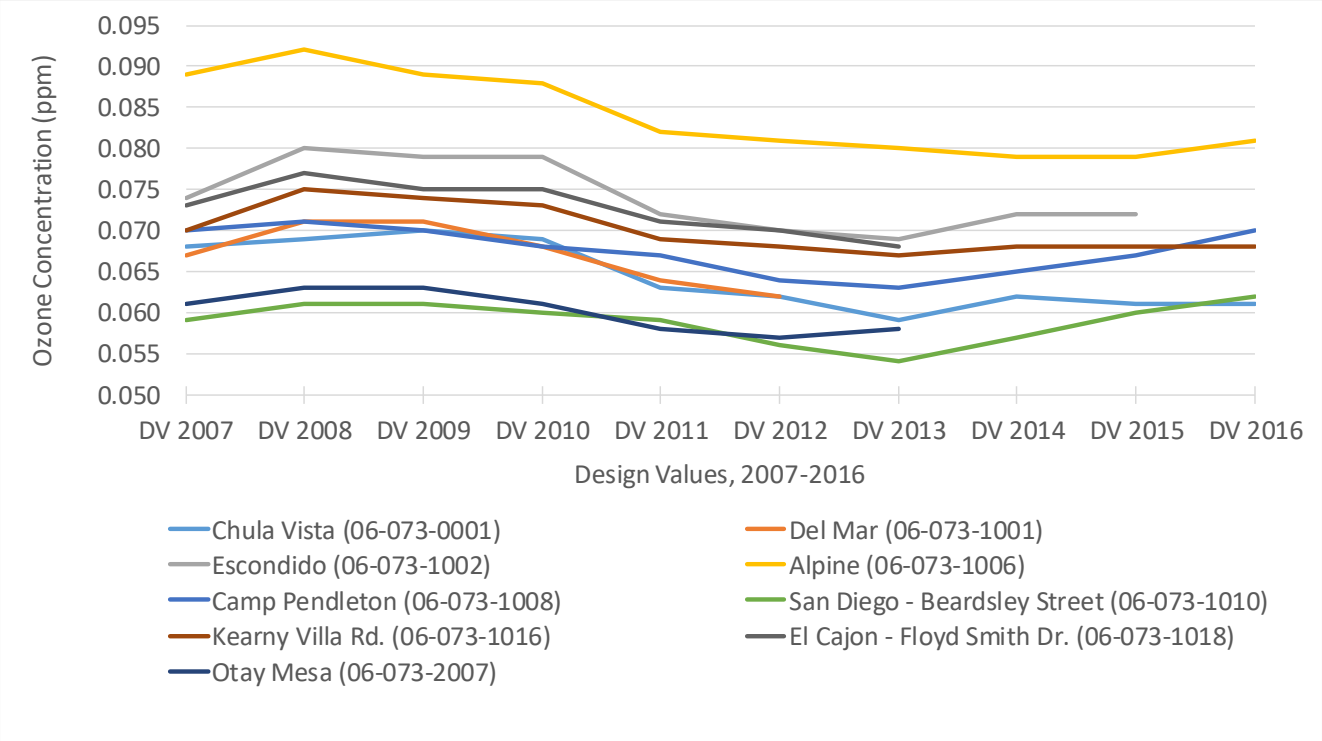
San Diego County shows a violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 14.1, shown previously, identifies the San Diego County nonattainment area and the violating monitors. Table 14.2 identifies the design values for all monitors in the area of analysis. Figure 14.2 shows the historical trend of design values for monitors in the area of analysis. As indicated on the map, there is one violating monitor, the Alpine monitor (AQS ID 06-073-1006), that is located in the city of Alpine, in the central portion of San Diego County. The next highest design value monitor, Camp Pendleton (AQS ID 06-073-1008) with a design value of 0.070, is located in the city of Camp Pendleton South, in the northwestern portion of San Diego County. The Escondido monitor (AQS ID 06-073-1002) is located in the northern portion of San Diego County. The Kearny Villa Rd. monitor (AQS ID 06-073-1016) is located in the city of San Diego, in the western portion of San Diego County. The Del Mar monitor (AQS ID 06-073-1001) is located in the city of Del Mar, in the western portion of San Diego County. The San Diego – Beardsley monitor (AQS ID 06-073-1010) is located in the city of San Diego, in the southwestern portion of San Diego County. The Chula Vista monitor (AQS ID 06-073-0001) is located in the city of Chula Vista, in the southwestern portion of San Diego County.

As shown in Figure 14.2, the trends for previous design values at monitoring sites located within the area of analysis show that the Alpine monitor (AQS ID 06-073-1006) continues to violate the 2015 ozone NAAQS, with a historical downward trend except for a rise in the last two years. The Camp Pendleton monitor (AQS ID 06-073-1008) had a historical downward trend until 2013 when the design value started rising. The Escondido monitor (AQS ID 06-073-1002) has had a historical downward trend since 2008, with the design value levelling off since 2012. The Kearny Villa Rd. monitor (AQS ID 06-073-1016) has had a historical downward trend since 2008, with the design value leveling off since 2012. The Del Mar monitor (AQS ID 06-073-1001) has had a historical downward trend in design value. The San Diego – Beardsley monitor (AQS ID 06-073-1010) had a historical downward

trend until 2013 when the design value started rising. The Chula Vista monitor (AQS ID 06-073-0001) has had a historical downward trend since 2009, with the design value tending to level off since 2012.

Figure 14.2 Three-Year Design Values for Monitors in the Area of Analysis (2007 – 2016).



San Diego County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitor is located within San Diego County which is included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and small point sources and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 14.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the San Diego County nonattainment area.

Table 14.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
San Diego, CA	Yes	33,139	54,240
	Area wide:	33,139	54,240

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large and small point sources are shown in Figure 14.3 below. The nonattainment boundary is also shown.

Figure 14.3 Large and Small Point Sources in the Area of Analysis.

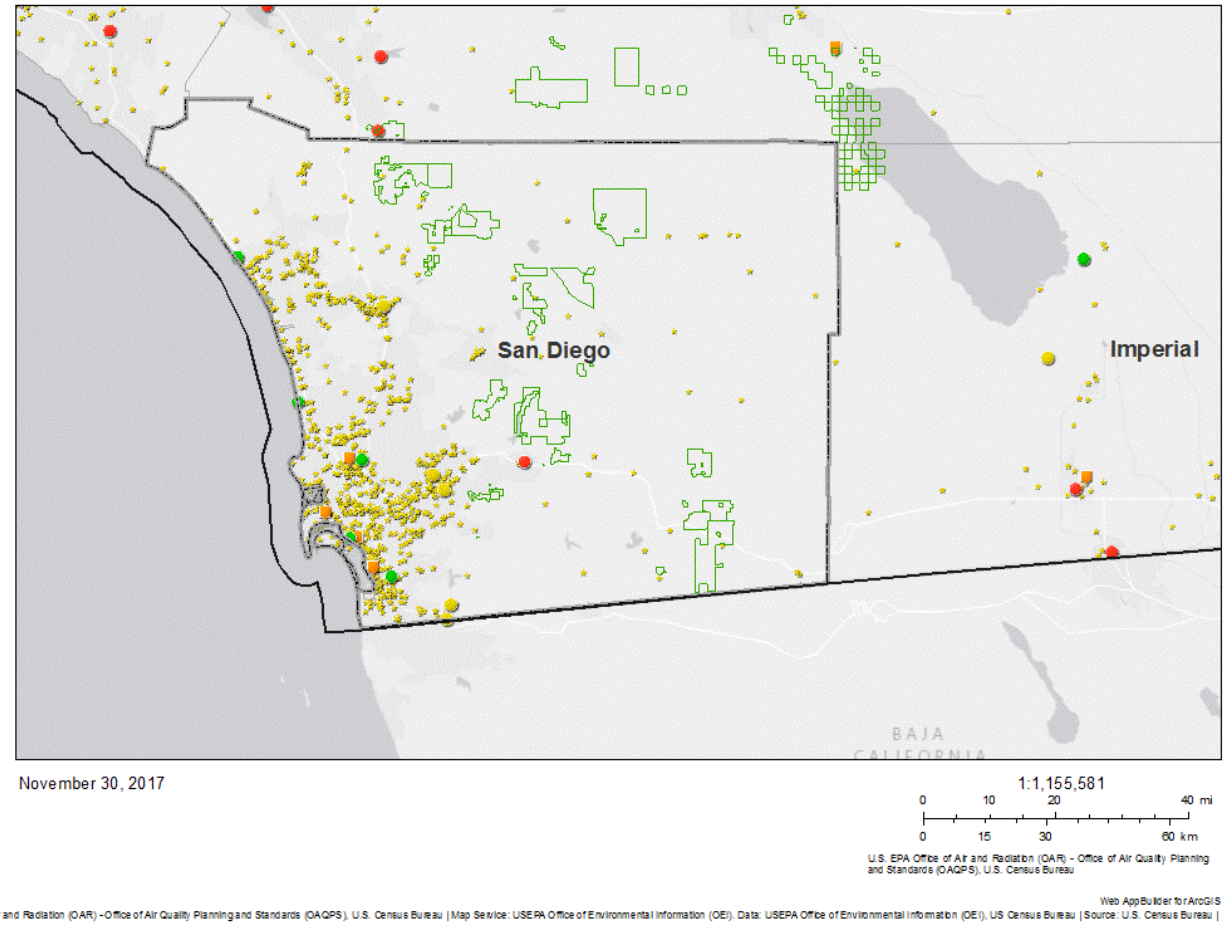


Figure 14.3 shows large point sources in the area of analysis for San Diego County, CA as orange squares. Small point sources are shown as yellow stars. The EPA's nonattainment boundary for San Diego County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

In summary, the EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission showed total emission levels of 33,139 tpy of NOx and 54,240 tpy of VOC, based on the 2014 NEI. The four large point sources noted on Figure 14.3 are located in the southwestern

portion of San Diego County. Small point sources are concentrated in the western half of San Diego County.

Emissions sources in Mexico may potentially contribute to violations of the ozone NAAQS in San Diego County, but because Mexico is outside of the U.S., the EPA did not include these emissions as part of our analysis.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 14.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 14.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
San Diego, CA	Yes	3,095,313	3,299,521	784	204,208	7%
	Area wide:	3,095,313	3,299,521	784	204,208	7%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 14.4 shows the 2012 census tract-level population information for San Diego County, which had a 2015 population of 3,299,521 people. Generally, the western portion of the county has the highest population levels within the area of analysis.

Figure 14.4 Census Tract-Level Population.

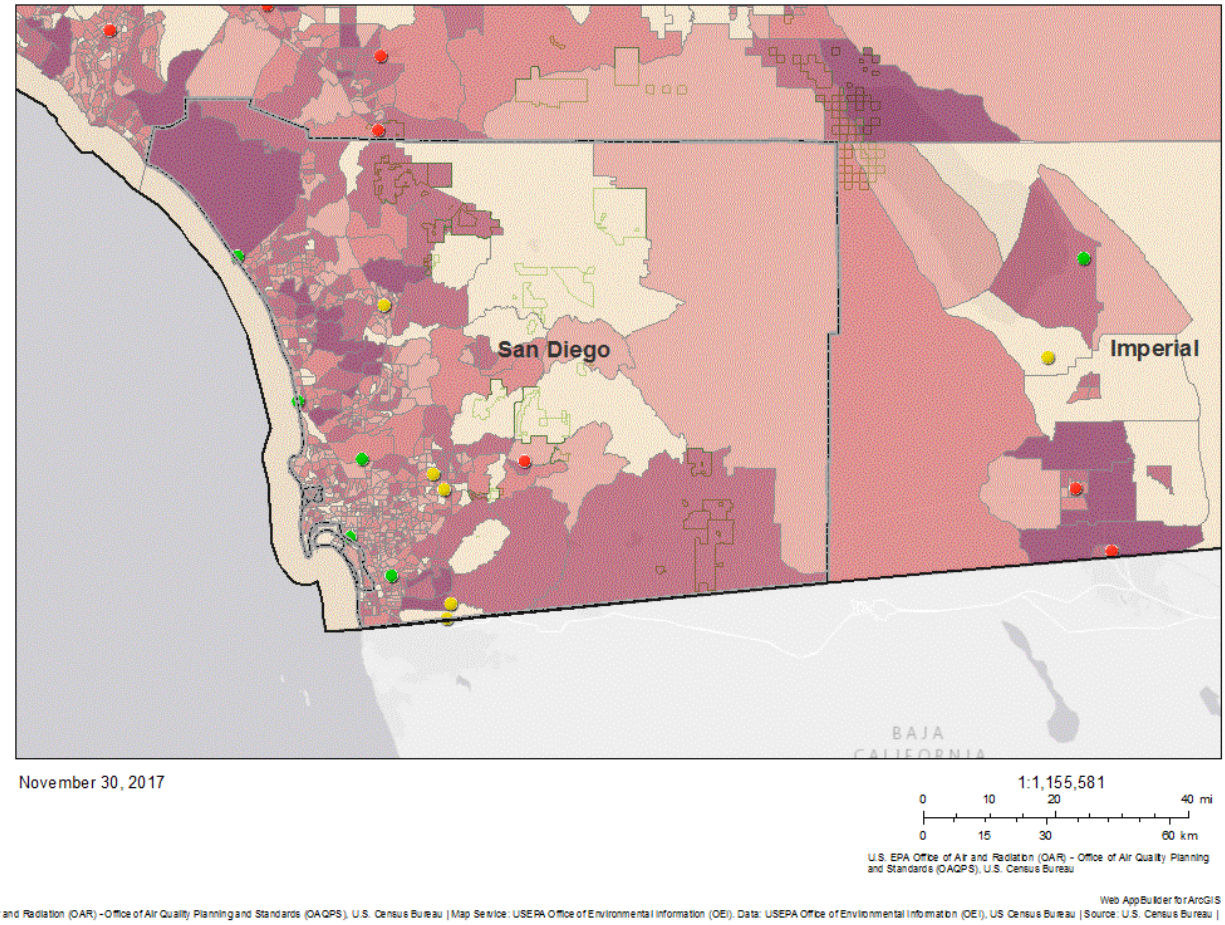


Figure 14.4 shows census tract population in the area of analysis for San Diego County, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for San Diego County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 14.5 shows the traffic and commuting pattern data, including total VMT for San Diego county, number of residents who work in the county, number of residents that work in the county with a violating monitor, and the percent of residents working in the county with a violating monitor. The data in Table 14.5 are 2014 data.

Table 14.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) Within Area of Analysis
San Diego, CA	**Yes**	**29,228**	**1,331,123**	**1,065,313**	**80.0%**
	Total:	29,228	1,331,123	**1,065,313**	**80.0**%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 14.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 14.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

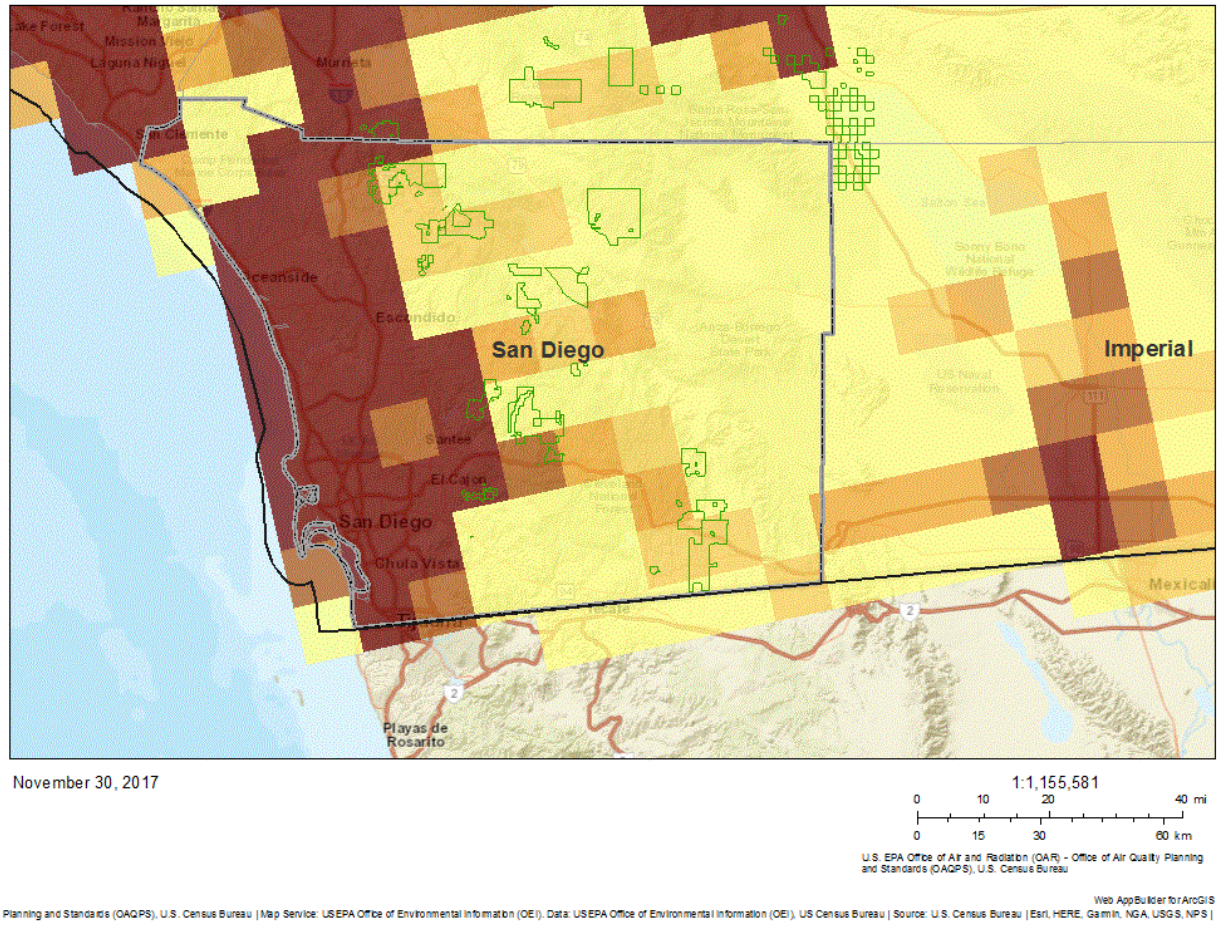


Figure 14.5 shows gridded VMT in the area of analysis for San Diego County, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for San Diego County, CA is shown as a gray line with a dashed black center. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau[2], and shows that San Diego County has a total 2014 VMT of 29,228 million miles. The twelve-kilometer

grids with the highest VMT occur in the western portion of the county and are associated with major transportation arteries.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 14.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

Figure 14.6. HYSPLIT Back Trajectories for Violating Monitor in Alpine (06-073-1006).

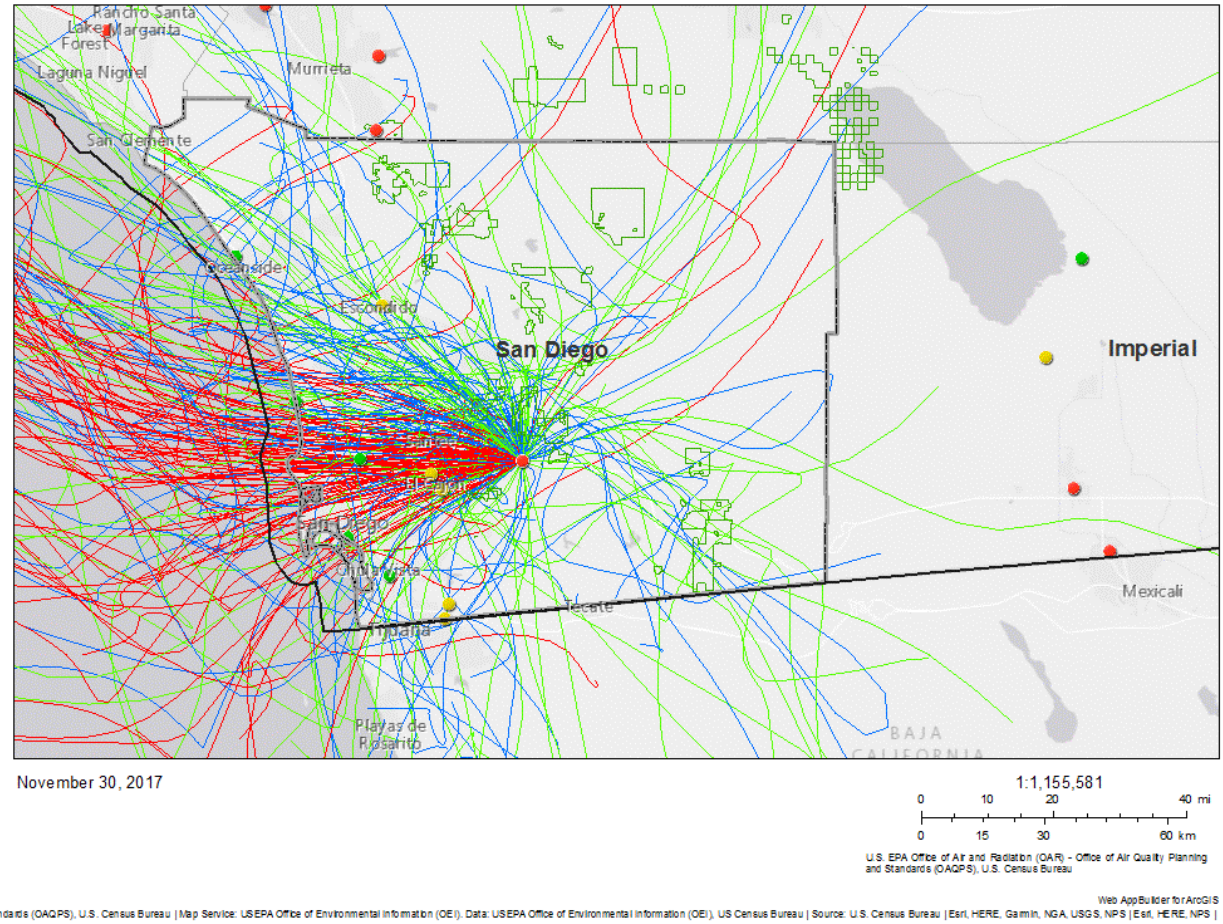


Figure 14.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Diego County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally pass through most areas included in the area of analysis, which indicates that sources previously discussed in Factor 2 in San Diego County may be contributing to exceedances or violations of the 2015 ozone NAAQS. The HYSPLIT results show that the winds during exceedance days are predominately from the west.

As previously discussed, the EPA is designating the adjacent Los Angeles-South Coast Air Basin, Imperial County, and Pechanga Band of Luiseno Mission Indians areas as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for these areas.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

In the western U.S., topography impacts pollutant formation and transport in California, and thus plays an important role in assessing what areas are contributing to monitored violations of the NAAQS.

Figure 14.7 shows the topography for San Diego County. The Laguna Mountains are bordered by the Cuyamaca Mountains area on the west and the Colorado Desert on the east, where the mountains form a steep escarpment along the Laguna Salada Fault. The highest point is Cuyapaipe Mountain at 6,378 feet (1,944 m). The mountains are largely contained within the Cleveland National Forest. The Anza-Borrego Desert State Park is located in the northeast portion of the county.

Figure 14.7. Topographic Illustration of the Physical Features.

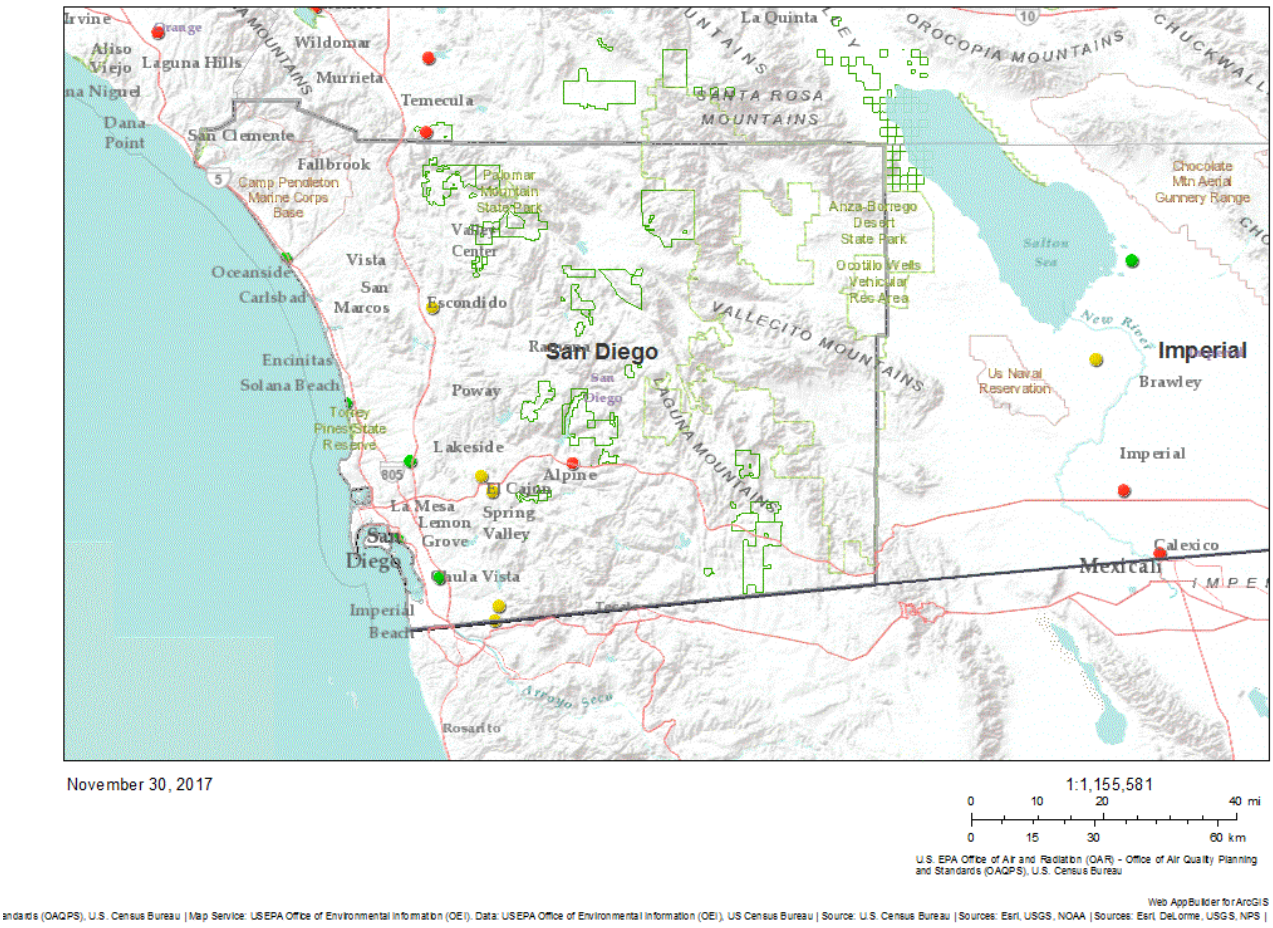


Figure 14.7 shows the topography in the area of analysis for San Diego County, CA. The EPA's nonattainment boundary for San Diego County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the San Diego County nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 14.8 shows the relevant jurisdictional boundaries for San Diego County, including county and CBSA boundaries, and areas of Indian country. The county is bounded by the Pacific Ocean to the west, Orange and Riverside counties to the north, Imperial County to the east, and Mexico to the south.

Figure 14.8 Jurisdictional Boundaries.

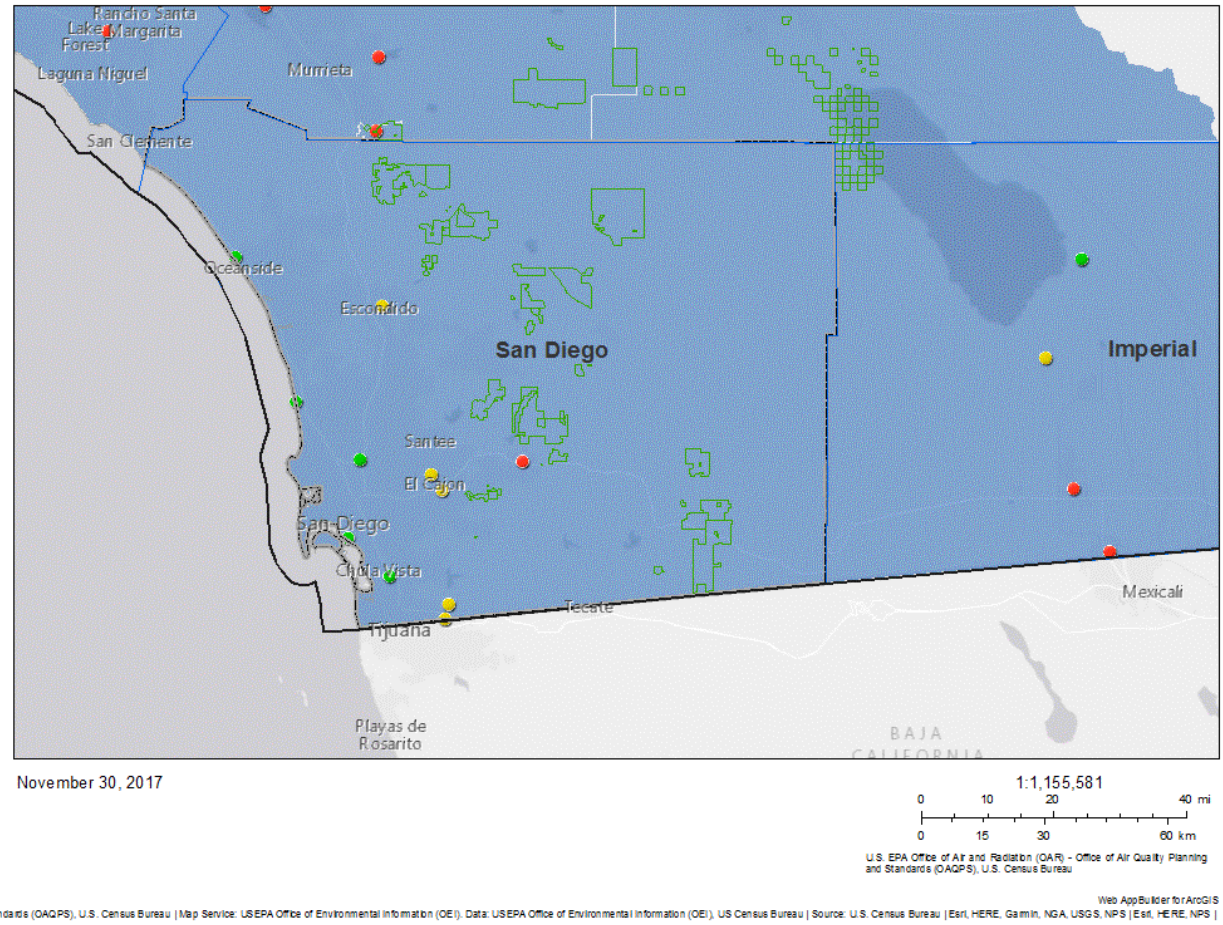


Figure14.8 shows jurisdictional boundaries, including state boundaries (black lines) and metropolitan statistical areas (dark blue lines) in the area of analysis for San Diego County, CA. The EPA's nonattainment boundary for San Diego County, CA is shown as a gray line with a dashed black center. The nonattainment boundary for the 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The San Diego County area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

The San Diego County Air Pollution Control District (APCD) jurisdictional boundary is the county boundary. The APCD performs air quality planning for the county, in addition to permitting and other regulatory and non-regulatory forms of air pollution controls. The metropolitan planning organization (MPO) in charge of transportation planning for the area is the San Diego Association of Governments (SANDAG). The jurisdictional boundary of SANDAG is the county boundary. The entirety of the county is also defined by the Office of Management and Budget (OMB) as the San Diego-Carlsbad, CA CBSA. The entirety of the county constitutes the San Diego County air basin, as defined by the state of California. The State's recommendation to designate the entirety of the county nonattainment reflects the boundary for the air district, the transportation planning agency, the county government, the State's air basin, and the OMB's definition for the CBSA.

The San Diego County area also includes portions of Indian country of the following tribes: Barona Band, Campo Band, Capitan Grande Band, Ewiiaapaayp Band, Iipay Nation, Inaja-Cosmit Band,

Jamul Tribe, La Jolla Band, La Posta Band, Los Coyotes Band of Indians, Manzanita Band, Mesa Grande Band, Pala Band, Pauma Band, Rincon Band, San Pasqual Band, Sycuan Band, and Viejas Band. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries. The Pechanga Band has contiguous areas of Indian country located within the boundaries of both the San Diego County and Los Angeles-South Coast Air Basin nonattainment areas. The Pechanga Band's portions of Indian country in San Diego County are being designated as part of the Pechanga Band nonattainment area. Information specific to the Pechanga Band nonattainment area is contained in the Technical Support Document for that area.

Conclusion for San Diego County, CA

The EPA is not modifying the State's recommendation to designate San Diego County as the San Diego County nonattainment area. This was the same boundary that was included in the San Diego County nonattainment area for the 1997 and 2008 ozone NAAQS.

One air quality monitor in San Diego County indicates a violation of the 2015 ozone NAAQS based on the 2016 design values, therefore, this county is included in the nonattainment area. Emissions and emission-related data show that the San Diego County nonattainment area encompasses several stationary sources and areas with expected mobile source emissions (based on population centers and traffic patterns). Meteorological data indicate the winds transporting ozone and ozone precursors during exceedance days are predominately from the west. The more mountainous topography in the inland eastern portions of the county, where the violating monitor is located, is expected to influence the fate and transport of ozone and ozone precursors within the area. The meteorology and geography/topography factors analysis supports the San Diego County nonattainment area. The jurisdictional factor also supports the nonattainment area, as the county boundary defines numerous jurisdictional entities.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation to include San Diego County as the EPA's nonattainment boundary for the 2015 ozone NAAQS.

15.0 Technical Analysis for the San Francisco Bay Area, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. It also provides EPA evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information.

Table 15.1 identifies the area of analysis for the San Francisco Bay Area, CA nonattainment area. The area of analysis comprises all of San Francisco-Oakland-Hayward, Napa, San Jose-Sunnyvale-Santa Clara, Santa Cruz-Watsonville, Vallejo-Fairfield, and Santa Rosa CBSAs; and portions of San Jose-San Francisco-Oakland CSA. The counties included in the area of analysis are: Alameda, Contra Costa, Marin, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma Counties.

The 2015 ozone NAAQS nonattainment areas of Sacramento Metro and San Joaquin Valley are adjacent to the San Francisco Bay Area. Information specific to counties in those areas is contained in the associated Technical Analysis sections for those nonattainment areas. Note that the portion of the San Jose-San Francisco-Oakland CSA that is not included in the analysis for the San Francisco Bay area the Stockton-Lodi CBSA, was recommended by the State for inclusion in the San Joaquin Valley area and is included in the area of analysis for the area.

Table 15.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
San Francisco Bay Area, CA	Alameda County Contra Costa County Marin County Napa County San Benito County San Francisco County San Mateo County Santa Clara County Santa Cruz County Solano County Sonoma County	San Francisco-Oakland-Hayward CBSA Napa CBSA San Jose-Sunnyvale-Santa Clara CBSA Santa Cruz-Watsonville CBSA Vallejo-Fairfield CBSA Santa Rosa CBSA	San Jose-San Francisco-Oakland (partial)*

* The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 15.1 is a map of the EPA's nonattainment boundary for the San Francisco Bay Area. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries.

For purposes of the 1997 and 2008 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 1997 and 2008 ozone NAAQS included the entire counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara, and parts of Solano and Sonoma counties. The San Francisco Bay Area also includes Indian country of the following tribes: Federated Indians of Graton Rancheria (Graton Rancheria), and Lytton Rancheria of California (Lytton Rancheria).

The EPA is not modifying the State's recommendation which is the same as the boundary for the 1997 ozone NAAQS and the boundary for the 2008 ozone NAAQS.

Figure 15.1 EPA's Nonattainment Boundaries for the San Francisco Bay Area, CA.

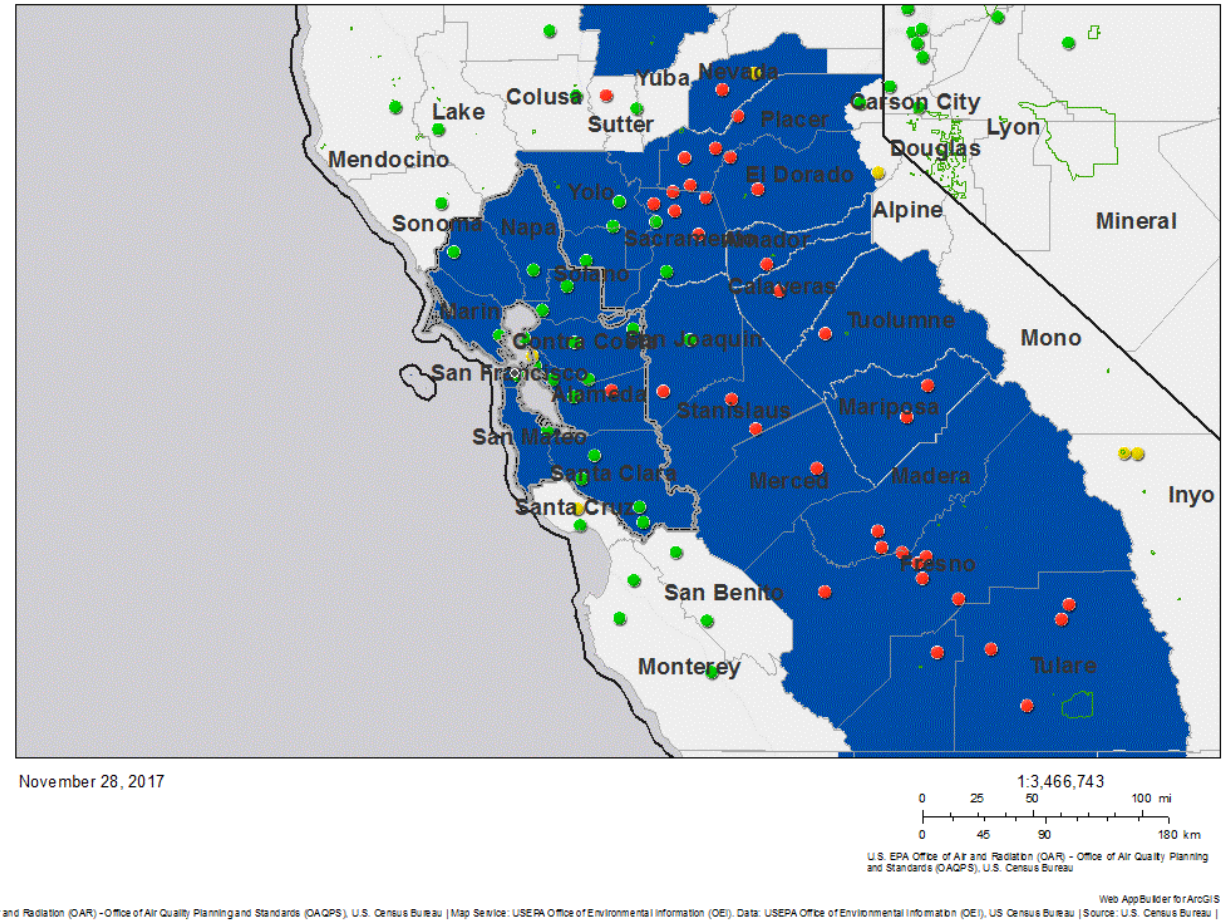


Figure 15.1 shows the EPA's nonattainment boundary for the San Francisco Bay Area, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and/or 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Alameda County has a monitor in violation of the 2015 ozone NAAQS, therefore this county is included in the final nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the San Francisco Bay Area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most

recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.

Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248). Modeling and information from non-regulatory monitors may not be used to determine a violation, but may be used in boundary determinations. There is one SPM that operated during portions of 2015 and 2016 in Alameda County that is not eligible for comparison to the NAAQS because it was discontinued within 24 months of start-up. This monitor (Patterson Pass, AQS ID 06-001-2005) is located within the nonattainment area for the San Francisco Bay Area, approximately 8 miles to the east of a violating regulatory monitor (Livermore, AQS ID 06-001-0007); it measured five exceedances of the 2015 ozone NAAQS in 2015, and 10 exceedances in 2016.

The 2014-2016 design values for counties in the area of analysis are shown in Table 15.2.

[2] Air quality data used in these TSDs were pulled from EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 15.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Alameda, CA	Yes	06-001-0007	**0.074**	0.076	0.074	0.072
		06-001-0009	0.055	0.057	0.055	0.054
		06-001-0011	0.049	0.051	0.052	0.045
		06-001-0013	N/A	N/A	N/A	0.036
		06-001-2001	0.066	0.072	0.064	0.063
Contra Costa, CA	Yes	06-013-0002	0.067	0.067	0.070	0.065
		06-013-1002	0.068	0.069	0.068	0.069
		06-013-1004	0.054	0.055	0.059	0.049
		06-013-2007	**0.069**	0.072	0.074	0.062
Marin, CA	Yes	06-041-0001	**0.061**	0.064	0.063	0.056
Napa, CA	Yes	06-055-0003	**0.062**	0.062	0.066	0.058
San Benito, CA	No	06-069-0002	0.063	0.068	0.063	0.058
		06-069-0003	**0.069**	0.069	0.066	0.072
San Francisco, CA	Yes	06-075-0005	**0.049**	0.052	0.050	0.046
San Mateo, CA	Yes	06-081-1001	**0.059**	0.064	0.059	0.056
Santa Clara, CA	Yes	06-085-0002	0.066	0.071	0.068	0.061
		06-085-0005	0.063	0.065	0.065	0.061
		06-085-1001	0.067	0.069	0.072	0.062
		06-085-2006	**0.070**	0.073	0.071	0.068
Santa Cruz, CA	No	06-087-0007	**0.057**	0.062	0.057	0.052
		06-087-1003	N/A	0.055	N/A	N/A
Solano, CA	Yes	06-095-0004	0.063	0.064	0.064	0.061
		06-095-0005	0.064	0.063	0.067	0.064
		06-095-3003	**0.067**	0.066	0.068	0.067
Sonoma, CA	Yes (partial)	06-097-0004	0.052	0.054	0.056	0.048
		06-097-1003	**0.058**	0.062	0.059	0.055

The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

Alameda County shows a violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 15.1, shown previously, identifies the San Francisco Bay Area nonattainment area and the violating monitor. Table 15.2 identifies the design values for all monitors in the area of analysis. As indicated on the map, there is one violating monitor that is located in the eastern portion of the area of analysis, Livermore (AQS ID 06-001-0007), that is located in the city of Livermore in Alameda County. The five counties with the lowest 2016 DVs in the area of analysis all border the Pacific Ocean. From north to south, they are: Sonoma, Marin, San Francisco, San Mateo, and Santa Cruz. The maximum 2016 DVs for these five counties range from 0.049 ppm to 0.061 ppm. Napa, located just east of Sonoma, has a 2016 DV of 0.062 ppm. The more inland counties (from north to south) of Solano, Contra Costa, Alameda, Santa Clara, and San Benito have the higher 2016 DVs, with

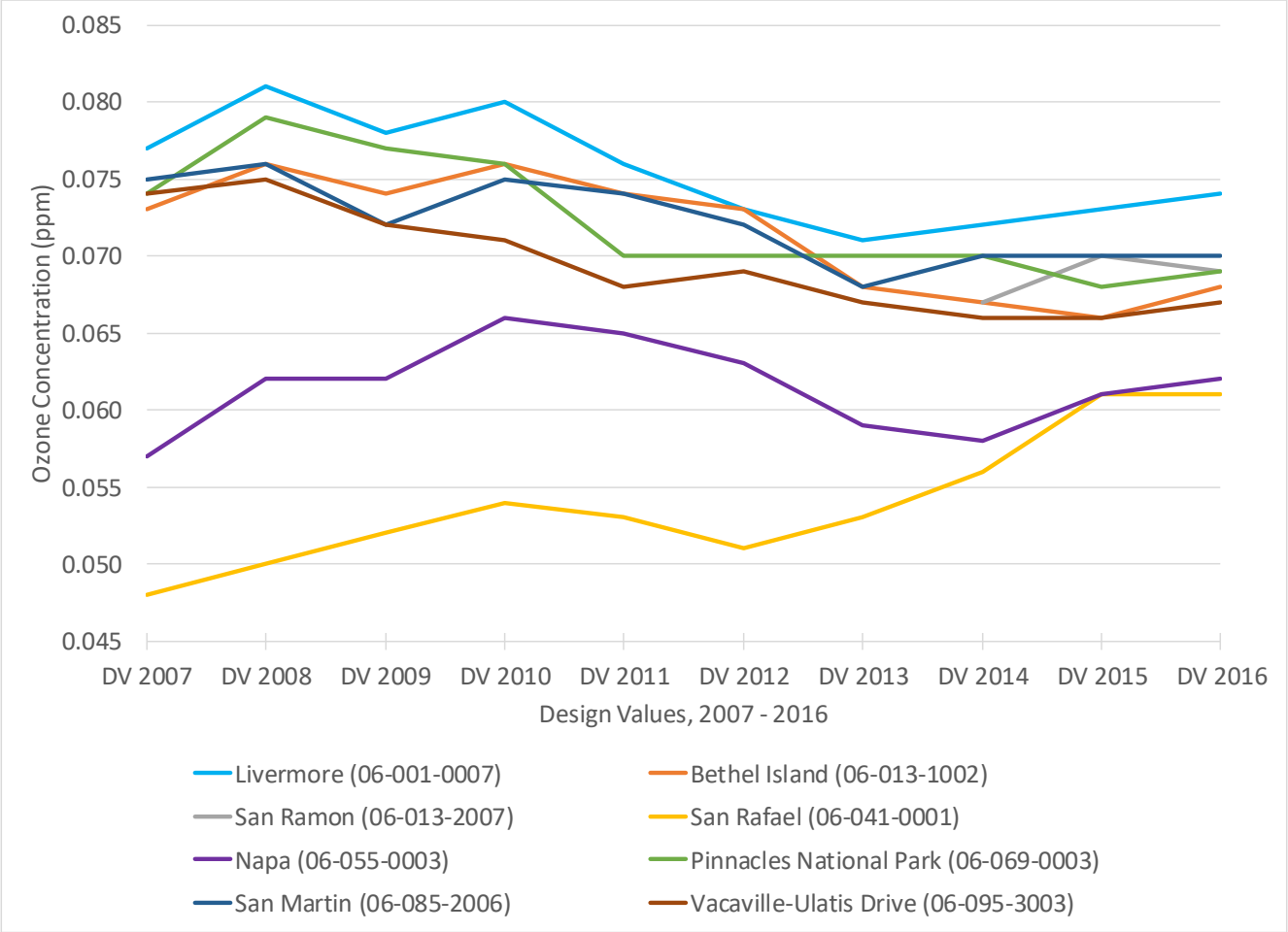
maximum 2016 DVs per county ranging from 0.066 ppm to 0.074 ppm. Only Alameda County, in the southeast portion of the area of analysis, has a violating monitor.

Figure 15.2 shows the historical trend of design values for eight monitors in the area of analysis. These eight monitors include the violating monitor and, for each county in the area of analysis with a 2016 DV above 0.060 ppm, the highest concentration monitor in the county. Figure 15.2 therefore includes monitoring data from seven counties: Alameda, Contra Costa, Marin, Napa, San Benito, Santa Clara, and Solano. San Francisco, Sonoma, Santa Cruz, and San Mateo counties are not represented in the figure, having 2016 DVs below 0.060 ppm. These counties were excluded from Figure 15.2 due to their relatively low concentrations relative to the NAAQS and as compared to the other monitors in the area. A second monitor, Bethel Island (AQS ID 06-013-1002), is included for Contra Costa County to better assess long-term trends, since the highest concentration monitor in that county, San Ramon (AQS ID 06-013-2007), did not have historical design values prior to 2013.

As shown in Figure 15.2, the trends for previous design values at monitoring sites located within the area of analysis show that aside from the violating monitor in Livermore, all monitors in the area have been consistently attaining the 2015 ozone NAAQS for the past four years. The San Martin monitor in Santa Clara County (AQS ID 06-085-2006), the San Ramon monitor in Contra Costa County (AQS ID 06-013-2007), and the Pinnacles National Park monitor in San Benito County (AQS ID 06-069-0003) have had one or more design values equal to 0.070 ppm over the past four years. The Napa monitor in Napa County (AQS ID 06-055-0003) and the San Rafael monitor in Marin County (AQS ID 06-041-0001) have been below the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally trending down for the last 10 years for sites near the 2015 ozone NAAQS, although concentrations for some sites with lower concentrations have been generally increasing over the same period.

The EPA's San Francisco Bay Area nonattainment area includes two partial counties: southern Sonoma County, and southern Solano County. The monitor located farther north in Sonoma County, outside of the nonattainment area, has an attaining, valid 2016 DV of 0.058 ppm. The monitor located farther south is within the nonattainment area and has an attaining valid 2016 DV of 0.052 ppm. Solano County has three monitors, all with valid, attaining 2016 DVs, ranging from 0.063 – 0.067 ppm. The highest of the three monitors is in the northern portion of the county, and is included in the Sacramento Metro nonattainment area. The remaining two monitors are in the southern part of the county and are included in the San Francisco Bay Area nonattainment area.

Figure 15.2 Three-Year Design Values for Monitors in the Area of Analysis (2007 – 2016).



Alameda County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitor is located within Alameda County which was included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS. Therefore, Factor 1 supports including the location of the violating monitor in Alameda County within the EPA's nonattainment boundary for the San Francisco Bay Area.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions

levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 15.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the San Francisco Bay Area nonattainment area.

Table 15.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Alameda, CA	Yes	21,567	18,095
Santa Clara, CA	Yes	18,099	19,124
Contra Costa, CA	Yes	16,525	17,292
San Francisco, CA	Yes	9,203	6,713
San Mateo, CA	Yes	9,100	7,843
Solano, CA	Yes	7,095	8,735
Sonoma, CA	Yes (partial)	5,992	8,477
Santa Cruz, CA	No	4,125	3,787
Marin, CA	Yes	2,936	4,112
Napa, CA	Yes	2,339	4,389
San Benito, CA	No	1,752	1,657
	Area wide:	98,732	100,225

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown as square orange icons in Figure 15.3 below. The nonattainment boundary is also shown.

Figure 15.3 Large Point Sources in the Area of Analysis.

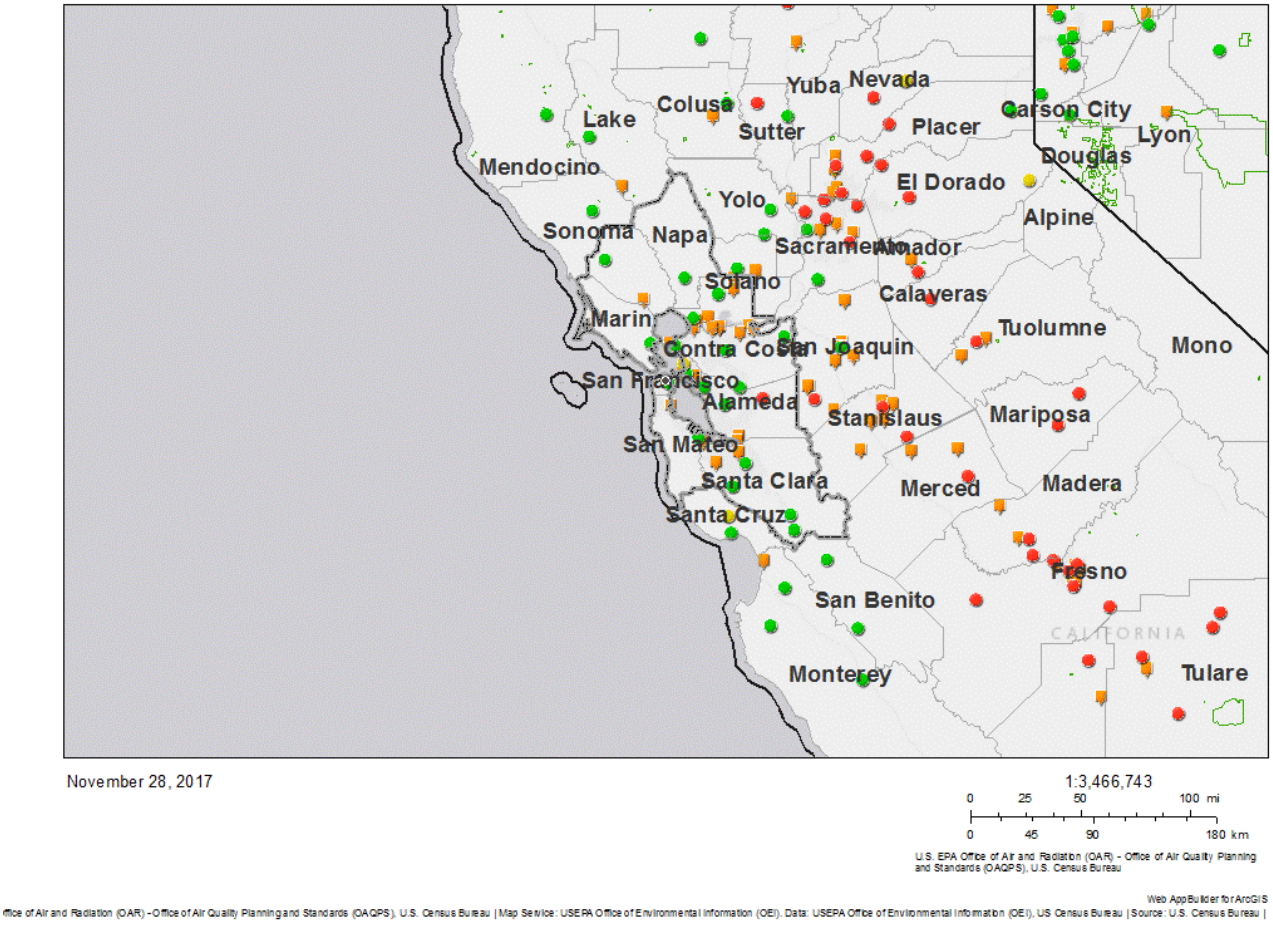


Figure 15.3 shows large point sources in the area of analysis for the San Francisco Bay Area, CA as orange squares. The EPA's nonattainment boundary for the San Francisco Bay Area, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emissions shows that Alameda, Santa Clara, and Contra Costa counties have the highest total NO_x and VOC emissions per county within the area of analysis. San Francisco, San Mateo, Solano, and Sonoma counties have moderate total NO_x and VOC emissions relative to other counties in the area of analysis, whereas Santa Cruz, Marin, Napa, and San Benito counties have low total NO_x and VOC emissions as compared to the other counties in the area of analysis. Many of the large point sources of ozone precursors are located in the central/eastern portion of the San Francisco Bay Area in Contra Costa County, near the northern border of the county. There are also large point sources of ozone precursors located in Alameda, Marin, San Mateo, Santa Clara, and Solano counties. There are no large point sources in Santa Cruz, San Benito, Napa, or Sonoma counties.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or

commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 15.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 15.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Santa Clara, CA	Yes	1,781,642	1,918,044	1,487	136,402	8%
Alameda, CA	Yes	1,510,271	1,638,215	2,217	127,944	8%
Contra Costa, CA	Yes	1,049,025	1,126,745	1,574	77,720	7%
San Francisco, CA	Yes	805,235	864,816	18,450	59,581	7%
San Mateo, CA	Yes	718,451	765,135	1,706	46,684	6%
Sonoma, CA	Yes (partial)	483,878	502,146	319	18,268	4%
Solano, CA	Yes	413,344	436,092	531	22,748	6%
Santa Cruz, CA	No	262,382	274,146	616	11,764	4%
Marin, CA	Yes	252,409	261,221	502	8,812	3%
Napa, CA	Yes	136,484	142,456	190	5,972	4%
San Benito, CA	No	55,269	58,792	42	3,523	6%
	Area wide:	7,468,390	7,987,808	914	519,418	7%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 15.4 shows the county-level population density for the area of analysis. As a general matter, this area is heavily and densely populated, with all but one county having a total population in excess of 100,000 and population densities ranging from 190 to 18,450 persons per square mile. Santa Clara, Alameda, and Contra Costa counties have the highest population levels within the area of analysis. San Francisco and San Mateo counties have populations between 765,000 and 865,000; Sonoma and Solano counties have populations between 436,000 and 503,000; Santa Cruz and Marin counties have populations between 261,000 and 275,000; and the least populated counties have populations of about 142,000 (Napa) and 59,000 (San Benito). San Francisco County has a much higher population density than the other counties, with a density of over 18,000. Alameda, San Mateo, Contra Costa, and Santa Clara counties, while all much less densely populated that San Francisco, still have relatively high population densities between 1,500 and approximately 2,200. San Benito is the least densely populated county with a density of 42. The remaining counties have population densities ranging from almost 200 to slightly more than 600. As a whole, the area experienced 7% growth between 2010-2015, and there is not wide variation in the growth rates among the counties. The lowest growth rate of 3% was in Marin County while the highest growth rate of 8% was experienced in Santa Clara and Alameda Counties.

Figure 15.4 County-Level Population.

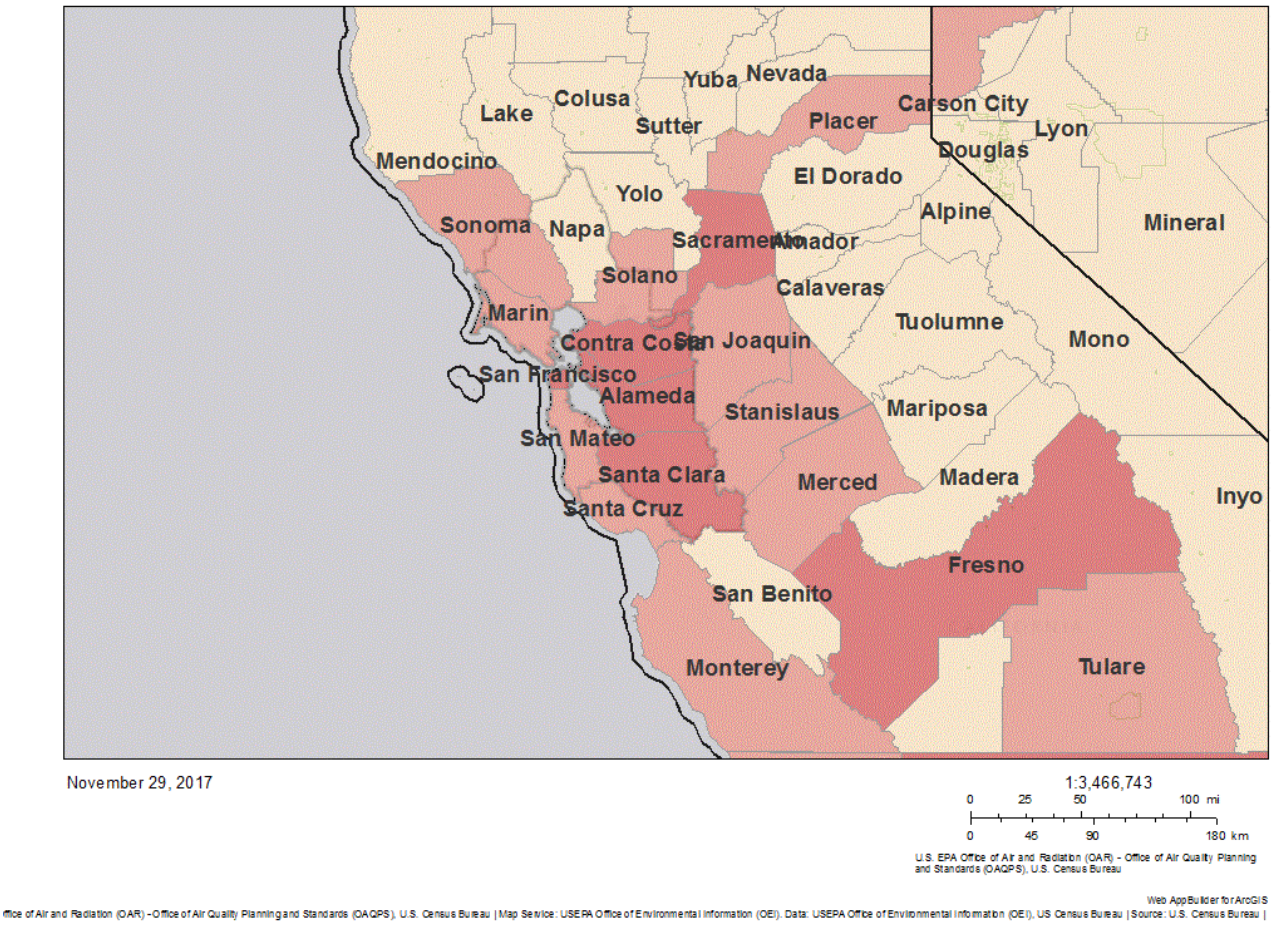


Figure 15.4 shows county-level population in the area of analysis for the San Francisco Bay Area, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for the San Francisco Bay Area, CA is shown as a gray line with a dashed black center. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 15.5 shows the traffic and commuting pattern data, including total VMT for each county, number of residents who work in each county, number of residents that work in counties with violating monitor(s), and the percent of residents working in counties with violating monitor(s). The data in Table 15.5 are 2014 data.

Table 15.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis
Santa Clara, CA	Yes	15,320	848,306	62,915	7.4%
Alameda, CA	**Yes**	**14,341**	**723,007**	**337,681**	**46.7%**
Contra Costa, CA	Yes	8,789	465,717	100,762	21.6%
San Mateo, CA	Yes	7,115	357,648	27,899	7.8%
Solano, CA	Yes	4,756	179,598	15,037	8.4%
Sonoma, CA	Yes (partial)	3,988	204,890	7,736	3.8%
San Francisco, CA	Yes	3,629	427,247	31,886	7.5%
Marin, CA	Yes	2,688	105,625	7,370	7.0%
Santa Cruz, CA	No	1,955	111,396	3,789	3.4%
Napa, CA	Yes	1,136	67,018	2,687	4.0%
San Benito, CA	No	487	21,570	536	2.5%
	Total:	64,204	3,512,022	598,298	17.0%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 15.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 15.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

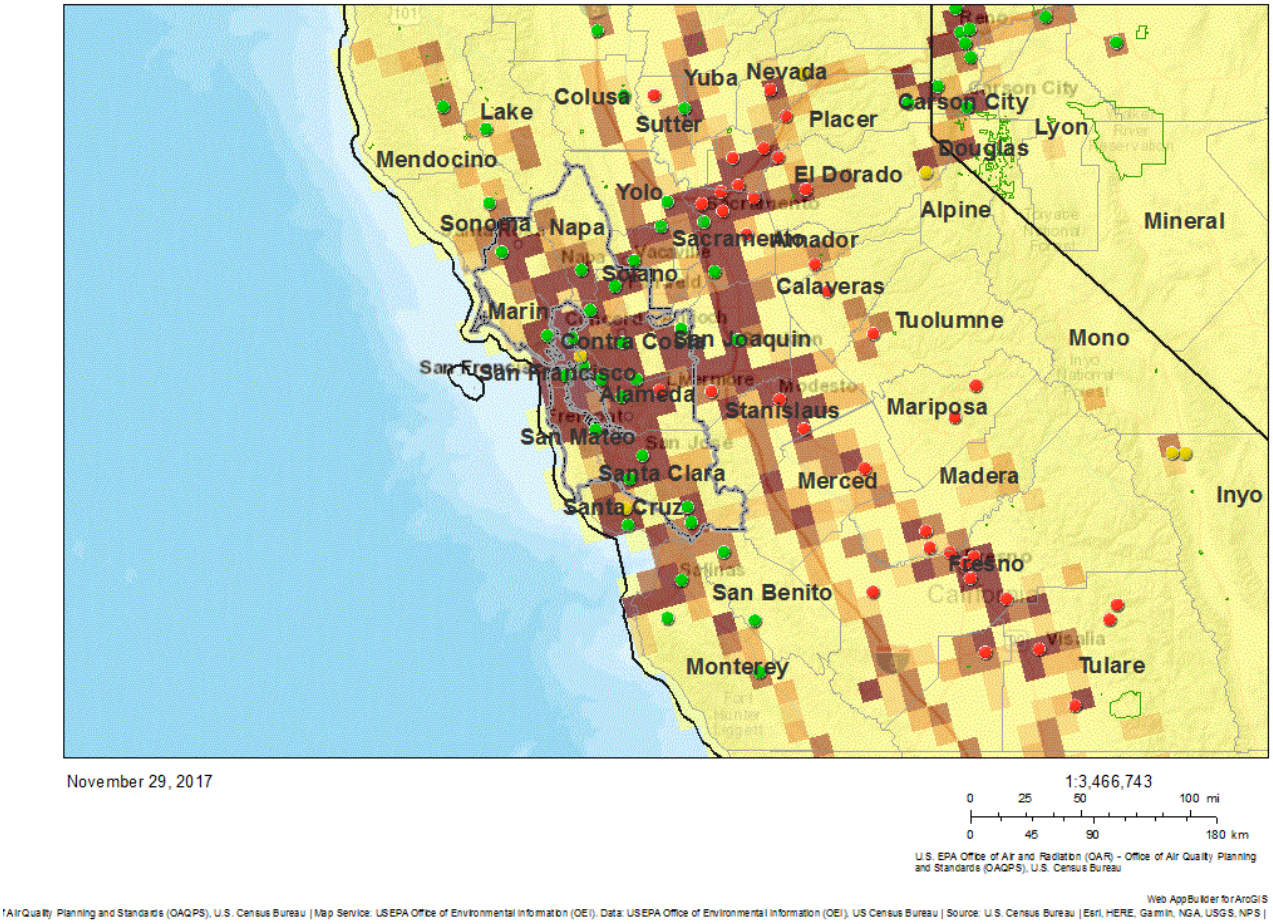


Figure 15.5 shows gridded VMT in the area of analysis for the San Francisco Bay Area, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for the San Francisco Bay Area, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau.[6] Santa Clara County and Alameda County have the highest total VMT levels within the area of analysis, and Contra Costa and San Mateo counties have roughly 50 to 60 percent of that level. San Benito County has the lowest VMT, approximately 3 percent of that in Santa Clara County. Alameda County, the only county with a violating monitor, has the largest number of commuters to or within a county with a violating monitor. Contra Costa County has the second highest level, but less than half that of Alameda County. The remaining counties have relatively low percentages of commuters traveling to or within a county with a violating monitor. As shown in Figure 15.5, most counties in the area of analysis contain areas with high VMT. San Benito County and the northern portions of Sonoma and Napa counties have areas with relatively lower VMT as compared to other counties within the area of analysis.

[6] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/ .

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 15.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

The EPA's HYSPLIT analysis shows that back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally pass through most areas included in the area of analysis. Almost all trajectories originate within the San Francisco Bay Area Air Basin, which is the area of analysis, or over the ocean, though a few of the 1000 m trajectories extend to the east and then to the northern and southern parts of California's Central Valley. Relatively few trajectories are from the south where Santa Cruz and San Benito Counties are located. The data also show that the winds during exceedance days are predominately from the west, that is, from over the Pacific Ocean, especially for the lowest (100 m) trajectories; higher elevation trajectories come from various compass directions.

This air flow is consistent with the area's topography, discussed below. The hills and mountains surrounding the San Francisco Bay Area Air Basin restrict air flow from the outside, except at gaps that allow winds from the ocean to pass through the Golden Gate entrance to San Francisco Bay, and sometimes winds from Central Valley in the east to pass through the general area of Suisun Bay (described below). As previously discussed, the EPA is designating the adjacent San Joaquin Valley and Sacramento Metro areas as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for these areas.

Figure 15.6 HYSPLIT Back Trajectories for Violating Monitor(s).

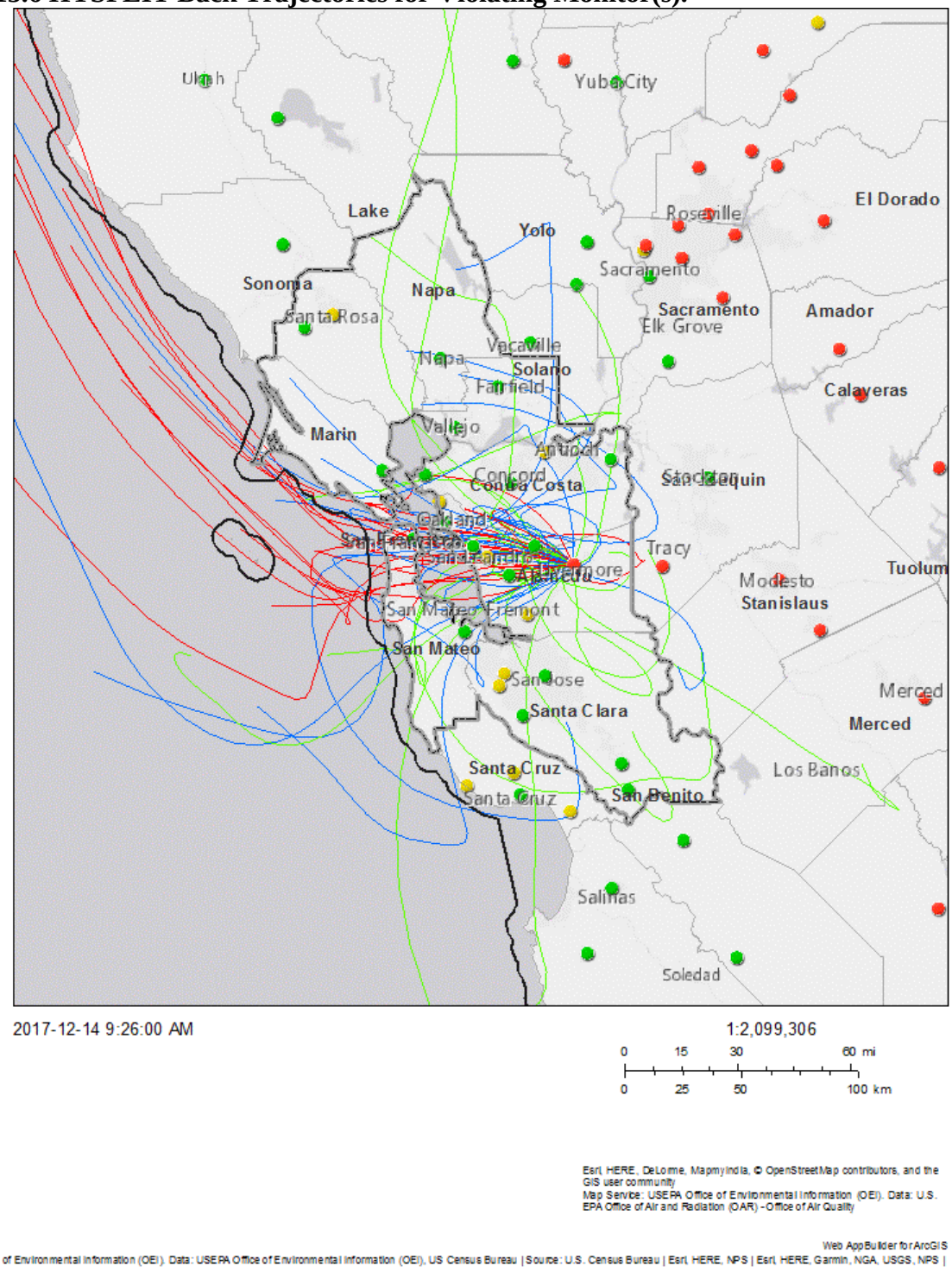


Figure 15.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Francisco Bay Area, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. Topography affects pollutant formation and transport in California, and thus plays an important role in assessing which areas are contributing to monitored violations of the NAAQS.

Figure 15.7 shows the topography for the area of analysis. California has historically been divided into fifteen distinct air basins. San Francisco Bay Area is located in the San Francisco Bay Area Air Basin and includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, and parts of Solano and Sonoma Counties.

The region is characterized by complex terrain, consisting of coastal mountain ranges surrounding the San Francisco and San Pablo bays, and includes rugged hillsides and inland valleys. The mountain ranges are part of the California Coast Ranges. Elevations range from sea level to 460 m (1,500 feet). The area is generally surrounded by hilly or mountainous terrain that separates it from neighboring areas, including Santa Cruz and San Benito counties to the south, and portions of Solano and Sonoma counties to the north. As indicated by the HYSPLIT trajectories, it is less likely that winds are transporting emissions from the counties separated from the basin by the elevated terrain into the basin. In addition, the less-severe topography within the San Francisco Bay Area Air Basin itself allows for the mixing of emissions from the various counties within the basin.

High terrain surrounds the air basin. There are two main gaps in the high terrain surrounding the air basin. One is in the northwest at the Golden Gate (at the mouth of San Francisco Bay), which leaves the area open to wind off the Pacific Ocean. The other is in the northeast at the Suisun Bay, which joins the area's two main bays to the delta at the confluence of the Sacramento and San Joaquin rivers. This gap permits wind toward and sometimes from the flatter regions of the Sacramento metropolitan area and other parts of California's Central Valley. Narrower gaps include the valley of the Petaluma River in the north, and the Coyote Creek corridor in the south, between the Santa Cruz Mountains and the Diablo Range.

As previously discussed, the EPA is designating Sacramento Metro and San Joaquin Valley nonattainment for the 2015 ozone NAAQS. More information on these areas is within the Technical Analysis sections for these areas.

Figure 15.7. Topographic Illustration of the Physical Features.

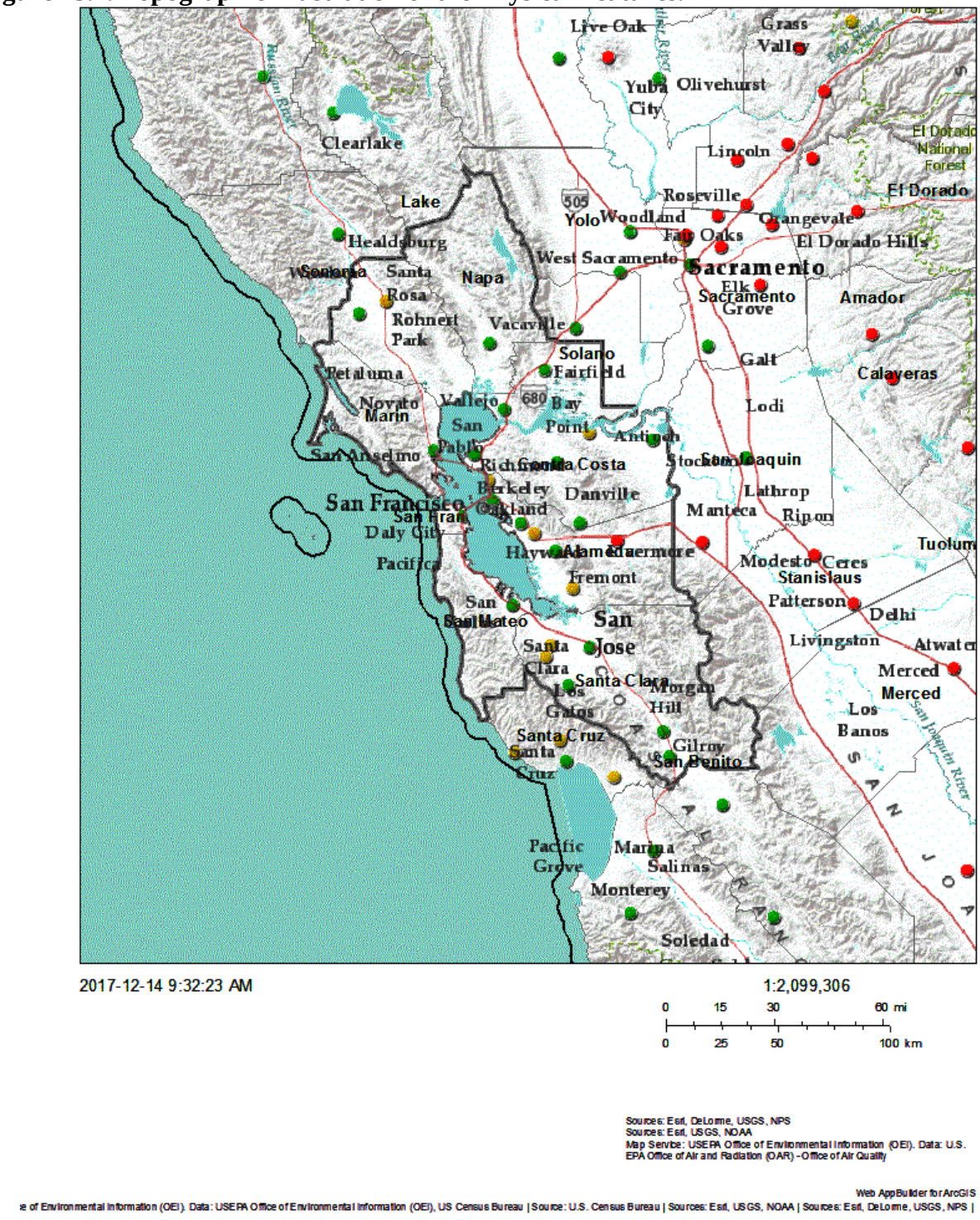


Figure 15.7 shows the topography in the area of analysis for San Francisco Bay Area, CA. The EPA's nonattainment boundary for San Francisco Bay Area, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the San Francisco Bay Area nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 15.8 shows the relevant jurisdictional boundaries for the San Francisco Bay Area nonattainment area, including county, CSA, and CBSA boundaries, and areas of Indian country.

Figure 15.8 Jurisdictional Boundaries.

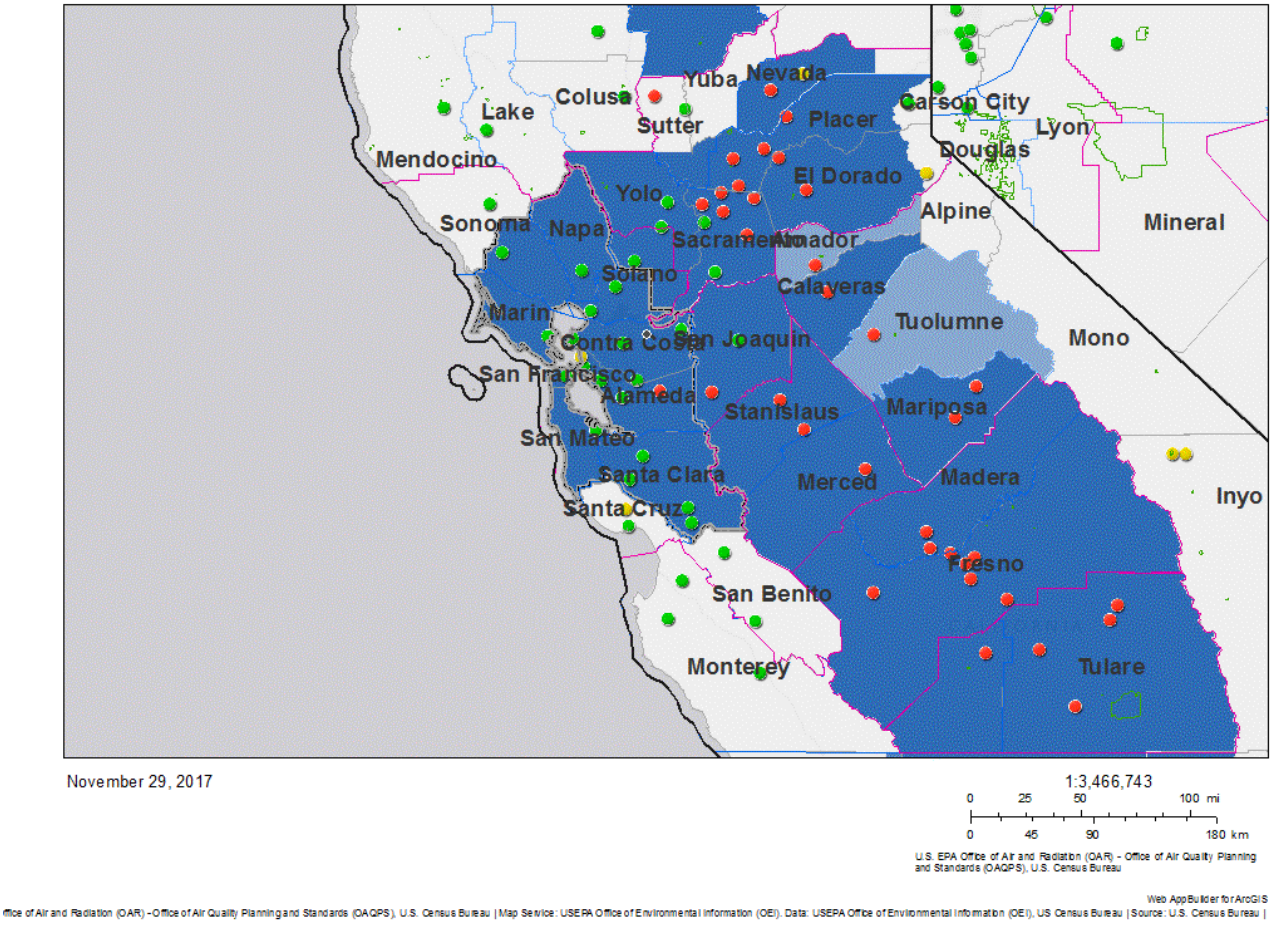


Figure 15.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for the San Francisco Bay Area, CA. The EPA's nonattainment boundary for the San Francisco Bay Area, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The San Francisco Bay Area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

All of the areas included in the nonattainment boundaries for the 1997 and 2008 ozone NAAQS are under the Bay Area Air Quality Management District's jurisdiction.

For the two counties that have been included in part in the San Francisco Bay area for the 1997 and 2008 ozone NAAQS, only the portions of the county within that area are under the jurisdiction of the Bay Area Air Quality Management District's jurisdiction. The remaining portion of Solano County is under the jurisdiction of the Yolo-Solano Air Quality Management District. The remaining portion of Sonoma County is part of the Northern Sonoma County Air Pollution Control District.

Regarding transportation planning, the partial county boundary in Solano County is also the boundary between the jurisdictions of the Metropolitan Transportation Commission, which is responsible for

transportation planning in the San Francisco Bay Area, and the Sacramento Council of Governments, which is responsible for transportation planning in the wider Sacramento Metro area. The northeastern portion of Solano County was included in the Sacramento Metro nonattainment area for the 1997 and 2008 ozone NAAQS and the EPA is including it with the Sacramento Metro nonattainment area for the 2015 ozone NAAQS as well.

The San Francisco Bay Area 2015 ozone NAAQS nonattainment area includes most of the San Jose-San Francisco-Oakland CSA. The CSA comprises six MSAs: Napa, San Francisco-Oakland-Hayward, Stockton-Lodi, Santa Cruz-Watsonville, San Jose-Sunnyvale-Santa Clara, Santa Rosa, and Vallejo-Fairfield. The CSA differs from the nonattainment area boundaries in that the nonattainment area includes only partial counties for Sonoma and Solano counties, excludes San Benito and Santa Cruz counties (San Jose-Sunnyvale-Santa Clara MSA) to the south, and excludes San Joaquin County (Stockton-Lodi MSA). San Benito and Santa Cruz counties are included in the North Central Coast Air Basin and are under the jurisdiction of the Monterey Bay Unified Air Pollution Control District. San Joaquin County is included in the San Joaquin Valley Air Basin, and is under the air planning jurisdiction of the San Joaquin Valley Air Pollution Control District.

As mentioned above, the San Francisco Bay Area also includes Indian country of the following tribes: Graton Rancheria, and Lytton Rancheria. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

Conclusion for San Francisco Bay Area

Based on the assessment of factors described above, the EPA has determined that it is not modifying the State's recommendation that the following counties should be included in the San Francisco Bay Area nonattainment area: Alameda County, Contra Costa County, Marin County, Napa County, San Francisco County, San Mateo County, Santa Clara County, Sonoma County (partial), and Solano County (partial). These are the same counties that are included in the San Francisco Bay Area nonattainment area for the 1997 and 2008 ozone NAAQS.

One air quality monitor in Alameda County indicates a violation of the 2015 ozone NAAQS based on the 2016 design values, therefore this county is included in the nonattainment area. Emissions and emissions-related data show that Alameda, Contra Costa, San Francisco, and Santa Clara counties have some of the highest population or most densely populated areas, the largest emissions, the majority of the large point sources, or the highest VMT. Marin, Napa, San Mateo, Sonoma and Solano counties also contain ozone precursor emissions sources in the forms of point sources, population, population densities, or VMT. There are also dense HYSPLIT trajectories over some of these counties. All of the counties or portions of counties included in the State's recommendation for the San Francisco Bay Area are within the geographic San Francisco Bay Area Air Basin and they are all under the

jurisdiction of the Bay Area Air Quality Management District. For these reasons, the EPA is not modifying the State's recommendation to include these counties or portions of counties.

Santa Cruz County, San Benito County, the northern portion of Sonoma County and the eastern portion of Solano County all lie outside the geographic San Francisco Bay Area Air Basin, defined mainly by mountain ranges that form a partial barrier to flow from the outside; and none are under the jurisdiction of the Bay Area Air Quality Management District. San Benito County ranks last and Santa Cruz County generally ranks toward the bottom in emission sources such as county-level emissions, population, population density, and VMT, and neither county has large point sources. While total emissions and population were only available at the county level, an analysis of point sources and VMT within Sonoma County also suggest that the northern portion of Sonoma County has relatively few emission sources. There are also a limited number of HYSPLIT trajectories over these areas. The State has recommended that the eastern portion of Solano County be designated as part of the Sacramento Metro nonattainment area. The EPA is not modifying the State's recommendation that Santa Cruz, San Benito and the northern portion of Sonoma County be designated attainment/unclassifiable for the 2015 ozone NAAQS and that the eastern portion of Solano County be included in the Sacramento nonattainment area for the 2015 ozone NAAQS (the eastern portion of Solano County is addressed in more detail in the technical analysis for the Sacramento area).

Based on consideration of all five factors, the EPA is not modifying the State's recommendation to include the following counties and partial counties as the San Francisco Bay Area for the 2015 ozone NAAQS: Alameda County, Contra Costa County, Marin County, Napa County, San Francisco County, San Mateo County, Santa Clara County, Sonoma County (partial), and Solano County (partial).

The San Francisco Bay Area also includes Indian country of the following tribes: Federated Indians of Graton Rancheria (Graton Rancheria), and Lytton Rancheria of California (Lytton Rancheria). None of the tribes submitted a designation recommendation to EPA regarding the tribal areas. The EPA is including these tribal areas as part of the San Francisco Bay Area for the 2015 ozone NAAQS.

16.0 Technical Analysis for San Joaquin Valley, CA

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area.

Table 16.1 identifies the area of analysis for the San Joaquin Valley, CA nonattainment area. The area of analysis includes all of Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare Counties. The area of analysis comprises all of the Fresno, Bakersfield, Hanford-Corcoran, Madera, Merced, Stockton-Lodi, Modesto, and Visalia-Porterville CBSAs; portions of the San Jose-San Francisco-Oakland CSA; and all of the Fresno-Madera, Modesto-Merced, and Visalia-Porterville-Hanford CSAs. The nonattainment area is identical to the existing 1997 and 2008 San Joaquin Valley nonattainment areas.

The 2015 ozone NAAQS nonattainment areas of Amador County, Calaveras County, Eastern Kern, Los Angeles-San Bernardino Counties (West Mojave Desert), Los Angeles-South Coast Air Basin, Mariposa County, Sacramento Metro, San Francisco Bay Area, Eastern San Luis Obispo, Tuolumne County, and Ventura County are adjacent to the San Joaquin Valley nonattainment area. Information specific to counties in those areas is contained in the associated Technical Analysis sections for those nonattainment areas.

Table 16.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
San Joaquin Valley, CA	Fresno County Kern County Kings County Madera County Merced County San Joaquin County Stanislaus County Tulare County	Fresno CBSA Bakersfield CBSA Hanford-Corcoran CBSA Madera CBSA Merced CBSA Stockton-Lodi CBSA Modesto CBSA Visalia-Porterville CBSA	Fresno-Madera CSA Modesto-Merced CSA San Jose-San Francisco-Oakland CSA (partial)* Visalia-Porterville-Hanford CSA

* The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 16.1 is a map of the EPA's nonattainment boundary for the San Joaquin Valley. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries.

For purposes of the 1997 and 2008 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 1997 and 2008 ozone NAAQS includes the entire counties of Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare, and the western part of Kern County. The San Joaquin Valley area also includes Indian country of the following tribes: Big Sandy Rancheria of Western Mono Indians of California (Big Sandy Rancheria), Cold Springs Rancheria of Mono Indians of California (Cold Springs Rancheria), Northfork Rancheria of Mono Indians of California (Northfork Rancheria), Picayune Rancheria of Chukchansi Indians of California (Picayune Rancheria), Santa Rosa Indian Community of the Santa Rosa Rancheria (Santa Rosa Rancheria), Table Mountain Rancheria of California (Table Mountain Rancheria), and Tule River Indian Tribe of the Tule River Reservation (Tule River Tribe). The tribes did not submit a recommendation, and EPA is designating the tribal areas as part of the San Joaquin Valley nonattainment area.

The EPA is not modifying the State's recommendation to designate the San Joaquin Valley area as nonattainment for the 2015 ozone NAAQS, with the same boundary as the San Joaquin Valley, CA nonattainment areas for the 1997 ozone NAAQS and the 2008 ozone NAAQS.

Figure 16.1 EPA's Nonattainment Boundaries for San Joaquin Valley, CA.

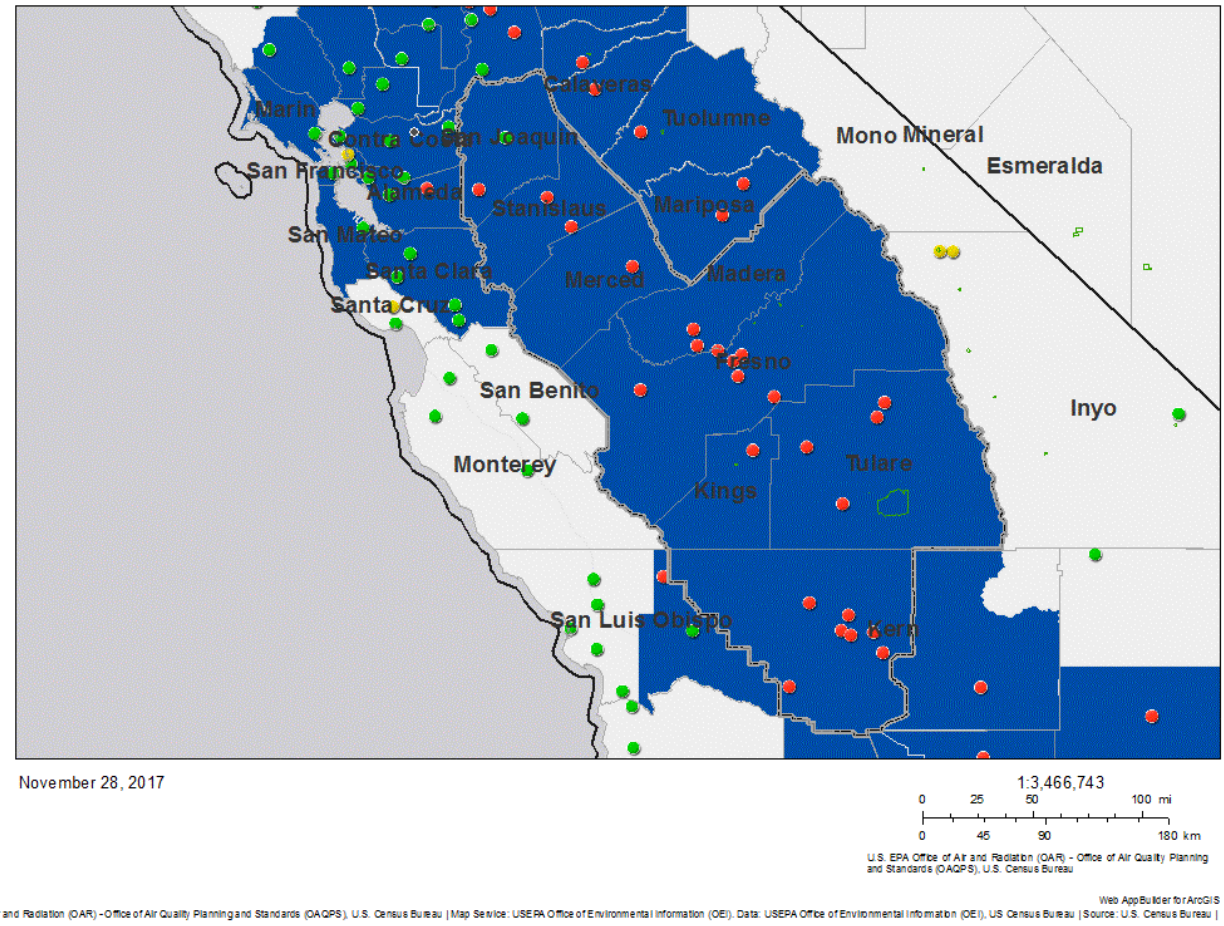


Figure 16.1 shows the EPA's nonattainment boundary for San Joaquin Valley, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties, and the western portion of Kern County, have monitors in violation of the 2015 ozone NAAQS, therefore these counties are included in the final nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the San Joaquin Valley area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the

most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 16.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at:
https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 16.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Fresno, CA	Yes	06-019-0007	0.086	0.084	0.088	0.088
		06-019-0011	0.089	0.090	0.087	0.091
		06-019-0242	0.086	0.091	0.084	0.084
		06-019-2009	0.076	0.075	0.077	0.077
		06-019-4001	0.091	0.087	0.093	0.093
		06-019-5001	**0.094**	0.097	0.093	0.092
Kern, CA	Yes (partial)	06-029-0007	0.087	0.085	0.090	0.086
		06-029-0008	0.081	0.078	0.083	0.083
		06-029-0011	0.084	0.089	0.080	0.084
		06-029-0014	0.084	0.084	0.088	0.082
		06-029-0232	0.077	0.078	0.082	0.072
		06-029-2012	**0.090**	0.087	0.097	0.088
		06-029-5002	0.087	0.088	0.087	0.087
		06-029-6001	0.081	0.081	0.082	0.082
Kings, CA	Yes	06-031-1004	**0.084**	0.086	0.085	0.083
Madera, CA	Yes	06-039-0004	**0.083**	0.088	0.080	0.081
		06-039-2010	**0.083**	0.082	0.083	0.084
Merced, CA	Yes	06-047-0003	**0.082**	0.082	0.083	0.082
San Joaquin, CA	Yes	06-077-1002	0.068	0.071	0.069	0.066
		06-077-3005	**0.079**	0.080	0.077	0.080
Stanislaus, CA	Yes	06-099-0005	0.081	0.081	0.083	0.080
		06-099-0006	**0.083**	0.081	0.085	0.085
Tulare, CA	Yes	06-107-0006	0.084	0.084	0.083	0.087
		06-107-0009	**0.089**	0.089	0.088	0.092
		06-107-2002	0.080	0.078	0.087	0.077
		06-107-2010	0.083	0.073	0.086	0.090

The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties, and the western portion of Kern County, show a violation of the 2015 ozone NAAQS, therefore these counties in full or part are included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

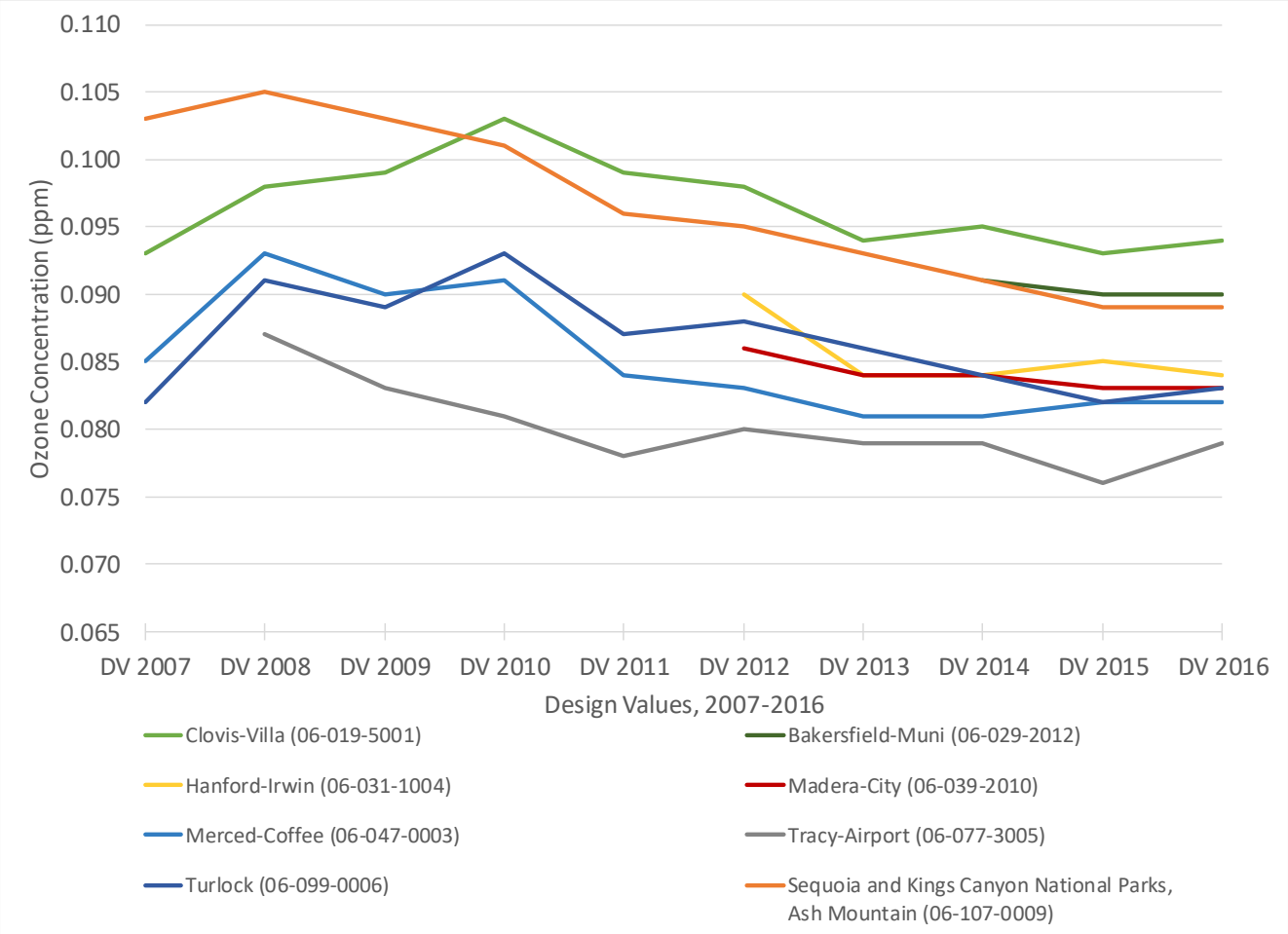
Figure 16.1, shown previously, identifies the San Joaquin Valley nonattainment area and the violating monitors. Table 16.2 identifies the design values for all monitors in the area of analysis. Figure 16.2 shows the historical trend of design values for the highest violating monitor in each of the eight counties. All eight monitors fall within the i San Joaquin Valley nonattainment area.

As indicated on the map, there are 25 violating monitors that are located throughout the area of analysis. The monitors with the highest design values in each county are generally located in the central and southern portions of San Joaquin Valley. Of these monitors, the monitor with the lowest 2016 DV, Tracy-Airport (AQS ID 06-077-1002), is in the northernmost county in the area of analysis,

San Joaquin County. The next three counties to the south also have the next lowest 2016 DVs (Stanislaus County, Turlock monitor (AQS ID 06-099-0006); Merced County, Merced-Coffee monitor (AQS ID 06-047-0003); and Madera County, Madera City monitor (AQS ID 06-039-2010)). The monitors with the highest 2016 DVs, Clovis Villa (AQS ID 06-019-5001), Sequoia and Kings Canyon National Parks, Ash Mountain (06-107-0009), and Bakersfield-Muni (06-029-2012) are located in the counties farther south in the area of analysis – Fresno, Tulare, and Kern counties, respectively. Kings County is also in the southern portion of the area of analysis, but its highest monitor, Hanford-Irwin (AQS ID 06-031-1004), has a slightly lower 2016 DV than the three other southern county monitors. There is an additional violating monitor, Mojave Poole (AQS ID 06-029-0011), located in the eastern portion of Kern County that is included within the Kern County (Eastern Kern) nonattainment area.

As shown in Figure 16.2, the trends for the highest violating monitors located within each county in the area of analysis show that ozone design values in the area have been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally decreasing in the past 10 years, although several monitors show a minimal increase in the design value trend in the past six years.

Figure 16.2 Three-Year Design Values for Highest Monitors in Each County (2007 – 2016).



Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties each have monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitors are located within the portions of the counties that were included as part of the designated San Joaquin Valley nonattainment area for the 1997 and 2008 ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 16.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the San Joaquin Valley nonattainment area.

Table 16.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Kern, CA	Yes (partial)	28,469	107,342
Fresno, CA	Yes	20,895	28,352
San Joaquin, CA	Yes	12,722	12,887
Tulare, CA	Yes	9,739	24,933
Stanislaus, CA	Yes	9,117	11,878
Merced, CA	Yes	7,409	9,532
Madera, CA	Yes	5,436	12,713
Kings, CA	Yes	3,920	5,234
	Area wide:	97,706	212,871

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown as square orange icons in Figure 16.3 below. The nonattainment boundary is also shown.

Figure 16.3 Large Point Sources in the Area of Analysis.

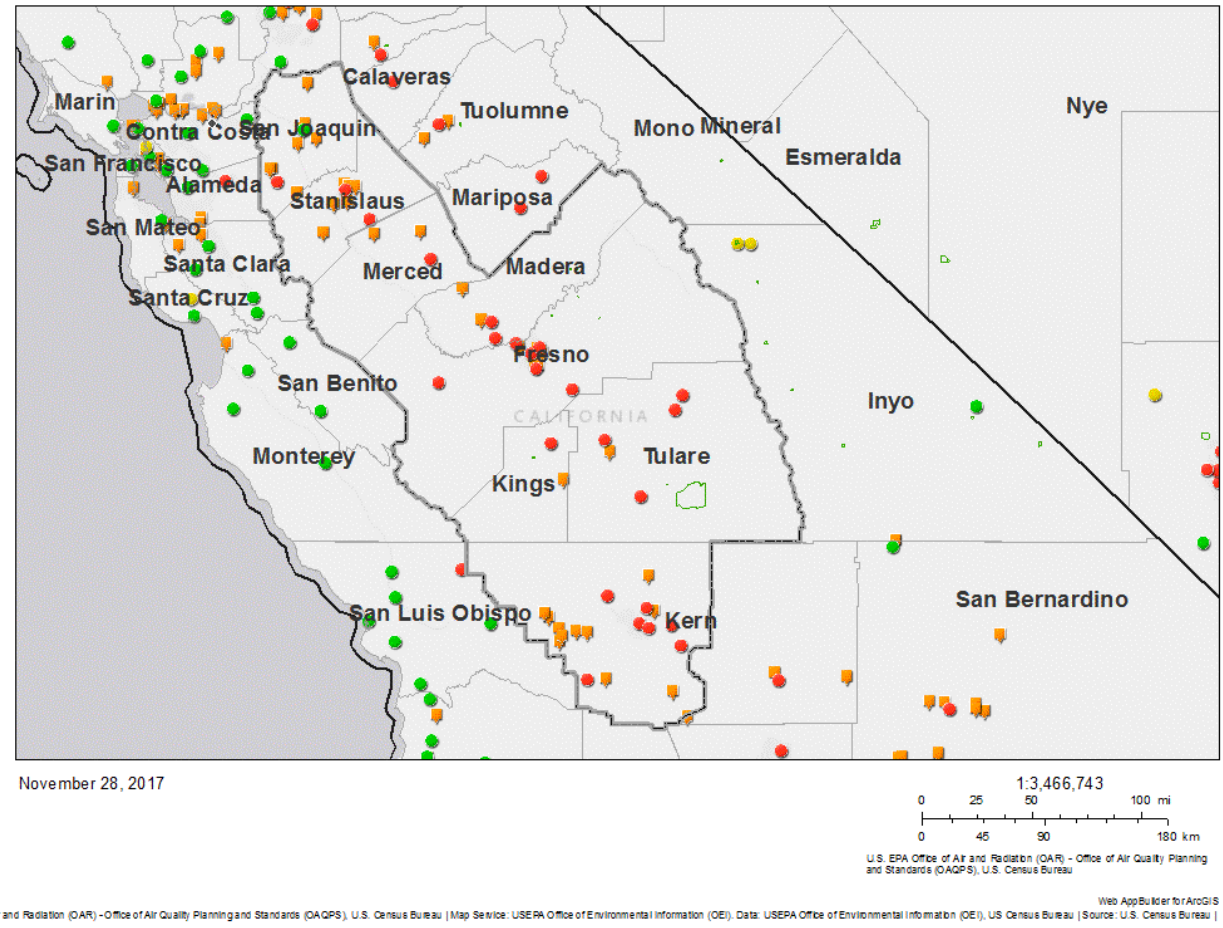


Figure 16.3 shows large point sources in the area of analysis for San Joaquin Valley, CA as orange squares. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission shows that Kern County had the highest emissions levels, 28,469 tpy of NO_x and 107,342 tpy of VOC, within the area of analysis. Fresno County had the next highest emission levels, 20,895 tpy of NO_x and 28,352 tpy of VOC. Kings County had the lowest emissions levels for both NO_x and VOC within the area of analysis. As shown in Figure 16.3, the western portion of Kern County contains the majority of the large point sources of ozone precursors, while the counties of San Joaquin and Stanislaus have the next highest number of large point sources within the area of analysis. Generally, there are numerous large point sources located throughout the central and western portions of San Joaquin Valley, and few large point sources located in the eastern portion of San Joaquin Valley.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions

that may contribute to violations of the NAAQS. Table 16.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 16.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Fresno, CA	Yes	930,450	974,861	164	44,411	5%
Kern, CA	Yes (partial)	839,631	882,176	108	42,545	5%
San Joaquin, CA	Yes	685,306	726,106	522	40,800	6%
Stanislaus, CA	Yes	514,453	538,388	360	23,935	5%
Tulare, CA	Yes	442,179	459,863	95	17,684	4%
Merced, CA	Yes	255,793	268,455	139	12,662	5%
Madera, CA	Yes	150,865	154,998	73	4,133	3%
Kings, CA	Yes	152,982	150,965	109	-2,017	-1%
	Area wide:	3,971,659	4,155,812	152	184,153	5%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 16.4 shows the county-level population density for the area of analysis. As shown in Table 16.4, Fresno County has the highest county population within the area of analysis, while the highest population density occurs in San Joaquin County. The county of Fresno had a 2015 population of approximately 975,000 people, with 5% population growth during the 2010-2015 period. Generally, Figure 16.4 and Table 16.4 show that Madera and Kings counties are more sparsely populated with lower population densities compared to Fresno and Kern counties, which contain the urban centers of Fresno and Bakersfield, respectively. San Joaquin, Stanislaus, Merced, and Tulare counties are moderately-populated relative to other counties in the area of analysis. Kings County is the only County with a population that decreased between 2010 and 2015 with all other Counties experiencing growth in the range of 3 to 6 percent.

Figure 16.4 County-Level Population.

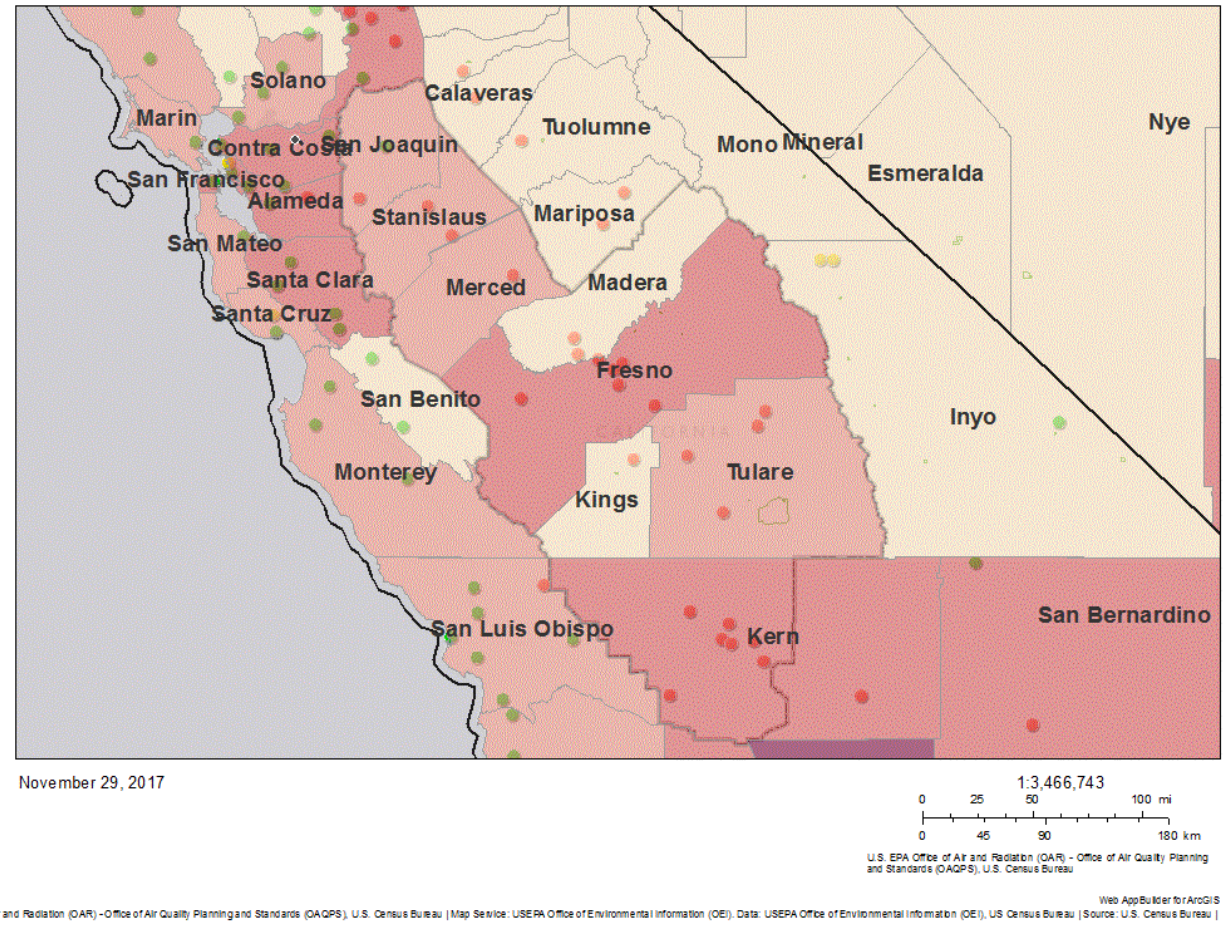


Figure 16.4 shows county-level population in the area of analysis for San Joaquin Valley, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 16.5 shows the traffic and commuting pattern data, including total VMT for each county, number of residents who work in each county, number of residents that work in counties with violating monitor(s), and the percent of residents working in counties with violating monitor(s). The data in Table 16.5 are 2014 data.

Table 16.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) within the Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) within the Area of Analysis
Kern, CA	**Yes (partial)**	**8,060**	**288,501**	**218,615**	**75.8%**
Fresno, CA	**Yes**	**6,838**	**344,259**	**292,127**	**84.9%**
San Joaquin, CA	**Yes**	**6,326**	**257,794**	**146,544**	**56.8%**
Stanislaus, CA	**Yes**	**4,272**	**192,245**	**138,496**	**72.0%**
Tulare, CA	**Yes**	**3,340**	**153,860**	**130,426**	**84.8%**
Merced, CA	**Yes**	**2,504**	**88,408**	**65,301**	**73.9%**
Madera, CA	**Yes**	**1,502**	**49,526**	**40,249**	**81.3%**
Kings, CA	**Yes**	**1,377**	**46,313**	**37,902**	**81.8%**
	Total:	34,218	1,420,906	1,069,660	75.3%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 16.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 16.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

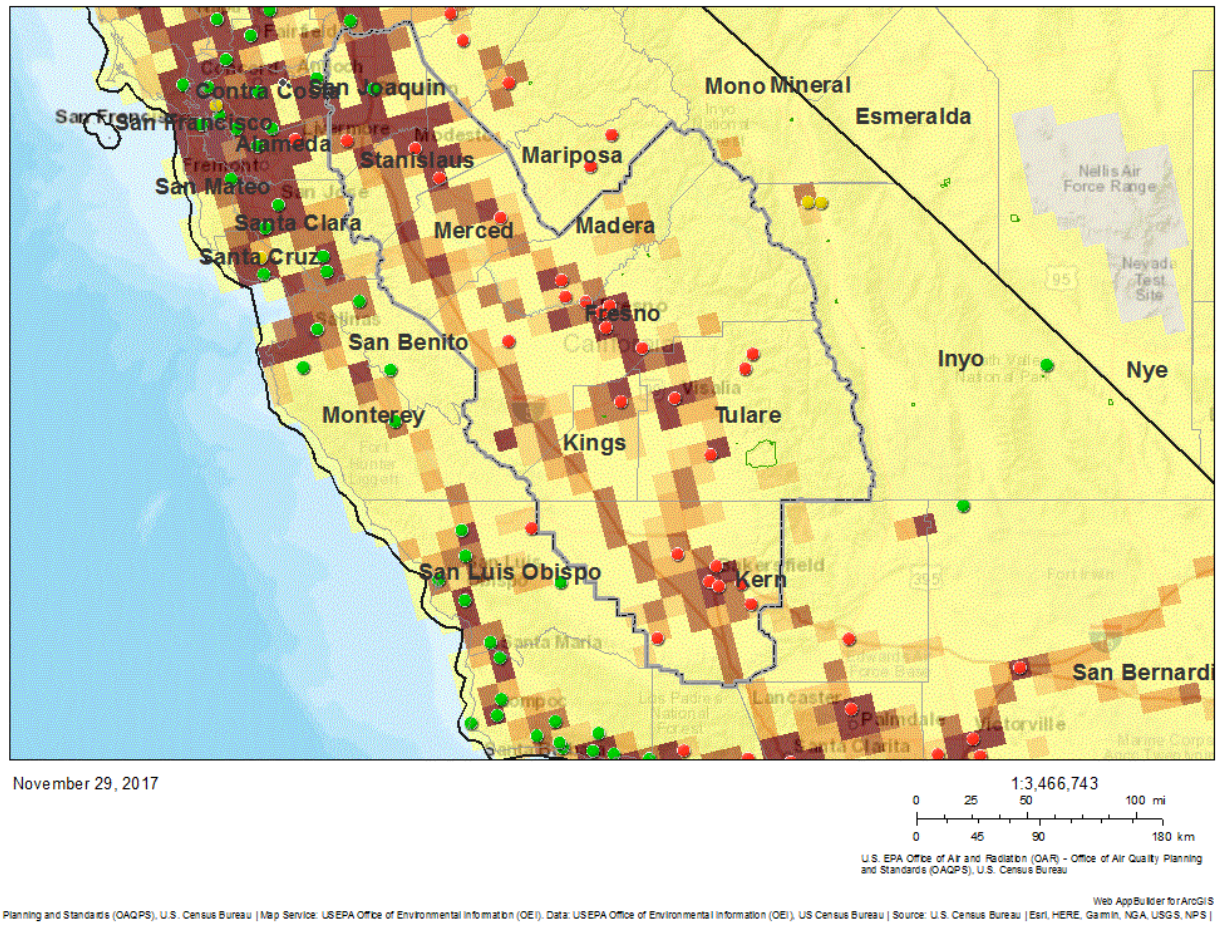


Figure 16.5 shows gridded VMT in the area of analysis for San Joaquin Valley, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau,[6] and shows that Kern has the highest total VMT levels within the area of analysis. The data also show that Kern and Fresno counties contain the largest number of commuters to or within counties with violating monitors. The twelve-kilometer grid cells with the highest VMT in San Joaquin Valley fall over cities such as Fresno, Bakersfield, Modesto, and Stockton, and in areas that include Interstate 5 and California State Route 99. As shown in Figure 16.5, the eastern portion of Kern County, which the State recommended as a separate nonattainment area, contains some of the lowest VMT areas in Kern County.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In

[6] The Census Bureau's On the Map web page can be found at https://onthemap.ces.census.gov/.

order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figures 6a-h show the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for one violating monitor in each of the eight counties in the nonattainment area (See Factor 1): Fresno (Figure 16.6a, Clovis-Villa monitor), Kern (Figure 16.6b, Bakersfield-Muni monitor), Kings (Figure 16.6c, Corcoran monitor), Madera (Figure 16.6d, Madera-City monitor), Merced (Figure 16.6e, Merced-Coffee monitor), San Joaquin (Figure 16.6f, Tracy-Airport monitor), Stanislaus (Figure 16.6g, Turlock), and Tulare (Figure 16.6h, Sequoia and Kings Canyon National Parks, Ash Mountain monitor).

Figure 16.6a HYSPLIT Back Trajectories for Clovis – N. Villa Ave. (06-019-5001).

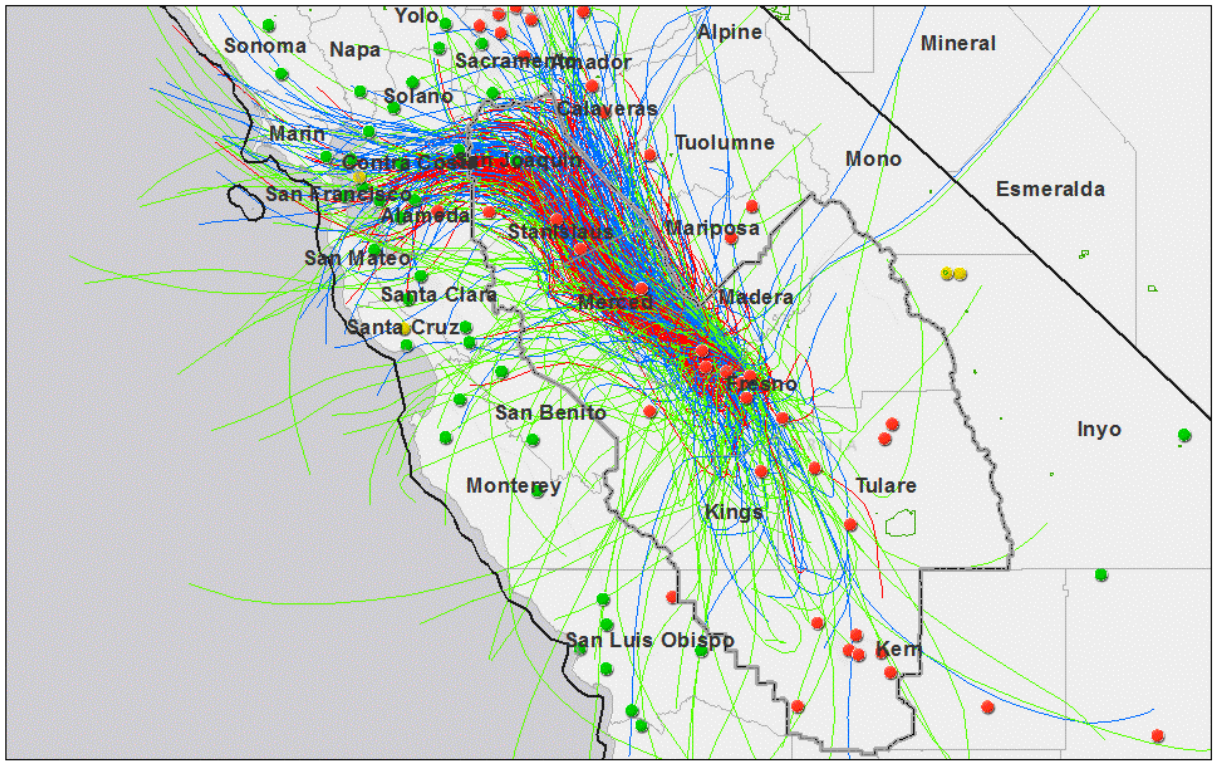


Figure 16.6a shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 16.6b HYSPLIT Back Trajectories for Bakersfield - Muni (06-029-2012).

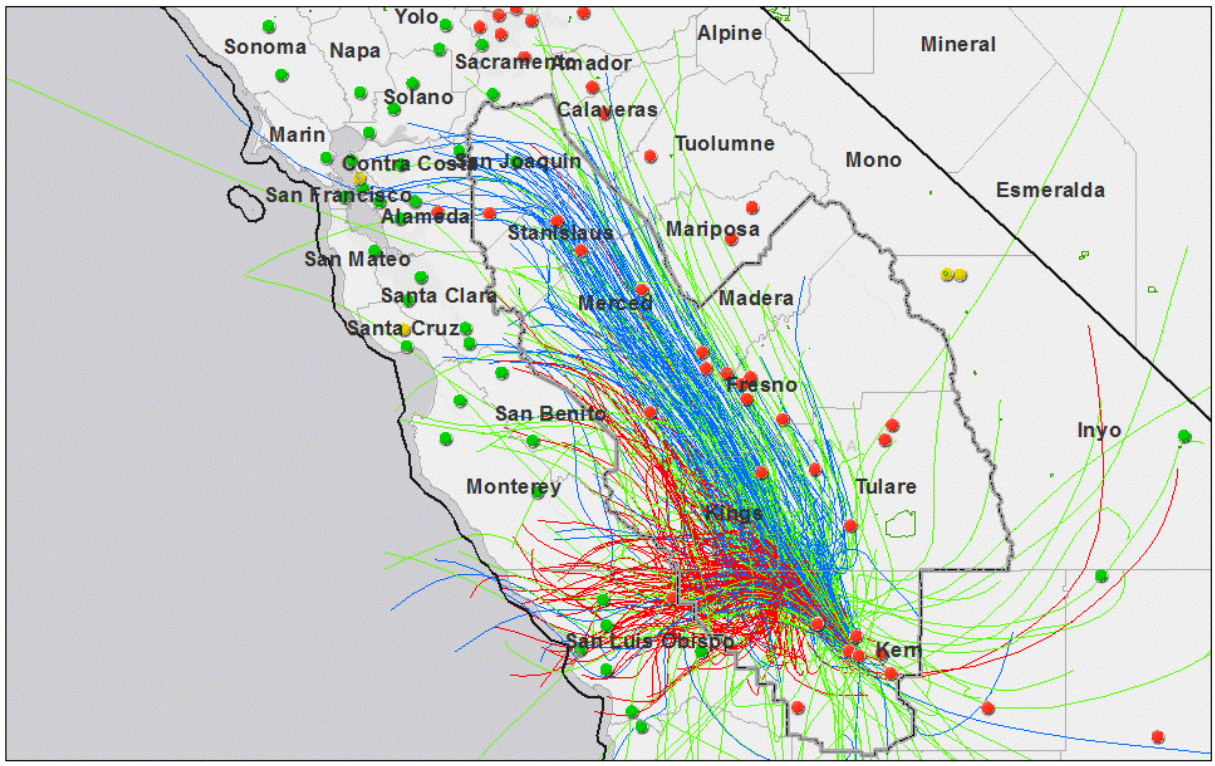


Figure 16.6b shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 16.6c HYSPLIT Back Trajectories for Corcoran (06-031-1004).

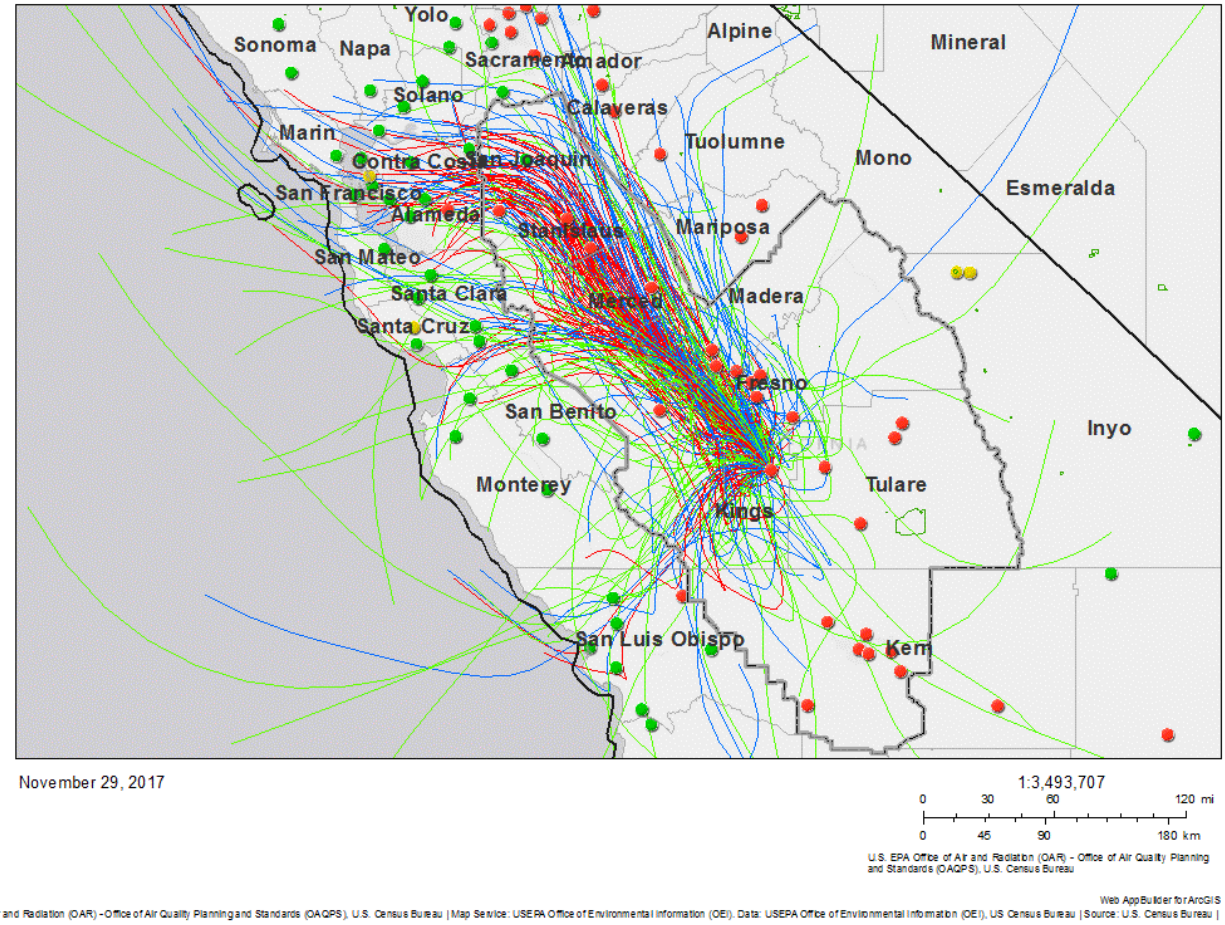


Figure 16.6c shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 16.6d HYSPLIT Back Trajectories for Madera-City (06-039-2010).

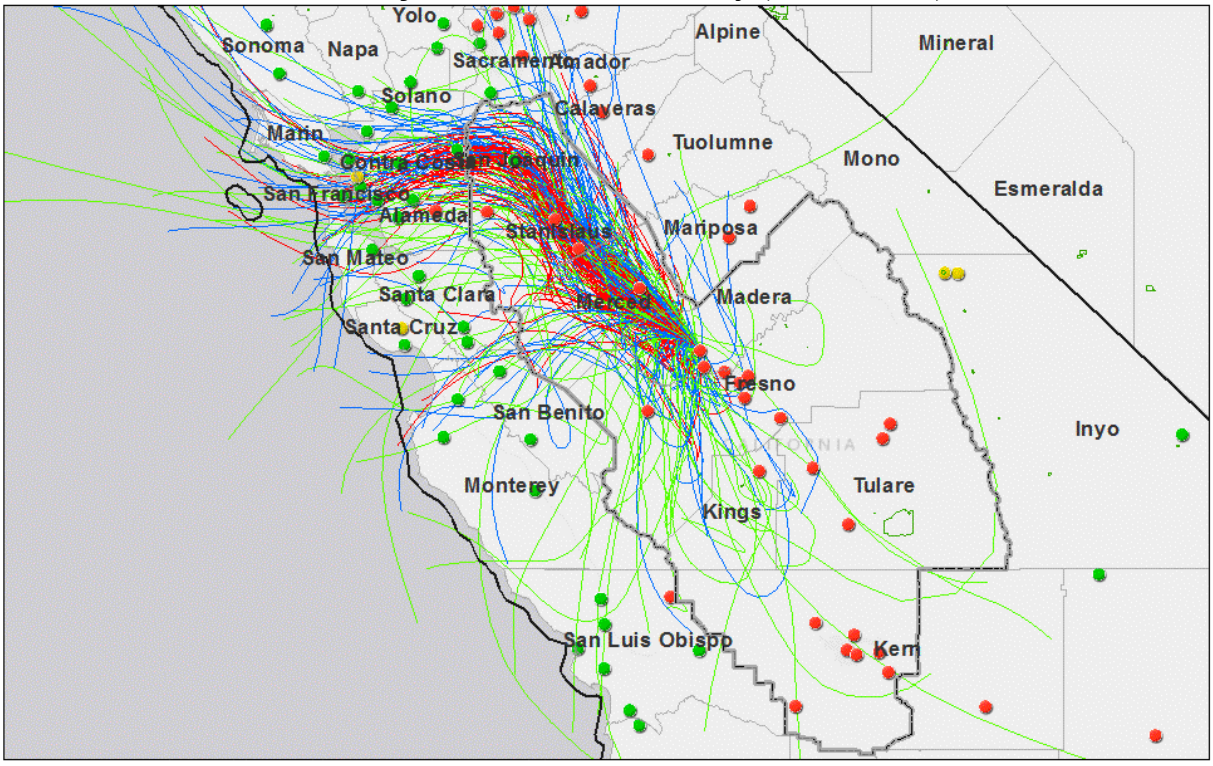


Figure 16.6d shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 16.6e HYSPLIT Back Trajectories for Merced – S. Coffee Ave. (06-047-0003).

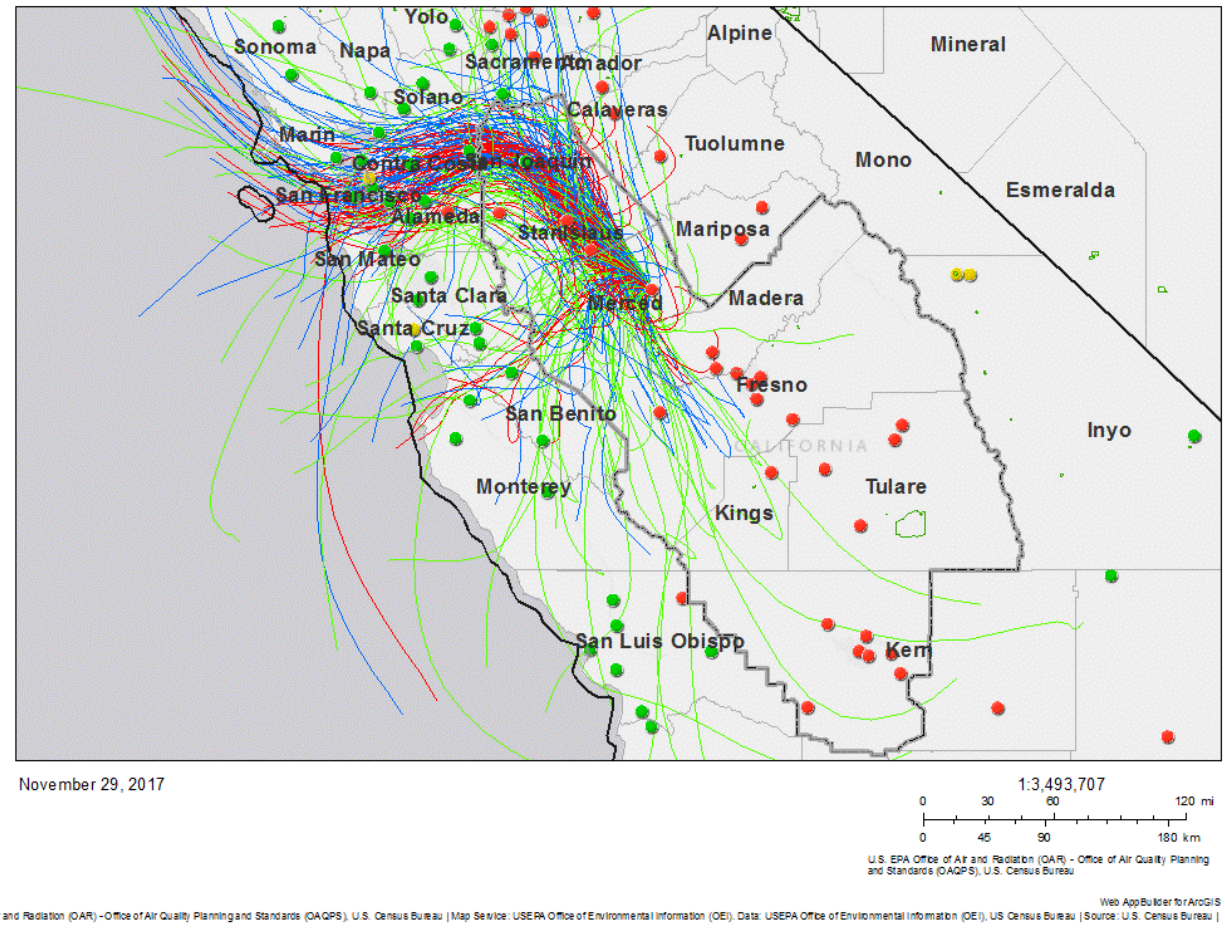


Figure 16.6e shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 16.6f HYSPLIT Back Trajectories for Tracy – Airport (06-077-3005).

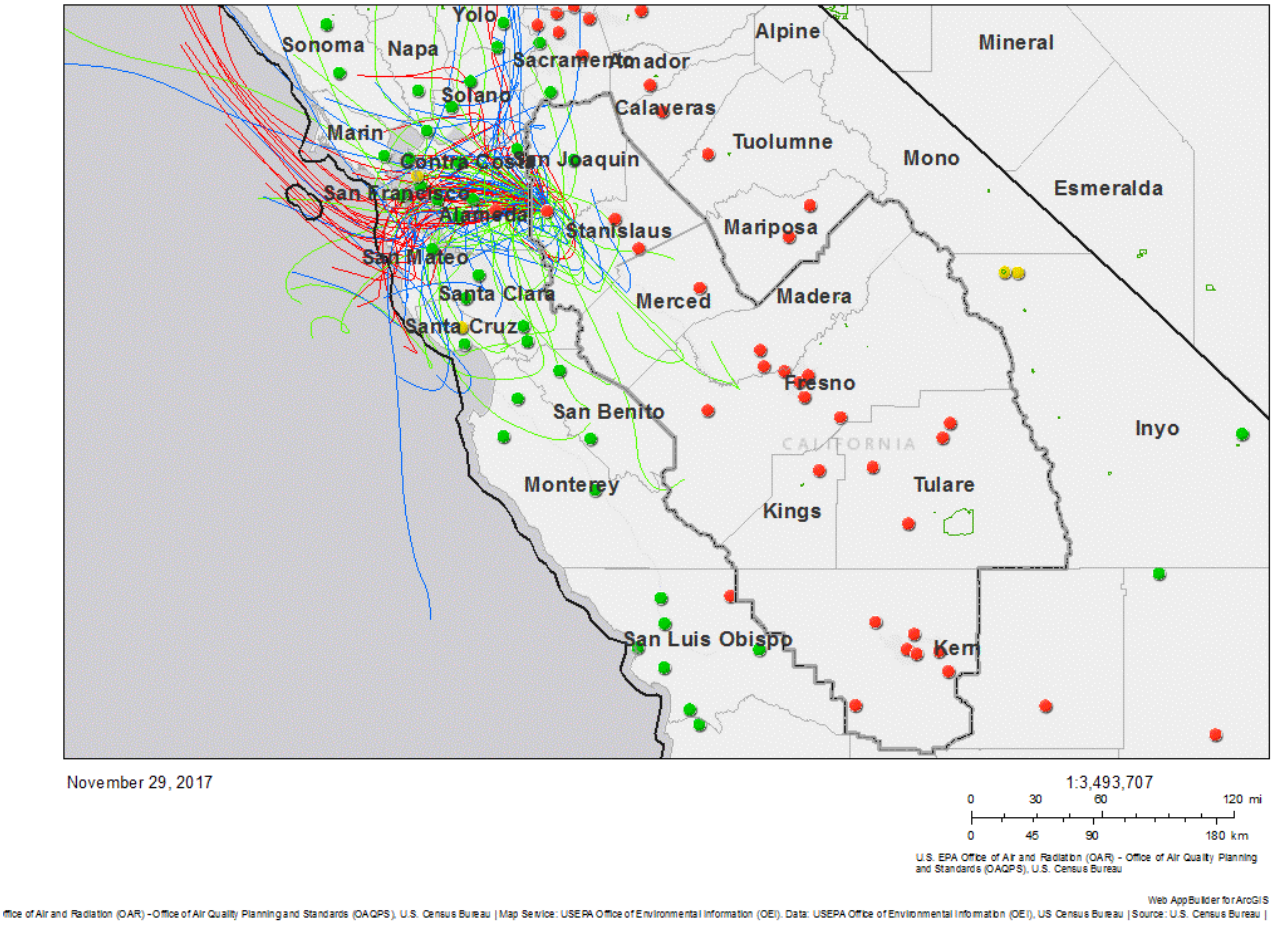


Figure 16.6f shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 16.6g HYSPLIT Back Trajectories for Turlock – S. Minaret St. (06-099-0006).

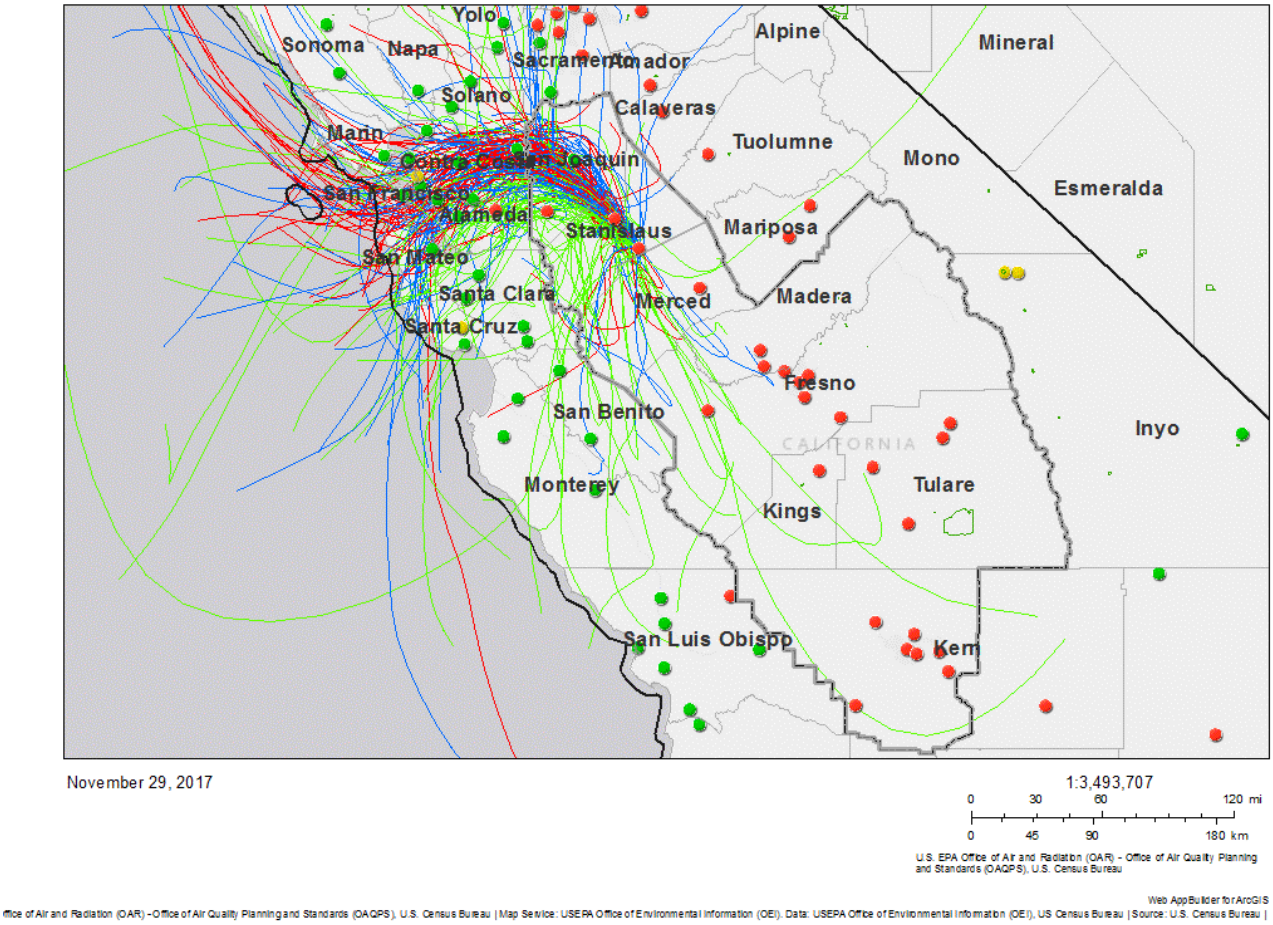


Figure 16.6g shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 16.6h HYSPLIT Back Trajectories for Sequoia – Ash Mountain (06-107-0009).

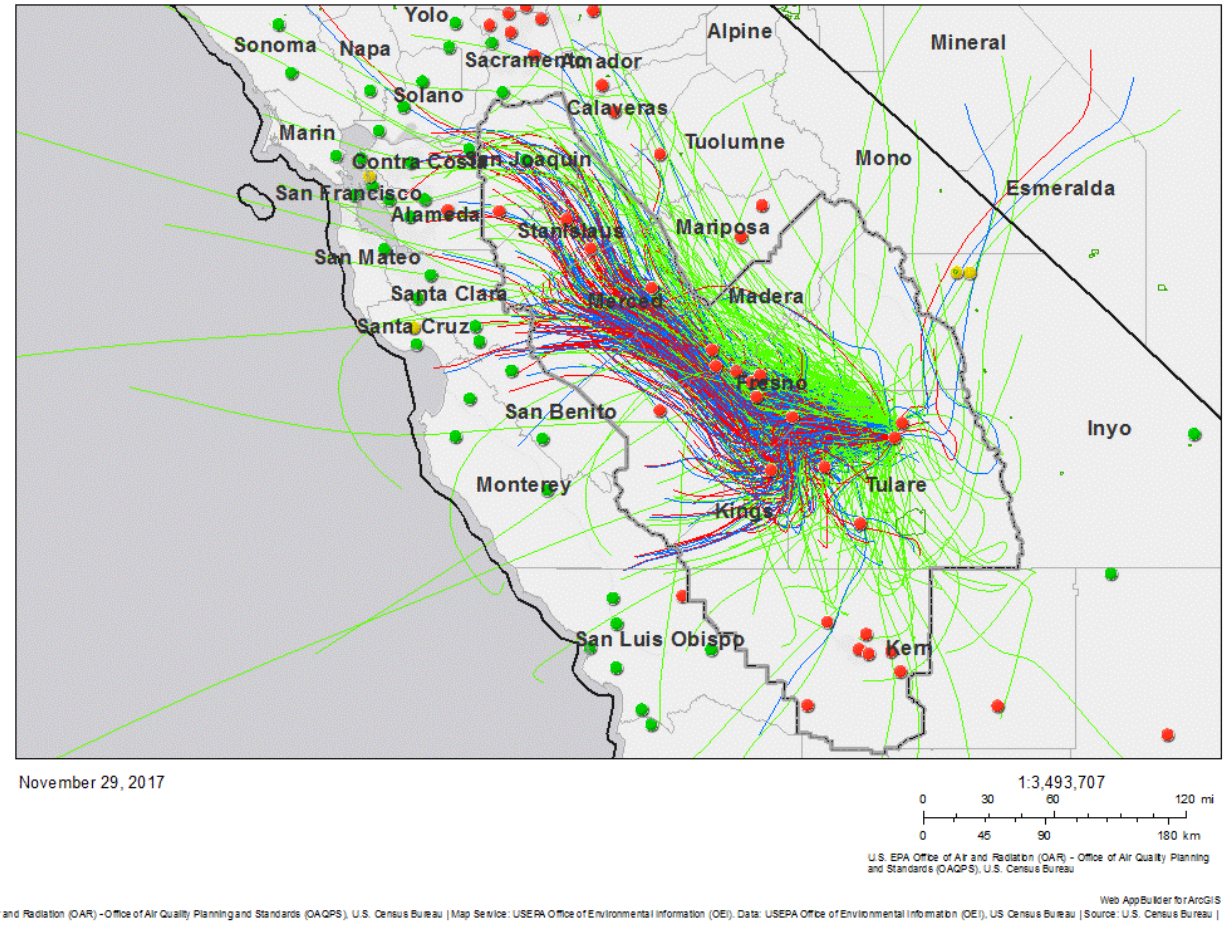


Figure 16.6h shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows that the winds during exceedance days are predominately from the north-northwest. This is consistent with the geographic orientation of the San Joaquin Valley and its relationship to the Golden Gate (at the mouth of San Francisco Bay), the key route for air flow between the Pacific Ocean and the Central Valley of California.

The San Joaquin Valley 2007 Ozone Plan[7] includes a conceptual description of ozone formation in the area. The Sierra Nevada, Tehachapi, and South Coast mountain ranges that surround the San Joaquin Valley on the east, south, and west, restrict air flow and ventilation. The summers are hot with little rainfall or cloud cover, and with frequent inversions that trap pollutants below them. Sea breezes (or "marine flows") may bring pollutants from coastal areas into the San Joaquin Valley from the northwest. Recirculation of San Joaquin Valley pollutants can occur via nighttime drainage winds ("slope flows"), which return pollutants that were transported up into mountain valleys during the day. Recirculation can also occur via the "Fresno eddy," a counterclockwise flow that returns polluted air

[7] "Photochemical Modeling Protocol for Developing Strategies to Attain the Federal 8-hour Ozone Air Quality Standard in Central California," California Air Resources Board, May 22, 2007; included as Appendix C to the ARB Staff Report. See especially pp.6-8. Available at http://www.arb.ca.gov/planning/sip/2007sip/sjv8hr/sjvozone.htm

that would otherwise escape through southern mountain passes. All of these contribute to the build-up of ozone and precursors due to enhanced photochemical formation and to restricted dispersion. Various flow patterns exist, including transport between the San Joaquin Valley and both the Sacramento Valley to the north and the San Francisco Bay Area to the northwest. While there is interchange of air between San Joaquin Valley and these nearby areas, its unique flow patterns make it meteorologically distinct from those areas. As previously noted, the State has recommended that EPA designate as separate nonattainment areas for the 2015 ozone NAAQS the upwind areas of Sacramento Metro, San Francisco Bay Area, the four mountain counties of Amador, Calaveras, Tuolumne, and Mariposa, and the eastern part of San Luis Obispo County; EPA addresses each of those areas in separate sections of this TSD.

Factor 4: Geography/topography

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. Topography impacts pollutant formation and transport in California, and thus plays an important role in assessing which areas are contributing to monitored violations of the NAAQS.

Figure 16.7 shows a topography of the San Joaquin Valley area of analysis. California has historically been divided into fifteen distinct air basins. The San Joaquin Valley is located in the San Joaquin Valley Air Basin and includes Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties, and the western portion of Kern County. The State recommended that the nonattainment area cover the same geographic extent as the Air Basin.

The San Joaquin Valley is the southern half of the large, flat Central Valley of California. Except to the north, the San Joaquin Valley is surrounded on all sides by mountains. These include the Sierra Nevada mountain range to the east, the Tehachapi range to the south and southwest, and South Coast ranges to the west. These ranges tend to restrict air flow and ventilation. In the southernmost portion of the San Joaquin Valley nonattainment area, Kern County is bisected by a generally north-south line along the Sierra Nevada mountain range.

While there is no topographic barrier between the San Joaquin Valley and the Sacramento Valley to the north, and at times there can be transport between them, generally the air flow from the Pacific Ocean through the Golden Gate toward the east tends to bifurcate where the two valleys meet, providing some degree of separation much of the time.

Figure 16.7 Topographic Illustration of the Physical Features.

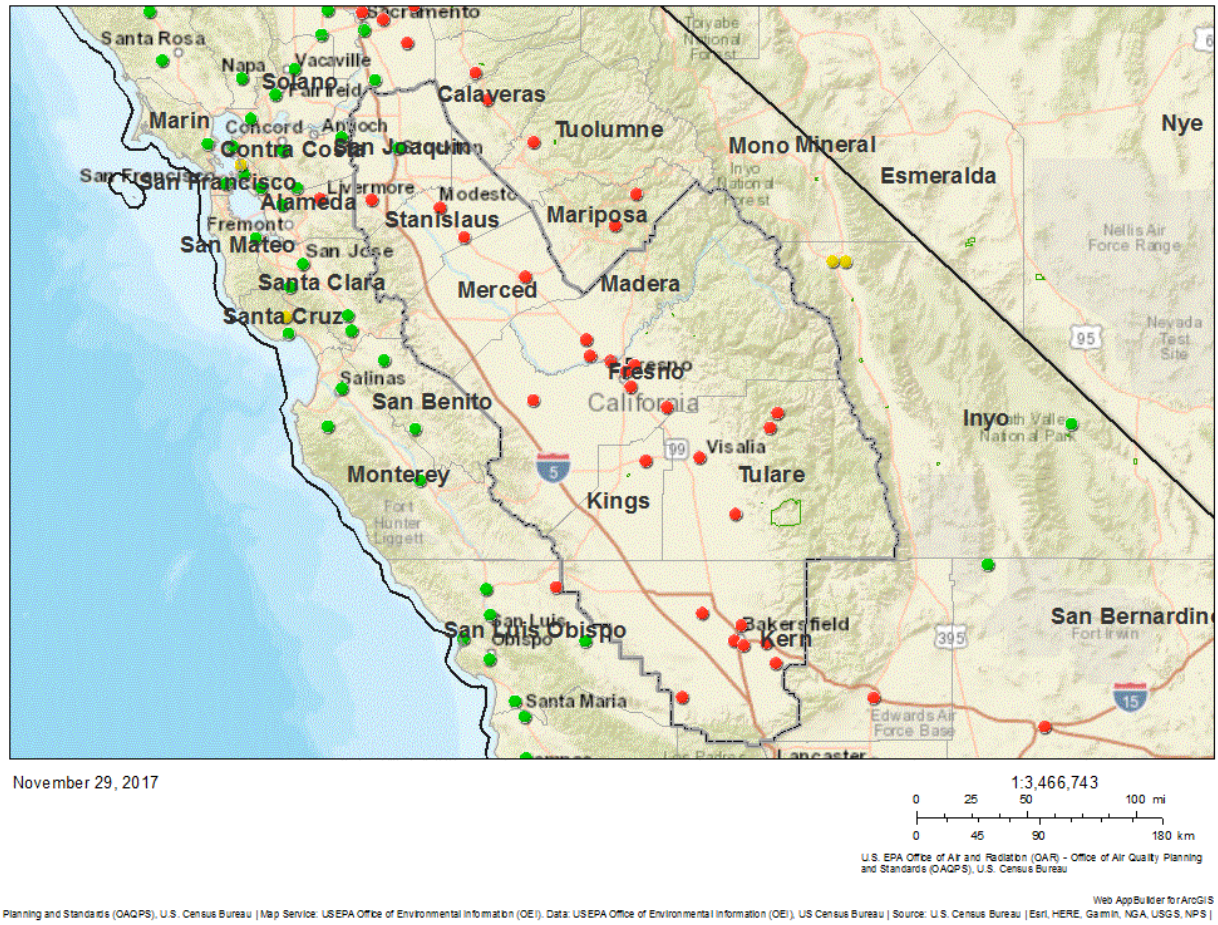


Figure 16.7 shows the topography in the area of analysis for San Joaquin Valley, CA. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the San Joaquin Valley nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 16.8 shows the relevant jurisdictional boundaries for the San Joaquin Valley nonattainment area, including county, CSA, and CBSA boundaries, and areas of Indian country.

Figure 16.8 Jurisdictional Boundaries.

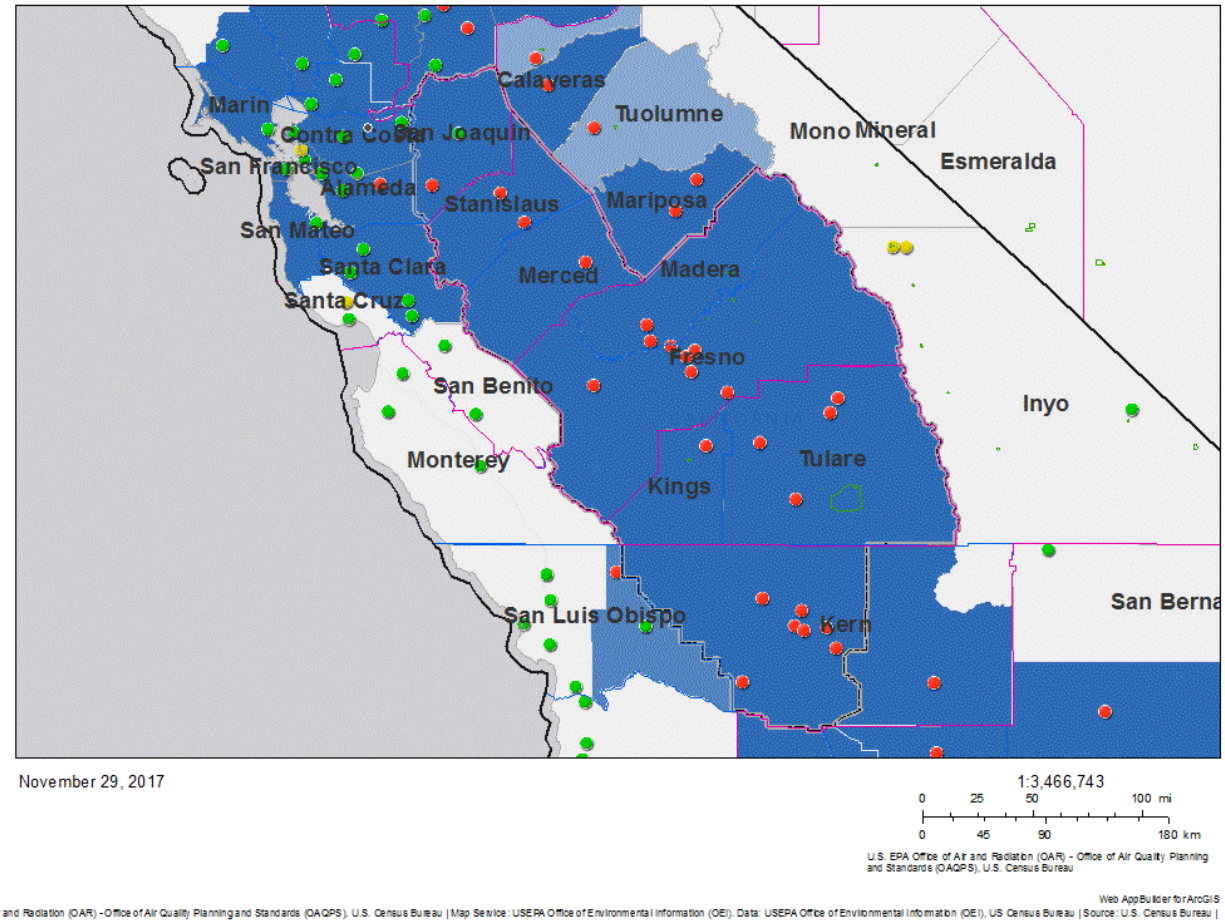


Figure 16.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for San Joaquin Valley, CA. The EPA's nonattainment boundary for San Joaquin Valley, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The San Joaquin Valley area has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

The State's recommended boundary for the San Joaquin Valley nonattainment area is the same as the San Joaquin Valley Air Pollution Control District's (APCD) jurisdictional boundary. This district contains seven whole counties (Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare) and one partial county (the western portion of Kern County). As described in the Section on topography, Kern County is bisected by a generally north-south line along the Sierra Nevada mountain range. The western side is in the San Joaquin Valley Air Basin and is under the jurisdiction of the San Joaquin Valley APCD. The eastern side of Kern County is in the Mojave Desert Air Basin and is under the jurisdiction of the Eastern Kern APCD.

The 2015 ozone NAAQS nonattainment areas of Amador County, Calaveras County, Eastern Kern, Los Angeles-San Bernardino Counties (West Mojave Desert), Los Angeles-South Coast Air Basin, Mariposa County, Sacramento Metro, San Francisco Bay Area, Eastern San Luis Obispo, Tuolumne County, and Ventura County are adjacent to the San Joaquin Valley nonattainment area. Each of these

areas has planning organizations that are separate from those in the San Joaquin Valley nonattainment area.

As mentioned above, the San Joaquin Valley area also includes Indian country of the following tribes: Big Sandy Rancheria, Cold Springs Rancheria, Northfork Rancheria, Picayune Rancheria, Santa Rosa Rancheria, Table Mountain Rancheria, and Tule River Tribe. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

Conclusion for San Joaquin Valley, CA

Based on the assessment of factors described above, the EPA has concluded that the following counties meet the CAA criteria for inclusion in the San Joaquin Valley nonattainment area: Fresno, Kern (partial), Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties. These are the same counties included in the San Joaquin Valley nonattainment area for the 1997 and 2008 ozone NAAQS.

The air quality monitors in Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties, and the western portion of Kern County, indicate violations of the 2015 ozone NAAQS based on the 2016 design values, therefore, these counties are included in the nonattainment area. Emissions and emission-related data show that these counties contain numerous large point sources, major population centers, major roadways, and other sources of ozone precursor emissions that contribute to violations in the San Joaquin Valley air basin. Meteorological data show the winds transporting ozone and ozone precursors during exceedance days are predominately from the north-northwest though there is also recirculation of the winds within the Valley that may be contributing to exceedances or violations of the 2015 ozone NAAQS. The topography of the Central Valley also likely influences the fate and transport of emissions as well as the formation and distribution of higher ozone concentrations in this area. The topography of the area – a basin surrounded on three sides by mountains also supports the State-recommended designation. In addition, jurisdictional considerations such as the recommended area is the same as for previous ozone NAAQS and is covered by a single APCD also support the State's recommendation.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation and is designating the following counties and partial county as the San Joaquin Valley, CA nonattainment for the 2015 ozone NAAQS: Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties, and the western portion of Kern County.

17.0 Technical Analysis for San Luis Obispo (Eastern Part), CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. It also provides the EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area.

Table 17.1 identifies the area of analysis for the San Luis Obispo (Eastern Part), CA nonattainment area. The area of analysis includes all of San Luis Obispo County, which comprises all of the San Luis Obispo-Paso Robles-Arroyo Grande CBSA. There is no CSA associated with this area. The final nonattainment area is identical to the existing 2008 San Luis Obispo (Eastern part), CA nonattainment area.

The San Luis Obispo-Paso Robles-Arroyo Grande CBSA includes the entirety of the existing Eastern San Luis Obispo, CA nonattainment area for the 2008 ozone NAAQS in the eastern portion of San Luis Obispo County. The 2015 ozone NAAQS Eastern San Luis Obispo, CA nonattainment area is adjacent to the San Joaquin Valley, CA nonattainment area. Information specific to San Joaquin Valley is contained in the associated Technical Analysis section for the San Joaquin Valley nonattainment area.

Table 17.1 Area of Analysis.

Final Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
San Luis Obispo (Eastern part), CA	San Luis Obispo County	San Luis Obispo-Paso Robles-Arroyo Grande CBSA	None

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

Figure 17.1 is a map of the EPA's final nonattainment boundary for Eastern San Luis Obispo. The map shows the location of the ambient air quality monitors, county boundaries, and existing 2008 ozone NAAQS nonattainment boundaries.

San Luis Obispo County was designated unclassifiable/attainment for the 1997 NAAQS. The eastern portion of San Luis Obispo County was designated nonattainment for the 2008 ozone NAAQS, and the western portion of the county was designated unclassifiable/attainment. There are no areas of Indian country in this area. The EPA is not modifying the State's recommendation to designate the eastern portion of San Luis Obispo County as nonattainment for the 2015 ozone NAAQS, with the same boundary as the San Luis Obispo County (Eastern part), CA nonattainment area for the 2008 ozone NAAQS.

Figure 17.1 The EPA's Final Nonattainment Boundaries for Eastern San Luis Obispo, CA.

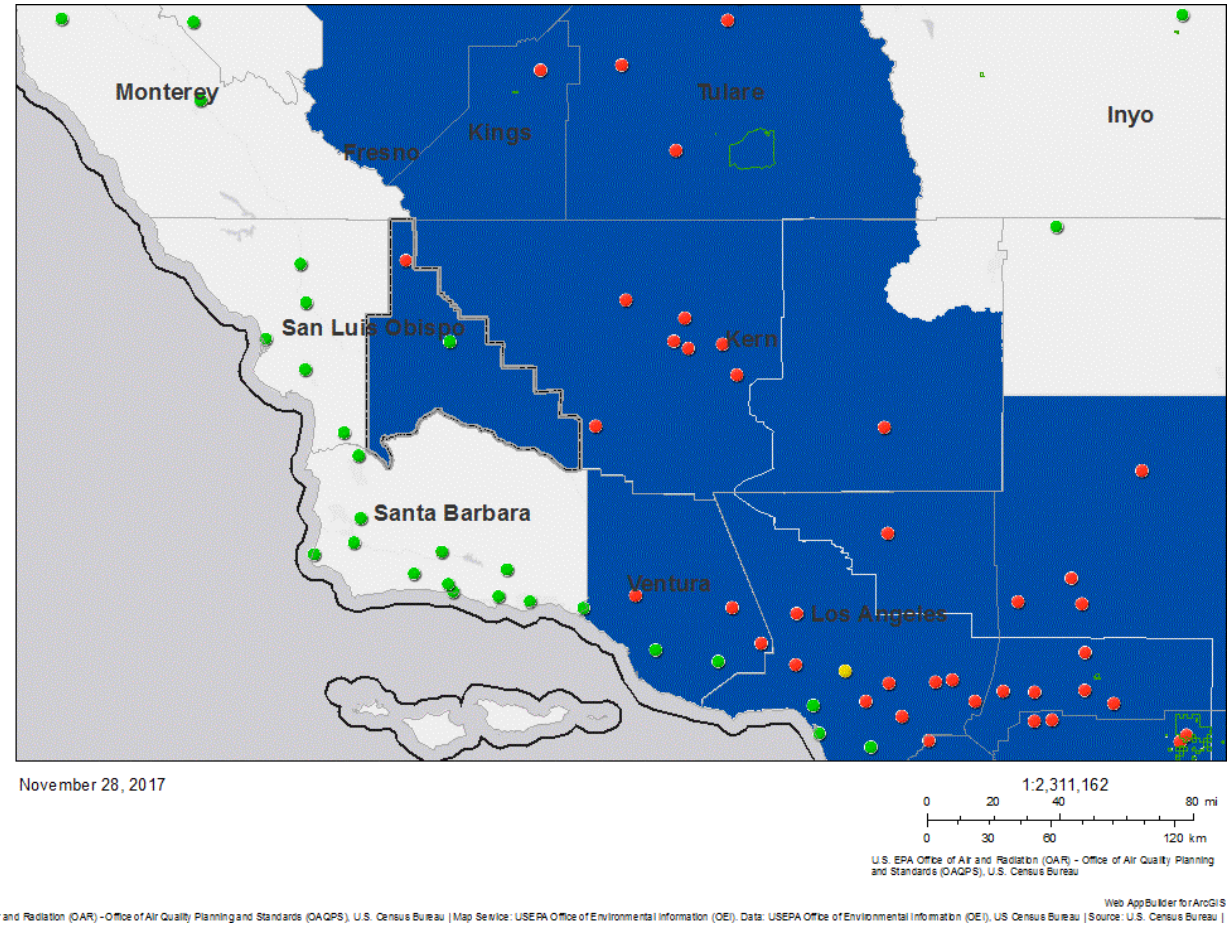


Figure 17.1 shows the EPA's nonattainment boundary for Eastern San Luis Obispo, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. San Luis Obispo County has a monitor in violation of the 2015 ozone NAAQS, therefore a portion of this county is included in the nonattainment area. The following sections describe the five factor analysis for the area of analysis, which is San Luis Obispo County. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the

area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in San Luis Obispo County based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values. Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016, Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 17.2.

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[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx

[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.

[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.

[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 17.2 Air Quality Data (all values in ppm).

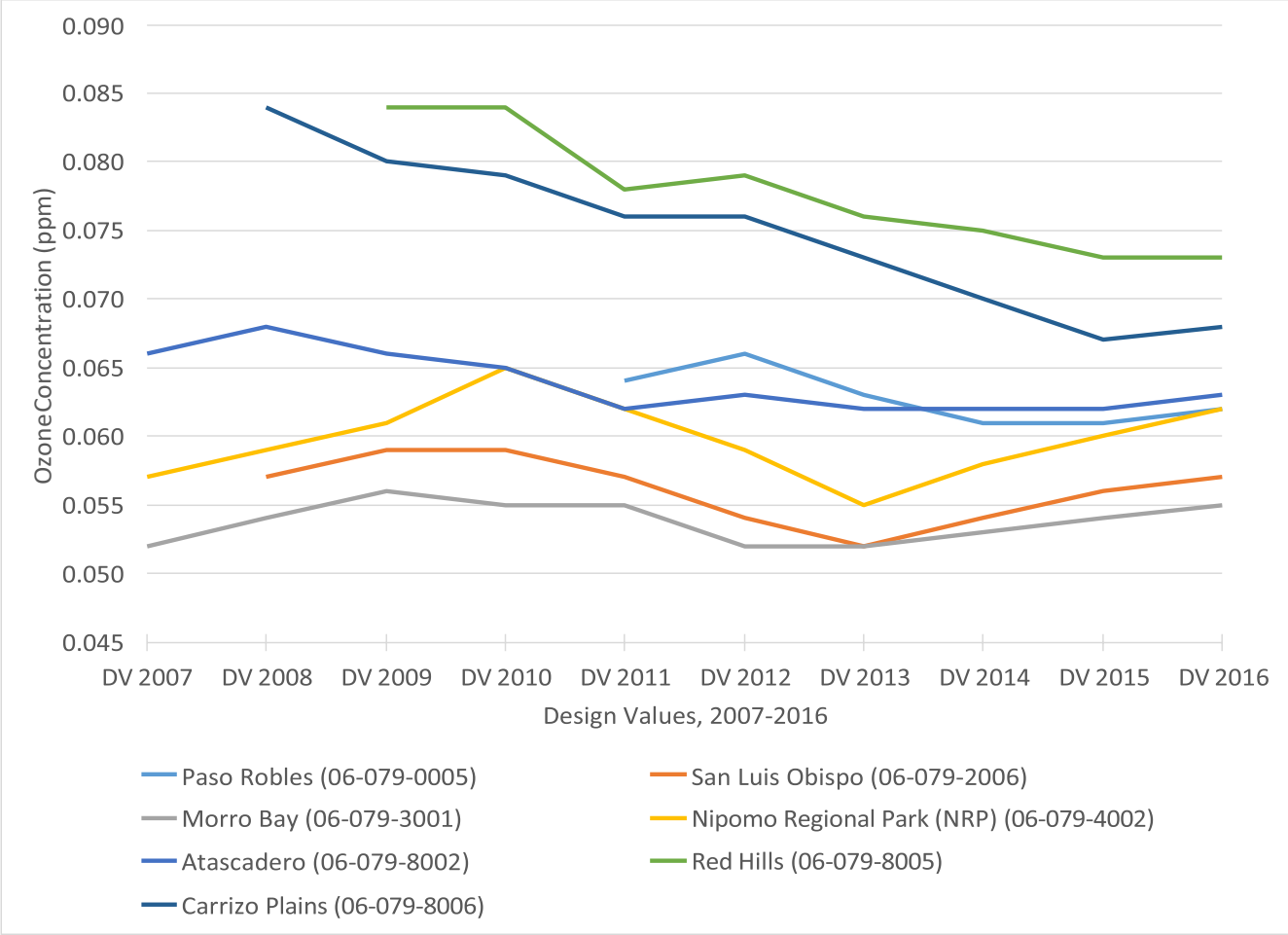
County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
San Luis Obispo, CA	Yes (partial)	06-079-0005	0.062	0.058	0.065	0.063
		06-079-2006	0.057	0.062	0.057	0.054
		06-079-3001	0.055	0.060	0.052	0.053
		06-079-4002	0.062	0.066	0.060	0.060
		06-079-8002	0.063	0.063	0.064	0.062
		06-079-8005	**0.073**	0.073	0.072	0.074
		06-079-8006	0.068	0.068	0.068	0.070

The highest design value in each county is indicated in bold type.
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

San Luis Obispo County shows a violation of the 2015 ozone NAAQS, therefore part of this county is included in the nonattainment area.

Figure 17.1, shown previously, identifies the Eastern San Luis Obispo nonattainment area and the violating monitor. Table 17.2 identifies the design values for all monitors in the area of analysis. Figure 17.2 shows the historical trend of design values for all monitors in the area of analysis. As indicated on the map, there is one violating monitor located in San Luis Obispo County, Red Hills (AQS ID 06-079-8005). The Red Hills monitor has a valid 2016 DV of 0.073 ppm and is located in the eastern portion of San Luis Obispo County. The other monitors in the county that are attaining the 2015 ozone NAAQS are generally located in the western portion of the county. As shown in Figure 17.2, the trend for previous design values at the Red Hills monitor has been consistently above the 2015 ozone NAAQS for the past eight years. The design values at the other monitor in the eastern portion of the county, Carrizo Plains (AQS ID 06-079-8006), have been generally decreasing for the past nine years and the monitor has a 2016 DV of 0.068 ppm. All of the monitors in the western portion of the county have been consistently below the 2015 ozone NAAQS, with no clear design value trend change in the past 10 years.

Figure 17.2 Three-Year Design Values for All Monitors in San Luis Obispo County (2007 – 2016).



San Luis Obispo County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitor is located within the eastern portion of San Luis Obispo County that was included as part of the designated nonattainment area for the 2008 ozone NAAQS.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

<u>Emissions Data</u>

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 17.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Eastern San Luis Obispo nonattainment area.

Table 17.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
San Luis Obispo, CA	Yes (partial)	4,697	6,019
	Area wide:	4,697	6,019

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown with orange icons in Figure 17.3 below. The nonattainment boundary is also shown.

Figure 17.3 Large Point Sources in the Area of Analysis.

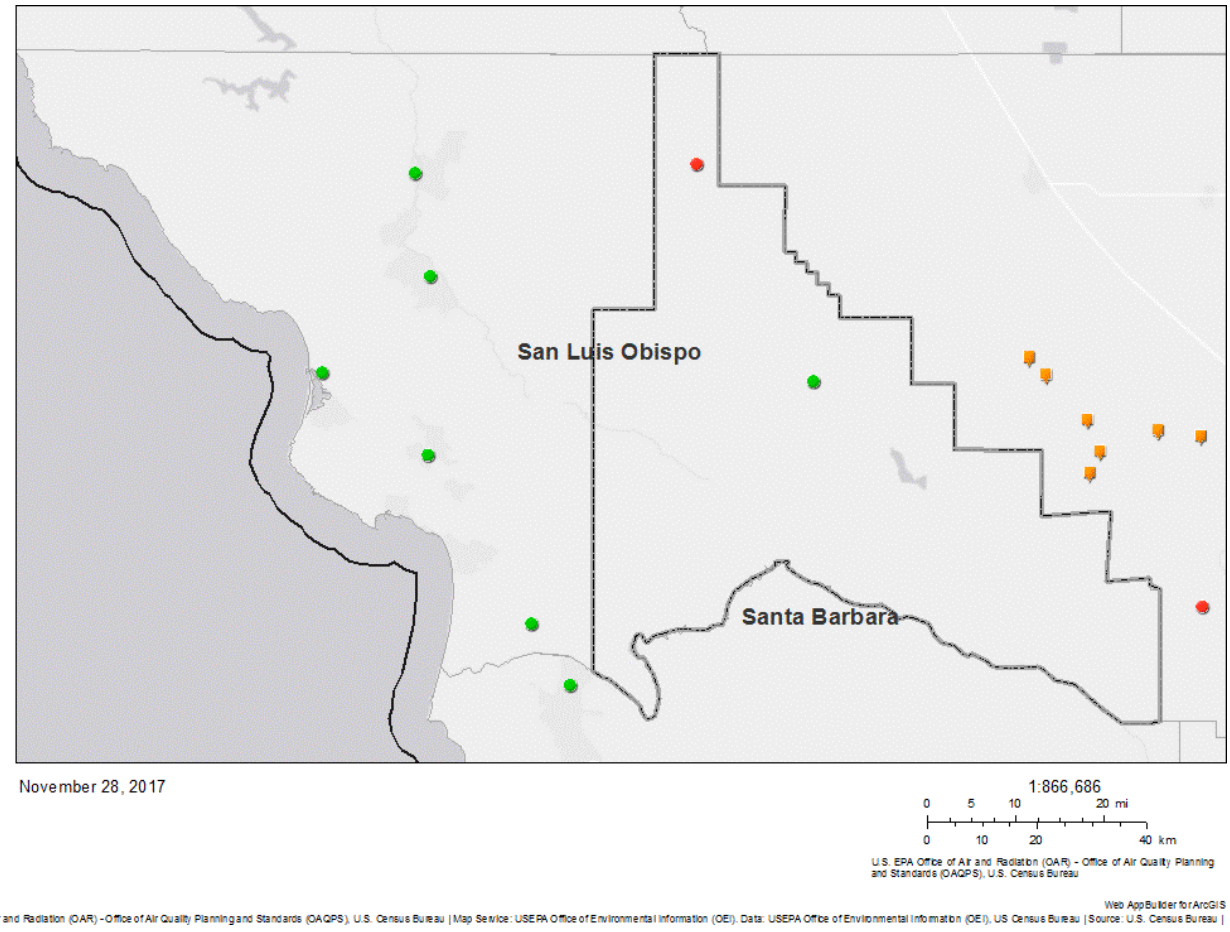


Figure 17.3 shows large point sources in the area of analysis for Eastern San Luis Obispo, CA as orange squares. The EPA's nonattainment boundary for Eastern San Luis Obispo, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission show that San Luis Obispo County has emissions levels of about 4,700 tpy of NO_x and about 6,000 tpy of VOC, based on the 2014 NEI. San Luis Obispo County does not contain any large point sources. As shown in Figure 17.3, San Luis Obispo County is bordered to the east by Kern County, which contains several large point sources of ozone precursors mostly concentrated in the western portion. Kern County has emission levels of 28,469 tpy of NO_x and 107,342 tpy of VOC. The western portion of Kern County in included in the EPA's San Joaquin Valley nonattainment area (see Technical Analysis for San Joaquin Valley, CA nonattainment area for a discussion of the western portion of Kern County).

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 17.4 shows the population, population density, and population growth information for San Luis Obispo County.

Table 17.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
San Luis Obispo, CA	Yes (partial)	269,637	281,401	85	11,764	4%
	Area wide:	269,637	281,401	85	11,764	4%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html

Figure 17.4 shows the 2012 census tract-level population information for San Luis Obispo County. The entire county of San Luis Obispo had a 2015 population of 281,401 people, with a 4% population increase during the 2010-2015 period. Generally, San Luis Obispo County is moderately-populated, with two areas of higher population density centered in the cities of San Luis Obispo in the southwestern portion of the county and Paso Robles in the northern portion of the county. The State's recommended boundary for the nonattainment area consists of three census tracts, each of which expand further west than the nonattainment area. Together, these three census tracts account for approximately 8% of the total population of the county, while encompassing roughly half of the county's land.

Figure 17.4 Census Tract-Level Population.

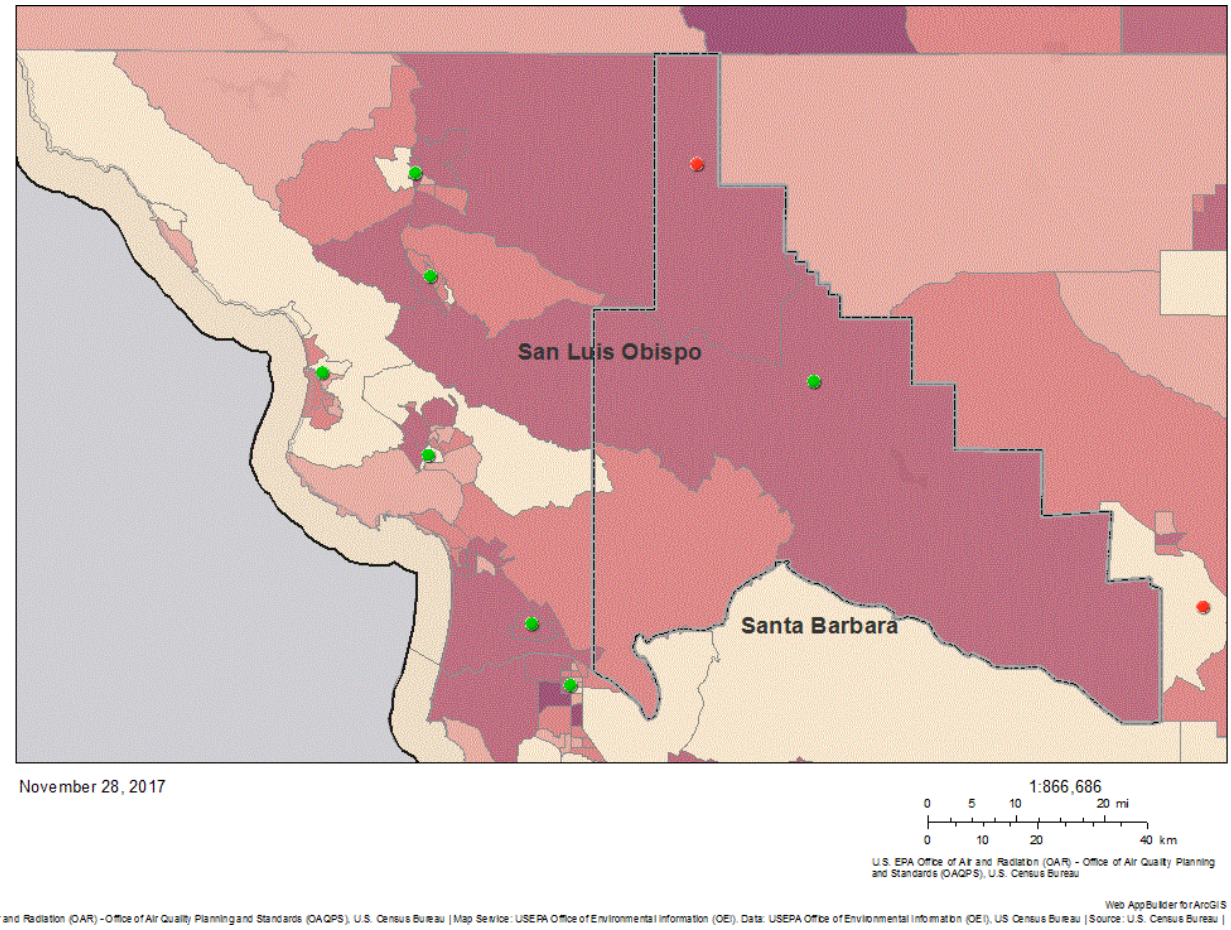


Figure 17.4 shows census tract population in the area of analysis for Eastern San Luis Obispo, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Eastern San Luis Obispo, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 17.5 shows the traffic and commuting pattern data, including total VMT for San Luis Obispo county, number of residents who work in the county, number of residents that work in the county with a violating monitor, and the percent of residents working in the county with a violating monitor. The data in Table 17.5 are 2014 data.

Table 17.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis
San Luis Obispo, CA	**Yes (partial)**	**2,930**	**108,355**	**71,687**	**66.2%**
	Total:	2,930	108,355	71,687	66.2%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 17.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 17.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

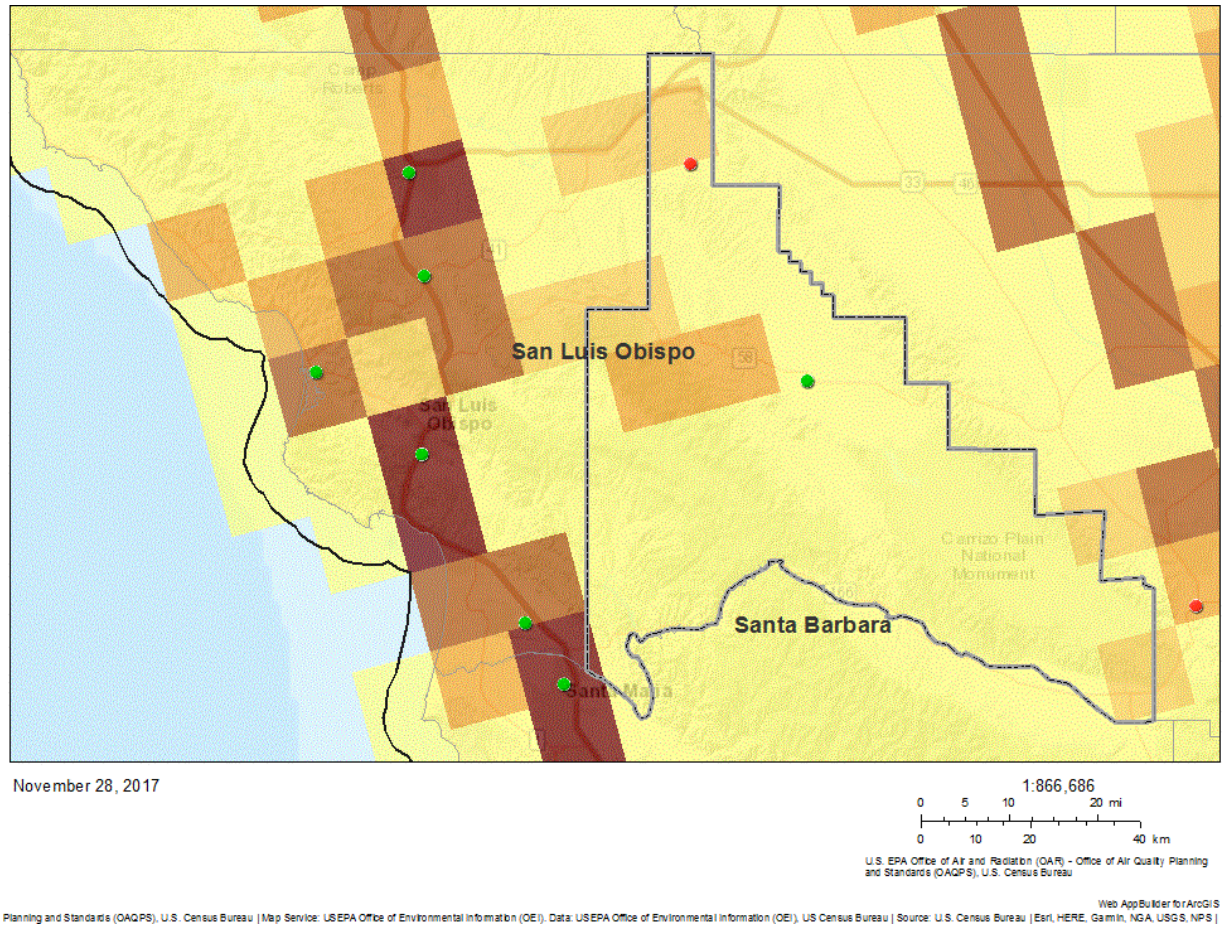


Figure 17.5 shows gridded VMT in the area of analysis for Eastern San Luis Obispo, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Eastern San Luis Obispo, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on the 2014 NEI and On the Map data from the Census Bureau and shows that VMT levels in San Luis Obispo County are higher in areas that include U.S. Highway 101, and lower everywhere else in the county. The twelve-kilometer grid

cells with the highest VMT in the county fall over the cities of San Luis Obispo and Paso Robles, where most of the attaining monitors are located, in the western portion of the county. The data also show that VMT levels in the eastern portion of San Luis Obispo County, where the violating monitor is located, are in the lowest VMT categories represented in the figure 17.5.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 17.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

Figure 17.6 HYSPLIT Back Trajectories for the Violating Monitor.

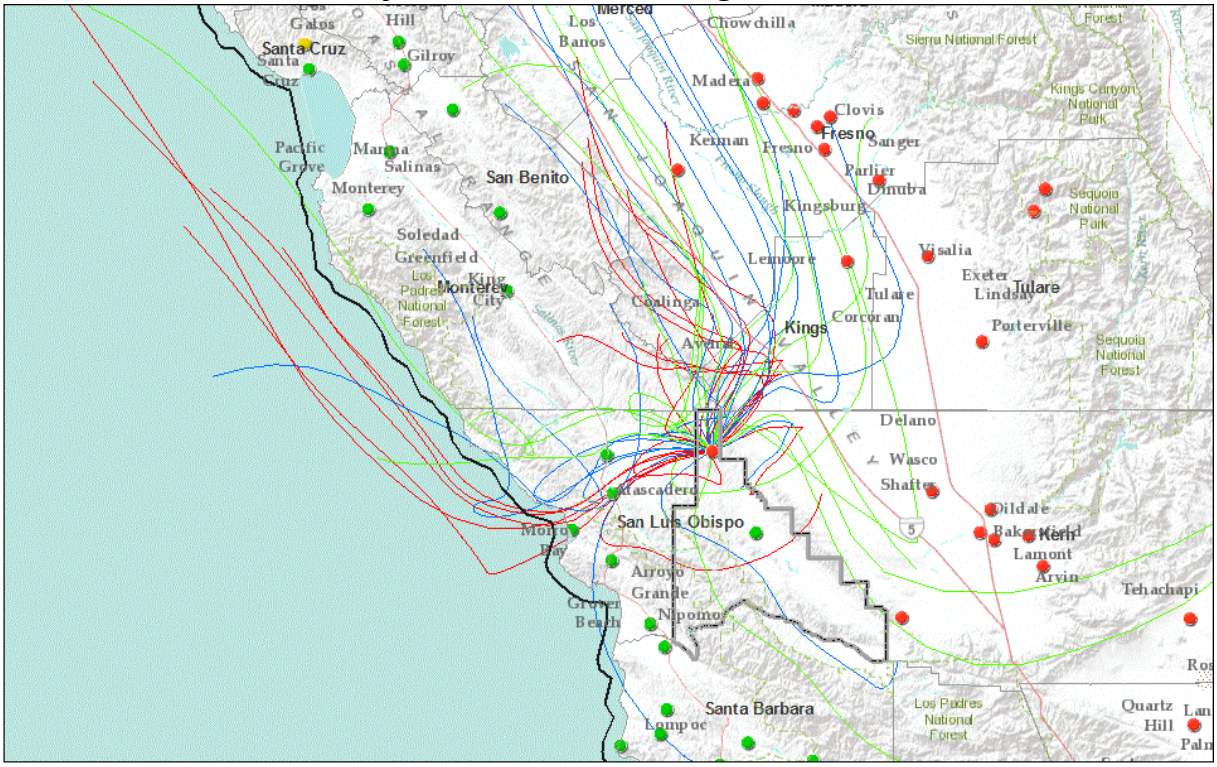


Figure 17.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Eastern San Luis Obispo, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows the back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 are generally from the northeast or the west. The back trajectories from the west travel though the northern part of San Luis Obispo County which is west of the violating monitor. The somewhat more numerous back trajectories from the northeast travel through the San Joaquin Valley Air Basin.

As previously discussed, the EPA is designating the adjacent San Joaquin Valley as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for the San Joaquin Valley area.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. In the western U.S., topography impacts pollutant formation and transport in California, and thus plays an important role in assessing what areas are contributing to monitored violations of the NAAQS.

California has historically been divided into 15 distinct air basins. San Luis Obispo County is not a "basin" in the sense of a single watershed or an area that is more or less surrounded by high terrain. Figure 17.7 shows the topography for San Luis Obispo County, which consists of three geographic regions: the coastal plateau along the Pacific Ocean, the upper Salinas River Valley in the northern section of the county, and the east county plain, which consists mostly of the Carrizo Plain, a large drainage basin. The Carrizo Plain borders the Temblor Mountain Range to the east, which lies in a northwest-southeast direction along the western side of the San Joaquin Valley Air Basin. The only major break in the range occurs at the Cholame Pass (elevation 1,155 feet) in the northern end of the mountain range.

Figure 17.7 Topographic Illustration of the Physical Features.

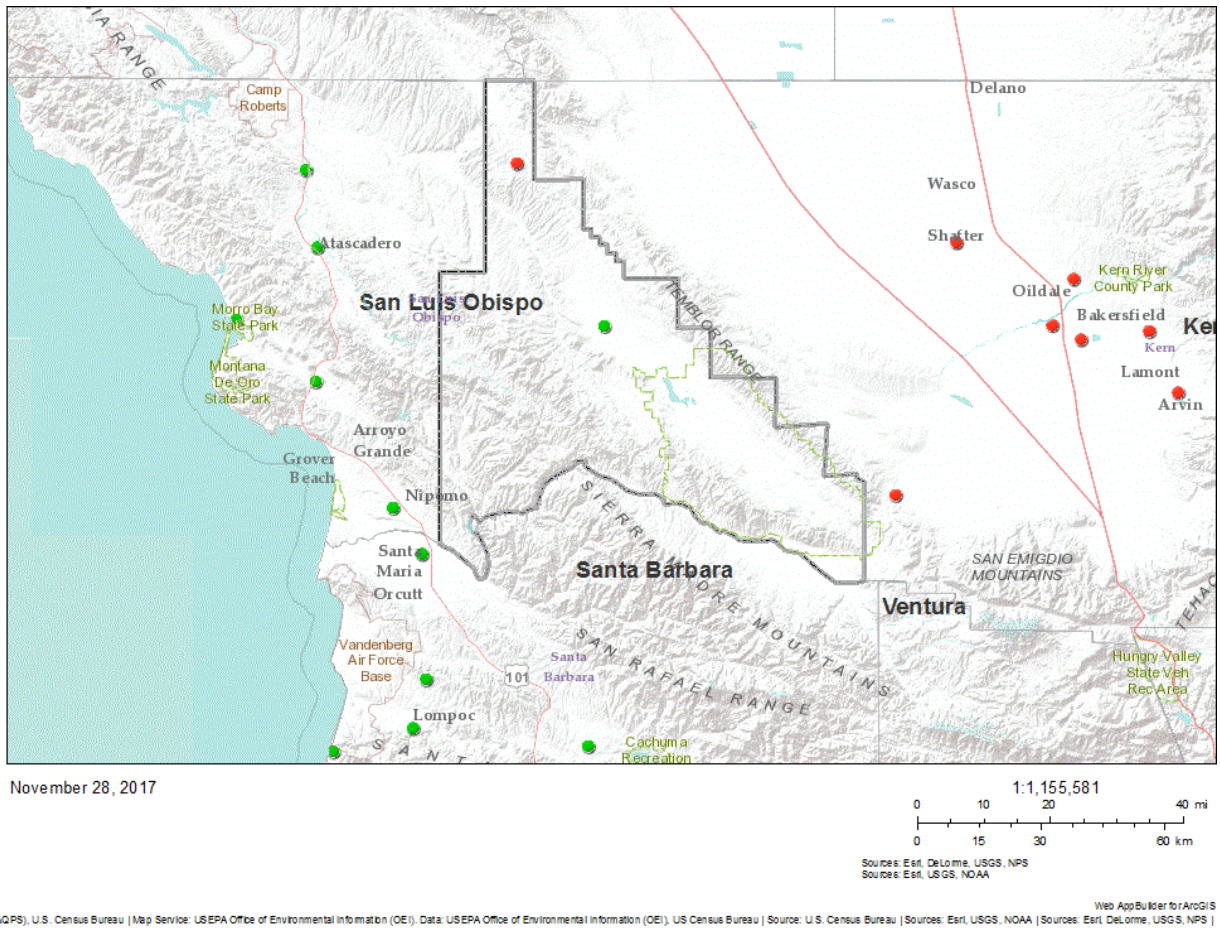


Figure 17.7 shows the topography in the area of analysis for Eastern San Luis Obispo, CA. The EPA's nonattainment boundary for Eastern San Luis Obispo, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 17.8 shows the relevant jurisdictional boundaries for the Eastern San Luis Obispo area, including county and CBSA boundaries, existing 1997 and 2008 ozone NAAQS nonattainment areas, and areas of Indian country.

Figure 17.8 Jurisdictional Boundaries.

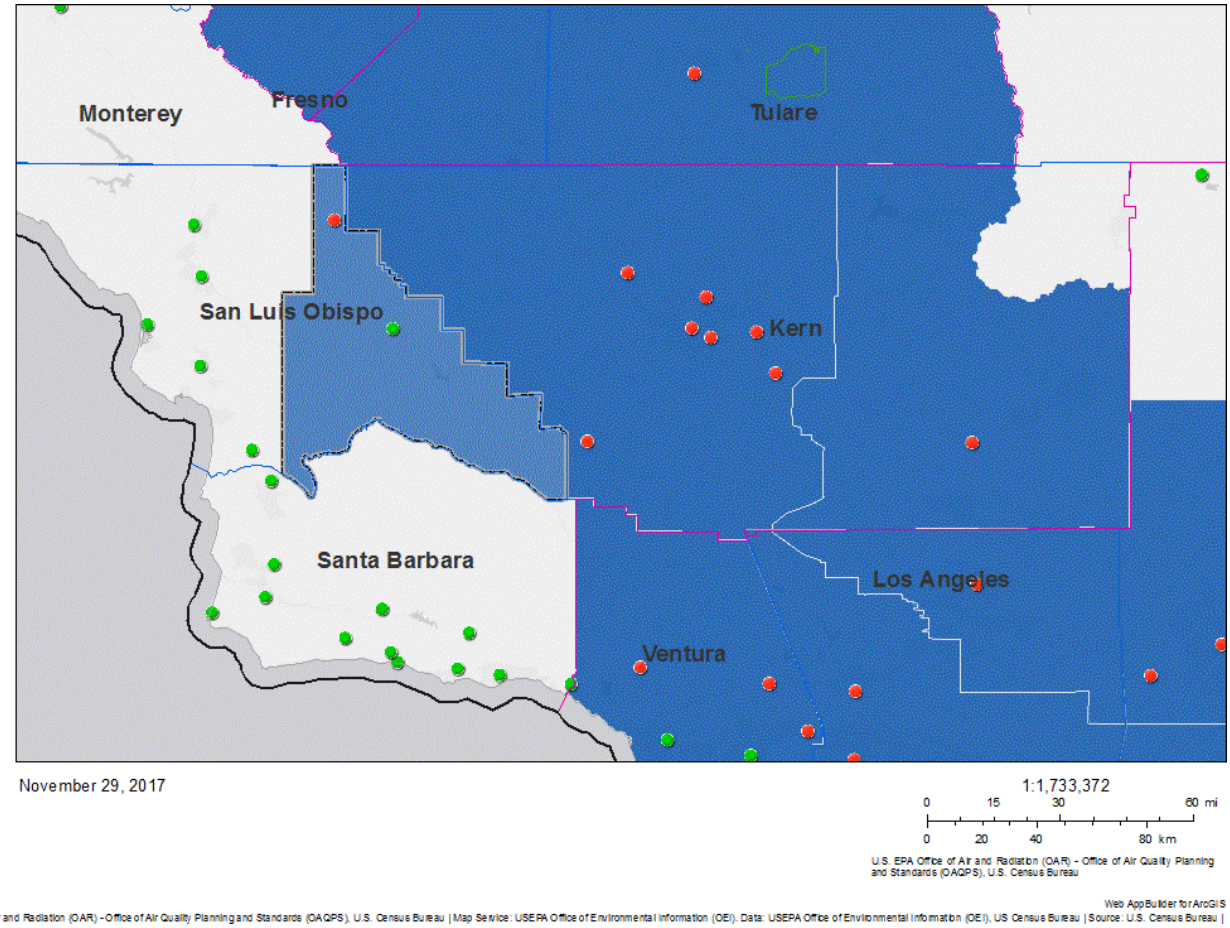


Figure 17.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for Eastern San Luis Obispo, CA. The EPA's nonattainment boundary for Eastern San Luis Obispo, CA is shown as a gray line with a dashed black center. The nonattainment boundary(ies) for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Eastern San Luis Obispo area has a previously established nonattainment boundary associated with the 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

The EPA is designating San Joaquin Valley, which borders the Eastern San Luis Obispo, CA nonattainment area to the east, as nonattainment for the 2015 ozone NAAQS. The San Luis Obispo Council of Governments is the MPO that has jurisdiction throughout San Luis Obispo County, and the San Luis Obispo Air Pollution Control District has jurisdiction for air quality planning throughout the County.

Conclusion for Eastern San Luis Obispo, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to designate the eastern portion of San Luis Obispo County as the Eastern San Luis Obispo County nonattainment area for the 2015 ozone NAAQS. This is the same partial county as the Eastern San Luis Obispo nonattainment area for the 2008 ozone NAAQS.

One air quality monitor in San Luis Obispo County indicates a violation of the 2015 ozone NAAQS based on 2016 design values, therefore the portion of this county where this monitor is located is included in the nonattainment area. Emissions and emission-related data show that San Luis Obispo County has no large point sources, though emissions within the county are not trivial (4697 tpy of NO_x and 6019 tpy VOC). There is no data that indicates which portion of these emissions are attributable to sources in the eastern portion of San Luis Obispo County. The majority of the population (approximately 92%) and the areas of heavier VMT lie outside the boundary of the nonattainment area. Meteorological data indicate the winds transporting ozone and ozone precursors during exceedance days are predominantly from the northeast San Joaquin Valley Air Basin. Neighboring San Joaquin Valley, including western Kern County, contains several large point sources, and, in comparison to San Luis Obispo County, has over ten times the emissions of NO_x and VOCs combined as all of San Luis Obispo County. The more mountainous topography in the eastern portion of San Luis Obispo County, where the violating monitor is located, suggests a heavier influence of emissions transport from San Joaquin Valley on the formation and distribution of higher ozone concentrations in this area. The jurisdictional factor supports a separate boundary for San Luis Obispo County from the adjacent San Joaquin Valley nonattainment area as separate air quality and transportation planning agencies have jurisdiction in the two areas.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation and is designating Eastern San Luis Obispo, CA as nonattainment for the 2015 ozone NAAQS and is designating the remainder of the County as attainment/unclassifiable.

18.0 Technical Analysis for Sutter Buttes, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area.

Table 18.1 identifies the area of analysis for the Sutter Buttes, CA nonattainment area. The area of analysis includes all of Sutter County. The area of analysis comprises part of the Yuba City Core Based Statistical Area (CBSA). The Yuba City CBSA is comprised of two counties, Sutter and Yuba. This CBSA is itself part of the larger Sacramento-Roseville Combined Statistical Area (CSA). The nonattainment area is identical to the existing 1997 Sutter Buttes, CA nonattainment area. Information specific to the other counties in the Sacramento-Roseville CSA is contained in the associated Technical Analysis section for the Sacramento Metro and Nevada County nonattainment areas.

The EPA designated portions of Sutter County as part of the Sacramento Metro nonattainment area for the 2008 ozone NAAQS. For the 1997 ozone NAAQS, portions of Sutter County were designated as part of the Sutter Buttes and Sacramento Metro nonattainment areas.

Table 18.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Sutter Buttes, CA	Sutter County	Yuba City CBSA (partial)*	Sacramento-Roseville CSA (partial)*

*The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

Figure 18.1 is a map of the EPA's nonattainment boundary for Sutter Buttes. The map shows the location of the ambient air quality monitors, county boundaries, and the 2008 ozone NAAQS nonattainment boundary. The 1997 ozone NAAQS nonattainment boundary for Sutter Buttes, the EPA's 2015 ozone NAAQS boundary, and the State's recommended boundary for Sutter Buttes are not visible in the figure. All three boundaries are characterized as the area of Sutter Buttes above 2,000 feet (610 meters) in elevation in Sutter County. This location is identified in the figure by the red dot icon within Sutter County, which represents the Sutter Buttes violating monitor. The EPA is not modifying the State's recommendation to designate Sutter Buttes as nonattainment for the 2015 ozone NAAQS, with the same boundary as the Sutter Buttes nonattainment area for the 1997 ozone NAAQS.

Figure 18.1 The EPA's Nonattainment Boundaries for Sutter Buttes, CA.

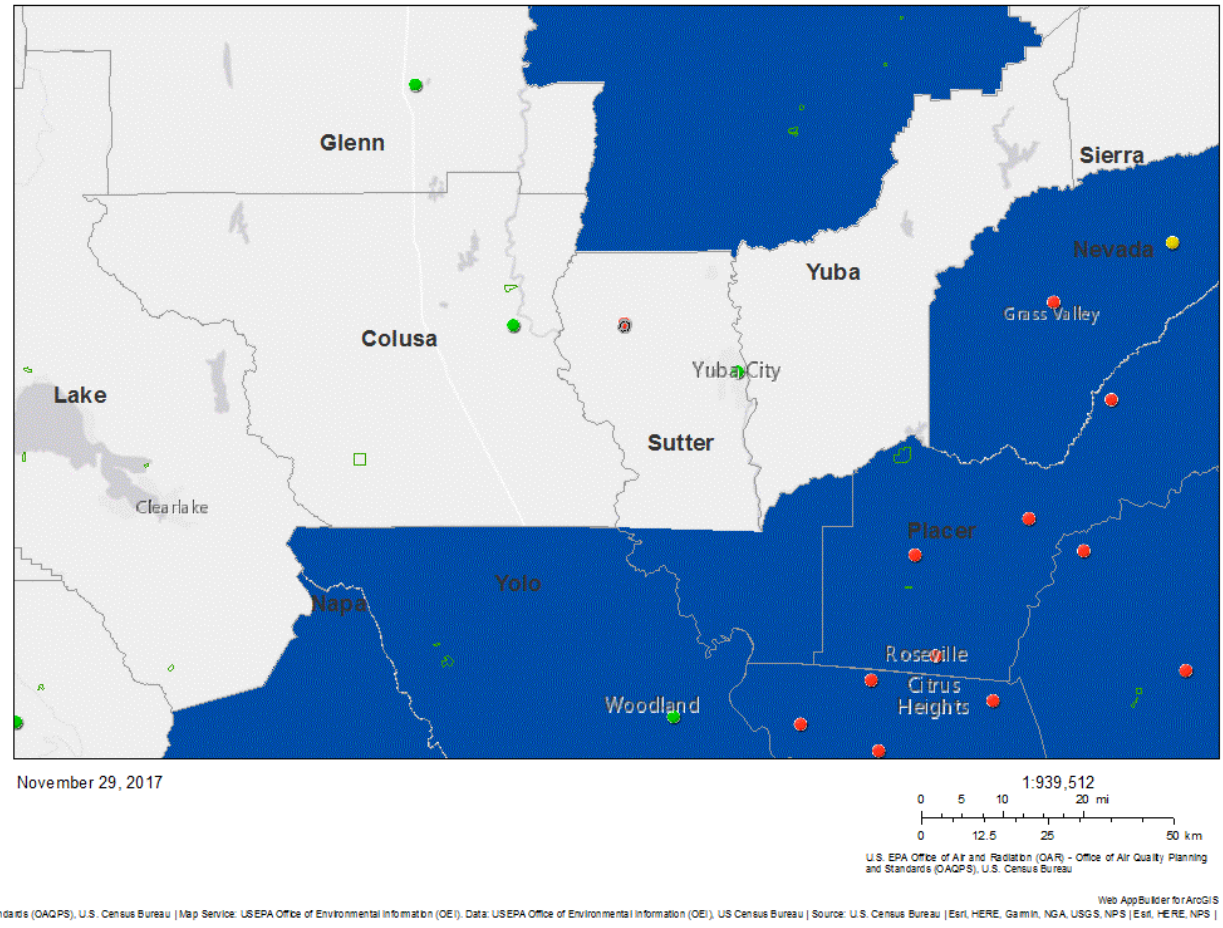


Figure 18.1 shows the EPA's nonattainment boundary for Sutter Buttes, CA as a gray line with a dashed black center (see the red dot in Sutter County for the approximate location). The boundary is small relative to the map extent and not clearly visible; it is characterized as the area atop Sutter Buttes, above 2000 feet (610 meters) in elevation. Nonattainment areas for the 2008 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Sutter County has a monitor in violation of the 2015 ozone NAAQS, therefore a portion of this county is included in the final nonattainment area. The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Sutter Buttes area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for the county in the area of analysis are shown in Table 18.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at:
https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 18.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Sutter, CA	Yes (partial)	06-101-0003	0.065	0.069	0.064	0.063
		06-101-0004	**0.075**	0.075	0.072	0.080

The highest design value in each county is indicated in bold type.

Sutter County shows a violation of the 2015 ozone NAAQS, therefore a portion of this county is included in the final nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

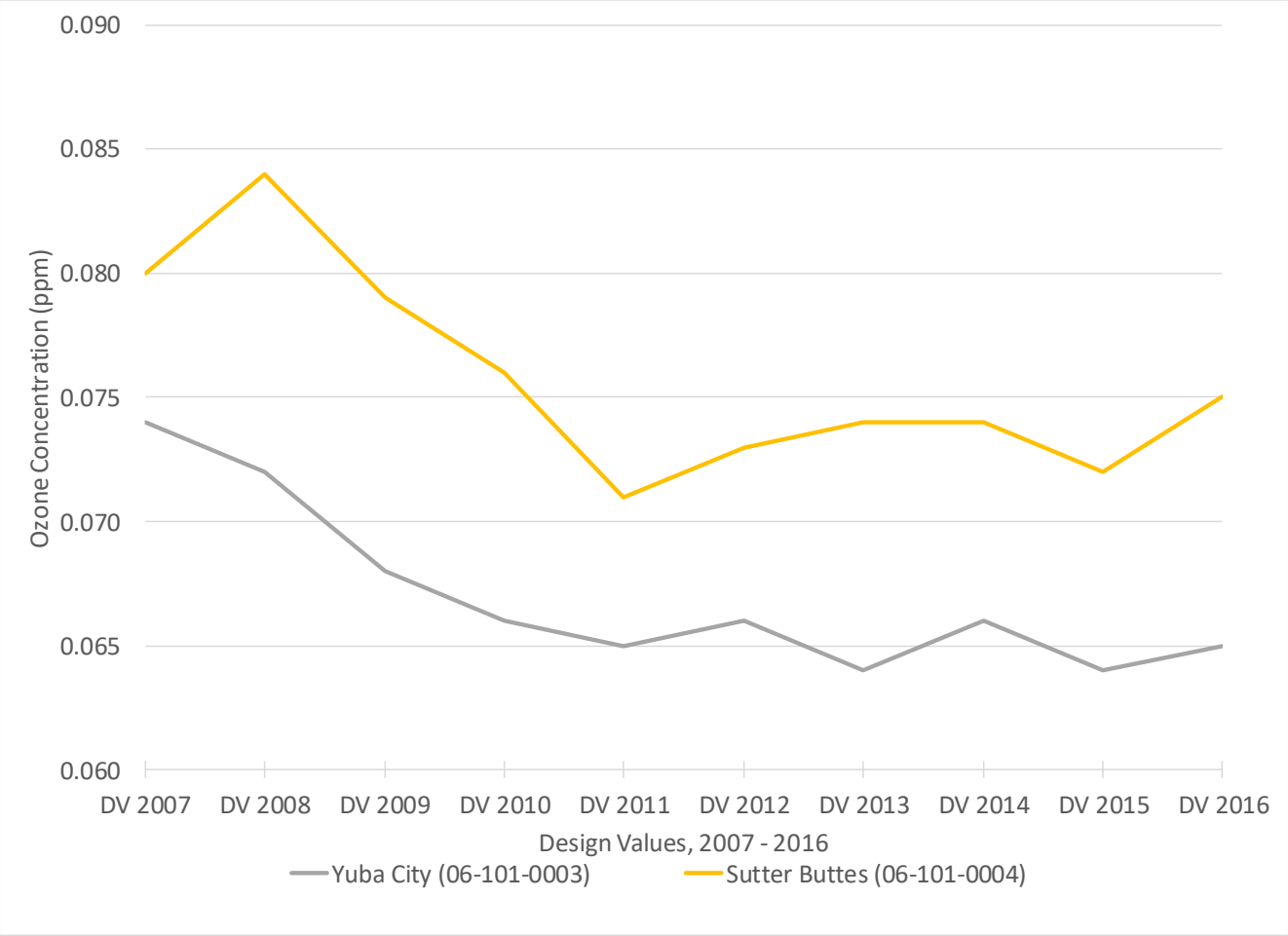
Figure 18.1, shown previously, identifies the Sutter Buttes nonattainment area and the violating monitor. Table 18.2 identifies the design values for all monitors in the area of analysis. Figure 18.2 shows the historical trend of design values for the monitors in the area of analysis. As indicated on the map, there is one violating monitor in the northwest portion of the county.

The violating monitor is the Sutter Buttes ozone monitor (AQS ID 06-101-0004), located atop the Sutter Buttes topographic feature, at approximately 2,115 feet (645 m) elevation. The Sutter Buttes ozone monitor has a valid 2016 DV of 0.075 ppm. The Sutter Buttes topographic feature is discussed more in Factor 4: Geography/Topography below.

The other monitor in Sutter County is the Yuba City monitor (AQS ID 06-101-0003), located in Yuba City. The Yuba City monitor is located further south and to the east of the Sutter Buttes monitor, at an elevation of approximately 60 feet (18 meters), and has a valid 2016 DV of 0.065 ppm.

As shown in Figure 18.2, the design values at monitoring sites located within the area of analysis show that the Sutter Buttes monitor (AQS ID 06-101-0004) has been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show the design value decreased from 2008 until 2011 and has increased slightly since then. The Yuba City monitor (AQS ID 06-101-0003) has been attaining the 2015 ozone NAAQS since 2009. The data also show that ozone concentrations decreased at the Yuba City from 2007 to 2011 and have remained relatively constant since then.

Figure 18.2 Three-Year Design Values for Monitors in the Area of Analysis (2007 – 2016).



Sutter County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitor is located within the portion of Sutter County that was included as part of the designated nonattainment area for the 1997 ozone NAAQS. The other monitor in the county is at lower elevation and has an attaining 2016 DV.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year), small sources, and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 18.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Sutter Buttes nonattainment area.

Table 18.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Sutter, CA	Yes (partial)	3,370	2,545
	Area wide:	3,370	2,545

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large and small point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown as orange icons in Figure 18.3 below. Small point sources are depicted with yellow icons. There are no large point sources in Sutter county. The nonattainment boundary is the area in Sutter County above 2,000 feet (610 meters) (located where the violating monitor icon is in the figure), atop Sutter Buttes.

Figure 18.3. Large and Small Point Sources in the Area of Analysis.

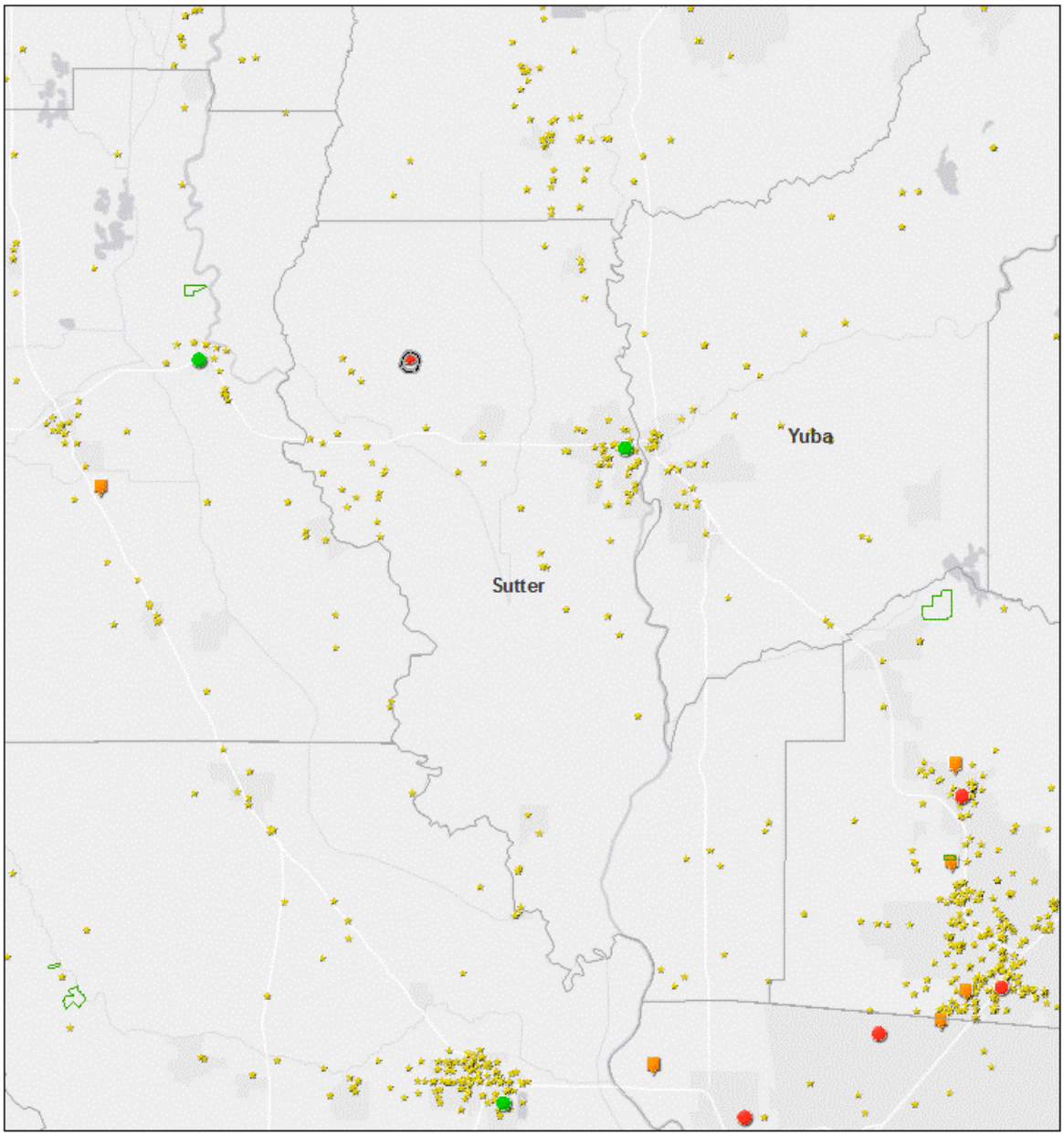


Figure 18.3 shows large point sources in the area of analysis for Sutter Buttes, CA as orange squares. Small point sources are shown as yellow stars. The EPA's nonattainment boundary for Sutter Buttes, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

In summary, the EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emissions showed that Sutter County has emission levels of 3,370 tpy NO_x and 2,545 tpy VOC based on the 2014 NEI. Sutter County does not include any large point sources. There are some small point sources of ozone precursors located outside of the Sutter Buttes nonattainment area, with a cluster of small point sources near Yuba City on the eastern side of Sutter County. There are no small point sources within the boundary of the Sutter Buttes nonattainment area.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 18.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 18.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Sutter, CA	Yes (partial)	94,737	96,463	160	1,726	2%
	Area wide:	94,737	96,463	160	1,726	2%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 18.4 shows the 2012 census tract-level information for Sutter County. Sutter County had a 2015 population of approximately 96,500 people, with a 2% population increase during the 2010-2015 period. Generally, the higher-population census tracts are in the northeast portion of the county, including those containing and surrounding Yuba City. By comparison, the census tract that contains Sutter Buttes violating monitor is relatively sparsely populated, with no residences or commercial buildings located above 2,000 feet (610 meters) of elevation.

Figure 18.4 Census Tract-Level Population.

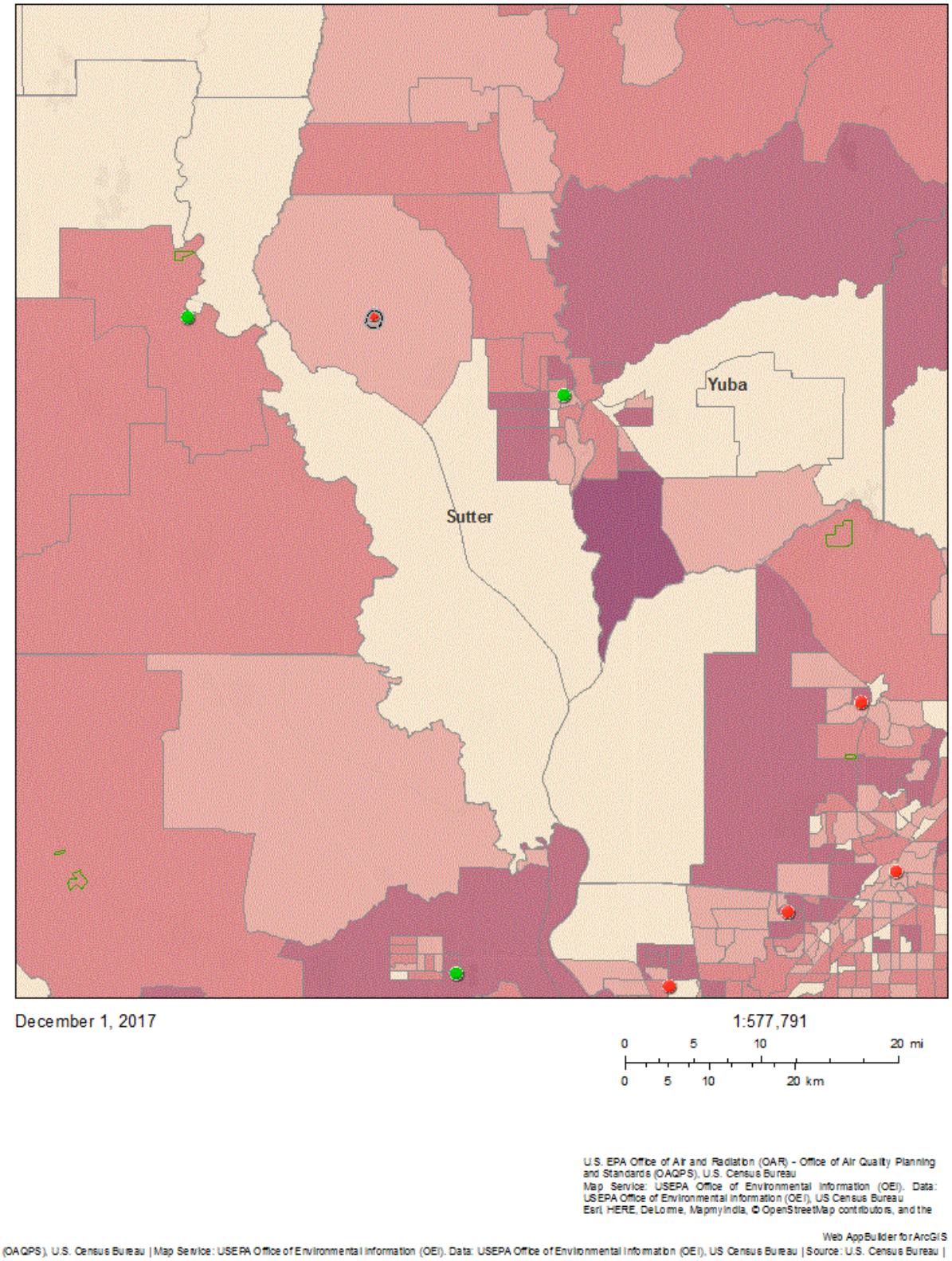


Figure 18.4 shows census tract population in the area of analysis for Sutter Buttes, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Sutter Buttes, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 18.5 shows the traffic and commuting pattern data, including total VMT for Sutter County, the number of residents who work in the county, the number of residents that work in the county with a violating monitor, and the percent of residents working in the county with a violating monitor. The data in Table 18.5 are 2014 data.

Table 18.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis
Sutter, CA	**Yes (partial)**	**830**	**36,280**	**12,602**	**34.7%**
	Total:	830	36,280	12,602	34.7%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 18.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 18.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

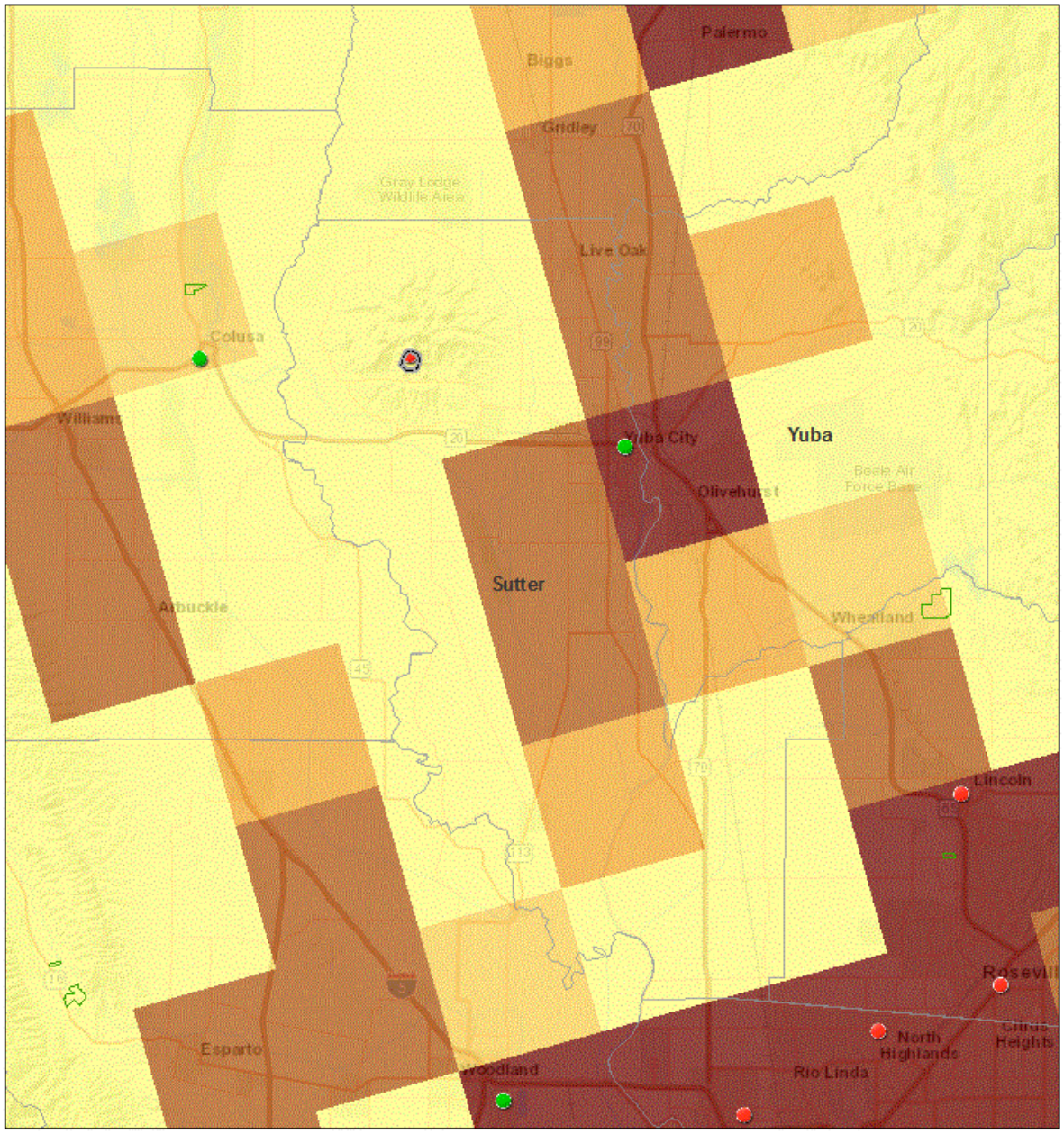


Figure 18.5 shows gridded VMT in the area of analysis for Sutter Buttes, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Sutter Buttes, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau,[6] and shows that VMT levels in Sutter County are higher in areas that include Highway 99, Highway 20, and Highway 113 than elsewhere in the county.

The twelve-kilometer grid with the highest VMT in the county (over 200 million VMT) falls over the city of Yuba City and includes portions of Highways 99 and 20. All twelve-kilometer grids in the rest of Sutter County (i.e., those that do not overlap with Highways 99, 20, or 113), including those around the Sutter Buttes violating monitor, have lower VMT. The twelve-kilometer grids closest to the Sutter Buttes violating monitor all have VMT in the lowest category on the map, below approximately 36 million VMT.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 18.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8-hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

[6] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/.

Figure 18.6. HYSPLIT Back Trajectories for the Violating Monitor.

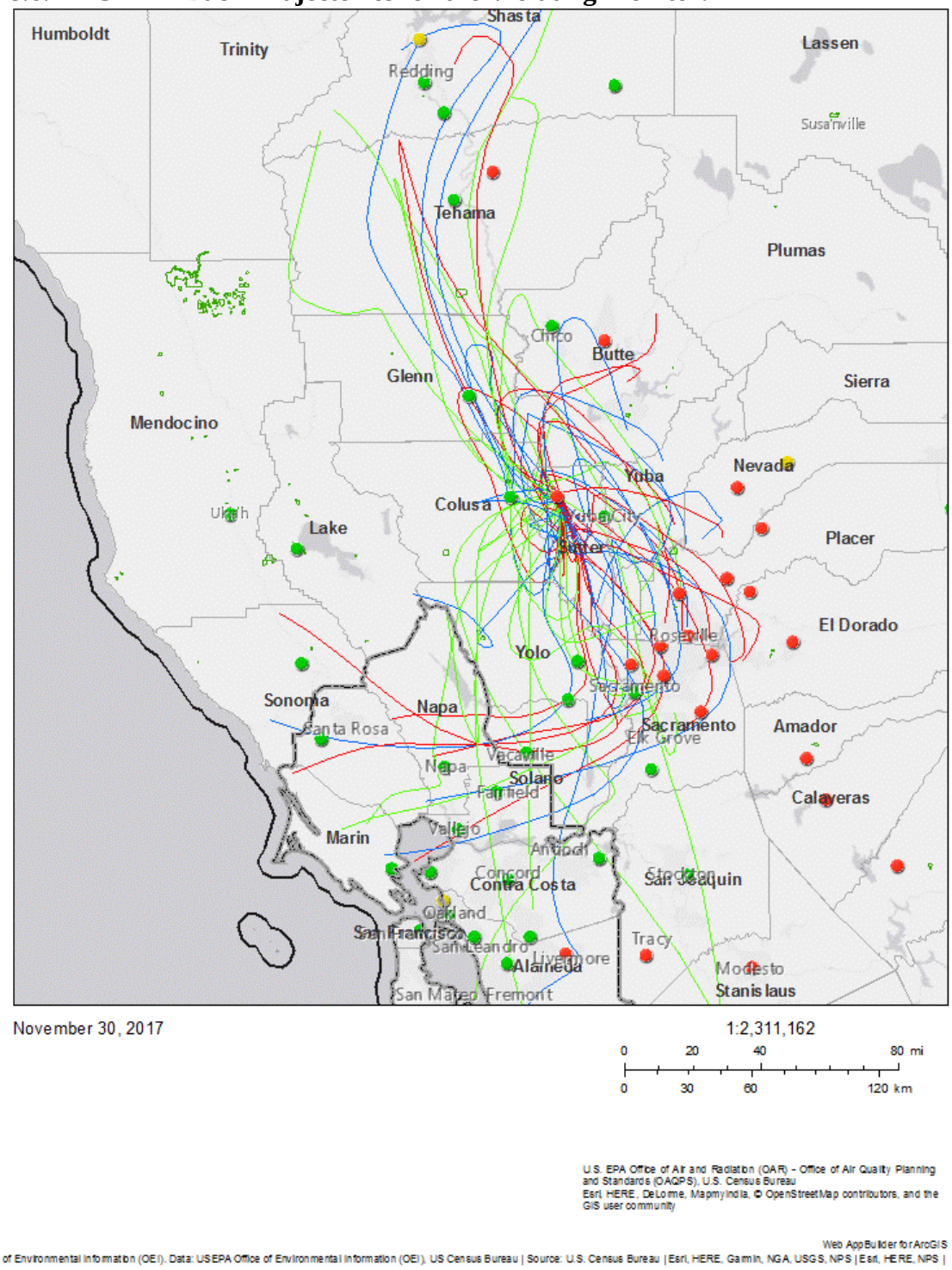


Figure 18.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Sutter Buttes, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally pass through the surrounding Sacramento metropolitan area; some trajectories also originate in the San Francisco Bay Area, well to the south. The data also show that the winds during exceedance days do not appear to have a single predominant direction, but are mainly oriented north-south.

Because of the high elevation of the Sutter Buttes monitor, as mentioned in Factor 1 and discussed further under Factor 4, the HYSPLIT trajectories terminate at elevations well above the surface and above pollution sources in Sutter and neighboring counties. They do not indicate that sources previously discussed in Factor 2 in Sutter County contribute to exceedances or violations of the 2015 ozone NAAQS at the Sutter Buttes monitor.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

The Sutter Buttes area does not have any geographical or topographical features significantly limiting air pollution transport within its air shed. Therefore, this factor did not play a role in this evaluation in terms of barrier to air flow, but nevertheless has implications for the appropriate area to include as part of the nonattainment area.

California has historically been divided into fifteen distinct air basins. The Sutter Buttes area is located at the approximate center of the Sacramento Valley Air Basin, which includes portions of 11 counties in the northern half of California's Central Valley. The Sutter Buttes are a group of buttes of volcanic origin, which rise to a maximum elevation of 2,115 feet, and cover a roughly circular area about 11 miles in diameter. The surrounding area is a broad, flat agricultural plain at elevation 65 feet, over 2000 feet lower than the monitor.

The Sacramento Valley is bounded on the west by the Northern Coast Ranges, on the north by the Siskiyou and Trinity Mountains, and on the east by the Sierra Nevada mountain range; it is open toward the south, ending in the vicinity of Sacramento. The Sacramento Valley is about 50 miles wide at the latitude of the Sutter Buttes. The lack of barriers leaves the monitor location subject to pollution transported from urban Sacramento.

The main topographic feature of the area is the Sutter Buttes themselves; the monitor was sited near the top of the South Butte to assess ozone transport aloft from urban areas to the south. There are no topographic barriers to flow in the vicinity of Sutter Buttes, but their own topography makes them isolated from the effects of nearby emissions, which are low, as discussed in Factor 2. The high elevation of the monitor relative to that of the rest of Sutter County makes it more subject to and reflective of wind and pollution conditions aloft than to conditions elsewhere within the county.

Figure 18.7. Topographic Illustration of the Physical Features.

Figure 18.7 shows the topography in the area of analysis for Sutter Buttes, CA. The EPA's nonattainment boundary for Sutter Buttes, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby areas contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Sutter Buttes nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations (MPOs), and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 18.8 shows the relevant jurisdictional boundaries for the Sutter Buttes area, including the Sutter County boundary and the Yuba City CBSA boundary. The Yuba City CBSA boundary consists of all of Sutter and Yuba counties.

Figure 18.8 Jurisdictional Boundaries.

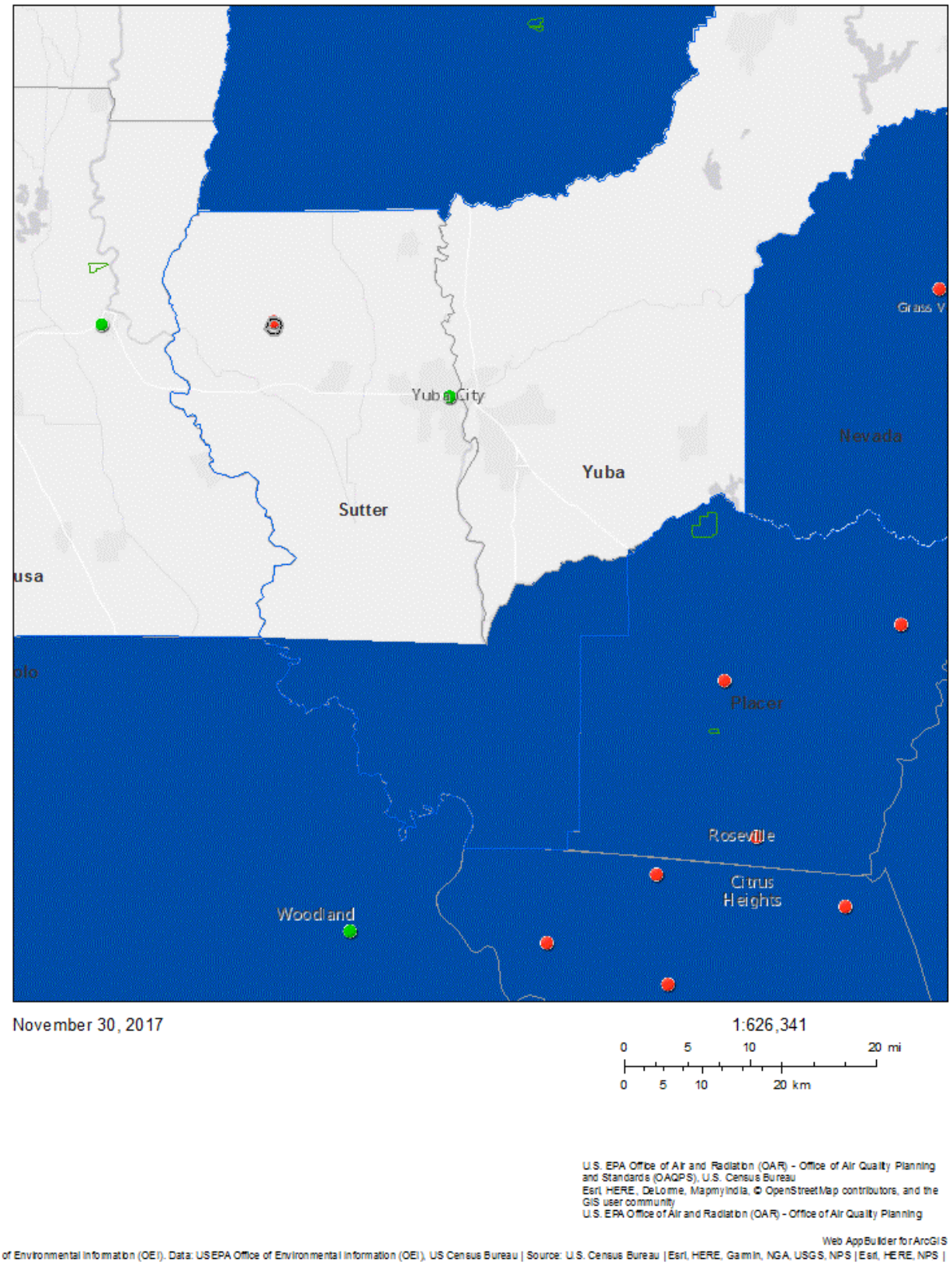


Figure 18.8 shows jurisdictional boundaries, including state boundaries (black lines) and metropolitan statistical areas (dark blue lines) in the area of analysis for Sutter Buttes, CA. The EPA's nonattainment boundary for Sutter Buttes, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Sutter Buttes area has previously established nonattainment boundaries associated with the 1997 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

As discussed above, the nonattainment area boundary is defined by topography and altitude rather than jurisdictional factors. However, we note that for implementation purposes, the Sacramento Area Council of Governments MPO is the transportation planning agency with jurisdiction over Sutter County, and the Feather River Air Quality Management District has air quality regulatory jurisdiction over the county.

Conclusion for Sutter Buttes, CA

Based on the assessment of factors described above, the EPA has concluded that the area above 2,000 feet atop Sutter Buttes in Sutter County meets the CAA criteria for inclusion in the Sutter Buttes nonattainment area. This is the same area that was included in the Sutter Buttes nonattainment area for the 1997 ozone NAAQS.

The Sutter Buttes air quality monitor in Sutter County indicates violations of the 2015 ozone NAAQS based on the 2016 design values, therefore this area is included in the nonattainment area. There are no large point sources of ozone precursors in Sutter County, and the county itself has relatively low NOx and VOC emissions. The meteorology factor indicates that days exceeding the 2015 NAAQS mostly occur when winds are coming from the south, meaning ozone is likely being transported from the Sacramento and San Francisco Bay areas, which EPA is also designating as nonattainment. The violating monitor is located on top of Sutter Buttes which is 2000 feet above the surrounding valley. Another monitor located on the valley floor in Yuba City has shown attainment with the 2015 NAAQS for the past several years, thus we conclude that the violating monitor is not affected by emissions originating within Sutter County. The EPA's nonattainment boundary is not associated with a jurisdictional boundary other than the previous 1997 nonattainment area boundary. The boundary relates to consideration of the other four factors described above.

Based on consideration of all five factors, the EPA is not modifying the State's recommendation and is designating Sutter Buttes, CA as nonattainment for the 2015 ozone NAAQS.

19.0 Technical Analysis for Tuolumne County, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. The EPA evaluated this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area.

Table 19.1 identifies the area of analysis for the Tuolumne County, CA final nonattainment area. The area of analysis includes all of Tuolumne County. The area of analysis comprises all of the Sonora CBSA. There is no CSA associated with this area. The nonattainment area differs from the existing nonattainment area for the 1997 ozone NAAQS that includes this county.

Tuolumne County is adjacent to several nonattainment areas for the 2015 ozone NAAQS. To the north of Tuolumne County is the Calaveras County nonattainment area which is not part of a CSA or CBSA; to the west is the San Joaquin Valley nonattainment area (the Modesto CBSA portion, which itself is part of the Modesto-Merced CSA); and to the south is the Mariposa County nonattainment area, which is not part of a CSA or CBSA. Information specific to these adjacent areas is contained in the associated Technical Analysis sections for those nonattainment areas (Calaveras County, San Joaquin Valley, and Mariposa County). To the northeast of Tuolumne County is Alpine County and to the east and southeast, Mono County. Alpine and Mono counties do not have air quality monitors and are not a part of a CSA or CBSA.

The EPA designated Tuolumne County unclassifiable/attainment for the 2008 ozone NAAQS. For the 1997 ozone NAAQS, the EPA designated Tuolumne County with Mariposa County as the two-county Southern Mountain Counties nonattainment area.

Table 19.1 Area of Analysis.

Final Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Tuolumne County, CA	Tuolumne County	Sonora CBSA	None

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 19.1 is a map of the EPA's nonattainment boundary for Tuolumne County. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 ozone NAAQS nonattainment boundaries. The EPA is not modifying the state's recommendation to designate Tuolumne County as nonattainment with the same boundary as that of the county. The Tuolumne County area also includes Indian country of the following tribes: Chicken Ranch Rancheria of Me-Wuk Indians of California (Chicken Ranch Rancheria) and Tuolumne Band of Me-Wuk Indians of the Tuolumne Rancheria of California (Tuolumne Band). The tribes did not submit a recommendation and the EPA is including these tribal areas as part of the designated nonattainment area.

Figure 19.1 The EPA's Final Nonattainment Boundaries for Tuolumne County, CA.

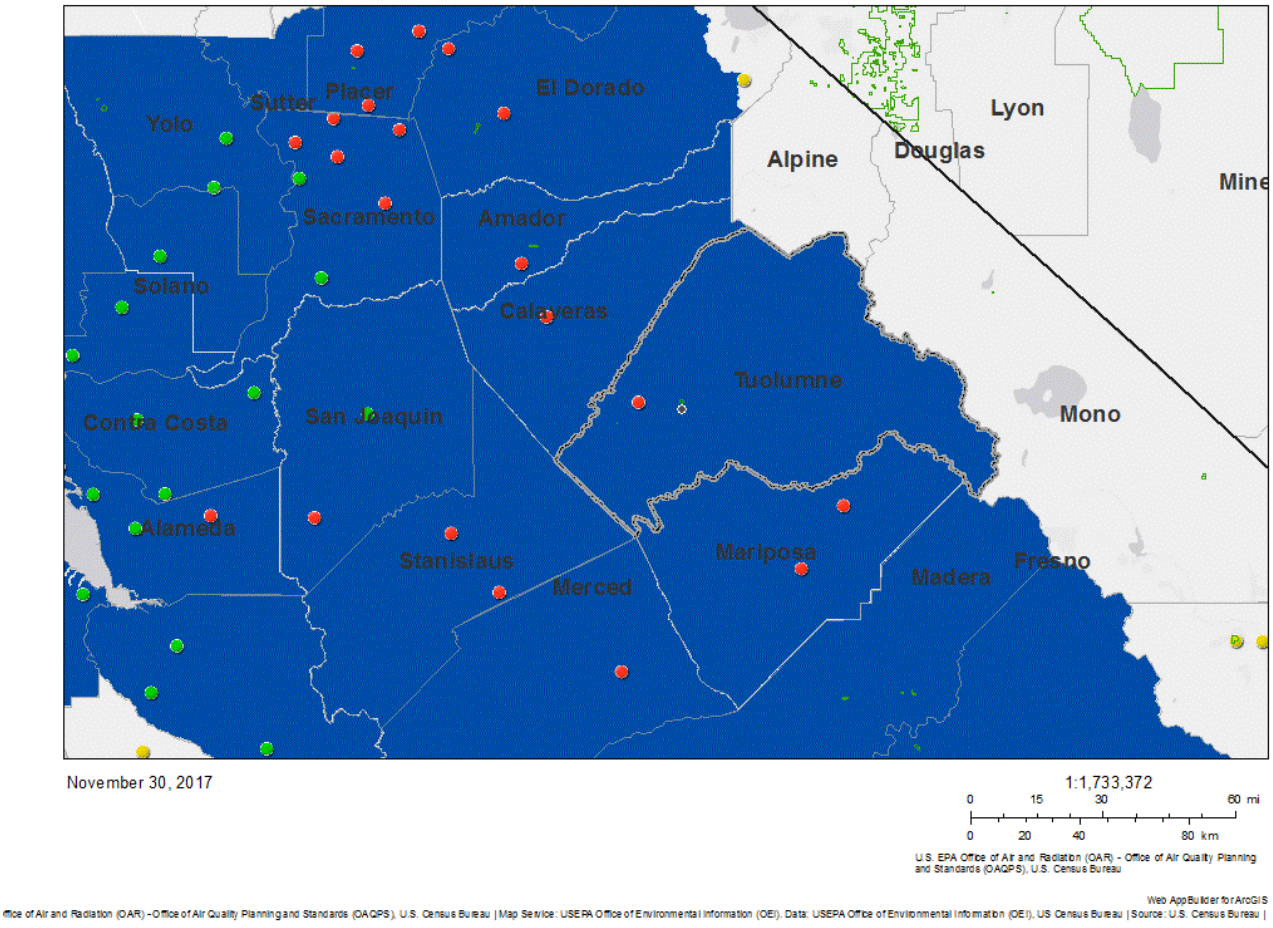


Figure 19.1 shows the EPA's nonattainment boundary for Tuolumne County, CA as a gray line with a dashed black center. Nonattainment areas for the 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Tuolumne County has a monitor in violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. The following

sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Tuolumne County area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e., monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design value for the Tuolumne County area of analysis is shown in Table 19.2.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at:
https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 19.2 Air Quality Data (all values in ppm).

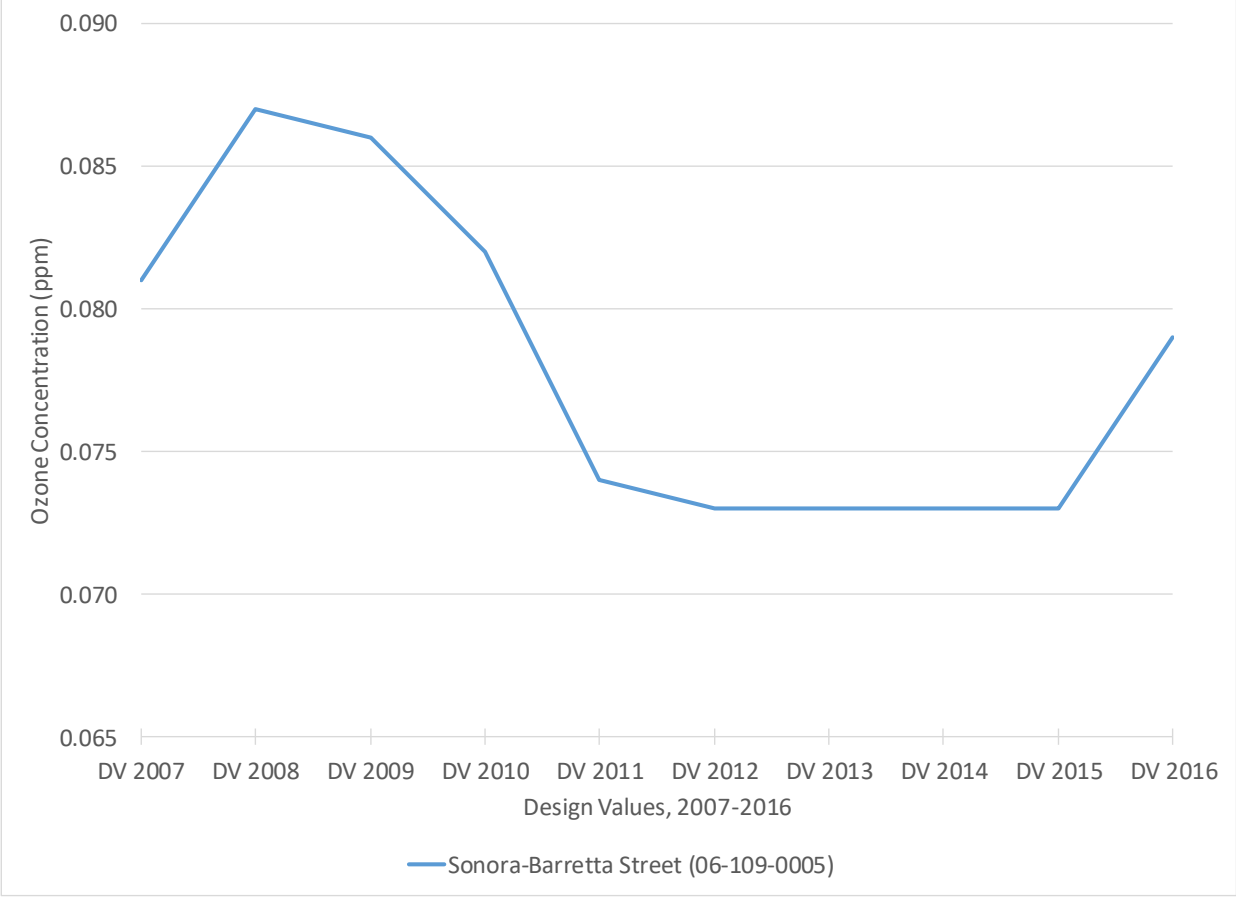
County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Tuolumne, CA	Yes	06-109-0005	**0.079**	0.075	0.076	0.088

The highest design value in each county is indicated in bold type.

Tuolumne County shows a violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 19.1, shown previously, identifies the Tuolumne County nonattainment area and the violating monitor. Table 19.2 identifies the design value for the monitor in the area of analysis. Figure 19.2 shows the historical trend of design values for the violating monitor. As indicated on the map, there is one violating monitor that is located in Tuolumne County. The violating monitor is the Sonora-Barretta Street ozone monitor (AQS ID 06-109-0005), located in the western portion of Tuolumne County. The Sonora-Barretta Street monitor has a valid 2016 DV of 0.079 ppm. As shown in Figure 19.2, the Sonora-Barretta Street monitor's design values have been consistently above the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally decreasing until 2011, with no clear design value trend in the past 6 years, although a slight increase in concentration was observed in 2016.

Figure 19.2 Three-Year Design Values for Violating Monitors (2007 – 2016).



Tuolumne County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 19.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Tuolumne County nonattainment area.

Table 19.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Tuolumne, CA	Yes	1,905	11,501
	Area wide:	1,905	11,501

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. Tuolumne County has only two large point sources, a power plant about 15 km to the southeast of the violating monitor, and a wood products manufacturer about 5 km to the southwest of the violating monitor. Together these two point sources emit around 360 tons/year of NOx and a negligible amount of VOC according to the 2014 NEI. The locations of the large point sources are shown with orange icons in Figure 19.3 below. The nonattainment boundary is also shown.

Figure 19.3 Large Point Sources in the Area of Analysis.

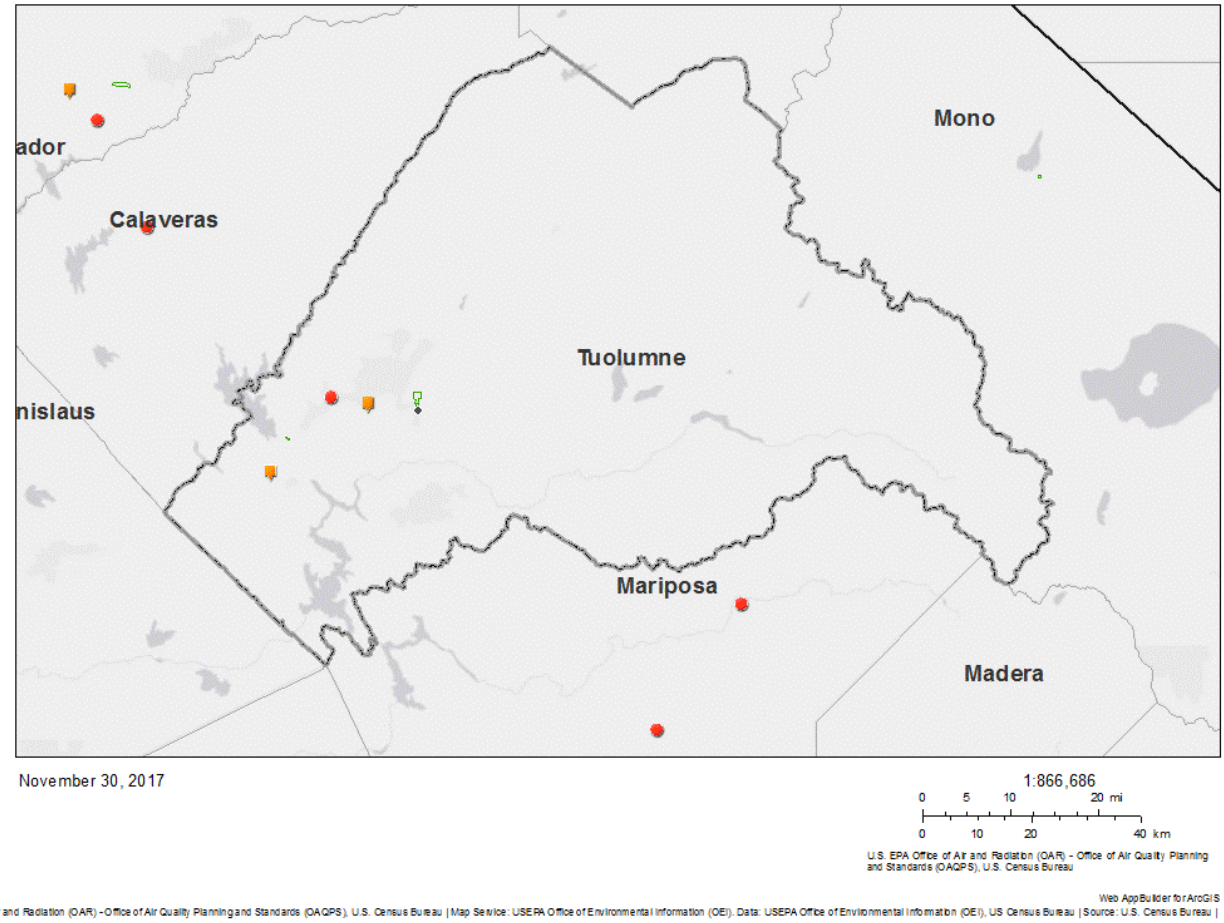


Figure 19.3 shows large point sources in the area of analysis for Tuolumne County, CA as orange squares. The EPA's nonattainment boundary for Tuolumne County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

In summary, the EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emissions showed that Tuolumne County has emissions levels of 1,905 tpy of NO_x and 11,501 tpy of VOC within the area of analysis. There are two large point sources of ozone precursors located in the southwestern portion of Tuolumne County, southwest and southeast of the violating monitor.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 19.4 shows the population, population density, and population growth information for the area of analysis.

Table 19.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Tuolumne, CA	Yes	55,365	53,709	24	-1,656	-3%
	Area wide:	55,365	53,709	24	-1,656	-3%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 19.4 shows the 2012 census tract-level population information for Tuolumne County. Tuolumne County had a 2015 population of approximately 54,000 people, with a 3% population decline during the 2010-2015 period. The population density of Tuolumne County reflects that the county is generally rural, with one population center in Sonora. The western portion of Tuolumne County is generally more populated than the eastern portion of the county, although the census tract containing the violating monitor has a lower population than surrounding census tracts within the county.

Figure 19.4 Census Tract-Level Population.

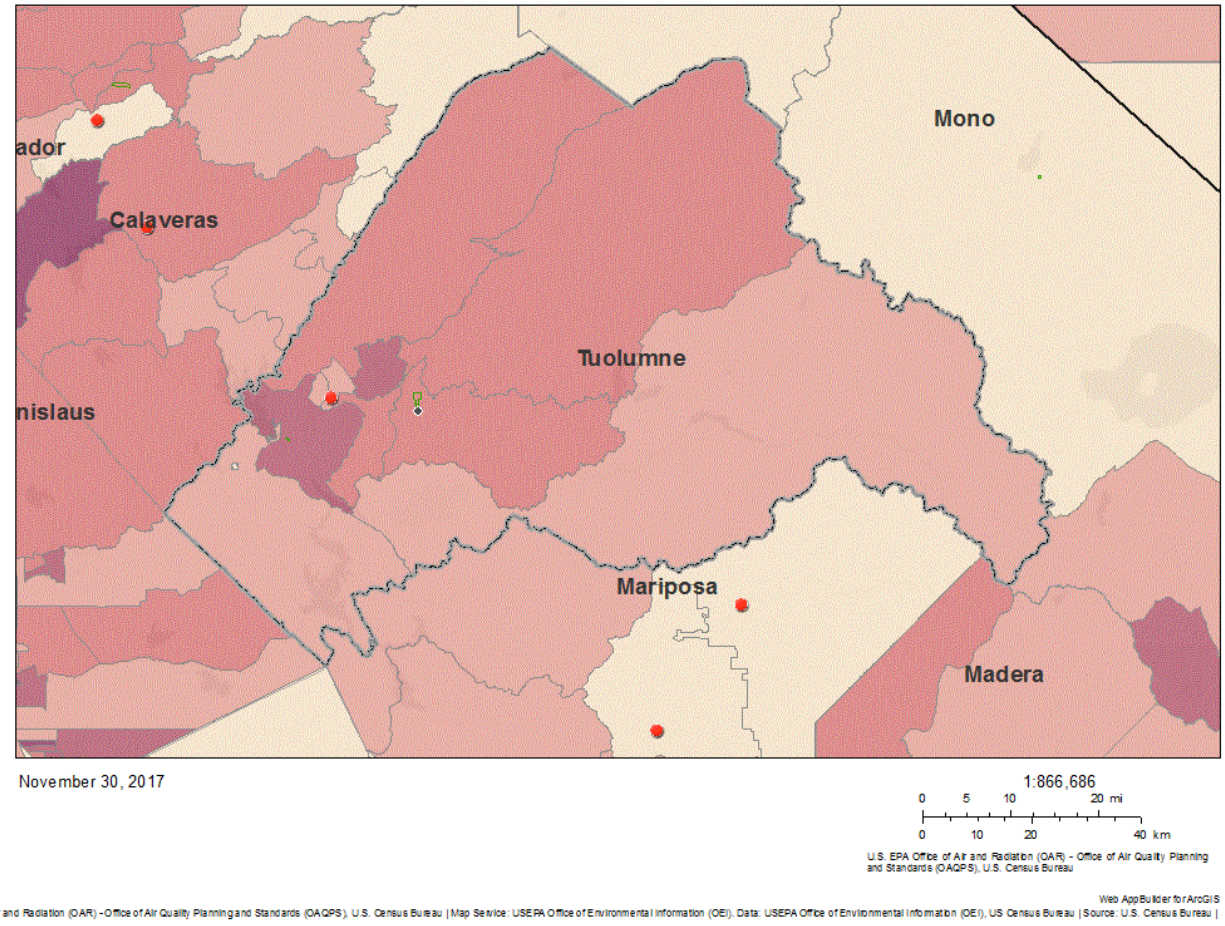


Figure 19.4 shows census tract population in the area of analysis for Tuolumne County, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Tuolumne County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 19.5 shows the traffic and commuting pattern data, including total VMT for Tuolumne County, the number of residents who work in the county, the number of residents that work in the county with a violating monitor, and the percent of residents working in the county with a violating monitor. The data in Table 19.5 are 2014 data.

Table 19.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis
Tuolumne, CA	**Yes**	**508**	**24,262**	**9,052**	**37.3%**
	Total:	508	24,262	9,052	37.3%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 19.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 19.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

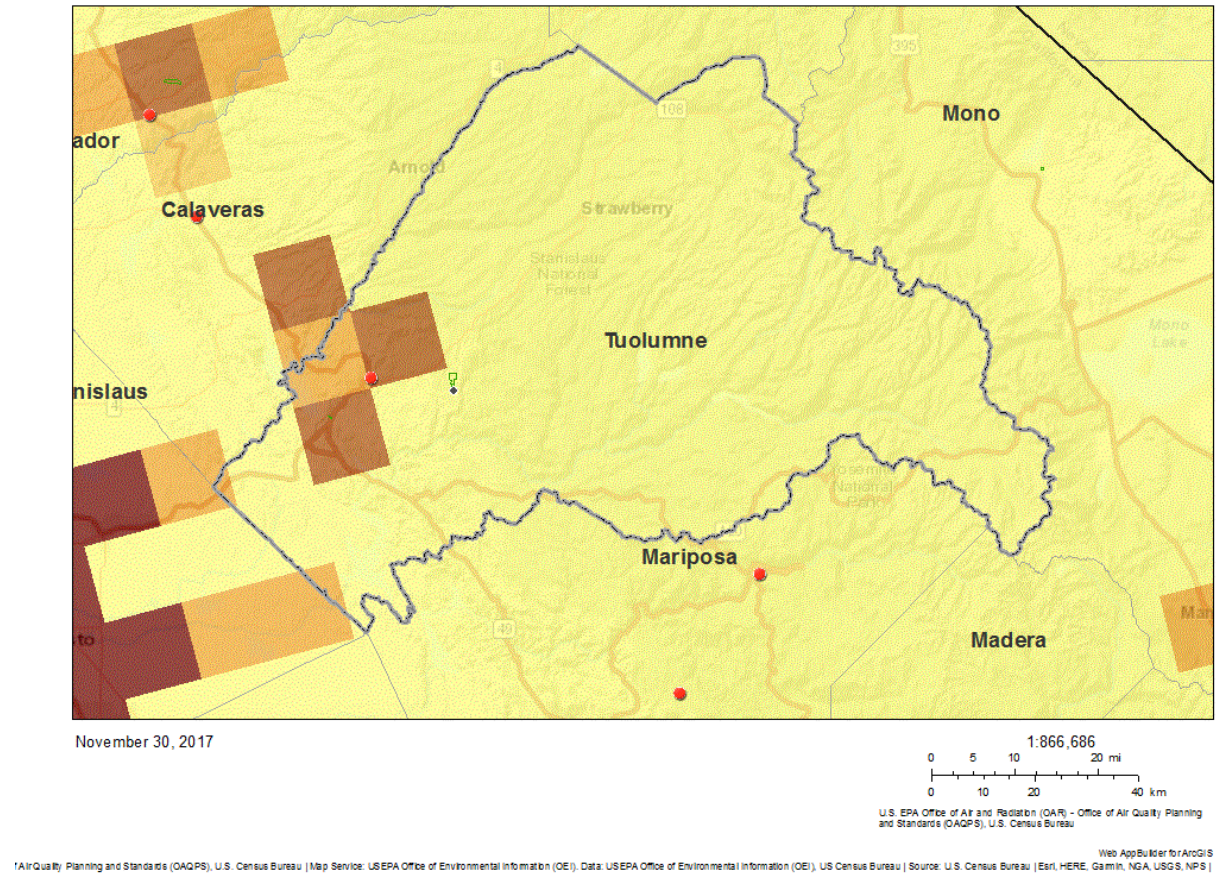


Figure 19.5 shows gridded VMT in the area of analysis for Tuolumne County, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Tuolumne County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on the 2014 NEI and On the Map data from the Census Bureau and shows that Tuolumne County has total 2014 VMT of 508 million miles. The twelve-kilometer grid cell with the highest VMT in the county falls over the city of Sonora. The data also show that VMT levels in the western portion of Tuolumne County are higher in areas that include transportation arteries with the largest number of commuters, and lower in the eastern portion of the county.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory) trajectories at 100, 500, and 1000 meters above ground level (AGL) that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 19.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8-hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

Figure 19.6 HYSPLIT Back Trajectories for the Violating Monitor.

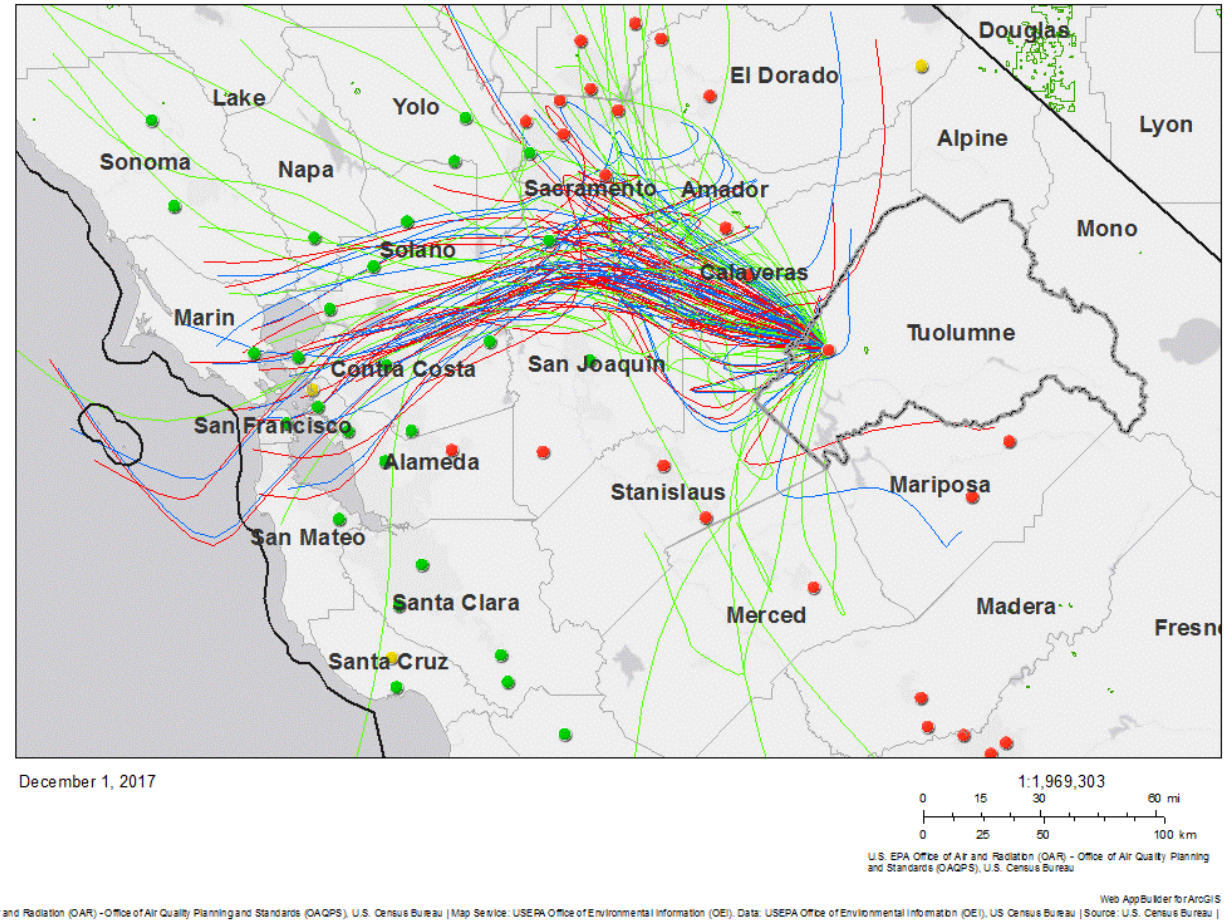


Figure 19.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Tuolumne County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally pass through some of the area included in the area of analysis, which indicates that sources in Tuolumne County previously discussed in Factor 2 may be contributing to exceedances or violations of the 2015 ozone NAAQS. The trajectories also show that the winds during exceedance days are predominately from the northwest, suggesting emissions transport from upwind Calaveras County, Amador County, and the Sacramento and northern San Joaquin Valley areas, consistent with local topography.

Summers in Tuolumne County are normally warm and dry. Winds are generally daytime upslope and nighttime downslope flows, caused by the differential heating or cooling of air near mountain ground surfaces relative to air at the same height over land at lower elevations.

Neighboring San Joaquin and Sacramento valleys can have temperature inversions from 2,000 to 2,500 feet (600 to 750 meters) above the valley floor to as high as 5,000 feet (1,500 meters). Ozone produced in the Sacramento and northern San Joaquin valleys and trapped under this inversion can reach fairly high into the mountain counties or be advected there by daytime upslope flows. Previous assessments of transport by the California Air Resources Board have found a strong potential for ozone transport from the Sacramento and San Joaquin valleys up into the mountain counties.[6] Nighttime drainage flows reverse this transport pattern, so some of this pollution, in combination with pollution generated in the mountain counties themselves, could be transported back into the valleys with the potential for some carryover into subsequent days.

North-south flow between Calaveras, Tuolumne, and Mariposa counties is possible due to the weaker topographic relief in the western parts of both counties. There is likely some transport of pollutants between these counties, as well as transport from the Sacramento Metro and San Joaquin Valley nonattainment areas. The EPA is designating Calaveras County, Mariposa County, the Sacramento Metro area, and the San Joaquin Valley as separate nonattainment areas for the 2015 ozone NAAQS.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

[6] "Assessment of the Impacts of Transported Pollutants on Ozone Concentrations in California". California Environmental Protection Agency, Air Resources Board, March 2001. http://www.arb.ca.gov/aqd/transport/assessments/assessments.htm

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area. Topography impacts pollutant formation and transport in California, and thus plays an important role in assessing which areas are contributing to monitored violations of the NAAQS. Figure 19.7 shows a topographic illustration of the physical barriers around the Tuolumne County area.

California has historically been divided into 15 distinct air basins. Tuolumne County is located in the Mountain Counties Air Basin. This is not a "basin" in the sense of a single watershed or an area that is more or less surrounded by high terrain. Rather it is a group of rural and largely mountainous counties compared to the more polluted, flatter, and more populous areas to the west (the broad Sacramento and San Joaquin valleys of central California). Tuolumne County is in the foothills and mountains of the Sierra Nevada mountain range with elevations increasing from about 400 feet (120 meters) above mean sea level in the west to over 11,000 feet (3,350 meters) in the east.

Air flow in the west-east direction is relatively unimpeded along the areas river valleys, which extend well east into the interior of the county. Eastward transport of pollutants from the more urbanized areas to the west is thus possible during conditions of upslope flow. Conversely, westward transport of locally generated pollution is possible during nighttime downslope flow.

Figure 19.7 Topographic Illustration of the Physical Features.

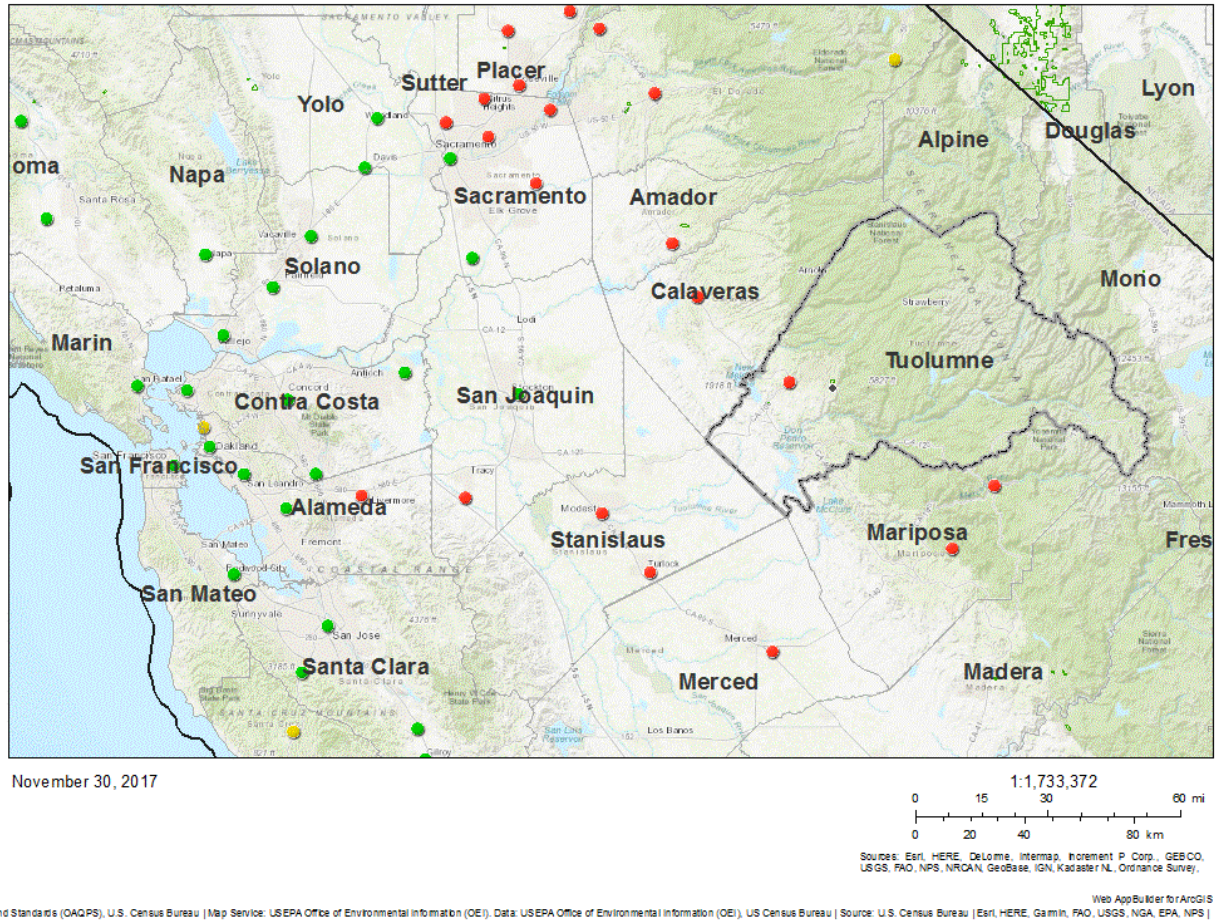


Figure 19.7 shows the topography in the area of analysis for Tuolumne County, CA. The EPA's nonattainment boundary for Tuolumne County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Tuolumne County nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 19.8 shows the relevant jurisdictional boundaries for the Tuolumne County area. Tuolumne County is defined by OMB as the Sonora CBSA.

Figure 19.8 Jurisdictional Boundaries.

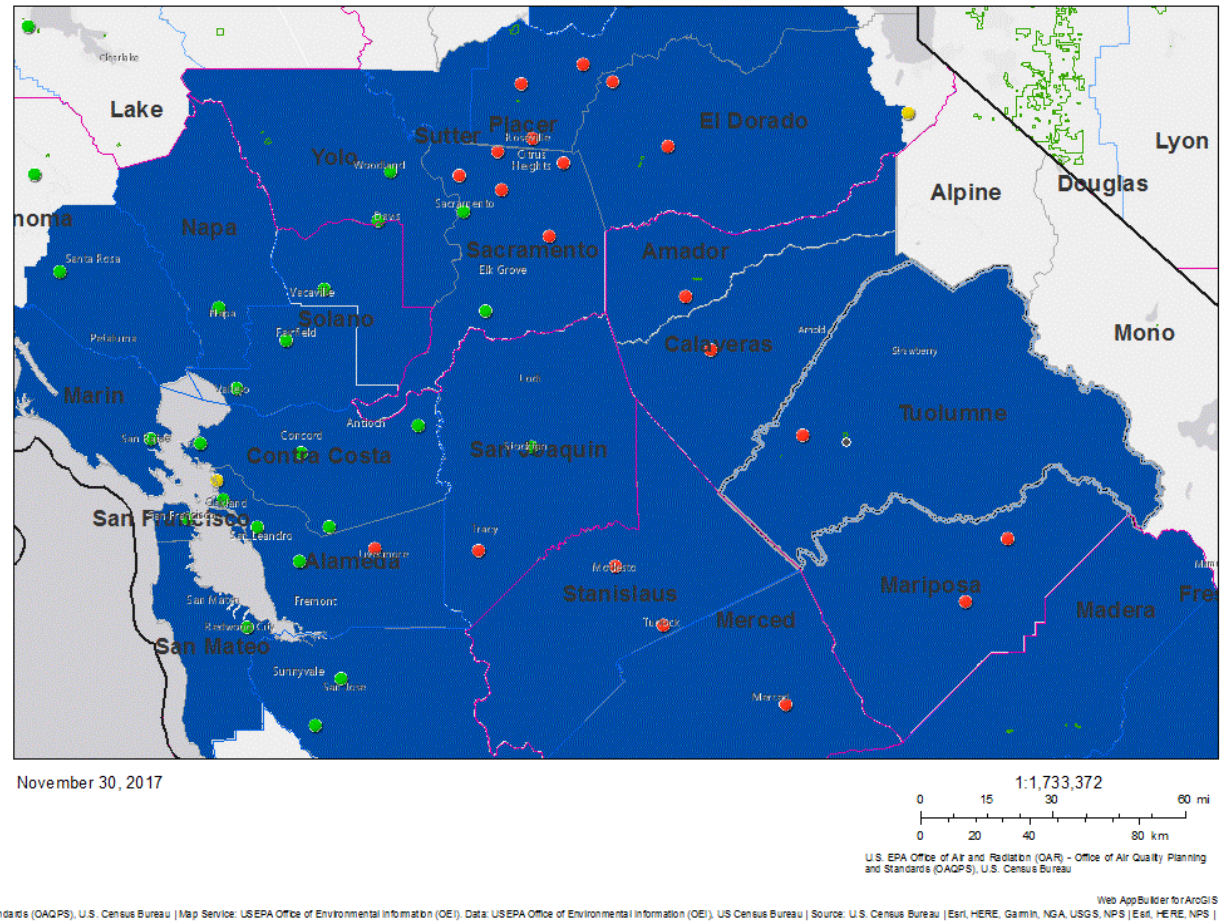


Figure 19.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for Tuolumne County, CA. The EPA's nonattainment boundary for Tuolumne County, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Tuolumne County area has previously established nonattainment boundaries associated with the 1997 ozone NAAQS. The state has recommended a different boundary for the 2015 ozone NAAQS.

As mentioned above, the Tuolumne County area also includes portions of Indian country of the following tribes: Chicken Ranch Rancheria and Tuolumne Band. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

The Tuolumne County nonattainment area for the 2015 ozone NAAQS differs from the existing Southern Mountain Counties nonattainment area for the 1997 ozone NAAQS in that the mountain counties area was a two-county area (the other county being Mariposa County), while in this analysis,

the EPA is designating the two counties separately as their own nonattainment areas for the 2015 ozone NAAQS. The EPA considered the state's recommendation to designate the two counties separately as well as several other jurisdictional considerations. The two counties were also designated as separate areas (Tuolumne County unclassifiable/attainment, Mariposa County nonattainment) for the 2008 ozone NAAQS. Both counties have their own county governments as well as their own air pollution control districts (Tuolumne County Air Pollution Control District (APCD) and the Mariposa County APCD). Each county also has its own transportation planning agency. The Tuolumne County Transportation Council (TCTC) is responsible for developing transportation improvements in the county. The Mariposa County Local Transportation Commission (LTC) is the Regional Transportation Planning Agency (RTPA) for Mariposa County. As an RTPA, the Maricopa County LTC is the designated planning and administrative agency for transportation projects and programs in the county. The adjacent Calaveras County and San Joaquin Valley nonattainment areas are also under different air quality planning and transportation planning jurisdictions than Tuolumne County.

Conclusion for Tuolumne County, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation to designation Tuolumne County as the Tuolumne County nonattainment area for the 2015 ozone NAAQS. This is one of the counties that was included in the Southern Mountain Counties nonattainment area for the 1997 ozone NAAQS.

The air quality monitor in Tuolumne County indicates a violation of the 2015 ozone NAAQS based on the 2016 design value, therefore this county is included in the nonattainment area. Emissions and emission-related data show that Tuolumne County has relatively low emissions of ozone precursors, a moderate-sized population, two large point sources of ozone precursors, and is likely affected by emissions from non-point sources (e.g., vehicles) and from commuters into the county. Meteorological data indicate the winds transporting ozone and ozone precursors during exceedance days are predominately from the northwest, suggesting emissions transport from the upwind Calaveras County, Amador County, and Sacramento Metro nonattainment areas and the northern portions of the San Joaquin Valley nonattainment area, consistent with local topography. The complex topography and unimpeded air flow along the river valleys in Tuolumne County may influence the fate and transport of emissions as well as the formation and distribution of higher ozone concentrations in the area. The jurisdictional factor supports a separate boundary for Tuolumne County from the adjacent nonattainment areas (i.e., Mariposa County, Calaveras County, and San Joaquin Valley), as the adjacent areas have separate air pollution control districts, with separate jurisdictional boards and authorities.

Based on our consideration of all five factors, the EPA is not modifying the state's recommendation and is designating Tuolumne County, CA nonattainment for the 2015 ozone NAAQS.

20.0 Technical Analysis for Tuscan Buttes, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. It also provides EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area.

Table 20.1 identifies the area of analysis for the Tuscan Buttes, CA nonattainment area. The area of analysis includes all of Tehama County, an area that is coterminous with the Red Bluff micropolitan Core Based Statistical Area (CBSA). The Red Bluff micropolitan CBSA (Tehama County) itself comprises one county of the two-county Redding-Red Bluff combined statistical area (CSA), the other county being Shasta County, directly to the north of Tehama County. The nonattainment area is a remote rural area and is identical to the existing 2008 Tuscan Buttes, CA nonattainment area.

Table 20.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Tuscan Buttes, CA	Tehama County	Red Bluff CBSA	Redding-Red Bluff CSA (partial)*

*Only the Red Bluff CBSA portion of the Redding-Red Bluff CSA was included in the area of analysis.

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 20.1 is a map of the Tuscan Buttes area. The map shows the location of the ambient air quality monitors, county boundaries, and 2008 ozone NAAQS nonattainment boundaries. The 2008 ozone NAAQS nonattainment boundary for Tuscan Buttes, as well as the EPA's 2015 ozone NAAQS boundary and the State's recommended boundary for Tuscan Buttes, are not visible in the figures; all

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

three are characterized as the area atop Tuscan Buttes, above 1,800 feet (549 meters) in elevation, in Tehama County. This location is identified in the figures by the red dot icon within Tehama County, which represents the Tuscan Butte violating monitor. The Sacramento River, shown in lighter grey, bifurcates Tehama County in a roughly north to south orientation.

For purposes of the 2008 ozone NAAQS, this area was designated nonattainment. The EPA is not modifying the state's recommended boundary for the 2015 ozone NAAQS which is the same as the boundary for the 2008 ozone NAAQS.

Along with their boundary recommendation, California requested Rural Transport Area (RTA) status for Tuscan Buttes nonattainment area. According to section 182(h) of the Clean Air Act Amendments of 1990, an ozone nonattainment area may be treated as an RTA if: 1) the Administrator determines that sources of VOC emissions within the area do not contribute significantly to the ozone concentrations measured in that area or in other locations; and 2) the area does not include, and is not adjacent to, a metropolitan statistical area as defined by the Office of Management and Budget. The EPA's analysis, provided at the end of this section, indicates that the Tuscan Buttes area meets the criteria for RTA status, and therefore the EPA is granting RTA status for the Tuscan Buttes nonattainment area.

Figure 20.1 The EPA's Nonattainment Boundaries for Tuscan Buttes, CA.

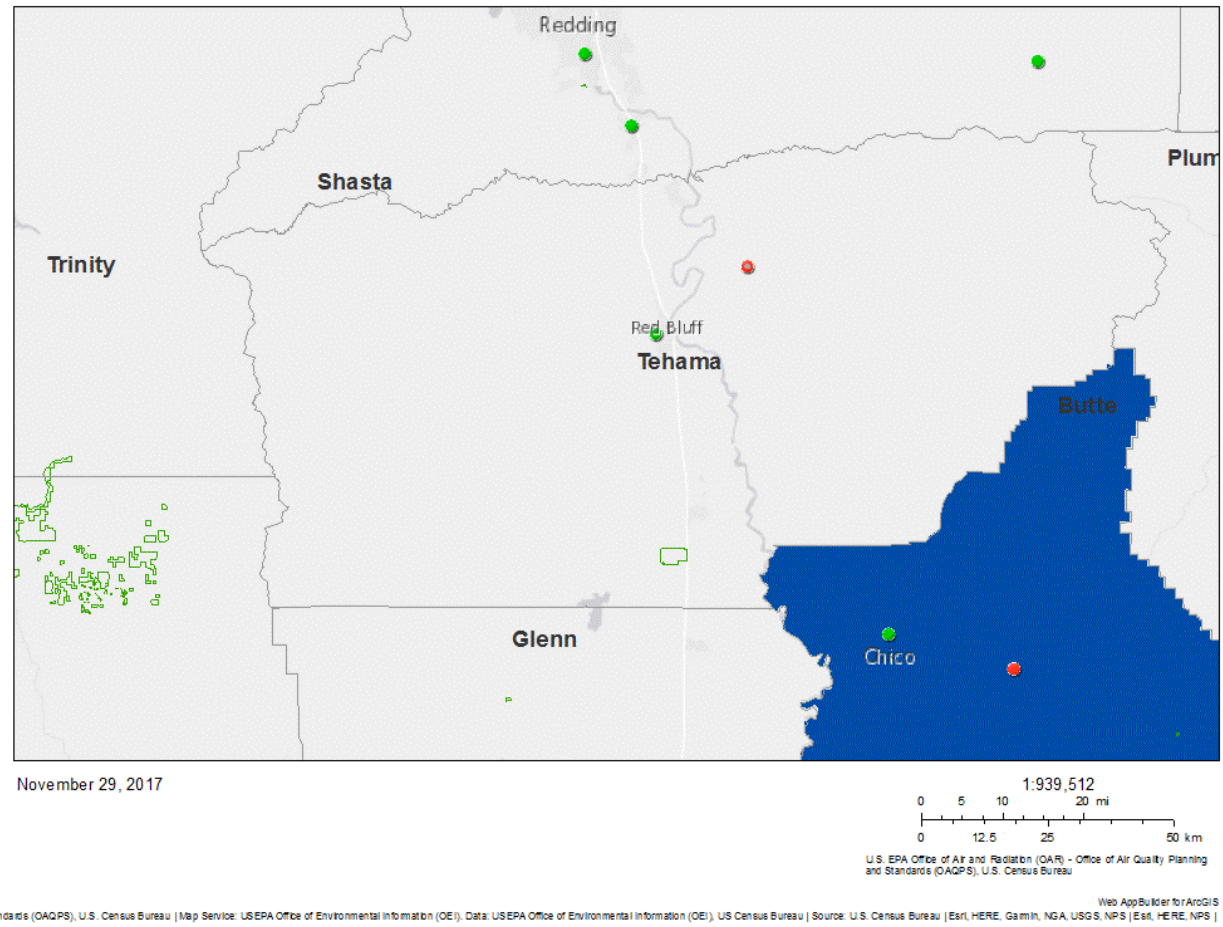


Figure 20.1 shows the EPA's nonattainment boundary for Tuscan Buttes, CA as a gray area within the red dot for the violating monitor in Tehama County. The boundary is small relative to the map extent and not clearly visible; it is characterized as the area atop Tuscan Buttes, above 1800 feet (549 meters) in elevation. Nonattainment areas for the 2008 ozone NAAQS, other than the Tuscan Buttes area, are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Tehama County has a monitor violating the 2015 ozone NAAQS, therefore portions of this county are included in the final nonattainment area. The following sections describe the five-factor analysis. While the factors are presented individually, they are not independent. The five-factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Tuscan Buttes area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most

recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values.
Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for the county in the area of analysis are shown in Table 20.2.

Table 20.2 Air Quality Data (all values in ppm).

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Tehama, CA	Yes (partial)	06-103-0004	**0.079**	0.076	0.076	0.087
		06-103-0007	0.067	0.068	0.063	0.070

The highest design value in each county is indicated in bold type.

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at:
https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx.
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

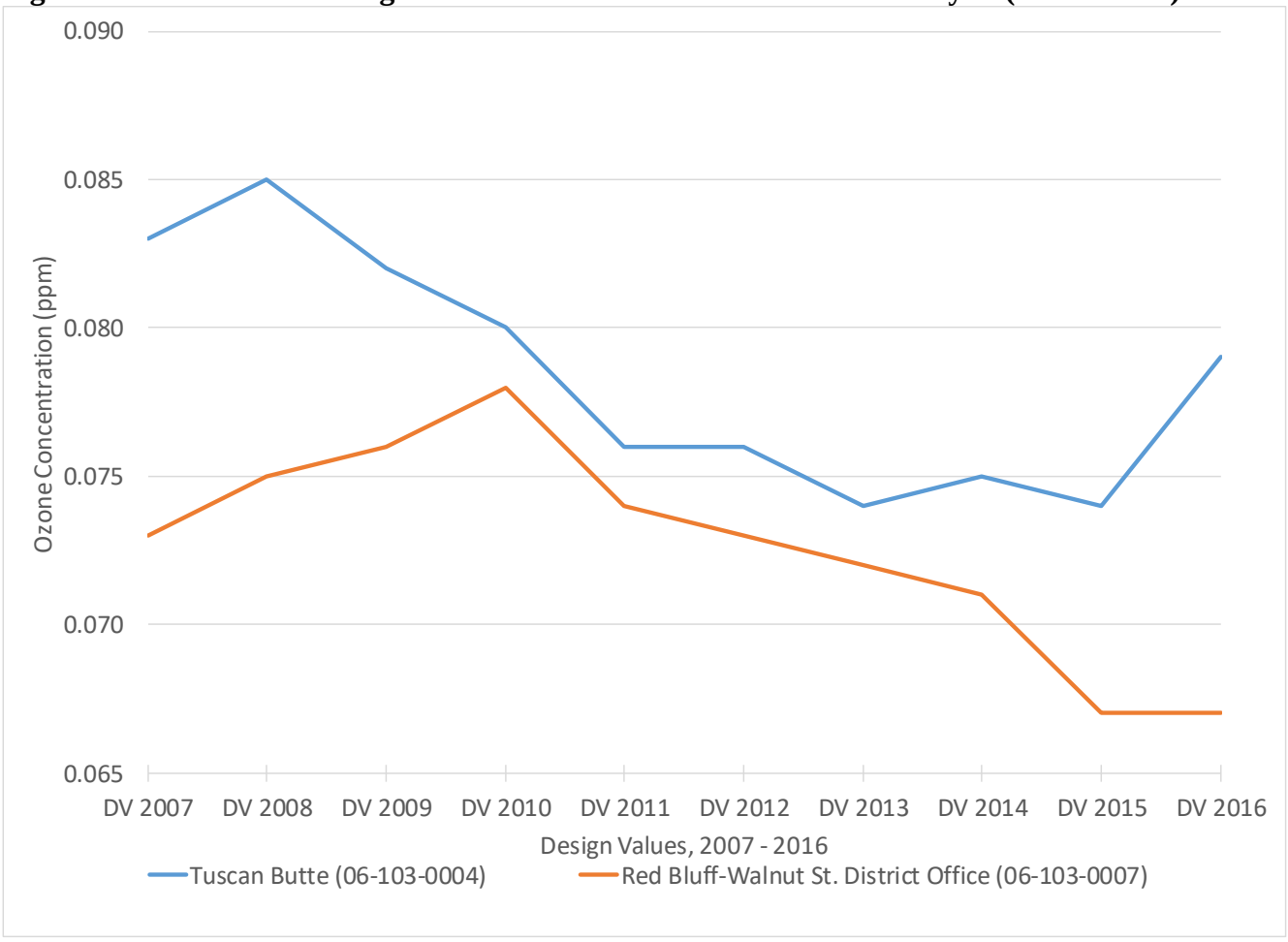
Tehama County shows a violation of the 2015 ozone NAAQS, therefore, a portion of this county is included in the final nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 20.1, shown previously, shows the violating monitor (which obscures the Tuscan Buttes nonattainment area). Table 20.2 identifies the design values for all monitors in the area of analysis. Figure 20.2 shows the historical trend of design values for the monitors in the area of analysis. As indicated on the map, there is one violating monitor in the central portion of the county.

The violating monitor is the Tuscan Butte ozone monitor (AQS ID 06-103-0004), located atop the Tuscan Buttes topographic feature, at 1,844 feet (562 meters) elevation. The Tuscan Butte ozone monitor has a valid 2016 DV of 0.079 ppm. The Tuscan Buttes topographic feature is discussed more in Factor 4 Geography/Topography below.

The other monitor in Tehama County is the Red Bluff monitor (AQS ID 06-103-0007), located in the city of Red Bluff. The Red Bluff monitor is located southwest 11 miles (17 km) of the Tuscan Butte monitor, at an elevation of approximately 300 feet. The Red Bluff monitor has a valid 2016 DV of 0.067 ppm. As shown in Figure 20.2, the Tuscan Butte monitor's design values have been above the 2015 ozone NAAQS for the past 10 years. The data also show that ozone concentrations have been generally decreasing until 2011, with no clear design value trend since 2012 despite an uptick in 2016. The Red Bluff monitor's design value has been generally decreasing since 2010.

Figure 20.2 Three-Year Design Values for Monitors in the Area of Analysis (2007 – 2016).



Tehama County has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitor is located within the portion of Tehama County that was designated nonattainment area for the 2008 ozone NAAQS. The other monitor in the county is at a lower elevation and has an attaining 2016 DV. Therefore, Factor 1 supports including the portion of the county with the violating monitor in Tehama County within the EPA's nonattainment boundary for Tuscan Buttes.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For the county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year), small sources, and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 20.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Tuscan Buttes nonattainment area.

Table 20.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Tehama, CA	Yes (partial)	2,955	3,564
	Area wide:	2,955	3,564

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large and small point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources, indicated with orange icons, are shown in Figure 20.3 below. Small point sources are depicted with yellow icons. In Figure 20.3, the county boundaries are shown in grey. The Sacramento River, shown in lighter grey, bifurcates Tehama County. The nonattainment boundary is the area in Tehama County above 1,800 feet (549 meters) (located where the violating monitor icon is in the figure), atop Tuscan Buttes.

Figure 20.3 Large and Small Point Sources in the Area of Analysis.

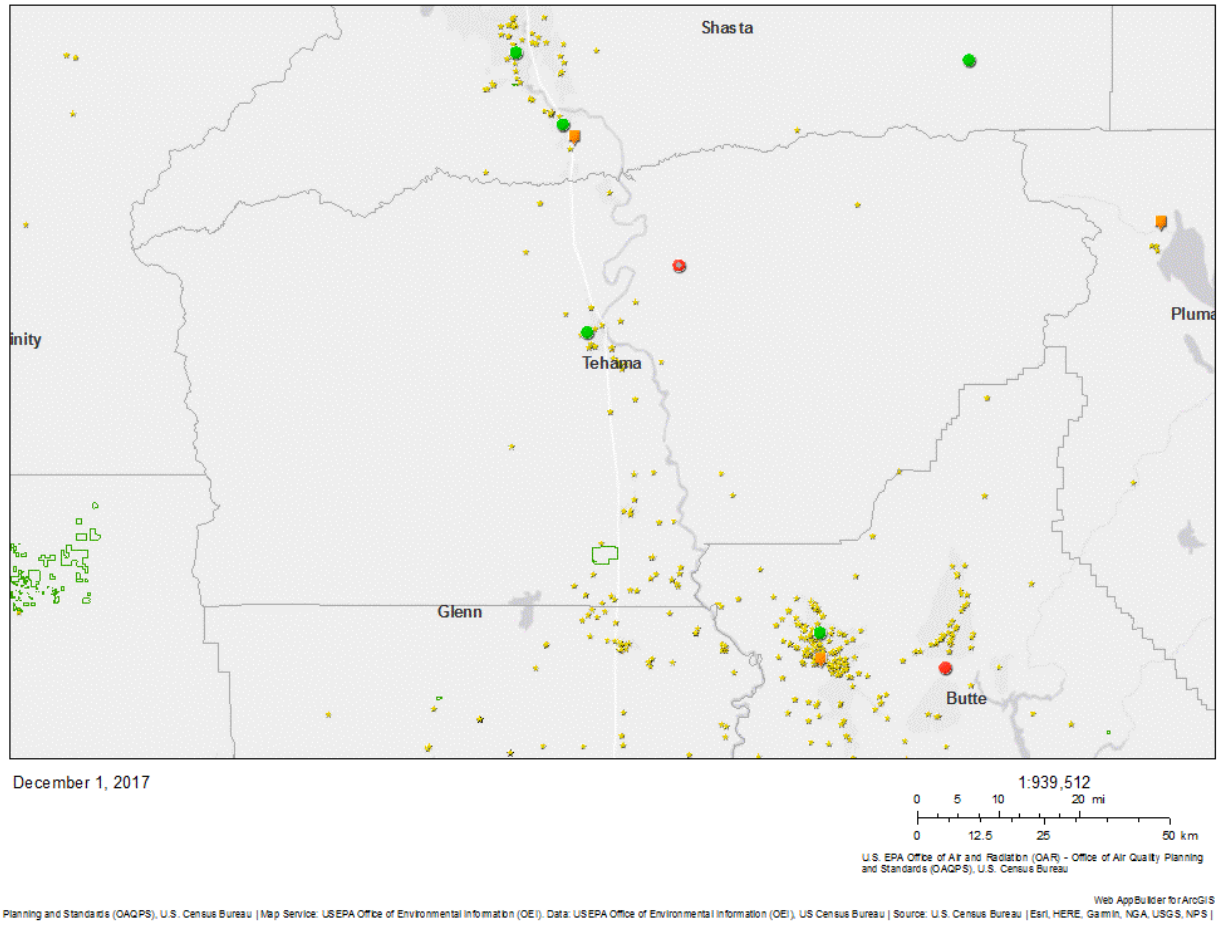


Figure 20.3 shows large point sources in the area of analysis for Tuscan Buttes, CA as orange squares. Small point sources are shown as yellow stars. The EPA's nonattainment boundary for Tuscan Buttes, CA is shown as a gray area within the red dot for the violating monitor in Tehama County. The boundary is small relative to the map extent and not clearly visible; it is characterized as the area atop Tuscan Buttes, above 1800 feet (549 meters) in elevation. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Tehama County has emissions levels of 2,955 tpy of NO_x and 3,564 tpy of VOC. Tehama County does not contain any large point sources. There are some small point sources of ozone precursors located primarily located to the west of the Sacramento River and in the southeast corner of Tehama County.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 20.4 shows the population, population density, and population growth information for the area of analysis.

Table 20.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Tehama, CA	Yes (partial)	63,463	63,308	21	-155	0%
	Area wide:	63,463	63,308	21	-155	0%

For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. www.census.gov/data.html.

Figure 20.4 shows the 2012 census tract-level information for Tehama County. Tehama County had a 2015 population of approximately 63,308 people, with a 0% population change during the 2010-2015 period. Generally, the higher-population tracts are at the northern and southern ends of the Sacramento River and Interstate-5 (discussed below) within Tehama County, as well as the census tract containing the city of Red Bluff.

Figure 20.4 Census Tract-Level Population.

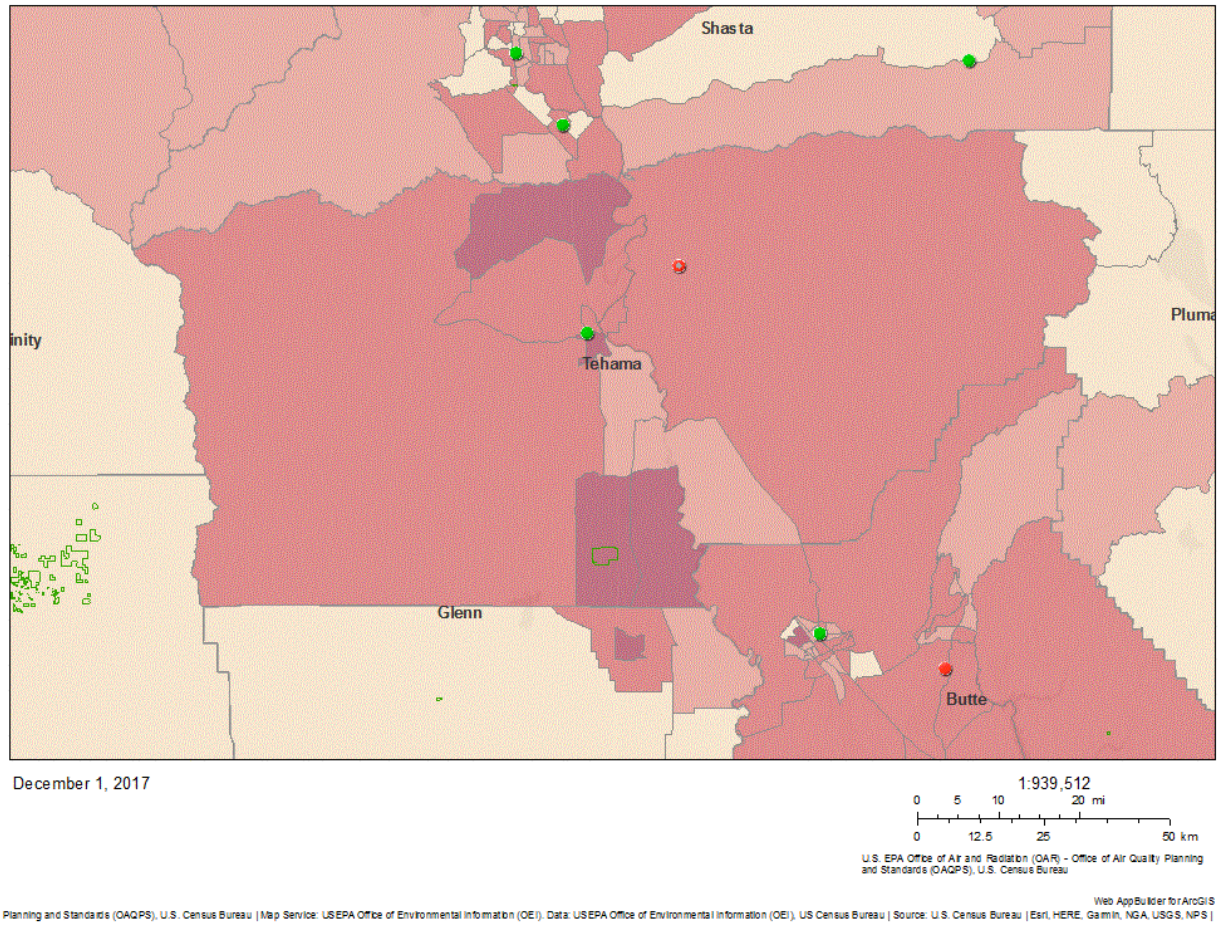


Figure 20.4 shows census tract population in the area of analysis for Tuscan Buttes, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Tuscan Buttes, CA is shown as a gray area within the red dot for the violating monitor in Tehama County. The boundary is small relative to the map extent and not clearly visible; it is characterized as the area atop Tuscan Buttes, above 1800 feet (549 meters) in elevation. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 20.5 shows the traffic and commuting pattern data, including total VMT for the area of analysis, the number of residents who work in the area, the number of residents that work in the county with the violating monitor, and the percent of residents working in that county. The data in Table 20.5 are 2014 data.

Table 20.5 Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis	Percentage Commuting To or Within Counties with Violating Monitor(s) within Area of Analysis
Tehama, CA	**Yes (partial)**	**884**	**21,846**	**9,176**	**42.0%**
	Total:	884	21,846	9,176	42.0%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 20.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 20.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

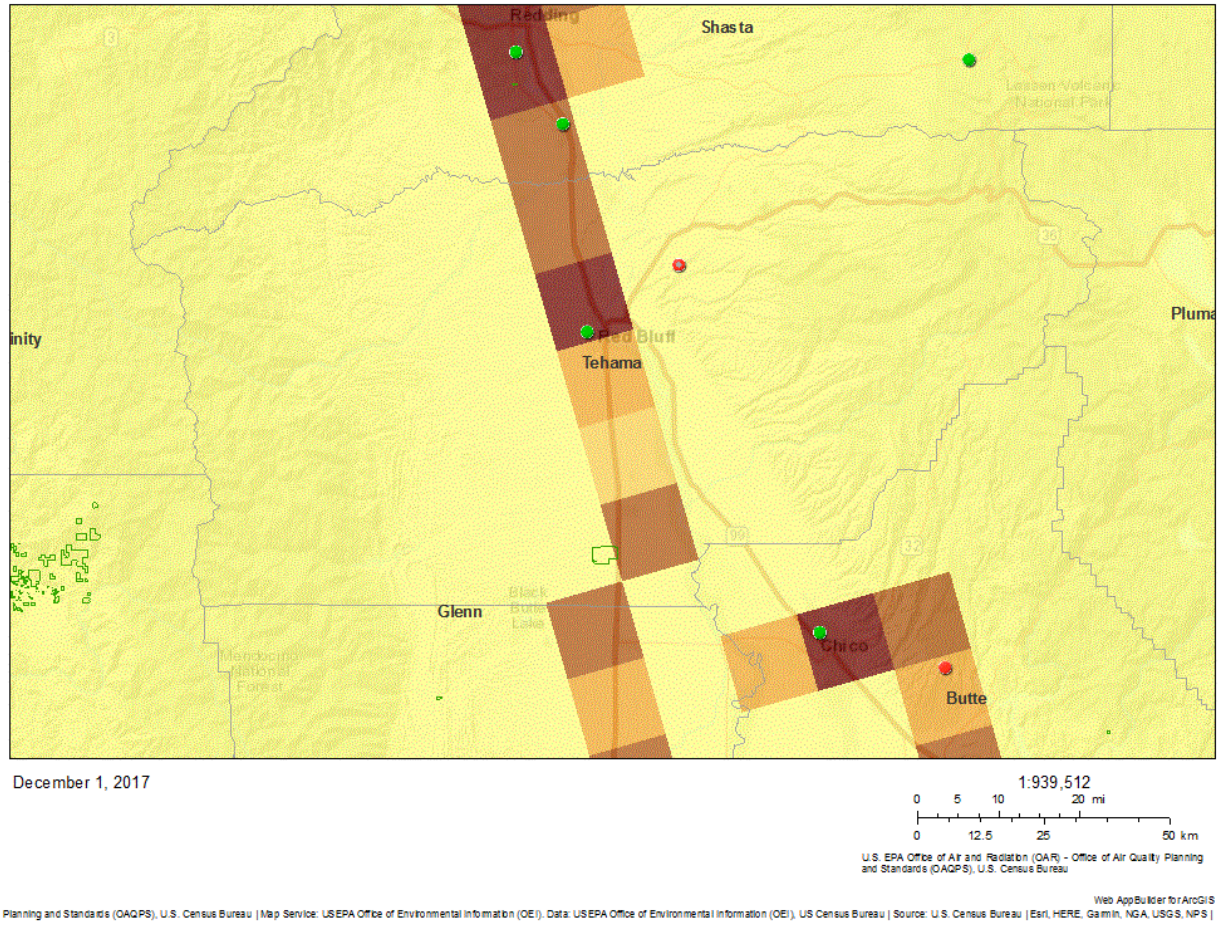


Figure 20.5 shows gridded VMT in the area of analysis for Tuscan Buttes, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Tuscan Buttes, CA is shown as a gray area within the red dot for the violating monitor in Tehama County. The boundary is small relative to the map extent and not clearly visible; it is characterized as the area atop Tuscan Buttes, above 1800 feet (549 meters) in elevation. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau,[6] and shows that VMT levels in Tehama County are higher in areas that include Interstate 5, and are lower everywhere else in the county.

The twelve-kilometer grid with the highest VMT in the county falls over the city of Red Bluff and includes a portion of Interstate 5. All twelve-kilometer grids in the rest of Tehama County (i.e., those that do not overlap with Interstate 5), including those around the Tuscan Buttes violating monitor, have lower VMT.

[6] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 20.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8-hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

Figure 20.6. HYSPLIT Back Trajectories for the Violating Monitor.

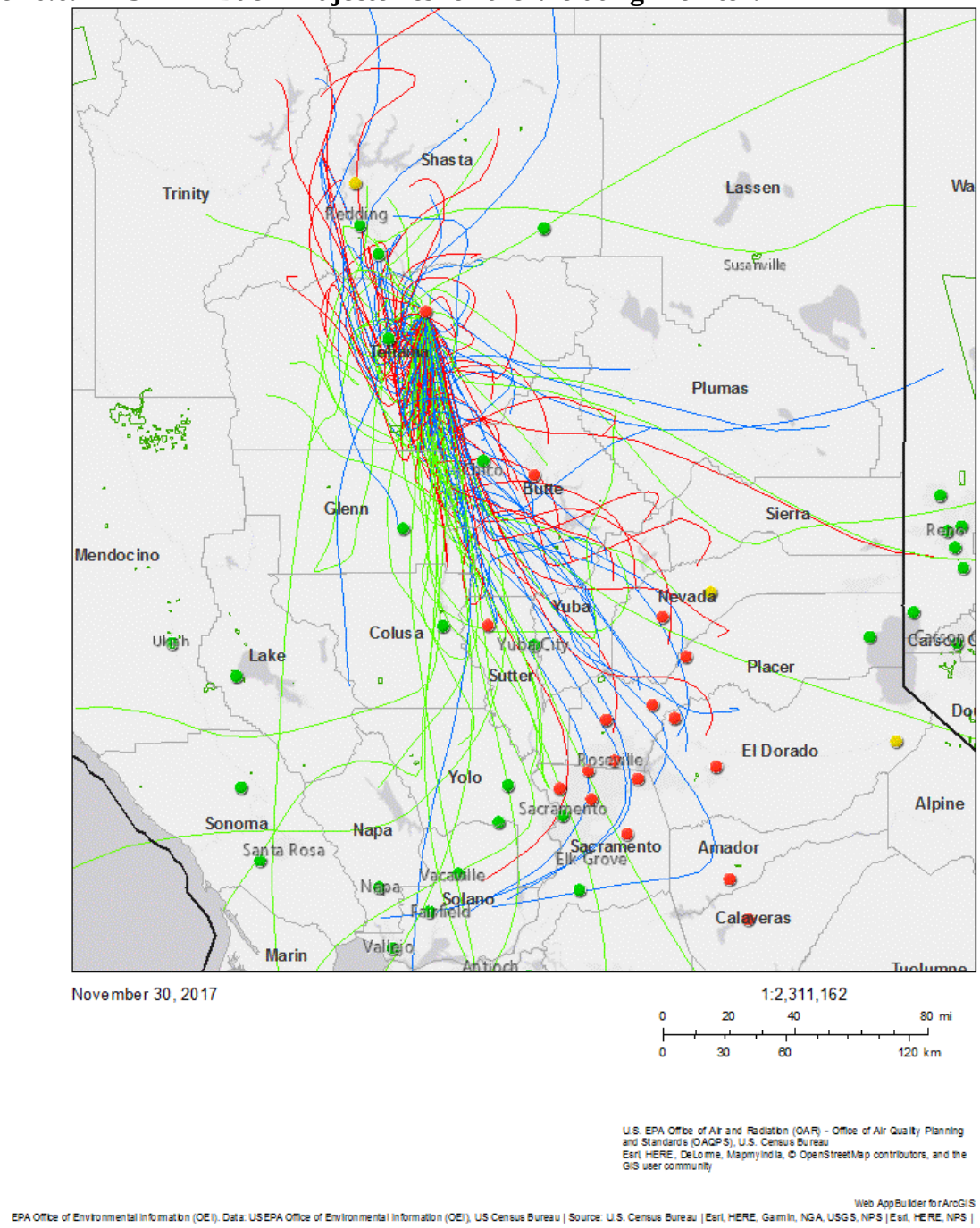


Figure 20.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally come from south, southwest, or southeast of Tuscan Buttes, and more rarely from directly east or west. They extend well beyond to the surrounding Sacramento metropolitan area in general; some trajectories originate in the San Francisco Bay Area, well to the south, and a number in the Sierra foothills to the east. The 500 m and 1000 m trajectories also show that the winds during exceedance days come predominantly from the south, but the 100 m trajectories also come from the Sierra foothills in the northeast, east, and southeast, and Shasta County in the north. This would seem to indicate that sources in Tehama County previously discussed in Factor 2 Emissions and Emissions-Related Data, and possibly sources in Shasta County, may be contributing to exceedances or violations of the 2015 ozone NAAQS. However, the high elevation of the Tuscan Buttes ozone monitor, as mentioned in Factor 1 Air Quality Data and discussed further under Factor 4 Geography/Topography must be taken into account. The HYSPLIT trajectories terminate at elevations well above the surface and above pollution sources in Tehama County and neighboring counties. They do not indicate that sources previously discussed in Factor 2 in Tehama County may be contributing to exceedances or violations of the 2015 ozone NAAQS at the Tuscan Buttes monitor.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

California has historically been divided into fifteen distinct air basins. The Tuscan Buttes area is located in the northeast portion of the Sacramento Valley Air Basin, which includes portions of 11 counties in the northern half of California's Central Valley. The Tuscan Buttes are a pair of steep hills northeast of Red Bluff in the foothills of the Sierra Nevada mountains, which rise to a maximum elevation of 1,868 feet (569 meters) over a short distance. (The monitor is at 1,844 feet or 562 meters.) The surrounding area includes Red Bluff at 299 feet (91 meters) elevation, with flat terrain 5 miles eastward to the start of the Sierra Nevada foothills, which rise gradually up to 1,500 feet (457 meters).

The Sacramento Valley is bounded on the west by the Northern Coast Ranges, on the north by the Siskiyou and Trinity Mountains, and on the east by the Sierra Nevada mountain range. It is open toward the south, ending in the vicinity of Sacramento; the Sacramento Valley is about 30 km (20 miles) wide at the latitude of the Tuscan Buttes. The monitor location is subject to pollution transported from areas to the south, such as urban Sacramento

The main topographic feature of the area is the Tuscan Buttes themselves. The Tuscan Butte monitor was sited near the top of the taller of the two hills to assess ozone transport aloft from urban areas to the south. The topography of the Tuscan Buttes makes them isolated from the effects of nearby emissions, which are low, as discussed under Factor 2. The high elevation of the monitor relative to that of the rest of Tehama County makes it subject to and reflective of wind and pollution conditions aloft rather than to conditions elsewhere within the county.

Figure 20.7. Topographic Illustration of the Surrounding Area

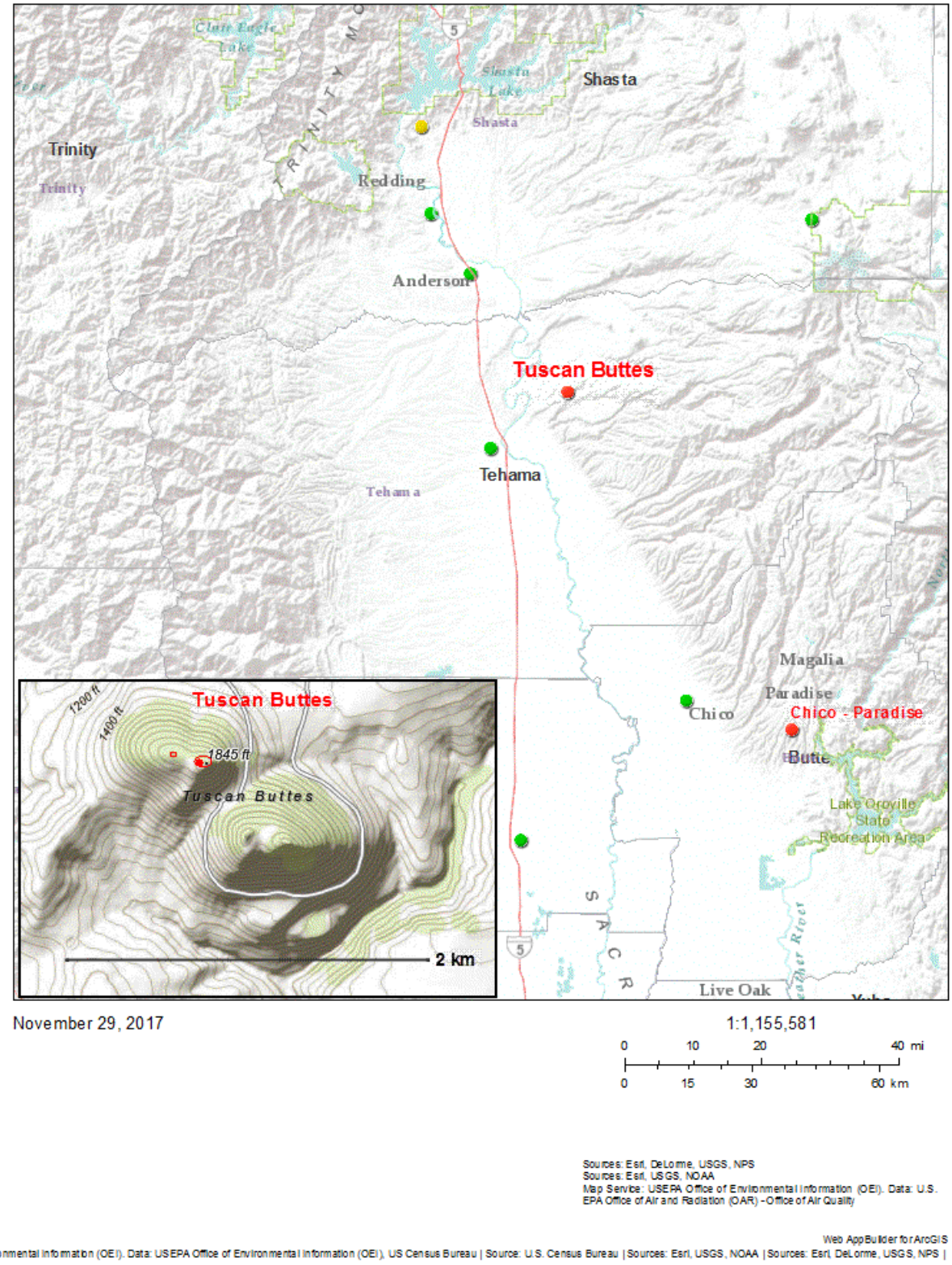


Figure 20.7 shows the topography in the area of analysis for Tuscan Buttes, CA. The EPA's nonattainment boundary for Tuscan Buttes, CA is shown as a red line in the inset. The boundary is characterized as the area atop Tuscan Buttes, above 1800 feet (549 meters) in elevation. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Tuscan Buttes nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 20.8 shows relevant jurisdictional boundaries for the Tuscan Buttes area, including the Tehama County boundary, the boundary for the Red Bluff CBSA, and areas of Indian country. The Red Bluff CBSA boundary is the same as the county boundary.

Figure 20.8 Jurisdictional Boundaries.

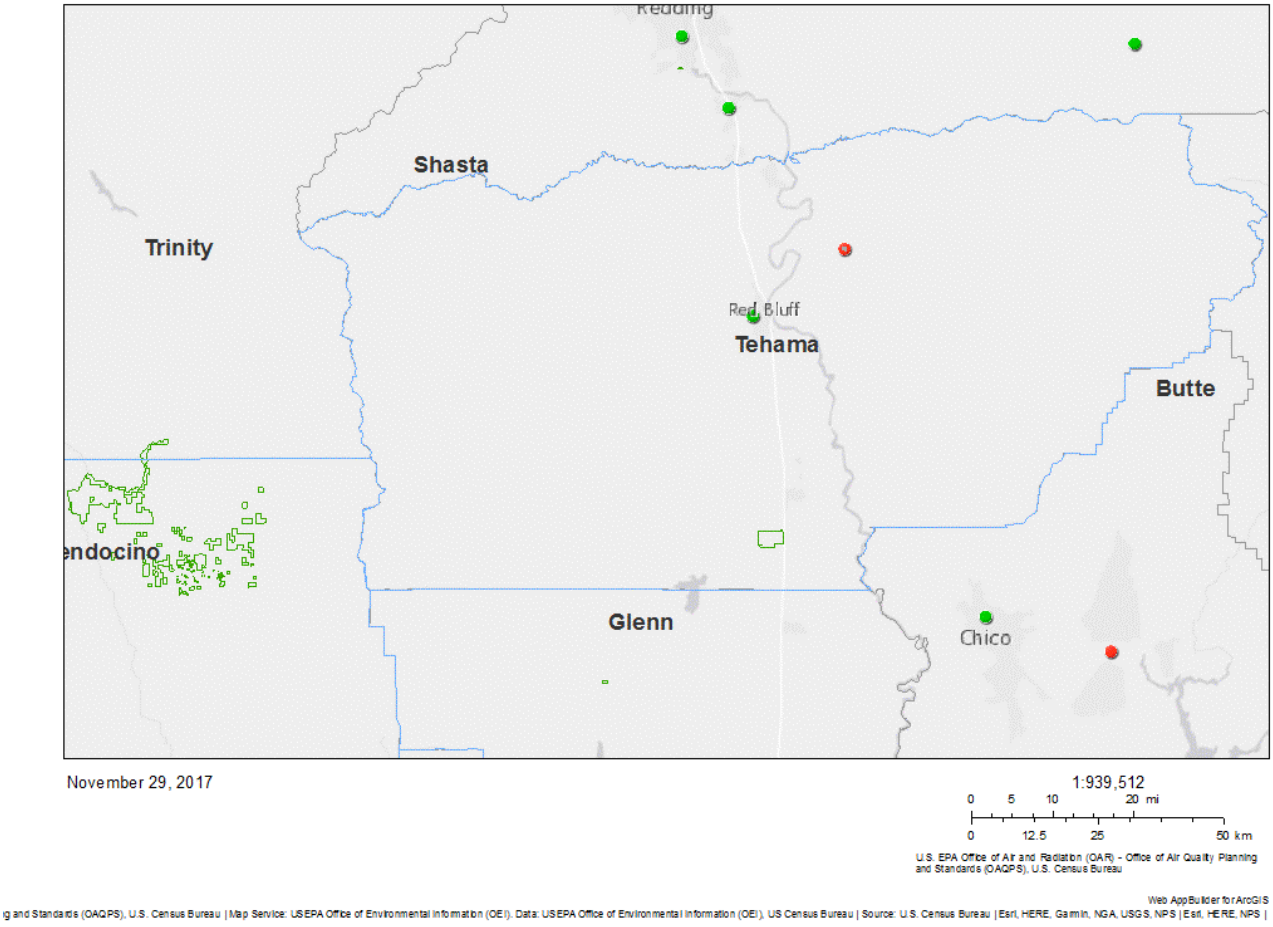


Figure 20.8 shows jurisdictional boundaries, including state boundaries (black lines) and micropolitan statistical areas (light blue lines) in the area of analysis for Tuscan Buttes, CA. The EPA's nonattainment boundary for Tuscan Buttes, CA is shown as a gray area within the red dot for the violating monitor in Tehama County. The boundary is small relative to the map extent and not clearly visible; it is characterized as the area atop Tuscan Buttes, above 1800 feet (549 meters) in elevation. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Tuscan Buttes area has previously established nonattainment boundaries associated with the 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

The Tehama County Air Pollution Control District has air quality regulatory jurisdiction for Tehama County. The Tehama County Transportation Commission has jurisdiction for transportation planning in Tehama County.

Conclusion for Tuscan Buttes, CA

Based on the assessment of factors described above, the EPA is not modifying the State's recommendation that the area above 1,800 feet atop Tuscan Buttes in Tehama County be included in

the Tuscan Buttes nonattainment area. This is the same area that was included in the Tuscan Buttes nonattainment area for the 2008 ozone NAAQS. The Tuscan Butte air quality monitor in Tehama County indicates violations of the 2015 ozone NAAQS based on the 2016 design values, therefore this area is included in the nonattainment area.

There are no large point sources of ozone precursors in Tehama County and emissions, population and VMT are all relatively low as compared with other areas in the region, as discussed in the portions of the TSD discussing other areas EPA is designating as nonattainment, such as the San Francisco and Sacramento areas. As described in the meteorology and geography/topography sections, the area with the monitor is located at a higher elevation in the county and is not affected by the emission sources in the county, but rather is affected by transport from more distant areas, such as the Sacramento metropolitan area to the south; the EPA is designating the Sacramento Metro area as a separate nonattainment area.

Based on consideration of all five factors, the EPA is not modifying the State's recommendation to designate Tuscan Buttes nonattainment for the 2015 ozone NAAQS.

Rural Transport Area (RTA) Analysis

Section 182(h) of the Clean Air Act provides that an area designated as an ozone nonattainment area may be identified as a rural transport area (RTA) if it meets specified criteria[7]. An RTA is treated as a Marginal area for purposes of ozone-related planning and control requirements, regardless of the area's classification. In order for an area to qualify as an RTA, the nonattainment area must meet two criteria. First, the nonattainment area cannot be adjacent to or include any part of a metropolitan statistical area, as defined by the U.S. Office of Management and Budget (OMB). Second, the NO_x and VOC emissions from sources within the area cannot make a significant contribution to ozone concentrations in the area itself, or in other areas.

For the first criterion, while Tehama County is adjacent to Shasta County, which is part of the Redding metropolitan statistical area, the portion of the county EPA is designating as nonattainment does not border Shasta County. Thus, the Tuscan Buttes nonattainment area meets the first criterion for RTA eligibility.

Regarding the second criterion, EPA has provided guidance that a multi-factor, weight-of-evidence approach should be used to demonstrate that emissions within a potential RTA do not contribute significantly to the local ozone nonattainment or to ozone nonattainment downwind.
EPA's 2015 designations guidance indicates that the first step in demonstrating that the NO_x and VOC emissions in a potential RTA do not significantly contribute to ozone in the area itself is the development of a conceptual description of the nature of ozone exceedances in the area. As described above in the 5-factor analysis, the conceptual explanation for violations of the ozone standard at the Tuscan Buttes monitor is that they result from long range transport from higher emissions locations in the Sacramento Valley. Emissions in Tehama County, and in particular within the nonattainment area (portion of Tuscan Buttes above 1800 feet), are relatively low. As discussed in Factor 4 of this TSD, emissions in other counties within the Sacramento Valley, particularly the counties in the Sacramento Metro nonattainment area, are significantly higher. The Sacramento Metro nonattainment area contains several large point sources in the area around urban Sacramento compared to Tehama County and has

[7] These criteria are discussed on page 8 of the February 25, 2016 EPA guidance document, "Area Designations for the 2015 Ozone National Ambient Air Quality Standards." See https://www.epa.gov/sites/production/files/2016-02/documents/ozone-designations-guidance-2015.pdf

over 30 times the emissions of NO_x and VOCs combined as all of Tehama County. Further, based on the air quality and meteorological data described above, the low levels of emissions within Tehama County would not have a significant impact on air quality downwind. We note that any emissions from within the nonattainment area would be expected to be transported to the north toward Shasta County. Shasta County contains four ozone monitors that are not violating: Anderson-North Street (AQS ID: 06-089-0007) with a valid 2016 DV of 0.068 ppm, Redding-Health Department (ADS ID: 06-089-0004) with a valid 2016 DV of 0.70 ppm, Lassen Volcanic National Park (AQS ID: 06-089-3003) with a valid 2016 DV of 0.065 ppm, and Shasta Lake-Lake Boulevard (AQS ID: 06-089-0009) with an invalid 2016 DV of 0.068 ppm. Anderson-North Street, Redding-Health Department, and Shasta Lake-Lake Boulevard are located in the southwestern portion of the county near the city of Redding, while Lassen Volcanic National Park monitor is located in the eastern portion of the county within Lassen National Forest.

We determine that the Tuscan Buttes nonattainment area for the 2015 ozone NAAQS has met both criteria for being treated as a Rural Transport Area.

21.0 Technical Analysis for Ventura County, CA

This technical analysis identifies the area with monitors that violate the 2015 ozone NAAQS. It also provides the EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitors in the area, based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes.

Table 21.1 identifies the area of analysis for the Ventura County, CA nonattainment area. The area of analysis is all of Ventura County. The area of analysis comprises all of the Oxnard-Thousand Oaks-Ventura CBSA, which comprises the westernmost portion of the Los Angeles-Long Beach CSA. The nonattainment area is identical to the existing 1997 and 2008 ozone NAAQS Ventura County nonattainment areas.

Table 21.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Ventura County, CA	Ventura County	Oxnard-Thousand Oaks-Ventura CBSA	Los Angeles-Long Beach (partial)*

*The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

The EPA's boundary for the Ventura County, CA nonattainment area includes only the continental portion of the Oxnard-Thousand Oaks-Ventura, CA CBSA, excluding Anacapa and San Nicolas, which are the two Channel Islands that are part of the county. The San Joaquin Valley nonattainment area to the north, the Los Angeles-South Coast Air Basin nonattainment area to the east, and the attainment/unclassifiable Santa Barbara County to the west are adjacent to the Ventura County nonattainment area. Information specific to the San Joaquin Valley and the Los Angeles-South Coast Air Basin is contained in the associated Technical Analysis sections for those nonattainment areas.

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.

Figure 21.1 is a map of the EPA's nonattainment boundary for Ventura County. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment area boundaries.

For purposes of the 1997 ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 1997 ozone NAAQS included the continental portion of Ventura County, that is, excluding the offshore Channel Islands portion of the county. For purposes of the 2008 ozone NAAQS, the same area was designated nonattainment.

The EPA is not modifying the State's recommended nonattainment boundary for Ventura County for the 2015 ozone NAAQS. The nonattainment boundary is the same as the boundaries for both the 1997 ozone NAAQS and the 2008 ozone NAAQS.

Figure 21.1 The EPA's Nonattainment Boundaries for Ventura County, CA.

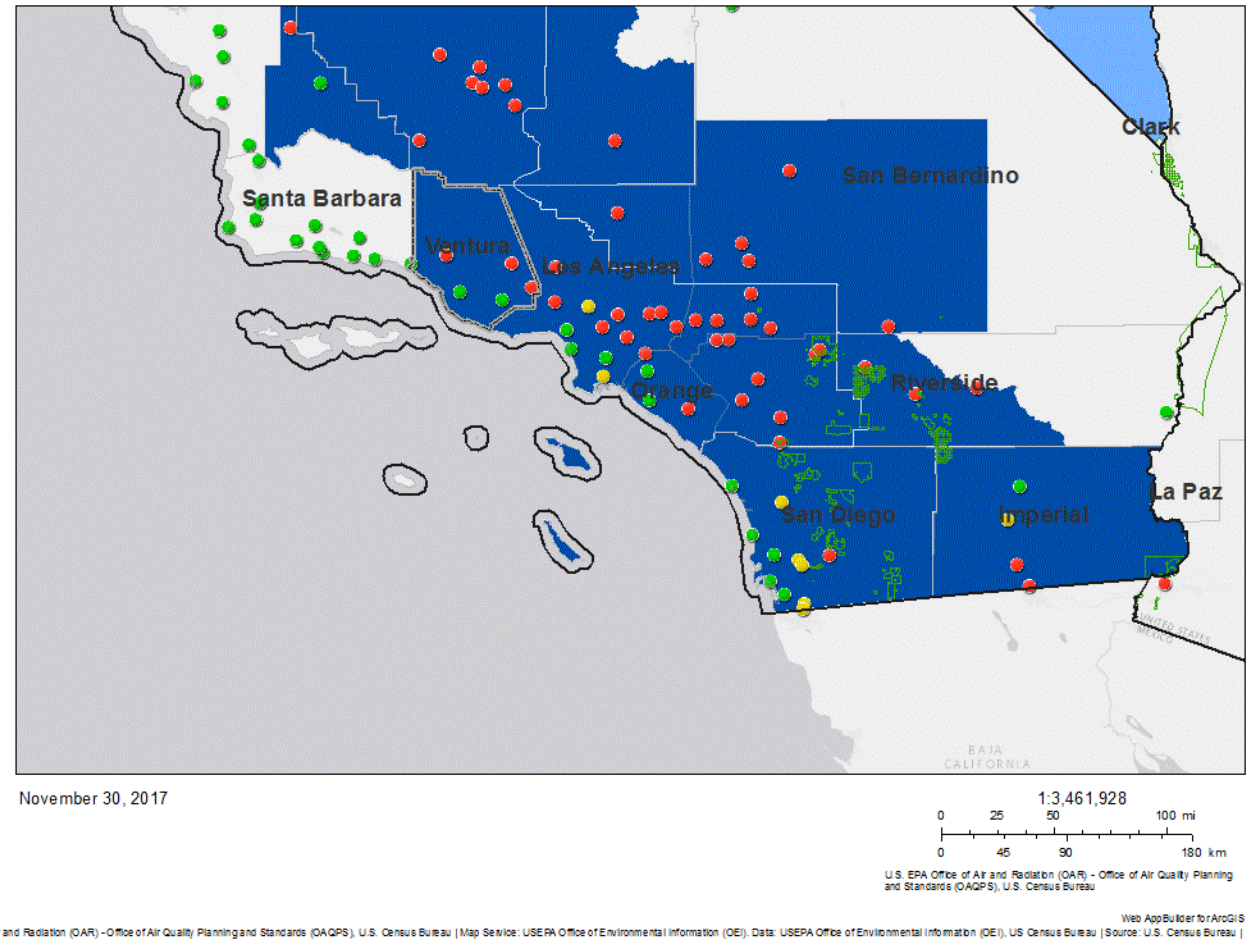


Figure 21.1 shows the EPA's nonattainment boundary for Ventura County, CA as a gray line with a dashed black center. Nonattainment areas for the 2008 and 1997 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Ventura County has monitors in violation of the 2015 ozone NAAQS, therefore this county in whole or in part is included in the nonattainment area. The following sections describe the five-factor analysis. While the factors are presented individually, they are not independent. The five-factor analysis process carefully considers the interconnections among

the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Ventura County area based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[2] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[3] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[4] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values. Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[5] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016, Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for counties in the area of analysis are shown in Table 21.2

[2] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx
[3] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.
[4] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.
[5] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Table 21.2 Air Quality Data (all values in ppm).

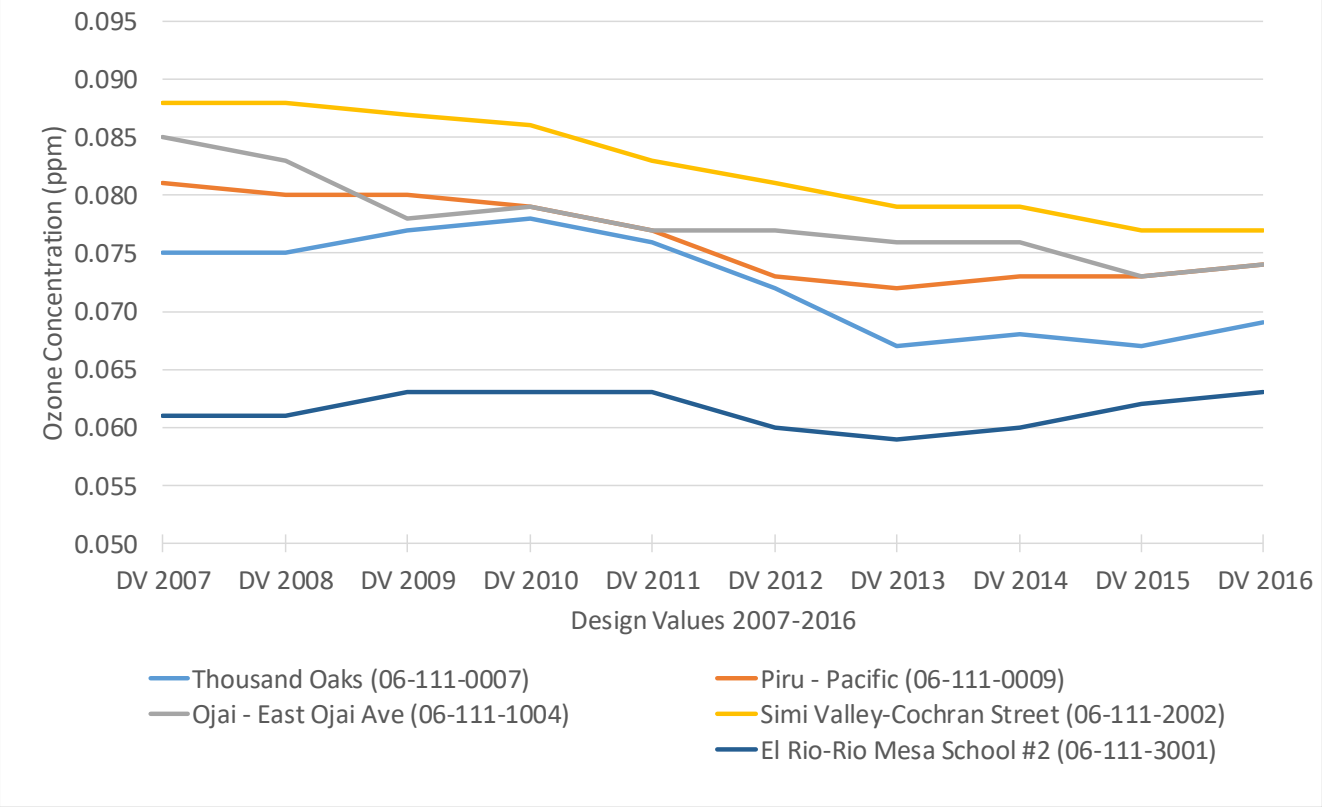
County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Ventura, CA	Yes (partial)	06-111-0007	0.069	0.074	0.066	0.067
		06-111-0009	0.074	0.079	0.072	0.073
		06-111-1004	0.074	0.077	0.072	0.073
		06-111-2002	**0.077**	0.081	0.074	0.077
		06-111-3001	0.063	0.067	0.060	0.063

The highest design value in each county is indicated in bold type.

Ventura County shows a violation of the 2015 ozone NAAQS, therefore this county is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 21.1, shown previously, identifies the Ventura County nonattainment area and the violating monitors. Table 21.2 identifies the design values for the violating monitors in the area of analysis. Figure 21.2 shows the historical trend of design values for the all monitors in the area of analysis. As indicated on the map, there are three violating monitors located in Ventura County. The monitor with the highest design value, Simi Valley-Cochran Street monitor (AQS ID 06-111-2002), is located in the city of Simi Valley in the south-eastern portion of Ventura County. The Piru-Pacific monitor (AQS ID 06-111-0009) is located in the city of Piru in the eastern portion of Ventura County. The Ojai – East Ojai Ave monitor (AQS ID 06-111-1004) is located in the city of Ojai in the western portion of Ventura County. The other monitors in Ventura County are attaining the 2015 ozone NAAQS. The Thousand Oaks monitor (06-111-0007) is located in the city of Thousand Oaks in the southern portion of Ventura County. The El-Rio-Rio Mesa School monitor (06-111-3001) is located in Oxnard, in the south-western portion of Ventura County. As shown in Figure 21.2, the Simi Valley-Cochran Street monitor continues to violate the 2015 ozone NAAQS but has been historically trending downward with the design value leveling off at 0.077 ppm in 2015 and 2016. The Piru-Pacific and Ojai – East Ojai Ave monitors continue to violate the 2015 ozone NAAQS, with both showing historical downward trends, except for the last two years with their respective design values increasing from 0.073 ppm in 2015 to 0.074 in 2016.

Figure 21.2 Three-Year Design Values for Monitors in the Area of Analysis (2007 – 2016).



Ventura County has three monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. These violating monitors are located within the portion of Ventura County that was included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS. Therefore, all or portions of Ventura County must be included within the EPA's nonattainment boundary for Ventura County.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For each county in the area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and small point sources and the magnitude of county-level emissions reported in the NEI. These county-level emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 21.3 provides a county-level emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Ventura County nonattainment area.

Table 21.3 Total County-Level NO_x and VOC Emissions.

County, State	State Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Ventura, CA	Yes (partial)	7,579	13,849
	Area wide:	7,579	13,849

For state-recommended partial counties, the emissions shown are for the entire county.

In addition to reviewing county-wide emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources are shown with orange square icons in Figure 21.3 below. The nonattainment boundary is also shown.

Figure 21.3 Large Point Sources in the Area of Analysis.

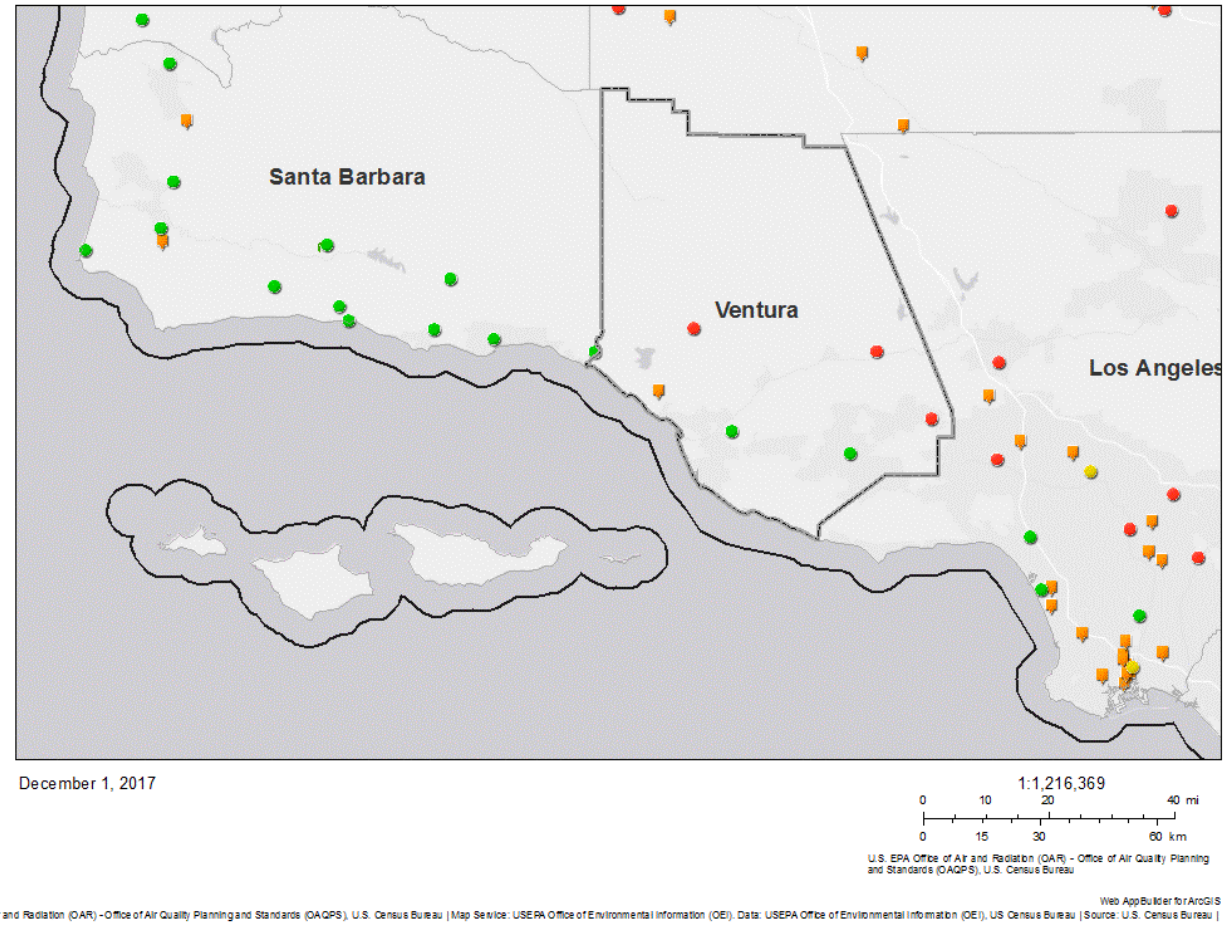


Figure 21.3 shows large point sources in the area of analysis for Ventura County, CA as orange squares. The EPA's nonattainment boundary for Ventura County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of relevant county-level emissions and the geographic locations of the relevant emission showed that Ventura County has emissions levels of 7,941 tpy of NO_x and 13,849 tpy of VOC, based on the 2014 NEI. There is one large point source, Aera Energy LLC – Ventura Production

Unit, in the city of Ventura, in the western portion of Ventura County. This large point source is southwest of the Ojai – East Ojai Ave monitor and northwest of the El Rio Mesa monitor.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 21.4 shows the population, population density, and population growth information for each county in the area of analysis.

Table 21.4 Population and Growth.

County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Ventura, CA	Yes (partial)	823,318	850,536	461	27,218	3%
	Area wide:	823,318	850,536	461	27,218	3%

* For state-recommended partial counties, the population shown is for the entire county.
Source: U.S. Census Bureau population estimates for 2010 and 2015. https://www.census.gov/data.html.

Figure 21.4 shows the 2012 census tract-level population information for Ventura County. Ventura County had a 2015 population of 850,536 people. Generally, the southern portion of the county has the highest population levels within the area of analysis. The northern portion of the County and the Channel Islands are less densely populated.

Figure 21.4 Census Tract-Level Population.

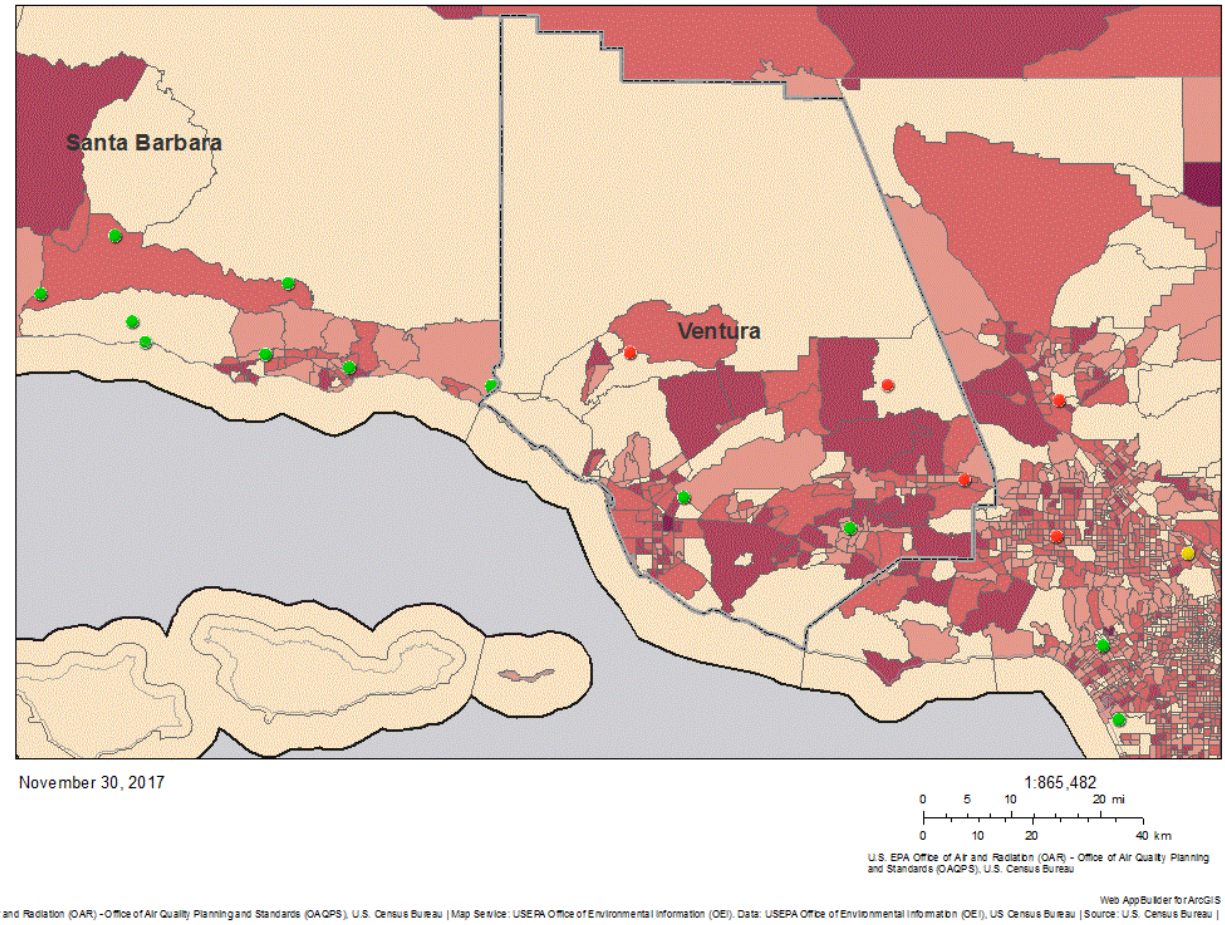


Figure 21.4 shows census tract population in the area of analysis for Ventura County, CA. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Ventura County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or a high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. Table 21.5 shows the traffic and commuting pattern data, including total VMT for Ventura county, number of residents who work in the county, number of residents that work in the county with a violating monitor, and the percent of residents working in the county with a violating monitor. The data in Table 21.5 are 2014 data.

Table 21.5. Traffic and Commuting Patterns.

County, State	State Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of County Residents Who Work	Number Commuting to or Within Counties with Violating Monitor(s) Within Area of Analysis	Percentage Commuting to or Within Counties with Violating Monitor(s) Within Area of Analysis
Ventura, CA	**Yes (partial)**	**6,733**	**369,650**	**188,596**	**51.0%**
	Total:	6,733	369,650	**188,596**	**51.0**%

For state-recommended partial counties, the data provided are for the entire county.
Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 21.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 21.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

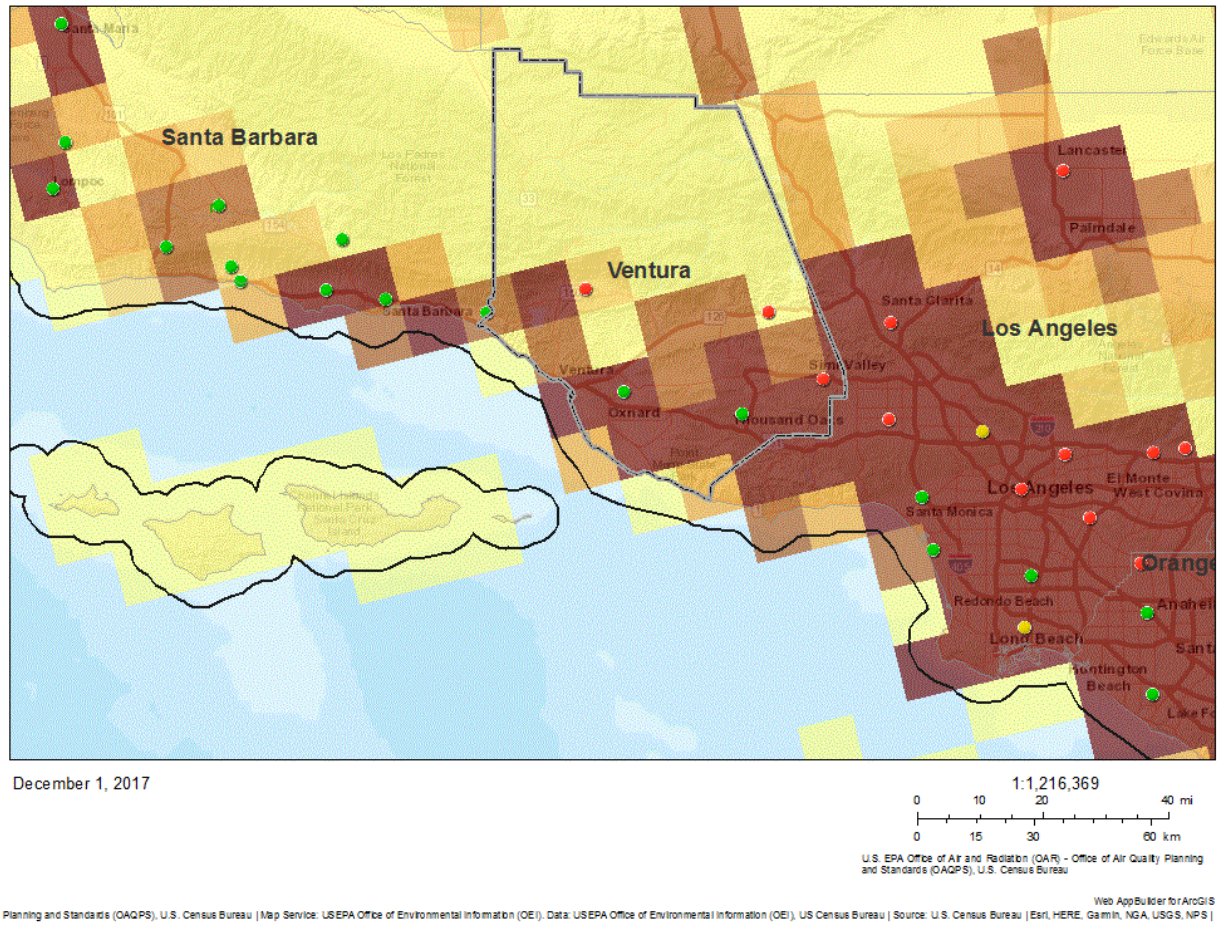


Figure 21.5 shows gridded VMT in the area of analysis for Ventura County, CA. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA's nonattainment boundary for Ventura County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau and shows that the twelve-kilometer grids with the highest VMT in the county fall over the cities of Ventura, Oxnard, and Thousand Oaks and are associated with major transportation arteries. Consistent with the population density, the areas of heavier VMT are located in the southern portion of the County.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 21.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating monitors.

Figure 21.6a HYSPLIT Back Trajectories for Ojai (AQS ID 06-111-1004).

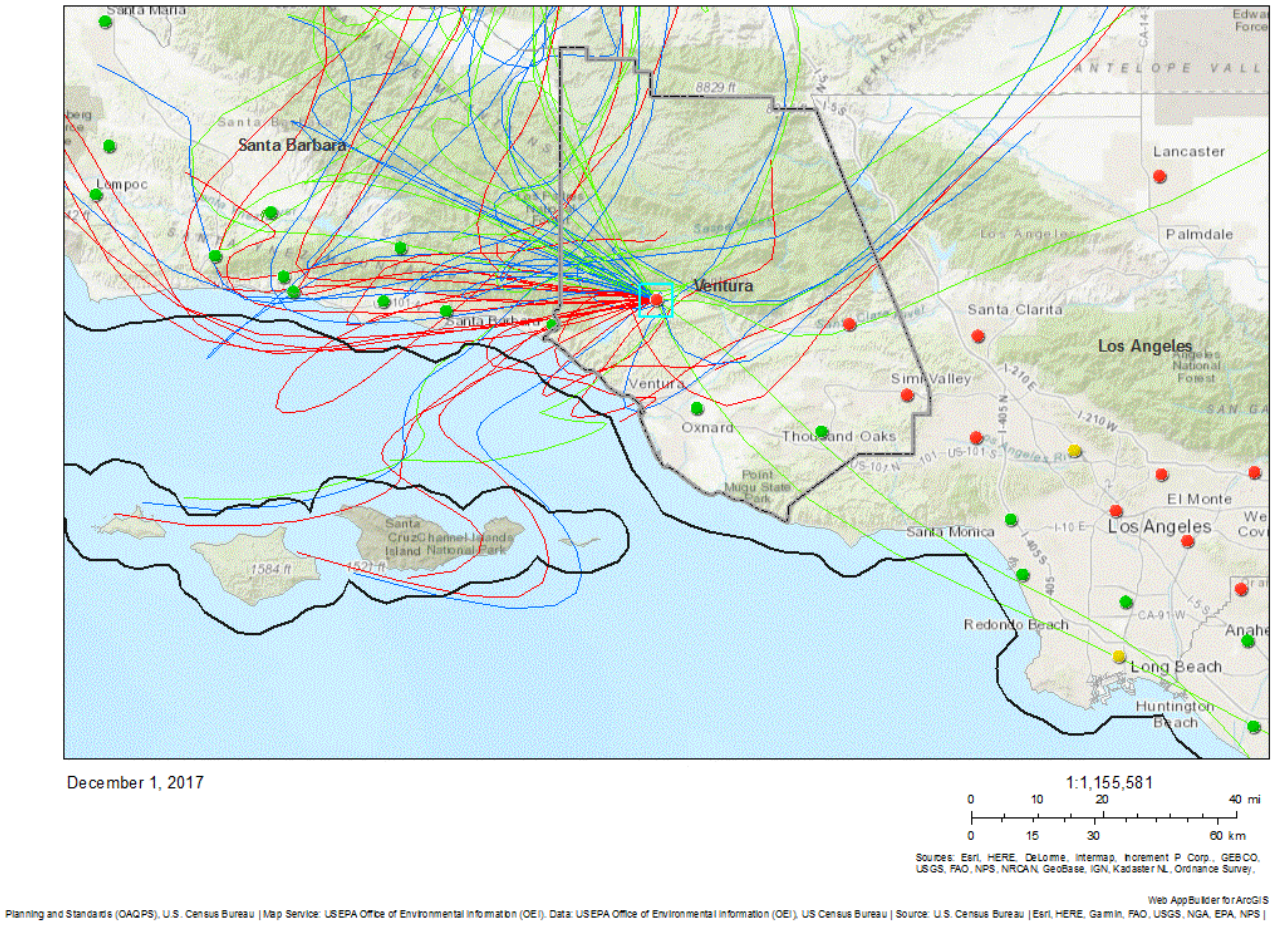


Figure 21.6a shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Ventura County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 21.6b HYSPLIT Back Trajectories for Piru (AQS ID 06-111-0009).

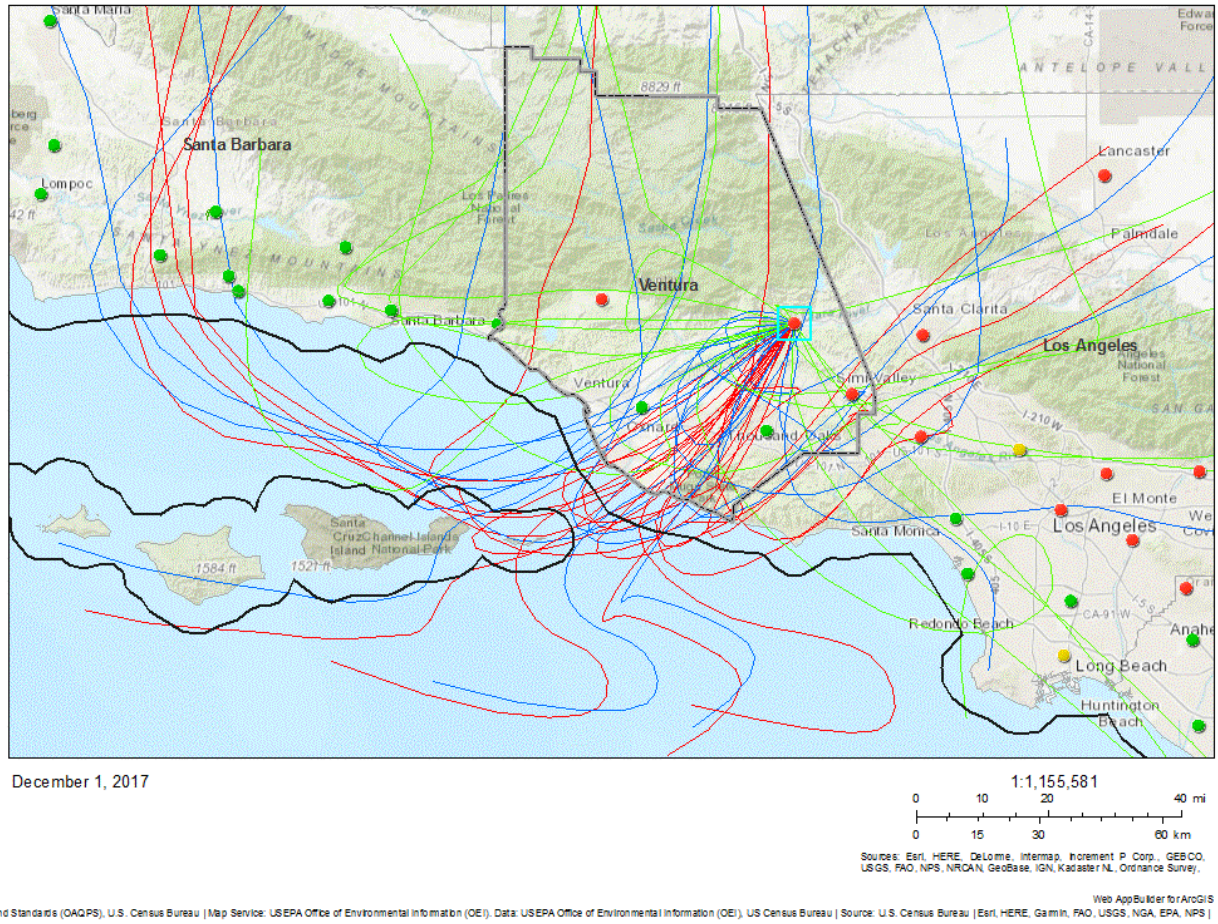


Figure 21.6b shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Ventura County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 21.6c HYSPLIT Back Trajectories for Simi Valley (AQS ID 06-111-2002).

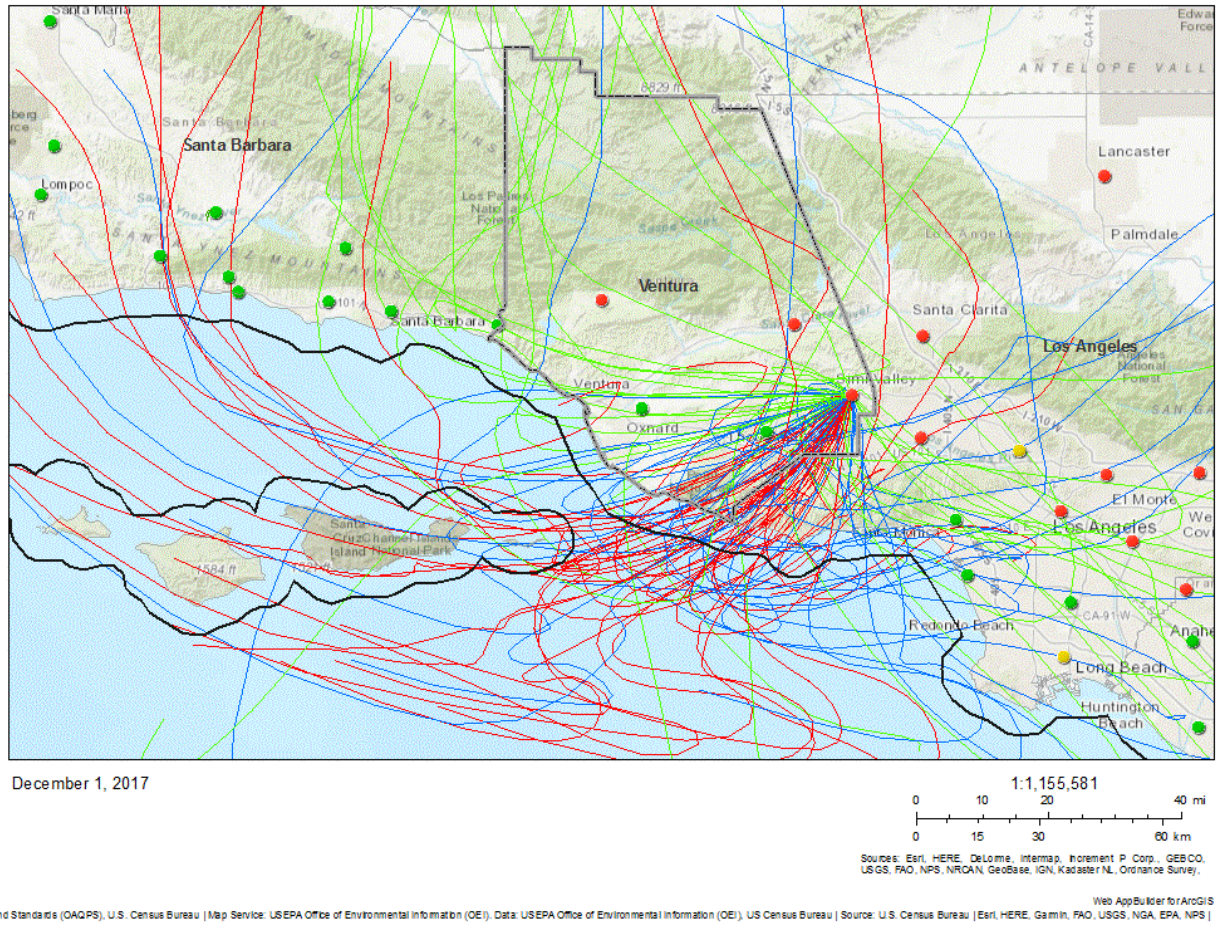


Figure 21.6c shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Ventura County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows that back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016 generally pass through most areas included in the area of analysis, which indicates that sources previously discussed in Factor 2 in Ventura County may be contributing to exceedances or violations of the 2015 ozone NAAQS. The HYSPLIT results also show that the winds during exceedance days are predominately from the southwest and west.

As previously discussed, the EPA is designating the adjacent San Joaquin Valley and Los Angeles-South Coast Air Basin as nonattainment for the 2015 ozone NAAQS. More information is available in the associated Technical Analysis sections for these areas.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might

define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

Figure 21.7 Map of Topographic Features.

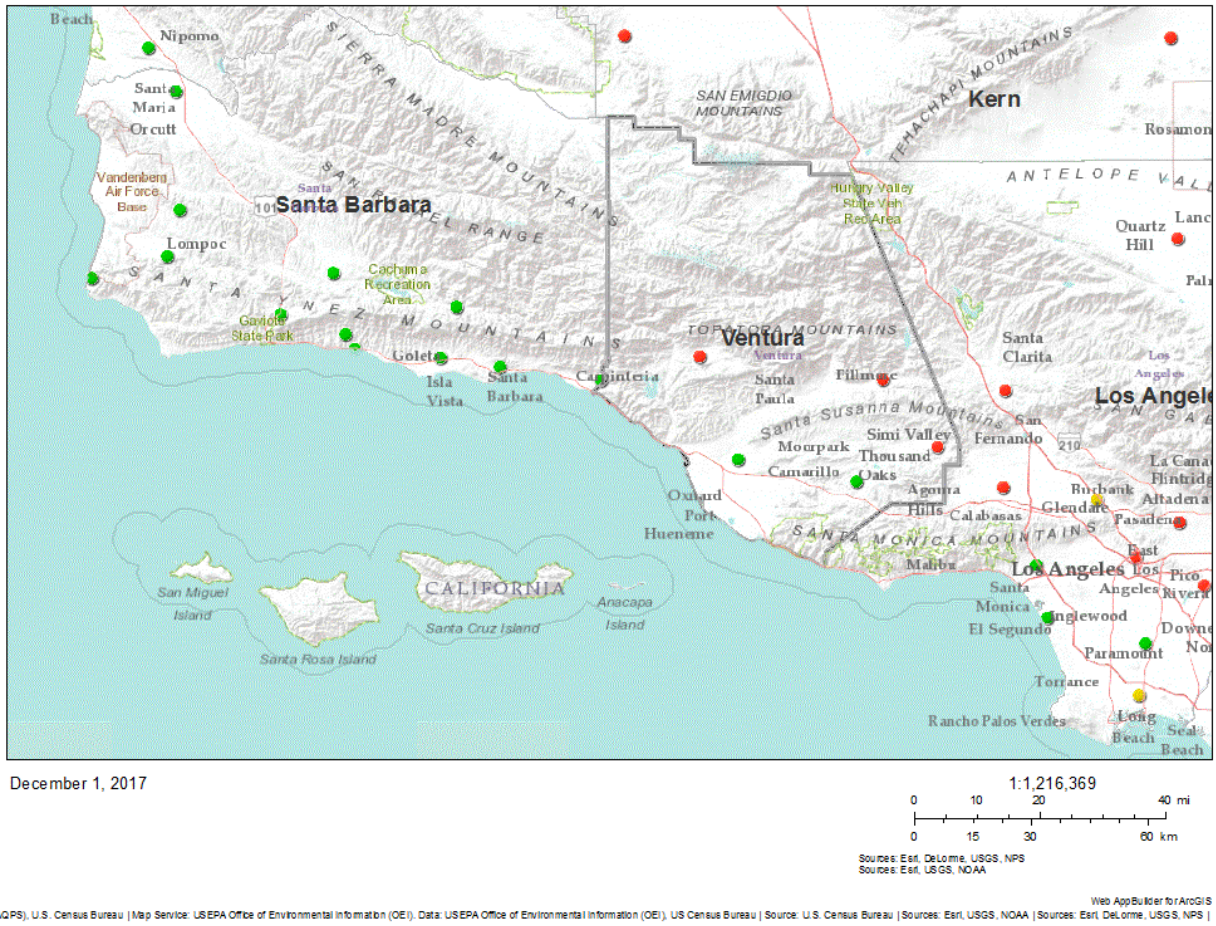


Figure 21.7 shows the topography in the area of analysis for Ventura County, CA. The EPA's nonattainment boundary for Ventura County, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

In the western U.S., topography impacts pollutant formation and transport in California, and thus plays an important role in assessing what areas are contributing to monitored violations of the NAAQS.

Figure 21.7 shows the topography for Ventura County. The Coastal Plain and Valley is bounded by the Pacific Ocean on the west and south, the Santa Monica-Santa Susanna Mountains on the east, and the Western Transverse Ranges on the north. The Santa Clara River Valley extends for approximately 45 miles (72 km) from the mouth of the Santa Clara River to east of Castaic Junction in Los Angeles County and ranges in elevation from sea level to approximately 1,010 feet (308 meters), measured from the riverbed to Castaic Junction (in Los Angeles County). The valley trends east to west, and is the largest valley in Ventura County, and generally bisects the county north and south geographically.

The Santa Monica-Santa Susanna Mountains trend east and west, with their western terminus at the eastern end of the Oxnard Plain. The mountains at the northwestern end of the Santa Monica Mountains are called the Conejo Mountains. The Santa Monica Mountains extend eastward towards Los Angeles, ending at the Los Angeles River in the Griffith Park area (in Los Angeles County) and are part of the Transverse Ranges and generally included within the Western Transverse Ranges sub-region of the California Floristic Province. These mountains are rugged and have high relief, ranging from sea level along their southern edge to 948 meters (3,111 feet) on Sandstone Peak, immediately south of Boney Mountain, both located within Ventura County. The Santa Susanna Mountains also trend east-west, originating in the west at the northeast corner of the Oxnard Plain and extend eastward to the Newhall Pass in Los Angeles County. The Santa Clara River Valley creates the northern boundary of these mountains.

The Western Transverse Ranges are the dominant landform of Ventura County, occupying the northern two-thirds of the land area of the county. The Western Transverse Ranges are a collection of east-west trending mountain ranges with intervening valleys. The Western Transverse Ranges are extremely rugged and have high relief, ranging from sea level west of Ventura along the Rincon coast to 2,682 meters (8,831 feet) on Mount Piños at the very northern edge of Ventura County. The Channel Islands are a chain of eight islands located in the Pacific Ocean off the coast of southern California along the Santa Barbara Channel. Two of the Channel Islands (Anacapa and San Nicholas) are in Ventura County. Topography in Ventura County is complex and can affect transport in myriad ways.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Ventura County nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, MPOs, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 21.8 shows the relevant jurisdictional boundaries for Ventura County, including county and CBSA boundaries, and areas of Indian country. The Ventura County Air Pollution Control District has jurisdiction over the entirety of Ventura County, including the continental portion as well as the Anacapa and San Nicolas islands portions. Likewise, the entire county's (mainland and island portions) transportation planning falls under the jurisdiction of the Southern California Association of Governments (SCAG), which is the MPO for the region. The mainland portion of Ventura County forms the southern end of California's South Central Coast Air Basin. The entirety of Ventura County forms the Oxnard-Thousand Oaks-Ventura CBSA. This CBSA is part of the larger Los Angeles-Long Beach CSA.

Figure 21.8 Jurisdictional Boundaries.

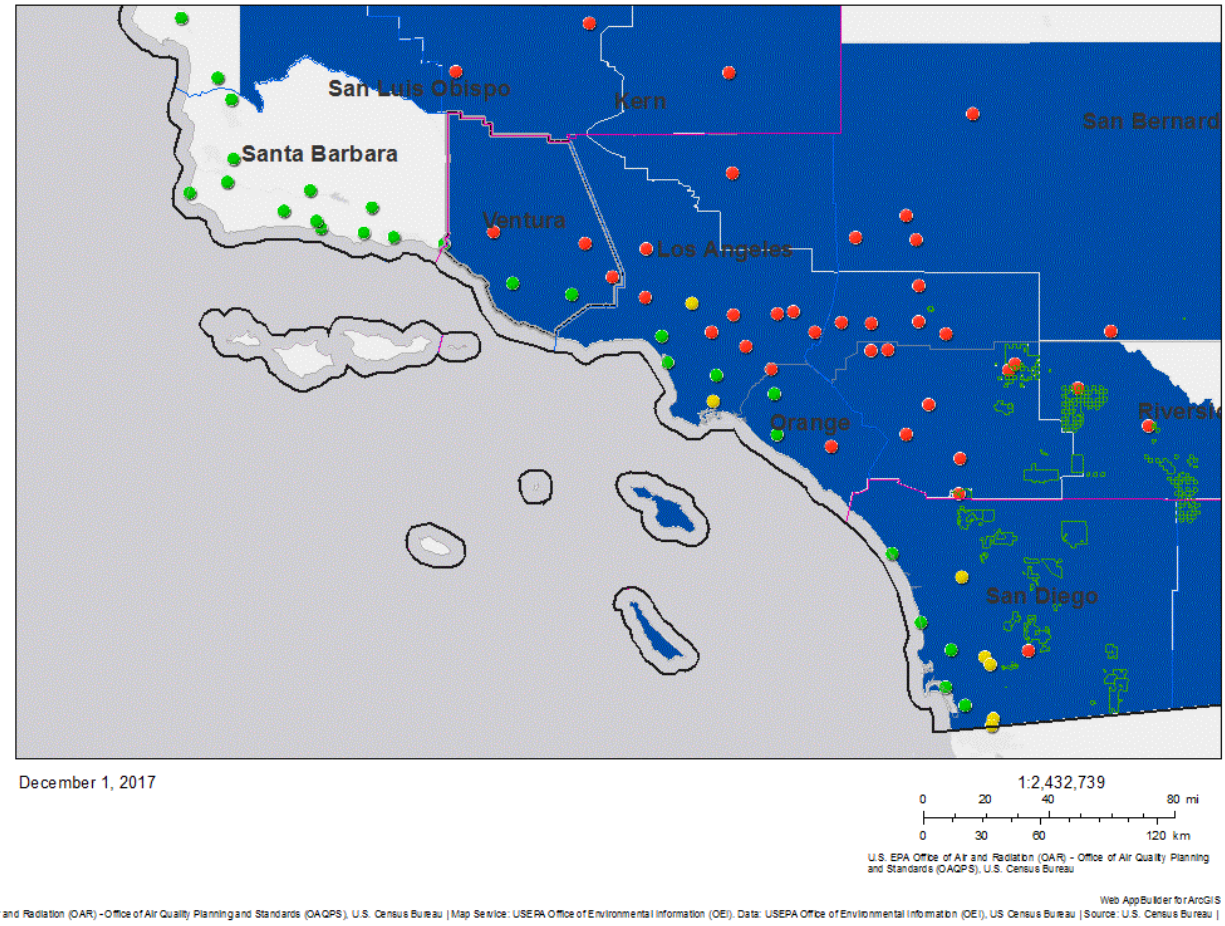


Figure 21.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for Ventura County, CA. The EPA's nonattainment boundary for Ventura County, CA is shown as a gray line with a dashed black center. The nonattainment boundaries for the 1997 and 2008 ozone NAAQS are shown in blue. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

San Joaquin Valley to the north, which shares Ventura County's northern boundary, has its own air district and is a separate air basin. The county at the southern end of the valley, which is closest to Ventura County, has a separate MPO, the Kern Council of Governments.

Santa Barbara County, which is west of Ventura, has a separate air district from Ventura County. The Los Angeles-South Coast Air Basin nonattainment area, which is east and south of Ventura, also has a separate air district from Ventura County.

The Ventura County area has previously established nonattainment boundaries associated with both the 1997 and 2008 ozone NAAQS. The State has recommended the same boundary for the 2015 ozone NAAQS.

Conclusion for Ventura County, CA

Based on the assessment of all five factors described above, the EPA is not modifying the State's recommendation to designate the continental portion of Ventura County as the Ventura County nonattainment area. This is the same partial county as the Ventura County nonattainment area for the 1997 and 2008 ozone NAAQS.

Three air quality monitors in Ventura County indicate violations of the 2015 ozone NAAQS based on 2016 design values, therefore these portions of Ventura County are included in the nonattainment area. Emissions and emission-related data indicate a large point source in the western portion of Ventura county. Population density and degree of urbanization data indicate that the southern portion of Ventura county has the highest population and population density levels within the area of analysis. Traffic and vehicle miles travelled data indicate that the twelve-kilometer grids with the highest VMT in the county fall over the cities of Ventura, Oxnard, and Thousand Oaks and are associated with major transportation arteries. Meteorology data indicate that winds during exceedance days are predominantly from the southwest and west. The Channel Islands are upwind of the violating monitors and have few emissions sources, comparatively low population and low VMT. Few trajectories pass over the Channel Islands before hitting the Ojai and Piru monitors. While more trajectories pass over the Channel Islands on exceedance days for the Simi Valley monitor, those trajectories also through the most densely populated areas of the county and the areas of the county with the highest VMT before reaching the monitor. The jurisdictional factor supports designating Ventura County as a separate nonattainment area from the several adjacent nonattainment areas as Ventura County operates under a separate air pollution control district than the adjacent areas and these same boundaries have been used for both the 1997 and 2008 ozone NAAQS. Geography also supports designating Ventura County as a separate area nonattainment area.

Based on our consideration of all five factors, the EPA is not modifying the State's recommendation and is designating Ventura County, CA, with the exception of the Channel Islands, as nonattainment for the 2015 ozone NAAQS. The EPA is not modifying the State's recommendation to designate the Channel Islands as attainment/unclassifiable.

22.0 Technical Analysis for the Morongo Band of Mission Indians, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. It also provides the EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area.

The Morongo Band of Mission Indians (Morongo Band) is a federally recognized tribe whose Indian country is located in the western part of Riverside County, CA. In addition, the Morongo Band has recently acquired and put into trust land (hereafter referred to as the "August 17, 2016 trust lands") contiguous to the boundary of the Morongo Reservation and is in the final stages of completing a land transfer authorized under section 3607 of the Water Infrastructure Improvements for the Nation Act, signed into law by the President on December 16, 2016 ("December 16, 2016 land transfer") that will transfer certain lands into trust and transfer certain lands out of trust.

On September 20, 2016, the Morongo Band recommended to the EPA that the Indian country of the Morongo Band of Mission Indians be designated as a separate nonattainment area from the surrounding state area for the 2015 ozone NAAQS. Please see September 20, 2016 letter from Robert Martin, Chairman, Morongo Band of Mission Indians to Deborah Jordan, Director, Air Division, EPA Region IX. On August 29, 2017, the Morongo Band supplemented its recommendation with a description of the land transfer referred to above as the December 16, 2016 land transfer and a revised boundary map reflecting the land transfer. Please see email from Dana Morey, Environmental Department Manager, Morongo Band of Mission Indians, to Alexis Strauss, Acting Regional Administrator, EPA Region IX. Subsequently, on January 9, 2018 and March 14, 2018, the Morongo Band provided the EPA with a status update on the December 16, 2016 land transfer indicating that the Morongo Band anticipated, by April 30, 2018, the close of escrow for the transfer of parcel "A" for "parcel "B" (as shown on the map titled "Morongo 2017 Ozone Designation Recommendation Map). That is, upon transfer, parcel "A" will be placed in trust for the Morongo Band, and parcel "B" will be taken out of trust. Please see emails from Dana Morey, Environmental Department Manager, Morongo Band of Mission Indians, to Ken Israels, Environmental Engineer, EPA Region IX.

In 2004, the EPA established the Los Angeles-South Coast Air Basin nonattainment boundaries for the 1997 ozone NAAQS consistent with those established for the 1-hour ozone NAAQS. The Los Angeles-South Coast Air Basin nonattainment area included the entirety of Orange County, the southwestern portion of Los Angeles County, the southwest portion of San Bernardino County, and the western portion of Riverside County. In 2004, the Morongo Band's Indian country was included as part of the Los Angeles-South Coast Air Basin nonattainment area for the 1997 ozone NAAQS.

In designating areas of the United States for the 2008 ozone NAAQS, the EPA designated the Morongo Band's reservation lands as a separate nonattainment area consistent with the Morongo Band's recommendation (see letters from Robert Martin, Chairman, Morongo Band of Mission Indians, to Deborah Jordan, Director, U.S. EPA Region IX Air Division, dated June 18, 2009, and from Jeff R. Keohane, Forman & Associates, on behalf of the Morongo Band of Mission Indians, to Jared Blumenfeld, Regional Administrator, U.S. EPA Region IX, dated February 27, 2012).

At the request of the Tribe, on September 23, 2013, the EPA revised the boundaries of the Morongo Band's area for the 1-hour and 1997 8-hour ozone NAAQS consistent with the boundaries identified for the Morongo Band's area under the 2008 ozone NAAQS (see 78 FR 58189, dated September 23, 2013). The EPA's analysis for the 2008 ozone NAAQS designations process and the analysis for our action dated September 23, 2013, regarding the 1997 ozone NAAQS, were each predicated on the

geographic extent of Morongo Band Indian country at the time and did not consider lands placed in trust since then.

For the EPA's 2015 ozone NAAQS, the area of analysis for the nonattainment boundary for the Morongo Band includes all of the Morongo Band's Indian country in the Banning Pass area in Riverside County that is either reservation lands or lands placed in trust for the Tribe (including those accepted into trust as of August 17, 2016) and those lands that are included in the December 16, 2016 land transfer and for which the transfer is anticipated to be completed by the effective date of the final rule designating the Morongo Band 2015 ozone nonattainment area. The EPA is designating surrounding state lands as part of the separate Los Angeles-South Coast Air Basin, CA and Riverside County (Coachella Valley), CA nonattainment areas. More information on this is contained in the associated Technical Analysis section for the Los Angeles-South Coast Air Basin and Riverside County (Coachella Valley) nonattainment areas.

Unless otherwise specified, in the following sections of this TSD, "the Morongo Band's jurisdictional area" refers to all of the Morongo Band's Indian country in the Banning Pass area that is either reservation lands or lands placed in trust for the tribe (including those accepted into trust as of August 17, 2016) and those anticipated to be accepted into trust upon the completion of the December 16, 2016 land transfer.

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes. The EPA's assessment of the Tribe's separate nonattainment area recommendation and other information was performed in accordance with the EPA's December 20, 2011 "Policy for Establishing Separate Air Quality Designations for Areas of Indian Country" (Tribal Policy)[2].

Table 22.1 identifies the area of analysis for the Morongo nonattainment area. The area of analysis includes all lands under the Morongo Band's tribal jurisdiction, which consists of lands in Riverside County. Nontribal lands in this county are analyzed in other sections of this document. The area of analysis comprises portions of the Riverside-San Bernardino-Ontario CBSA and Los Angeles-Long Beach CSA. The nonattainment area differs from the existing 1997 and 2008 Morongo nonattainment areas (see above trust lands and designations discussion).

Table 22.1 Area of Analysis.

Final Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Morongo Band of Mission Indians	All lands under Morongo Band's tribal jurisdiction in Riverside County	Riverside-San Bernardino-Ontario CBSA (partial)*	Los Angeles-Long Beach CSA (partial)*

*The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.
[2] https://www.epa.gov/sites/production/files/2016-02/documents/indian-country-separate-area.pdf

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);
2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 22.1a is a map of the EPA's final nonattainment boundary for the Morongo Band. The map shows the location of the ambient air quality monitor, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries. The EPA is not modifying the 2015 ozone NAAQS designation recommendation that we received from the Morongo Band. Figure 22.1b shows the final nonattainment area in greater detail.

Figure 22.1a The EPA's Final Nonattainment Boundaries for the Morongo Band of Mission Indians, CA.

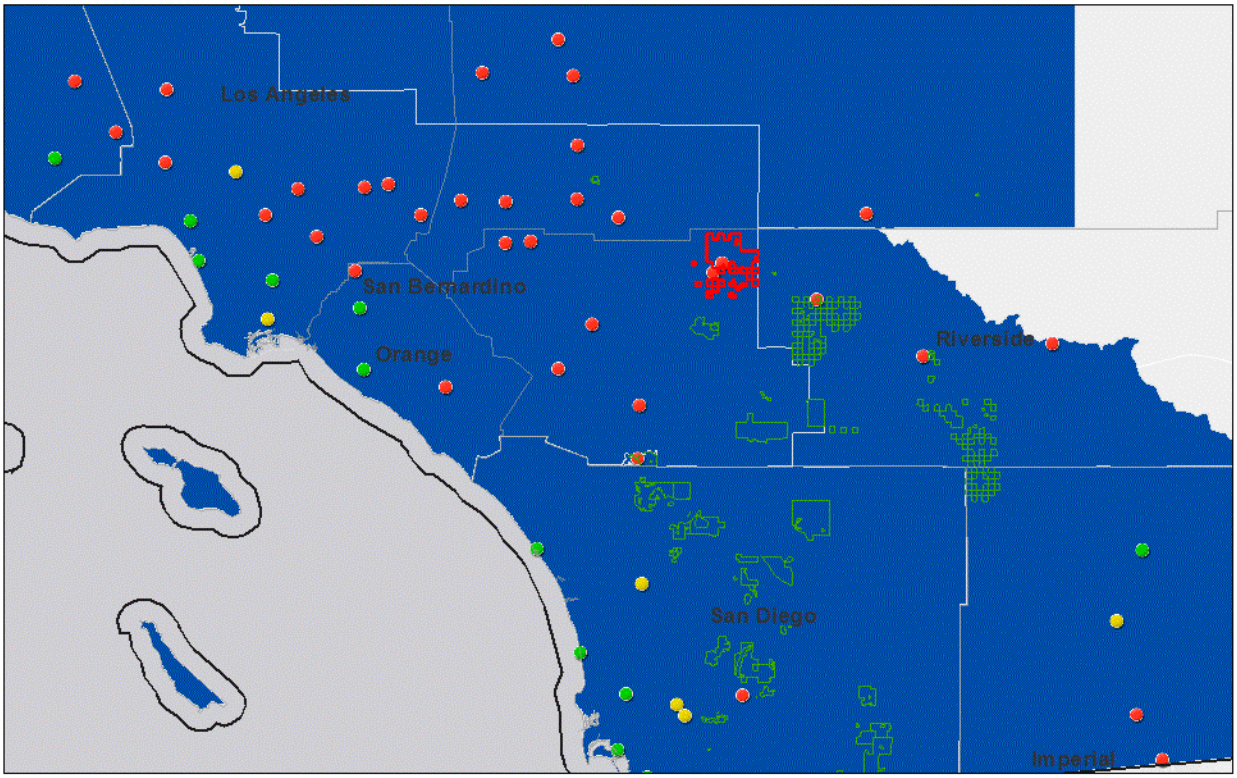


Figure 22.1a shows the EPA's nonattainment boundary for Morongo Band as a red line. Nonattainment areas for the 1997 and 2008 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 22.1b The EPA's Final Nonattainment Boundaries for the Morongo Band of Mission Indians, CA (zoomed in).

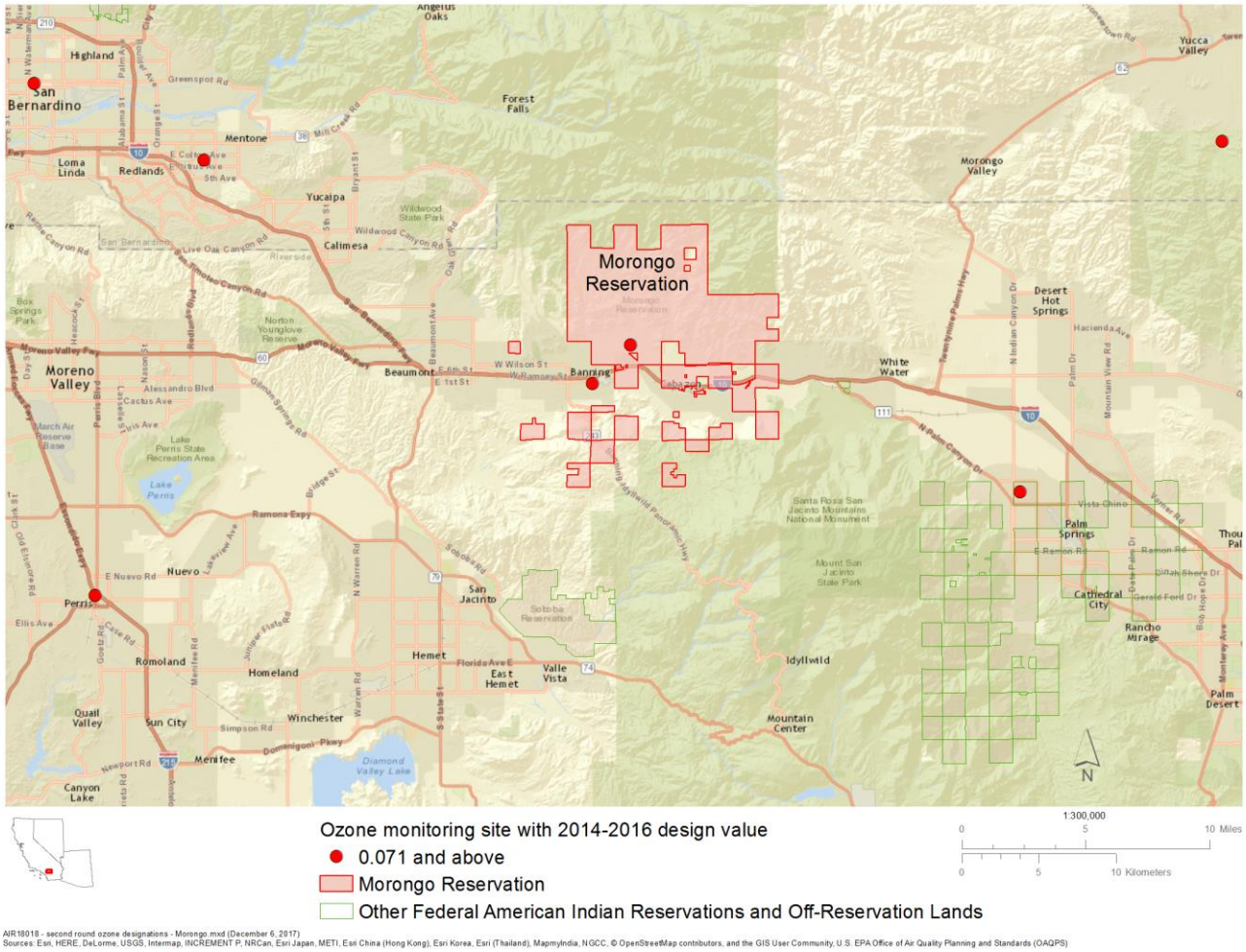


Figure 22.1b shows the EPA's nonattainment boundary for Morongo Band in greater detail, denoted with red outline and pink fill.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. The Morongo Band has a monitor in violation of the 2015 ozone NAAQS, therefore the Morongo Band's lands are included in the Morongo nonattainment area.

The following sections describe the five factor analysis. While the factors are presented individually, they are not independent. The five factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Morongo Band area of analysis based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the

most recent three-year period with fully-certified air quality data.[3] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[4] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[5] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values. Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[6] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for monitors in the area of analysis are shown in Table 22.2.

Table 22.2 Air Quality Data (all values in ppm).

Tribal Area, State	Tribe Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Morongo Band, CA	Yes	06-065-1016	**0.097**	0.098	0.097	0.097

The Morongo Band's jurisdictional area shows a violation of the 2015 ozone NAAQS, therefore the Morongo Band's jurisdictional area is included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

[3] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx

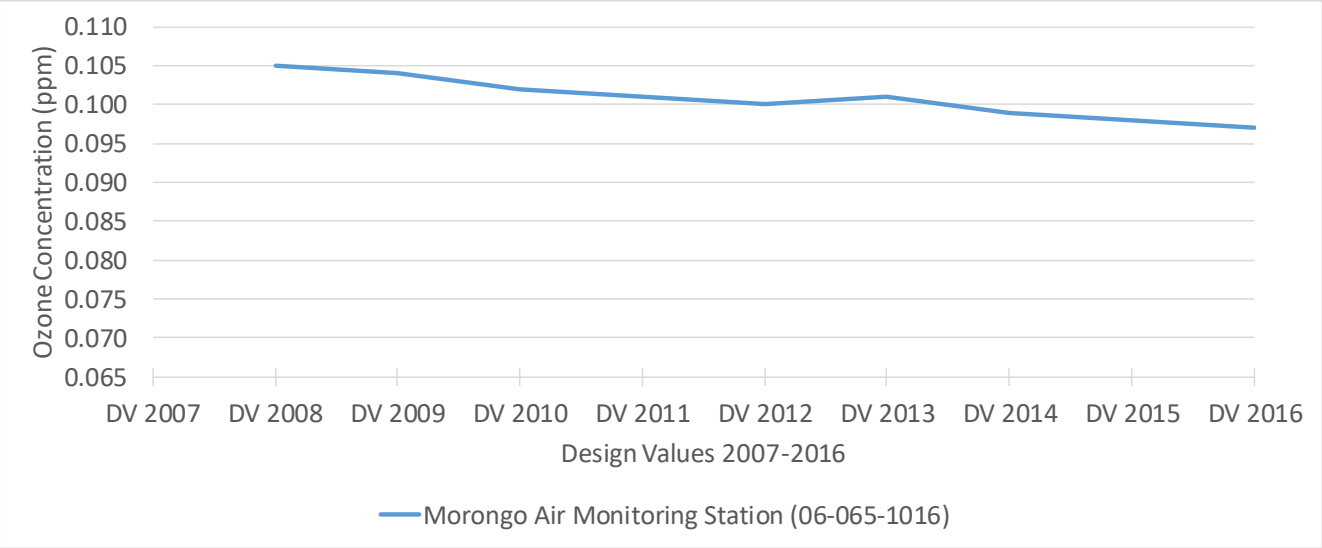
[4] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.

[5] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.

[6] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

Figure 22.1a, shown previously, identifies the Morongo Band nonattainment area and the violating monitor. Table 22.2 identifies the design values for all monitors in the area of analysis. Figure 22.2 shows the historical trend of design values for the single monitor that is located in the Morongo Band's jurisdictional area. As shown in Figure 22.2, this monitor continues to violate the 2015 ozone NAAQS, but generally shows a gradual downward trend.

Figure 22.2 Three-Year Design Values for Monitors in the Area of Analysis (2007 - 2016).



The Morongo Band's jurisdictional area has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. This violating monitor is located within the Morongo Band's designated nonattainment area for the 1997 and 2008 ozone NAAQS. Therefore, Factor 1 supports including the location of the violating monitor in the Morongo Band's jurisdictional area within the EPA's nonattainment boundary for the Morongo Band nonattainment area.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

The EPA reviewed data from the 2014 National Emissions Inventory (NEI). For the Morongo Band area of analysis, the EPA examined the magnitude of large sources (NO_x or VOC emissions greater than 100 tons per year) and small point sources for the Morongo Band's jurisdictional area emissions as reported in the NEI. These emissions represent the sum of emissions from the following general source categories: point sources, non-point (i.e., area) sources, non-road mobile, on-road mobile, and fires. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations. Table 22.3 provides an emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions[7] for the area of analysis considered for inclusion in the Morongo Band nonattainment area.

[7] NOx and VOC data used in this TSD were pulled from the EPA's 2014 NEI (2014TR582) not including biogenics. Emissions operating type: shutdown, routine, startup, and upset. Pollutants: NOx and VOC.

Table 22.3. Total Morongo Band NO_x and VOC Emissions.

Tribal Area, State	Tribe Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Morongo Band, CA	Yes	143	24
	Area wide:	143	24

In addition to reviewing emissions of NO_x and VOC in the area of analysis using data from the 2014 NEI (not including biogenics), the EPA also reviewed emissions from large and small point sources within the area of analysis. There are no large point sources within the reservation boundary and one small point source. The location of this source, together with the other factors, can help inform nonattainment boundaries. The locations of the small point source are shown in Figure 22.3 below as a yellow square and is next to the monitor. The nonattainment boundary is also shown.

Figure 22.3 Large and Small Point Sources in the Area of Analysis.

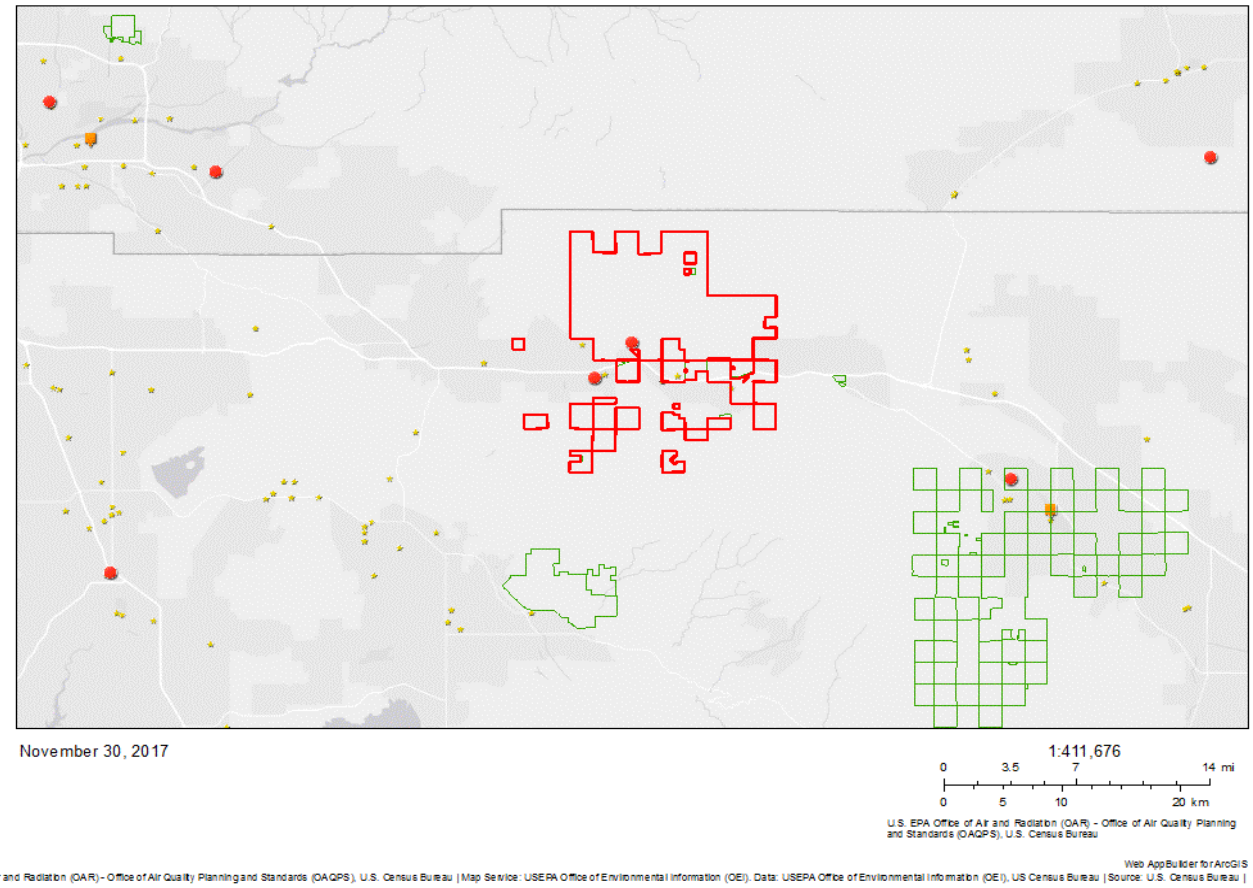


Figure 22.3 shows large point sources in the area of analysis for Morongo Band as orange squares (none appear within the nonattainment area). Small point sources are shown as yellow stars. The EPA's nonattainment boundary for Morongo Band is shown as a red line. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

In summary, the EPA's analysis of relevant emissions and the geographic locations of the relevant emissions shows that the NOx and VOC emissions are less than 150 tpy each and there are no large point sources and few small point sources of ozone precursor emissions within the area of analysis.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 22.4 shows the population and population density for the Morongo Band area of analysis. The data used in Table 22.4 is the same as that used as the basis for the area designation for the 2008 ozone standard, but the population has remained essentially unchanged since then.

Table 22.4. Population and Growth.

Tribal Area, State	Tribe Recommended Nonattainment?	2012 Population	2012 Population Density (per sq. mi.)
Morongo Band, CA	Yes	1,500	27
	Area wide:	1,500	27

Figure 22.4 shows that the census tract covering the Morongo Band's monitor and nearby Morongo jurisdictional lands has a relatively low population as compared to state land census tracts further west and east. We note that Table 22.4 reflects population data for the tribe only, while the census tracts shown in Figure 22.4 reflect population from both state and tribal lands. Based on Table 22.4, there are, on average, approximately 27 tribal members residing per square mile within the Morongo Band's jurisdictional area.

Figure 22.4 Census Tract-Level Population.

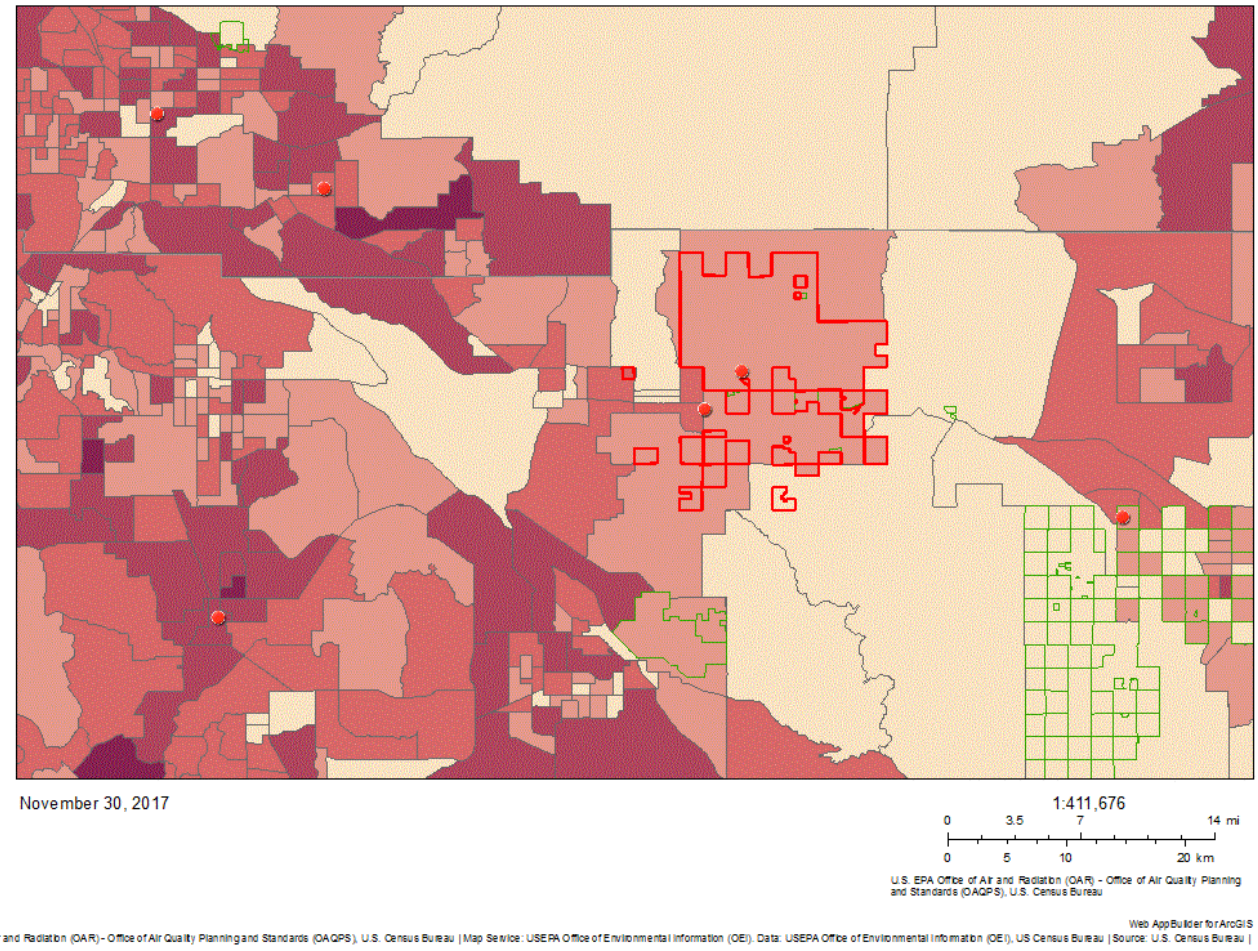


Figure 22.4 shows census tract population in the area of analysis for Morongo Band. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Morongo Band is shown as a red line. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. The data in Table 22.5 are 2014 data.

Table 22.5. Traffic and Commuting Patterns.

Tribal Area, State	Tribe Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of Tribal Residents Who Work	Number Commuting To or Within Tribal Area with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Tribal or County Area with Violating Monitor(s) Within Area of Analysis
Morongo Band, CA	**Yes**	**N/A**	**179**	**174**	**97.2%**
	Total:	N/A	179	174	97.2%

Areas with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 22.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 22.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

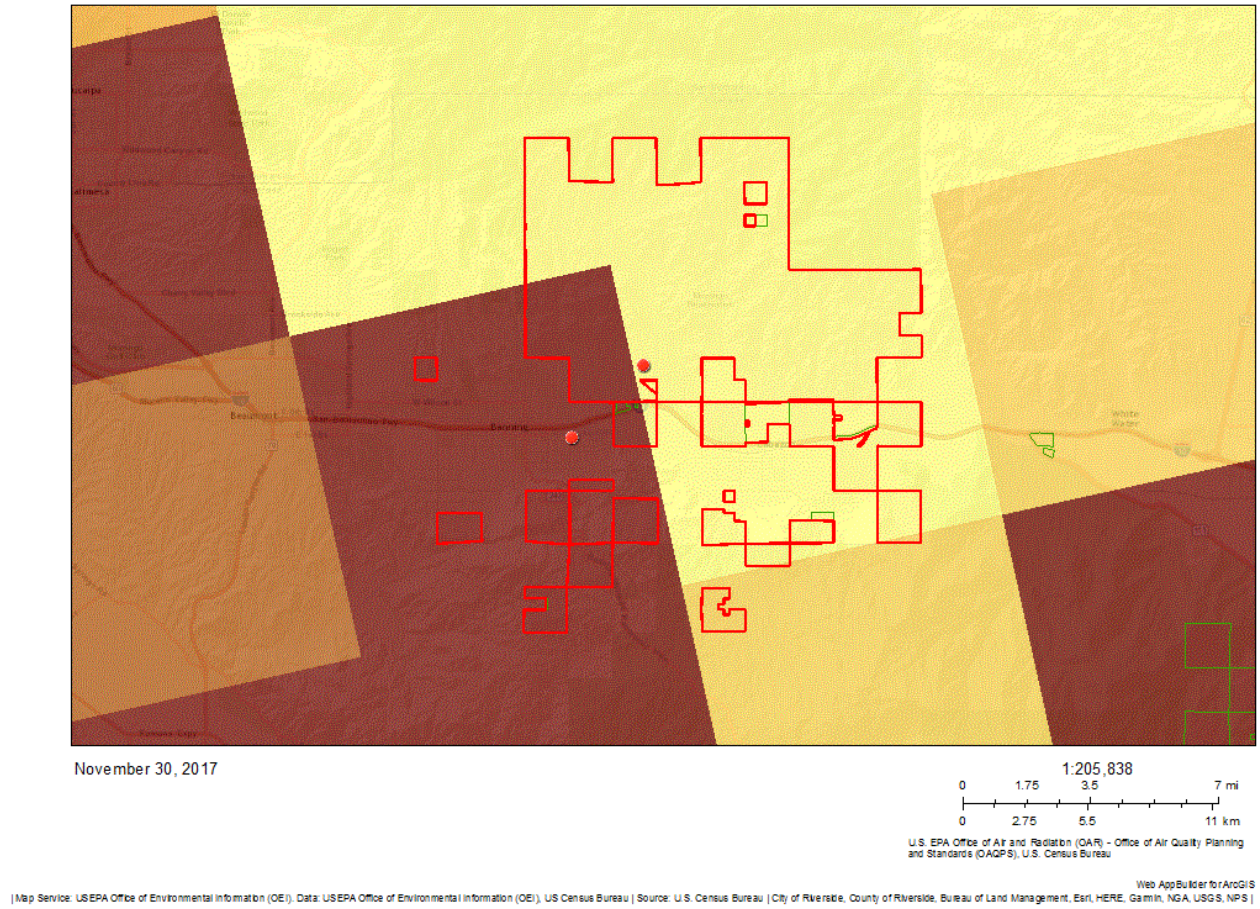


Figure 22.5 shows gridded VMT in the area of analysis for Morongo Band. Lighter shades of yellow indicate areas with lower VMT; darker shades of brown indicate areas with higher VMT. The EPA's nonattainment boundary for Morongo Band, CA is shown as a red line. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau,[8] and shows that VMT is low within the area of analysis, as compared to the surrounding areas to the west, south, and east. Interstate Highway I-10 runs just south of the main body of the Morongo Band's jurisdictional area. Consistent with the EPA's prior designations of the Morongo Band's nonattainment area, emissions from I-10 are included in the technical analysis discussion associated with the Los Angeles-South Coast Air Basin nonattainment area.

Factor 3: Meteorology

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 22.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8-hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

[8] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/ .

Figure 6. HYSPLIT Back Trajectories for Morongo Monitor (AQS ID 06-065-1016).

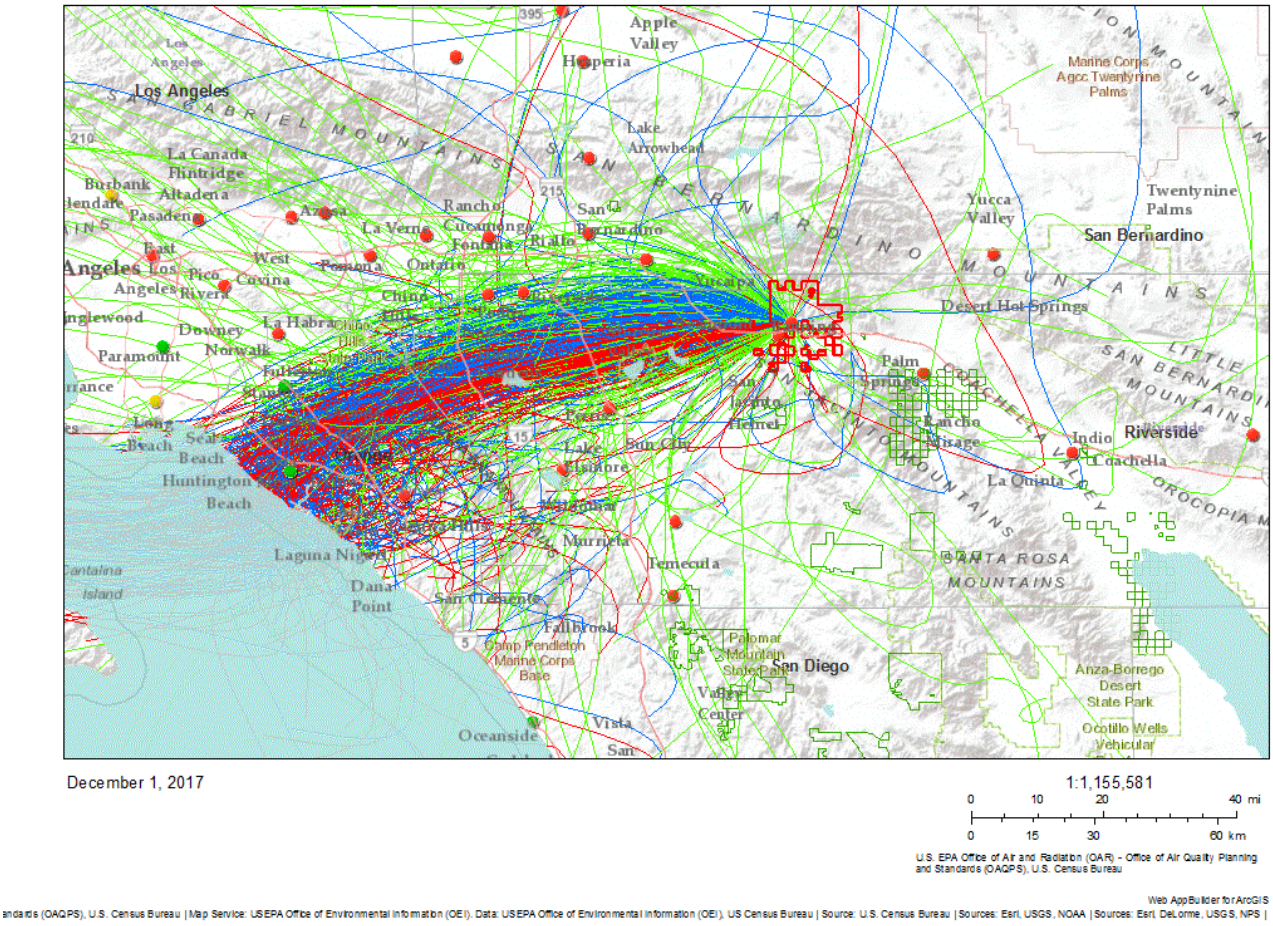


Figure 22.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Morongo Band is shown as a red line. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016. The HYSPLIT results show that the winds during exceedance days are predominately from the west.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

In the western U.S., topography impacts pollutant formation and transport, and thus plays an important role in assessing what areas are contributing to monitored violations of the NAAQS.

The Morongo Band's jurisdictional area is located in an area known as Banning Pass, which is an elevated mountain pass connecting the South Coast Air Basin to the Coachella Valley portion of the Salton Sea Air Basin. The Banning Pass (also known as the San Gorgonio Pass) is one of the three major routes by which air pollutants are transported out of the Los Angeles metropolitan area (which lies within the South Coast Air Basin). Banning Pass runs in an east-west direction for about 15 miles and is about 5 miles wide. The pass starts west of Beaumont at an elevation of about 2,200 feet and reaches a maximum elevation of around 2,600 feet in the city of Beaumont, then drops to an elevation of near 1,400 feet between Cabazon and White Water. The San Bernardino Mountains are on the north side of the pass and the San Jacinto Mountains are on the south side. The San Bernardino Mountains reach a maximum elevation of approximately 11,500 feet at the top of San Gorgonio Mountain and the San Jacinto Mountains reach a maximum elevation of approximately 10,800 feet at Mt. San Jacinto.

Figure 22.7 Topographic Illustration of the Physical Features

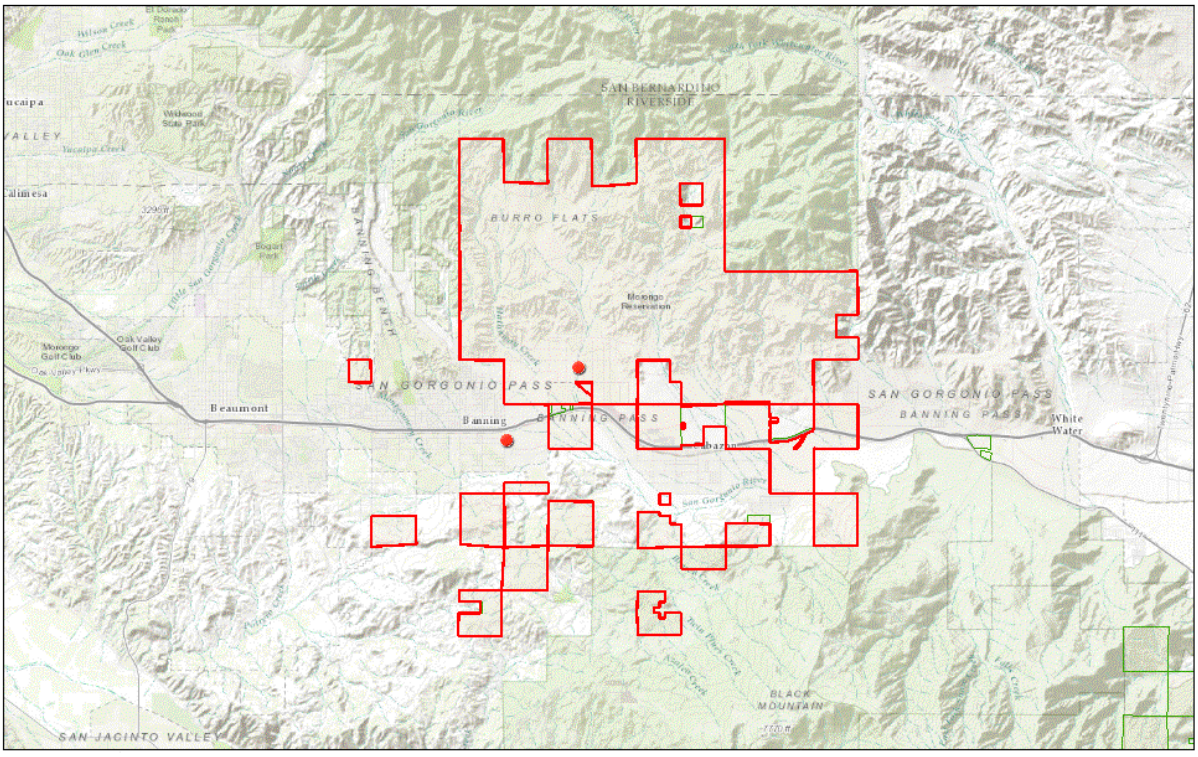


Figure 22.7 shows the topography in the area of analysis for Morongo Band. The EPA's nonattainment boundary for Morongo Band, CA is shown as a red line. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations was determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Morongo Band nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations (MPOs), and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 22.8 shows the relevant jurisdictional boundaries for the Morongo Band. The Morongo Band has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The Morongo Band's lands are located in the western portion of the Riverside-San Bernardino-Ontario MSA.

The Morongo Band's jurisdictional area for the 2015 ozone designations process includes all of the Morongo Band's Indian country in the Banning Pass area that is either reservation lands or lands placed in trust for the tribe (including those accepted into trust as of August 17, 2016) and those lands that are included in the December 16, 2016 land transfer and for which the transfer is anticipated to be completed by the effective date of the final rule designating the Morongo Band 2015 ozone nonattainment area. As noted above, the August 17, 2016 trust lands are contiguous to the boundary of the main body of the Morongo Reservation. The same is true for the land to be placed in trust upon completion of the December 16, 2016 land transfer. The main body of the Morongo Reservation and the August 17, 2016 trust lands are under the Morongo Band's jurisdiction, and the same is true for the land to be placed in trust upon completion of the December 16, 2016 land transfer.

Figure 22.8 Jurisdictional Boundaries

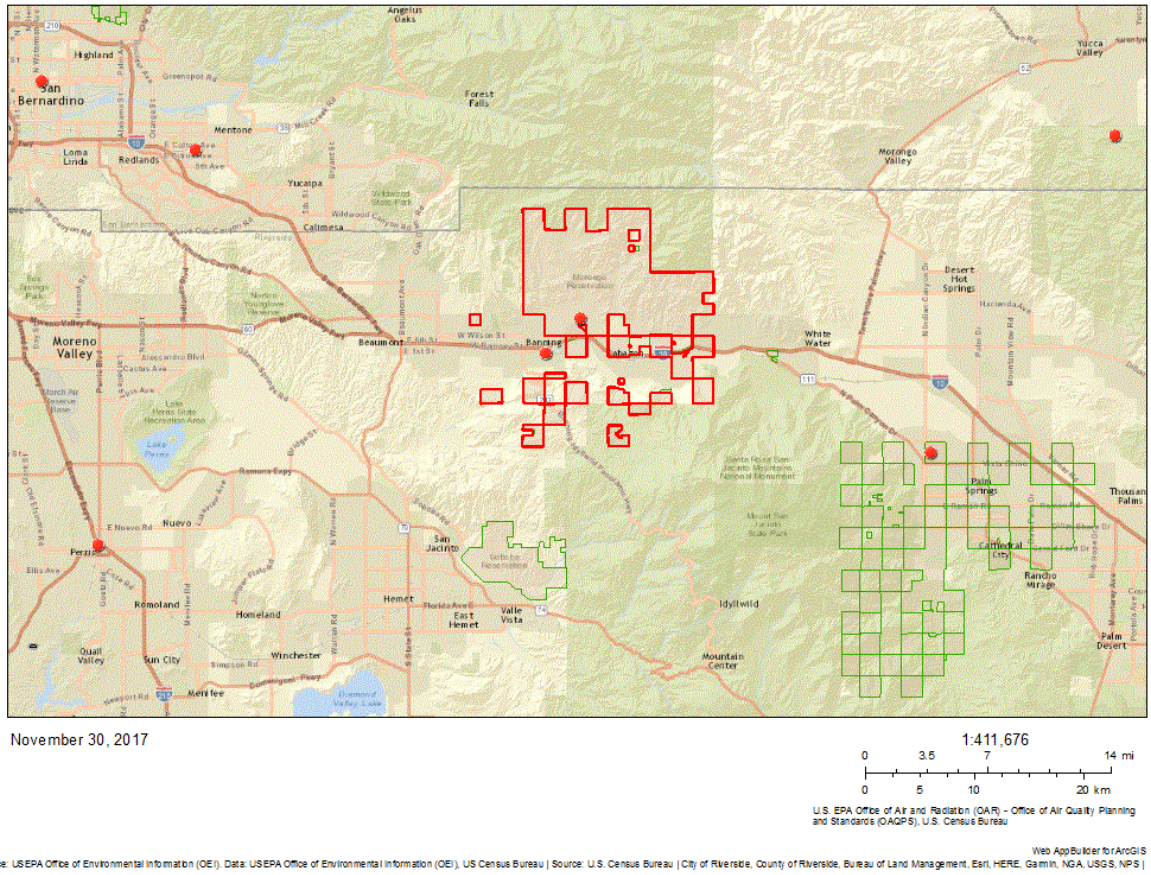


Figure 22.8 shows jurisdictional boundaries in the area of analysis for Morongo Band. The EPA's nonattainment boundary for Morongo Band, CA is shown as a red line. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

The Morongo Band has previously established nonattainment boundaries associated with the 1997 and 2008 ozone NAAQS. The Morongo Band has recommended a different boundary for the 2015 ozone NAAQS due to additional lands being placed in trust since those designations were established. For the 2015 ozone NAAQS, the Morongo Band's recommended nonattainment area includes all of the Morongo Band's Indian country in the Banning Pass area that is either reservation lands or lands placed in trust for the tribe (including those accepted into trust as of August 17, 2016) over which the Morongo Band has jurisdiction and those lands that are included in the December 16, 2016 land transfer and for which the transfer is anticipated to be completed by the effective date of the final rule designating the Morongo Band 2015 ozone nonattainment area.

As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

The EPA's assessment of the jurisdictional factor was performed in accordance with the Tribal Designations Policy. The policy stresses the importance of recognizing tribal sovereignty and the jurisdictional status of Indian country in the decision-making process. It also articulates circumstances under which the jurisdictional boundaries factor could bear the most weight when evaluating a tribe's multi-factor analysis.

The policy states that it may be appropriate to apply the most weight to the jurisdiction factor in a situation where a Tribe recommends being designated as a separate nonattainment area from an adjacent nonattainment area when an analysis of the factors indicates that there are no sources in Indian country contributing to nonattainment in the adjacent area. As with prior designations analyses, taking into account the relative amount of emissions associated with activities within the Morongo Band jurisdictional area and corresponding minimal contribution to regional ozone violations, we believe that under the circumstances present here, it would be appropriate to assign particular weight to the jurisdictional boundaries factor, consistent with the principles for designations of Indian country set forth in the Tribal Designation Policy and the Tribe's recommendation. This approach is consistent with our prior designations that resulted in the EPA designating the Morongo Reservation as a separate ozone nonattainment area for the 1-hour ozone, 1997 8-hour ozone, and 2008 8-hour ozone standards. Therefore, consistent with the prior designations of the Morongo Reservation for the earlier ozone standards, we are applying the most weight to the jurisdiction factor in our designations analysis for the 2015 8-hour ozone standard.

Conclusion for the Morongo Band of Mission Indians, CA

Based on the assessment of the five factors described above (especially the three factors of air quality data, meteorology, and topography) and assigning particular weight to the jurisdiction factor, the EPA is not modifying the Morongo Band's recommendation to establish a separate nonattainment area for the Morongo Band's jurisdictional area for the 2015 ozone standard.

We are designating as nonattainment all of the Morongo Band's Indian country in the Banning Pass area in Riverside County that is either reservation lands or lands placed in trust for the tribe (including those accepted into trust as of August 17, 2016) and those lands that are included in the December 16, 2016 land transfer and for which the transfer is completed by the effective date of the final rule designating the Morongo Band 2015 ozone nonattainment area. The air quality monitor in the Morongo Band's jurisdictional area indicates a violation of the 2015 ozone NAAQS based on the 2016 design values. NOx and VOC emissions are less than 150 tpy each and there are no large point sources and few small point sources of ozone precursor emissions within the area of analysis. There are, on average, approximately 27 tribal members residing per square mile within the Morongo Band's jurisdictional area. Interstate Highway I-10 runs just south of the main body of the Morongo Band's jurisdictional area. HYSPLIT results show that the winds during exceedance days are predominately from the west. The Morongo Band is located in the Banning Pass, which is one of the three major routes by which air pollutants are transported out of the Los Angeles metropolitan area. The Morongo Band jurisdictional area is designated as a separate nonattainment area for the 1-hour ozone, 1997 8-hour ozone, and 2008 8-hour ozone standards.[9] The EPA's Tribal Designations Policy further supports designating this area separately from adjacent non-tribal lands.

[9] See 78 FR 58189, dated September 23, 2013 and 77 FR 30088, dated May 21, 2012.

The EPA therefore is designating the lands within the Morongo Band's jurisdiction as "nonattainment" separate from the adjacent Los Angeles South Coast Air Basin and Riverside County (Coachella Valley) nonattainment areas.

23.0 Technical Analysis for the Pechanga Band of Luiseno Mission Indians, CA

This technical analysis identifies the area with a monitor that violates the 2015 ozone NAAQS. It also provides the EPA's evaluation of this area and nearby areas to determine whether those nearby areas have emissions sources that potentially contribute to ambient ozone concentrations at the violating monitor in the area.

The Pechanga Band of Luiseno Mission Indians (Pechanga Band) is a federally recognized tribe whose Indian country is located primarily in the southern part of the Los Angeles-Long Beach Combined Statistical Area (CSA), with some land extending into the northern portion of the San Diego-Carlsbad Core Based Statistical Area (CBSA). The Pechanga Band's Indian country consists of a main Reservation and lands recently acquired and put into trust, including lands proximate to the western boundary of the Reservation (Pu'eska Mountain) and lands approximately 30 miles to the northwest of the northern boundary of the Reservation (Meadowbrook).

On October 1, 2016, the Pechanga Band recommended to the EPA that lands within their jurisdiction be designated nonattainment for the 2015 ozone NAAQS. Specifically, the Pechanga Band recommended a nonattainment area designation for the main Reservation and the Pu'eska Mountain land, and a separate nonattainment area designation for the Meadowbrook lands. Please see the October 1, 2016 letter from Mark Macarro, Tribal Chairman, Pechanga Band to Elizabeth Adams, Acting Director, Air Division, EPA Region IX.

In designating areas of the country for the 1997 ozone NAAQS, in 2004 the EPA established boundaries for the Los Angeles-South Coast Air Basin, CA nonattainment area. The Los Angeles-South Coast Air Basin nonattainment area includes the entirety of Orange County, the southwestern portion of Los Angeles County, the southwest portion of San Bernardino County, and the western portion of Riverside County. At the time in 2004, all of the Pechanga Band's reservation lands were in the southwestern portion of Riverside County and the EPA included the Pechanga Band's Indian country in the Los Angeles-South Coast Air Basin nonattainment area.

After the 2004 designations for the 1997 ozone NAAQS, the Pechanga Band acquired lands that extended the Reservation into San Diego County. For the 2008 ozone NAAQS designations process, the EPA designated the Pechanga Band's reservation lands as a separate nonattainment area on April 30, 2012, consistent with the Tribe's recommendation (letter from Mark Macarro, Tribal Chairman, Pechanga Band of Luiseno Indians, to Jared Blumenfeld, Regional Administrator, U.S. EPA Region IX, February 23, 2012).

On April 3, 2015, the EPA revised the boundaries of the Pechanga Band's area for the 1997 8-hour ozone NAAQS consistent with the boundaries identified for the Pechanga Band under the 2008 ozone NAAQS (see 80 FR 18125, dated April 3, 2015). The EPA's analysis for the 2008 ozone NAAQS designations process and our April 3, 2015 action regarding the 1997 ozone NAAQS did not consider Pechanga Band's then-recent acquisition of Pu'eska Mountain and Meadowbrook lands.

For the EPA's 2015 ozone NAAQS nonattainment boundary for the Pechanga Band, the area of analysis includes lands that are identified in the EPA's 1997 and 2008 ozone NAAQS nonattainment area boundaries, along with the additional lands that have been recently accepted into trust for the Pechanga Band (the Pu'eska Mountain and Meadowbrook lands). All of these lands are in western Riverside County and northern San Diego County. The EPA is designating surrounding state lands as part of the separate Los Angeles-South Coast Air Basin, CA and the San Diego County, CA

nonattainment areas. Information specific to those areas is contained in the associated Technical Analysis sections for the Los Angeles-South Coast Air Basin and the San Diego County nonattainment areas.

Unless otherwise specified, in the following sections of this TSD, "the Pechanga Band's jurisdictional area" refers to all of Pechanga Band's trust lands: lands identified in the EPA's 1997 and 2008 ozone NAAQS nonattainment area boundaries, along with the additional lands that have been recently accepted into trust for the Pechanga Band (the Pu'eska Mountain and Meadowbrook lands). "The Pechanga Band's reservation land" refers to the same area minus the Pu'eska Mountain and Meadowbrook lands.

Table 23.1 identifies the area of analysis for the Pechanga nonattainment area. The area of analysis includes all lands under the Pechanga Band's tribal jurisdiction, which consists of lands in Riverside County and San Diego County. Nontribal lands in these counties are analyzed in other sections of this document. The area of analysis comprises portions of the Riverside-San Bernardino-Ontario CBSA, San Diego-Carlsbad CBSA, and Los Angeles-Long Beach CSA that are under the Pechanga Band's tribal jurisdiction. The nonattainment area differs from the existing 1997 and 2008 Pechanga nonattainment areas by including Pu'eska Mountain lands, and it differs from the area of analysis by excluding Meadowbrook lands.

Table 23.1 Area of Analysis.

Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Pechanga Band of Luiseno Mission Indians	Tribal lands in Riverside County and San Diego County under the Pechanga Band's jurisdiction	Riverside-San Bernardino-Ontario CBSA (partial)* San Diego-Carlsbad CBSA (partial)*	Los Angeles-Long Beach CSA (partial)*

*The remainder of the CBSA/CSA was analyzed in the context of an adjacent nonattainment area.

This analysis was based on the weight-of-evidence of the five factors recommended in the EPA's ozone designations guidance and other relevant information. In developing this technical analysis, the EPA used the latest data and information available to the EPA (and to the states and tribes through the Ozone Designations Mapping Tool and the EPA Ozone Designations Guidance and Data web page).[1] In addition, the EPA considered all additional data or information provided to the EPA by states or tribes. The EPA's assessment of the Tribe's separate nonattainment area recommendation and other information was performed in accordance with the EPA's December 20, 2011 "Policy for Establishing Separate Air Quality Designations for Areas of Indian Country" (Tribal Policy)[2].

The five factors recommended in the EPA's guidance are:

1. Air Quality Data (including the design value calculated for each Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitor);

[1] The EPA's Ozone Designations Guidance and Data web page can be found at *https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data*.
[2] https://www.epa.gov/sites/production/files/2016-02/documents/indian-country-separate-area.pdf

2. Emissions and Emissions-Related Data (including locations of sources, population, amount of emissions, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography/Topography (including mountain ranges or other physical features that may influence the fate and transport of emissions and ozone concentrations); and
5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 23.1a is a map of the EPA's nonattainment boundary for the Pechanga Band's jurisdictional area. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 and 2008 ozone NAAQS nonattainment boundaries. The EPA's 2015 ozone NAAQS designation for the Pechanga Band modifies a portion of the recommendation we received from the Pechanga Band. Figure 23.1b shows the nonattainment area in greater detail.

Figure 23.1a: The EPA's Nonattainment Boundaries for the Pechanga Band, CA.

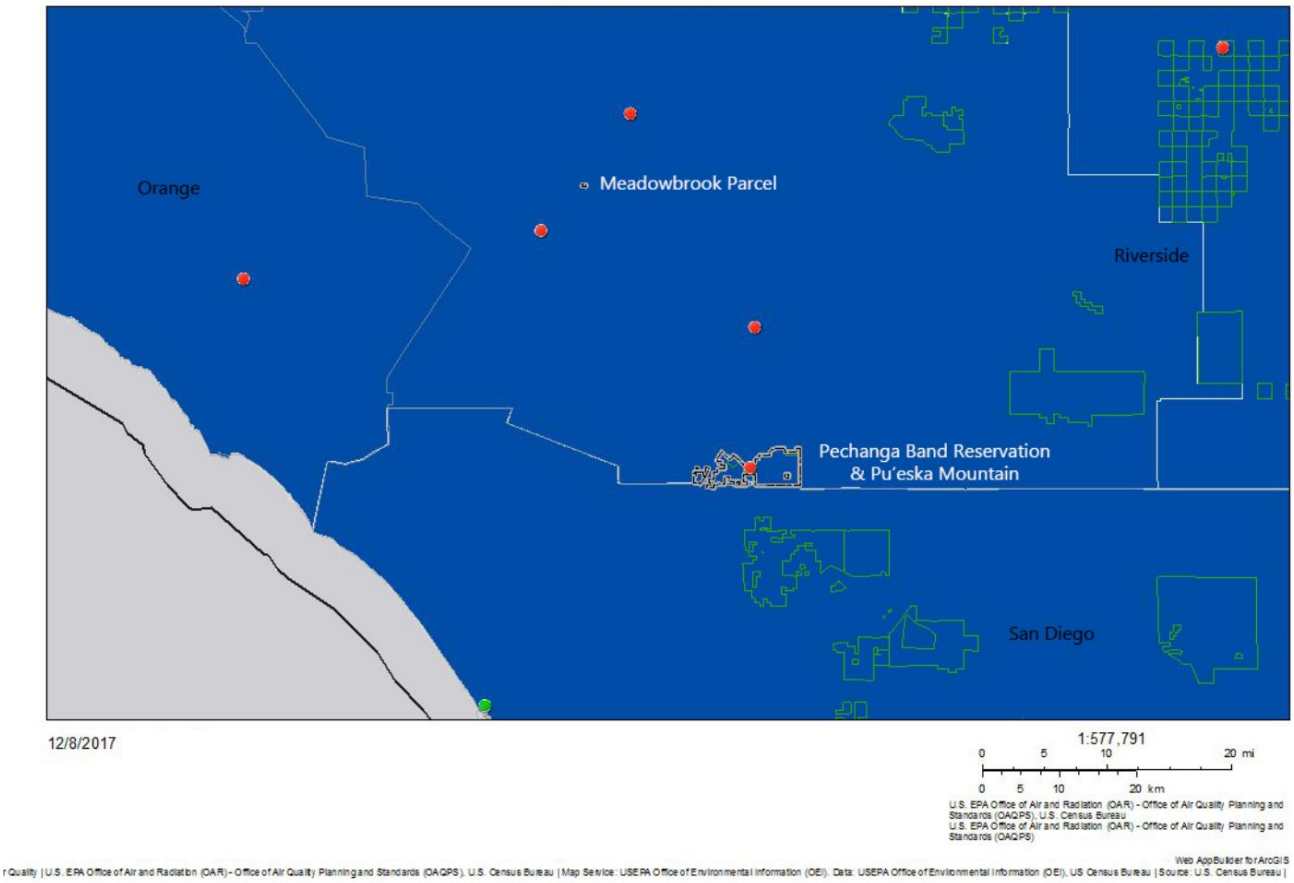


Figure 23.1a shows the EPA's nonattainment boundary for Pechanga Band as a gray line with a dashed black center. Nonattainment areas for the 2008 ozone NAAQS are shown in dark blue areas. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Tribal land boundaries are outlined in green. Please refer to the master legend near the beginning of this document.

Figure 23.1b: The EPA's Nonattainment Boundaries for the Pechanga Band, CA (zoomed in).

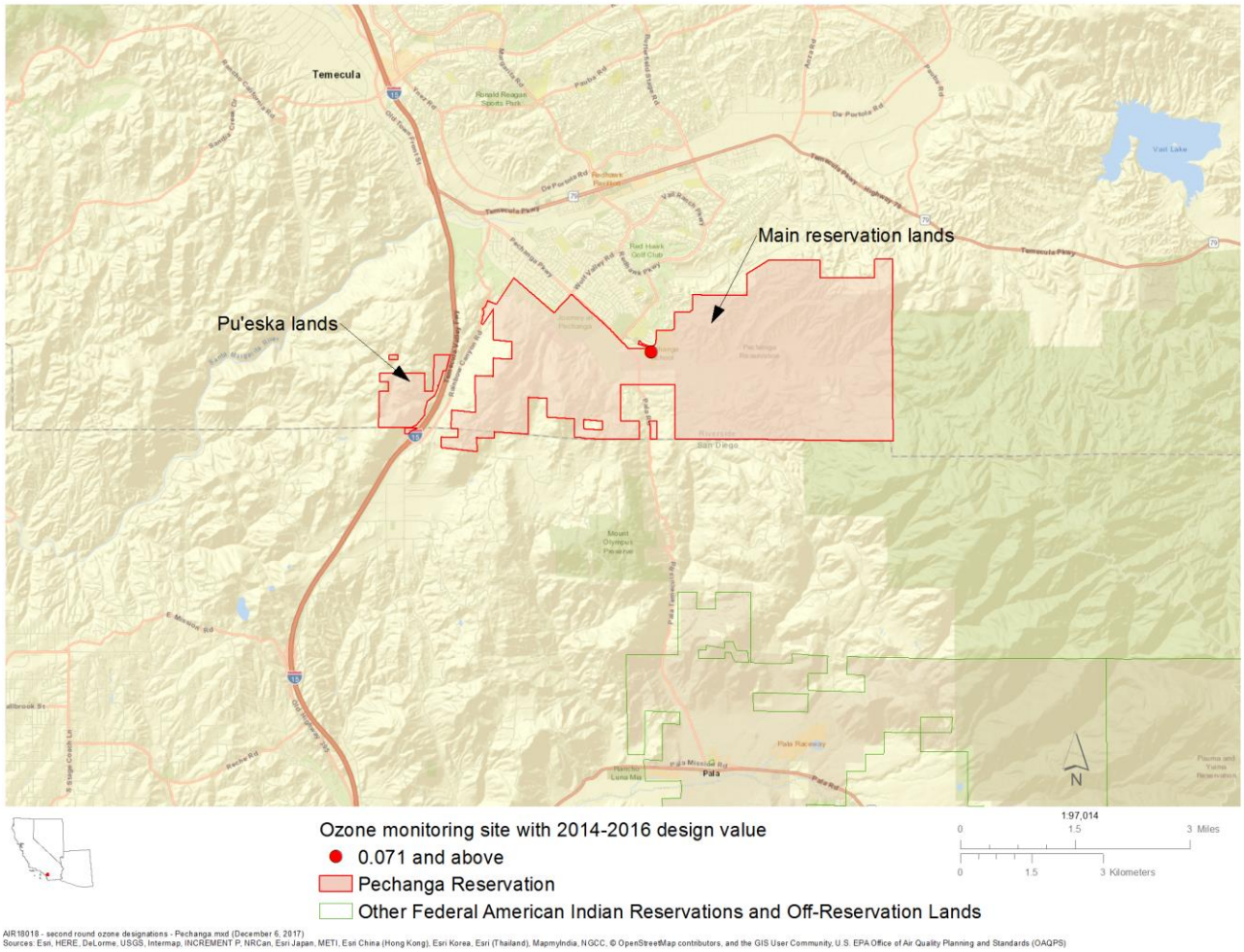


Figure 23.1b shows the EPA's nonattainment boundary for Pechanga Band in greater detail, denoted with red outline and pink fill.

The EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. The Pechanga Band has a monitor in violation of the 2015 ozone NAAQS, therefore portions of the Pechanga Band's lands are included in the nonattainment area.

The following sections describe the five-factor analysis. While the factors are presented individually, they are not independent. The five-factor analysis process carefully considers the interconnections among the different factors and the dependence of each factor on one or more of the others, such as the interaction between emissions and meteorology for the area being evaluated.

Factor Assessment

Factor 1: Air Quality Data

The EPA considered 8-hour ozone design values in ppm for air quality monitors in the Pechanga Band area of analysis based on data for the 2014-2016 period (i.e., the 2016 design value, or DV). This is the most recent three-year period with fully-certified air quality data.[3] The design value is the 3-year average of the annual 4th highest daily maximum 8-hour average ozone concentration.[4] The 2015 NAAQS are met when the design value is 0.070 ppm or less. Only ozone measurement data collected in accordance with the quality assurance (QA) requirements using approved (FRM/FEM) monitors are used for NAAQS compliance determinations.[5] The EPA uses FRM/FEM measurement data residing in the EPA's Air Quality System (AQS) database to calculate the ozone design values. Individual exceedances or violations of the 2015 ozone NAAQS that the EPA determines have been caused by an exceptional event that meets the administrative and technical criteria in the Exceptional Events Rule[6] are not included in these calculations. Whenever several monitors are located in a county (or designated nonattainment area), the design value for the county or area is determined by the monitor with the highest valid design value. The presence of one or more violating monitors (i.e. monitors with design values greater than 0.070 ppm) in a county or other geographic area forms the basis for designating that county or area as nonattainment. The remaining four factors are then used as the technical basis for determining the spatial extent of the designated nonattainment area surrounding the violating monitor(s) based on a consideration of what nearby areas are contributing to a violation of the NAAQS.

The EPA identified monitors where the most recent design values violate the NAAQS, and examined historical ozone air quality measurement data (including previous design values) to understand the nature of the ozone ambient air quality problem in the area. Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are operated in accordance with 40 CFR part 58 Appendices A, C, D, and E and operating with an FRM or FEM monitor. These requirements must be met in order to be acceptable for comparison to the 2015 ozone NAAQS for designation purposes. All data from Special Purpose Monitors (SPMs) using an FRM or FEM are eligible for comparison to the NAAQS, subject to the requirements given in the March 28, 2016 Revision to Ambient Monitoring Quality Assurance and Other Requirements Rule (81 FR 17248).

The 2014-2016 design values for monitors in the area of analysis are shown in Table 23.2.

[3] Air quality data used in these TSDs were pulled from the EPA's Air Quality System on October 2, 2017 and are available at: *https://www.epa.gov/sites/production/files/2017-10/ozone_designvalues_20142016_final_10_02_17_0.xlsx*

[4] The specific methodology for calculating the ozone design values, including computational formulas and data completeness requirements, is described in 40 CFR part 50 Appendix U.

[5] The QA requirements for ozone monitoring data are specified in 40 CFR part 58 Appendix A. The performance test requirements for candidate FEMs are provided in 40 CFR part 53 Subpart B.

[6] The EPA finalized the rule on the Treatment of Data Influenced by Exceptional Events (81 FR 68513) and the guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events in September of 2016. For more information, see *https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance*.

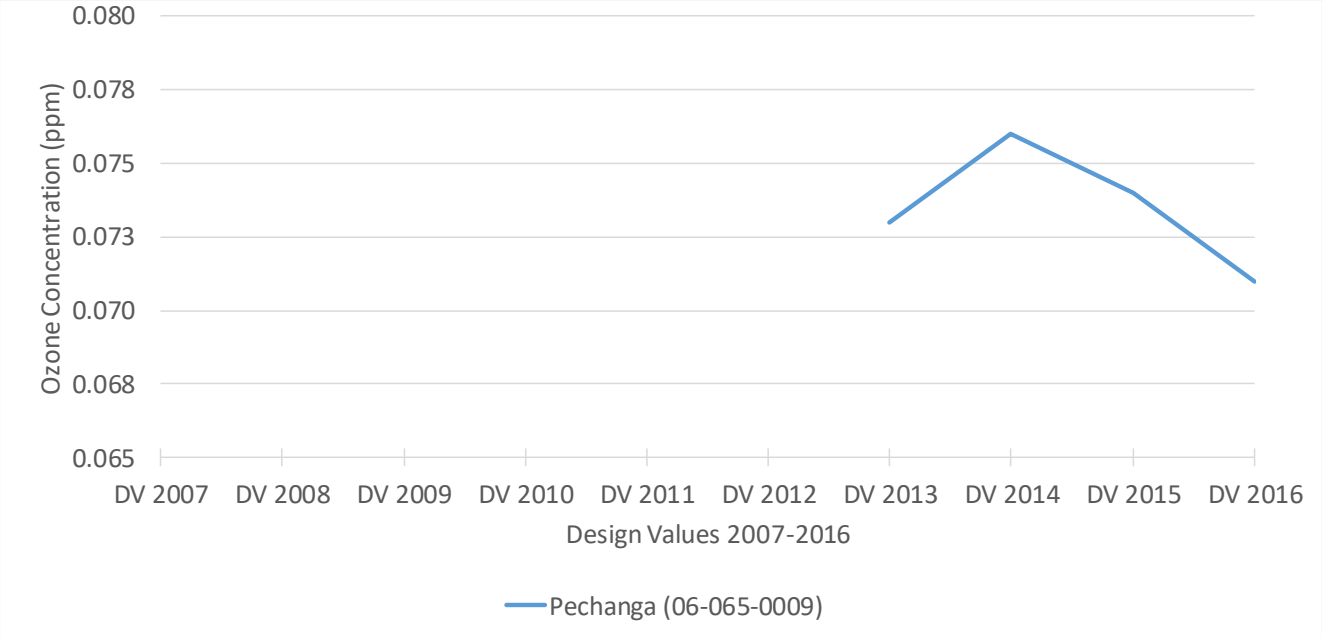
Table 23.2 Air Quality Data (all values in ppm).

Tribal Area, State	Tribe Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4th highest daily max value	2015 4th highest daily max value	2016 4th highest daily max value
Pechanga Band, CA	Yes	06-065-0009	**0.071**	0.079	0.069	0.067

The Pechanga Band's jurisdictional area shows a violation of the 2015 ozone NAAQS, therefore portions of the Pechanga Band's jurisdictional area are included in the nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area.

Figure 23.1a, shown previously, identifies the Pechanga Band nonattainment area and the violating monitor. Table 23.2 identifies the design value for all monitors in the area of analysis. Figure 23.2 shows the historical trend of design values for the single monitor that is located in the Pechanga Band's jurisdictional area. As shown in Figure 23.2, this monitor has a valid DV starting in 2013, and has a decreasing DV since 2014.

Figure 23.2 Three-Year Design Values for Monitor in the Area of Analysis (2007 - 2016).



The Pechanga area has one monitoring site showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. The violating monitor is located on the portions of the reservation that were included as part of the designated nonattainment area for the 1997 and 2008 ozone NAAQS. There is no monitor on the Pu'eska Mountain or Meadowbrook lands.

Factor 2: Emissions and Emissions-Related Data

The EPA evaluated ozone precursor emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOC) and other emissions-related data that provide information on areas contributing to violating monitors.

Emissions Data

Data from the 2014 National Emissions Inventory (NEI) was not available for the Pechanga Band, therefore, the EPA utilized emissions data developed for a 2015 Pechanga Band rulemaking (80 FR 18120, dated April 3, 2015) for this section of the technical analysis. For the Pechanga Band area of analysis, the EPA examined the magnitude of NO_x and VOC emissions. These emissions represent that sum of emissions from the following general source categories: point sources and on-road mobile sources. Emissions levels from sources in a nearby area indicate the potential for the area to contribute to monitored violations.

Table 23.3 provides an emissions summary of NO_x and VOC (given in tons per year (tpy)) emissions for the area of analysis considered for inclusion in the Pechanga Band nonattainment area.

Table 23.3 Total Pechanga Area NO_x and VOC Emissions.

Tribal Area, State	Tribe Recommended Nonattainment?	Total NO_x (tpy)	Total VOC (tpy)
Pechanga Band, CA	Yes	32.1	55.1
	Area wide:	32.1	55.1

In addition to reviewing emissions of NO_x and VOC in the area of analysis, the EPA also reviewed emissions from large point sources within the area of analysis. The location of these sources, together with the other factors, can help inform nonattainment boundaries. The locations of the large point sources would be shown in Figure 23.3 below if there were any within the area of analysis but there are no such sources in the area of analysis. The nonattainment boundary is also shown in Figure 23.3

Figure 23.3 Large and Small Point Sources in the Area of Analysis*.

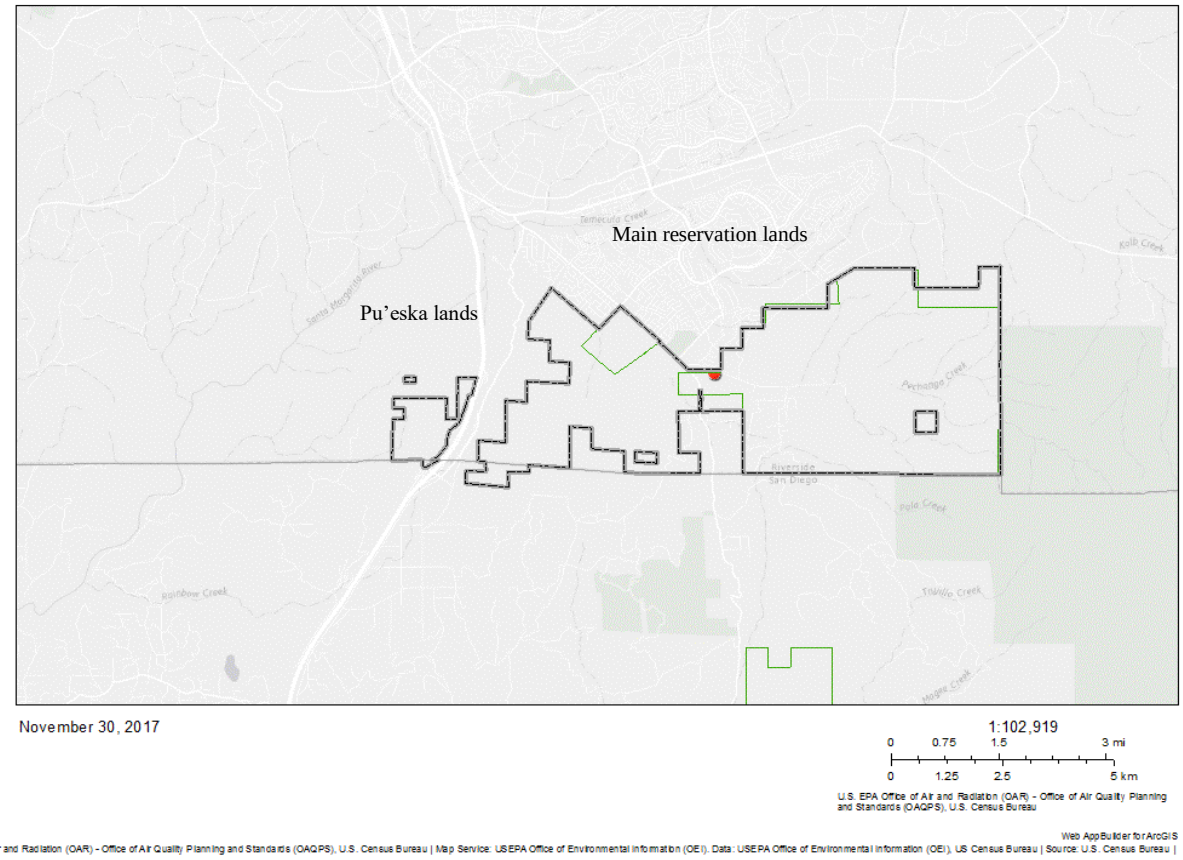


Figure 23.3 shows large point sources in the area of analysis* for Pechanga Band as orange squares (none appear), and small point sources as yellow stars (none appear). The EPA's nonattainment boundary for Pechanga Band is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Please refer to the master legend near the beginning of this document.
*Meadowbrook is not shown in the figure. There are no large or small point sources on the Meadowbrook land.

In summary, the EPA's analysis of relevant emissions and the geographic locations of the relevant emissions shows that the NOx and VOC emissions are less than 100 tpy and there are no large or small point sources of ozone precursor emissions within the area of analysis.

Population density and degree of urbanization

In this part of the factor analysis, the EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include emissions of NO_x and VOC from on-road and non-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to violations of the NAAQS. Table 23.4 shows the population and population density for the Pechanga Band area of analysis. The data used in the table is from 80 FR 18125, dated April 3, 2015.

Table 23.4. Population and Growth.

Tribal Area, State	Tribe Recommended Nonattainment?	2015 Population	2015 Population Density (per sq. mi.)
Pechanga Band, CA	Yes	467	44.5
	Area wide:	467	44.5

Figure 23.4 shows that the census tract covering the Pechanga Band's monitor and east has higher population than the census tract immediately west of the monitor. There are approximately 44 people per square mile within the Pechanga Band's jurisdictional area.

Figure 23.4 Census Tract-Level Population.

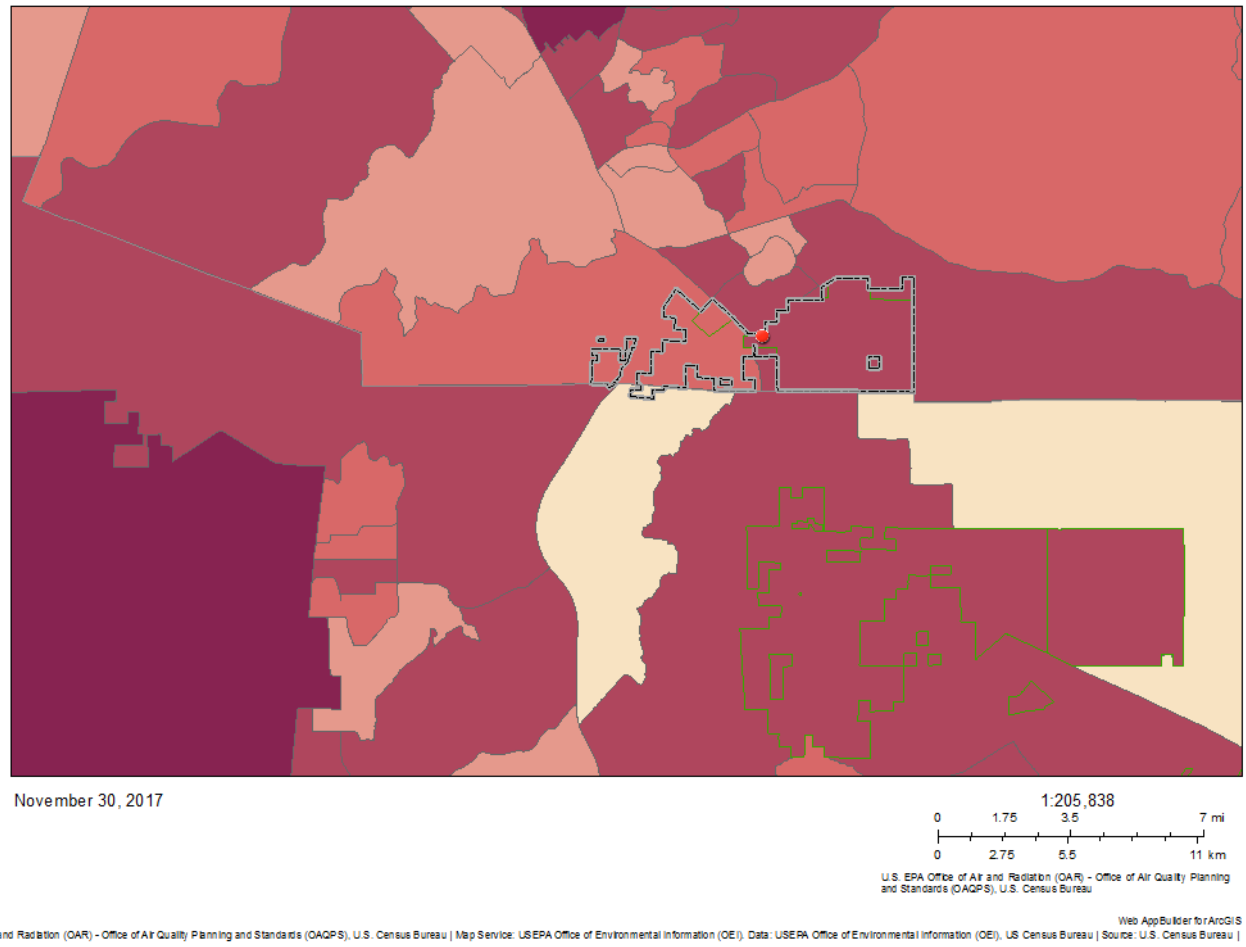


Figure 23.4 shows census tract population in the area of analysis* for Pechanga Band. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's nonattainment boundary for Pechanga Band is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Please refer to the master legend near the beginning of this document.
*Meadowbrook is not shown in the figure. There are no residents on the Meadowbrook land.

Traffic and Vehicle Miles Travelled (VMT)

The EPA evaluated the commuting patterns of residents, as well as the total vehicle miles traveled (VMT) for each county in the area of analysis. In combination with the population/population density data and the location of main transportation arteries, this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters is generally an integral part of an urban area and high VMT and/or high number of commuters indicates the presence of motor vehicle emissions that may contribute to violations of the NAAQS. Rapid population or VMT growth in a county on the urban perimeter may signify increasing integration with the core urban area, and thus could indicate that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. In addition to VMT, the EPA evaluated worker data collected by the U.S. Census Bureau for the area of analysis. The data in Table 23.5 are 2014 data.

Table 23.5. Traffic and Commuting Patterns.

Tribal Area, State	Tribe Recommended Nonattainment?	2014 Total VMT (Million Miles)	Number of Tribal Residents Who Work	Number Commuting To or Within Tribal Area with Violating Monitor(s) Within Area of Analysis	Percentage Commuting To or Within Tribal Area with Violating Monitor(s) Within Area of Analysis
Pechanga Band, CA	**Yes**	**N/A**	**62**	**60**	**96.8%**
Total:		N/A	62	60	96.8%

Areas with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 23.5 overlays twelve-kilometer gridded VMT from the 2014 NEI with a map of the transportation arteries.

Figure 23.5 Twelve Kilometer Gridded VMT (Miles) Overlaid with Transportation Arteries.

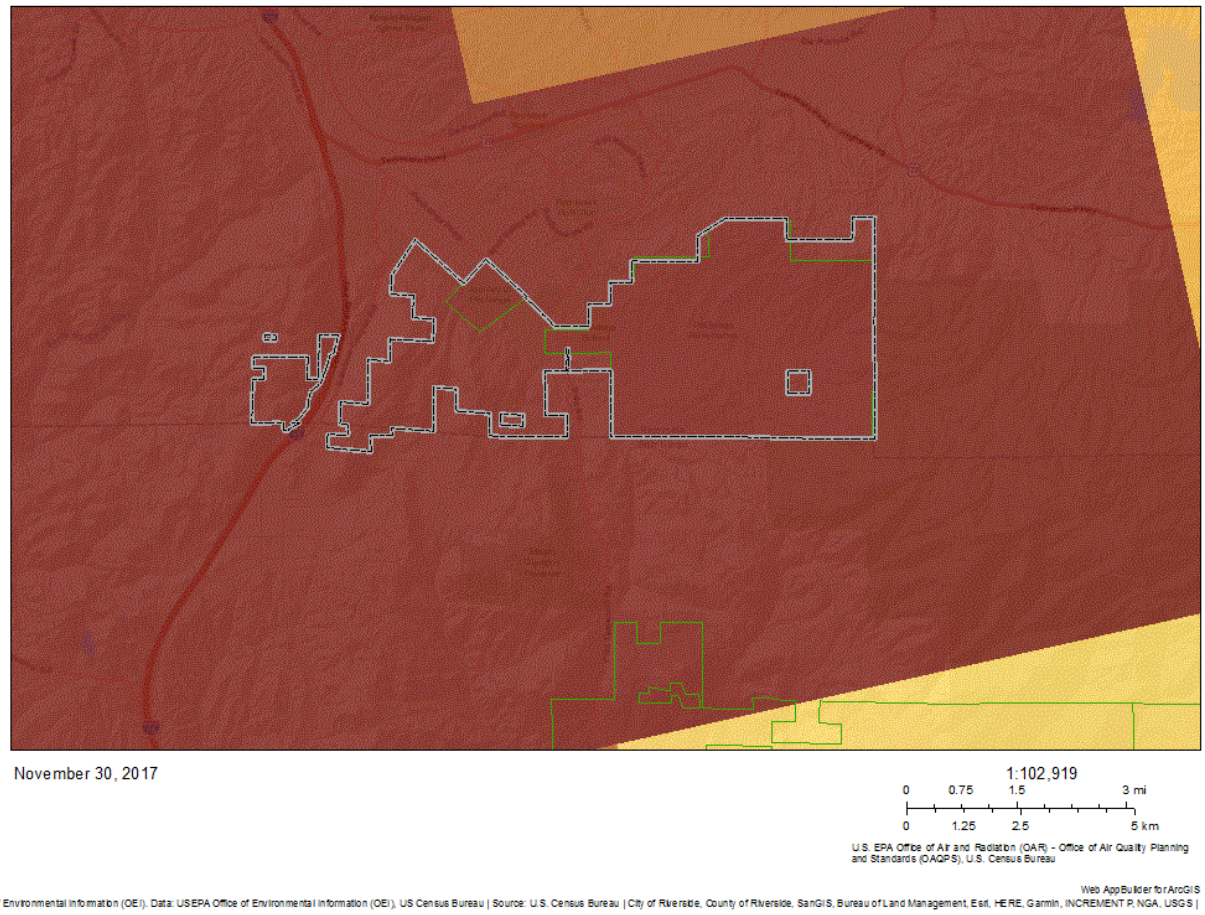


Figure 23.5 shows gridded VMT in the area of analysis* for Pechanga Band. Lighter shades of yellow indicate areas with lower VMT; darker shades of brown indicate areas with higher VMT. The EPA's nonattainment boundary for Pechanga Band is shown as a gray line with a dashed black center. Please refer to the master legend near the beginning of this document.
*Meadowbrook is not shown in the figure. There are no residents at Meadowbrook.

The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau,[7] and shows that about 97% of the workers work in an area with a violating monitor. Interstate Highway I-15 runs between the main body of the Pechanga Band's jurisdictional area and the new Pu'eska Mountain section. Consistent with the EPA's prior designations of the Pechanga Band's nonattainment area, emissions from I-15 are included in the technical analysis discussion associated with the Los Angeles-South Coast Air Basin nonattainment area.

The EPA also reviewed relevant analysis and data used in a recent designation action (see 80 FR 18120, dated April 3, 2015). These more detailed analyses assume 17,100 average daily vehicle trips associated with non-residents and 1,870 daily vehicle trips associated with residents (for additional detail, please see 80 FR 18126, dated April 3, 2015).

Factor 3: Meteorology

[7] The Census Bureau's On The Map web page can be found at https://onthemap.ces.census.gov/ .

Evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to the monitored violations. Results of meteorological data analysis may inform the determination of nonattainment area boundaries. In order to determine how meteorological conditions, including, but not limited to, weather, transport patterns, and stagnation conditions, could affect the fate and transport of ozone and precursor emissions from sources in the area, the EPA evaluated 2014-2016 HYbrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) trajectories at 100, 500, and 1000 meters above ground level that illustrate the three-dimensional paths traveled by air parcels to a violating monitor. Figure 23.6 shows the 24-hour HYSPLIT back trajectories for each exceedance day (i.e., daily maximum 8 hour values that exceed the 2015 ozone NAAQS) for the violating monitor.

Figure 23.6. HYSPLIT Back Trajectories for Pechanga Monitor (AQS ID 06-065-0009).

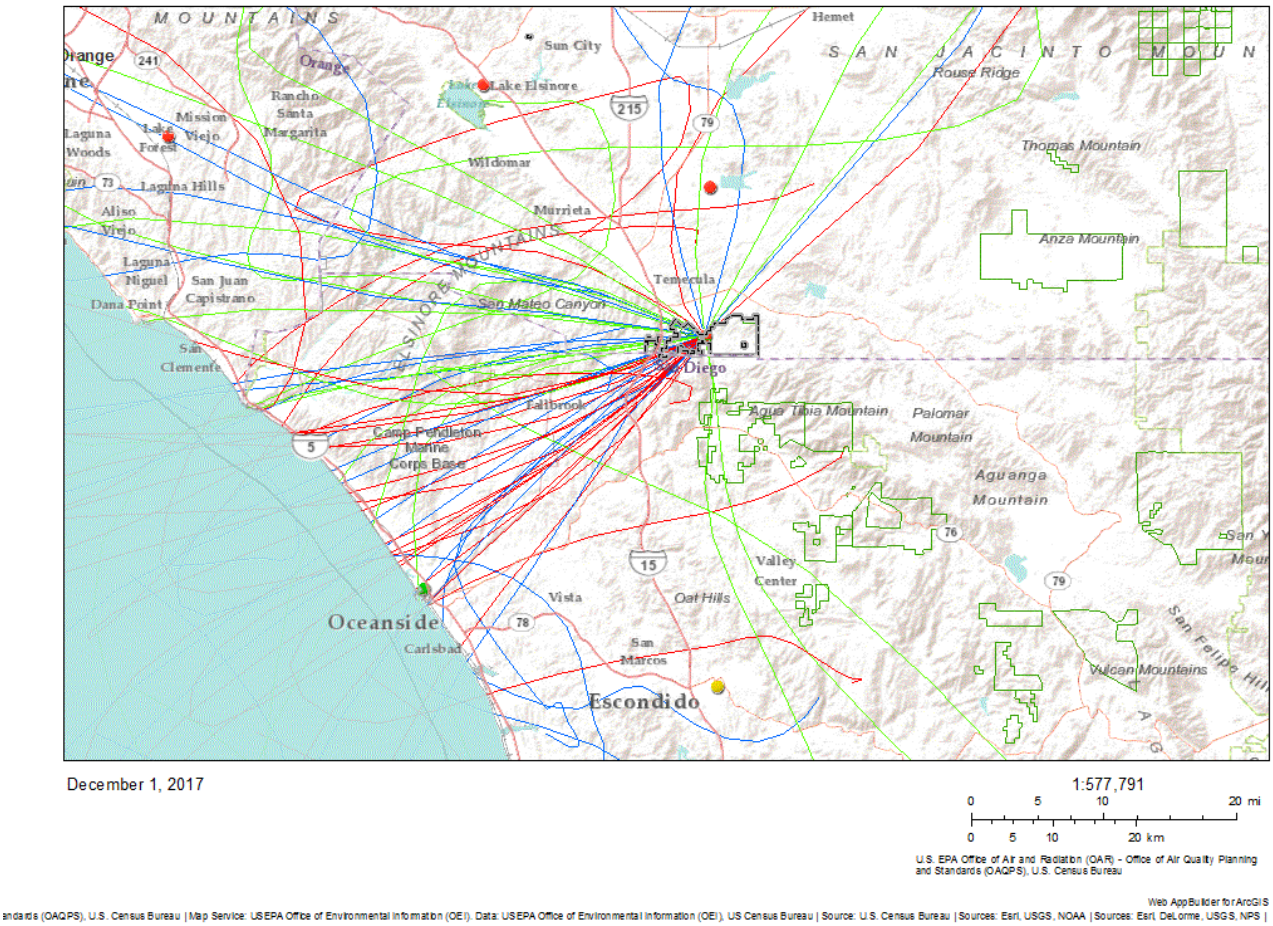


Figure 23.6 shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's nonattainment boundary for Pechanga Band is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Please refer to the master legend near the beginning of this document.

The EPA's HYSPLIT analysis shows back trajectories for days exceeding the 2015 ozone NAAQS in 2014-2016. The model output shows that the winds during exceedance days are predominantly from the west, with trajectories coming from the north, northwest and southwest to a lesser extent.

Factor 4: Geography/topography

Consideration of geography or topography can provide additional information relevant to defining nonattainment area boundaries. Analyses should examine the physical features of the land that might define the airshed. Mountains or other physical features may influence the fate and transport of emissions as well as the formation and distribution of ozone concentrations. The absence of any such geographic or topographic features may also be a relevant consideration in selecting boundaries for a given area.

The EPA used geography/topography analysis to evaluate the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

Western U.S., topography impacts pollutant formation and transport, and thus plays an important role in assessing what areas are contributing to monitored violations of the NAAQS.

The Pechanga Band's jurisdictional area consists of 6,700 acres located in the northwestern portion of the Cleveland National Forest, ranging between 1,100 and 2,600 feet in elevation. The Pechanga Band's jurisdictional area does not have any geographical or topographical features that would prevent air pollution transport from the surrounding San Diego County or Los Angeles-South Coast Air Basin nonattainment areas. This suggests that Pechanga Band's jurisdictional area may experience similar air quality to the surrounding nonattainment areas. The Meadowbrook lands are approximately 30 miles north of the northernmost corner of the main body, Reservation land, of the Pechanga Band's jurisdictional area; the Pu'eska Mountain lands are approximately 0.3 miles west of the Reservation land.

Figure 23.7. Topographic Illustration of the Physical Features.

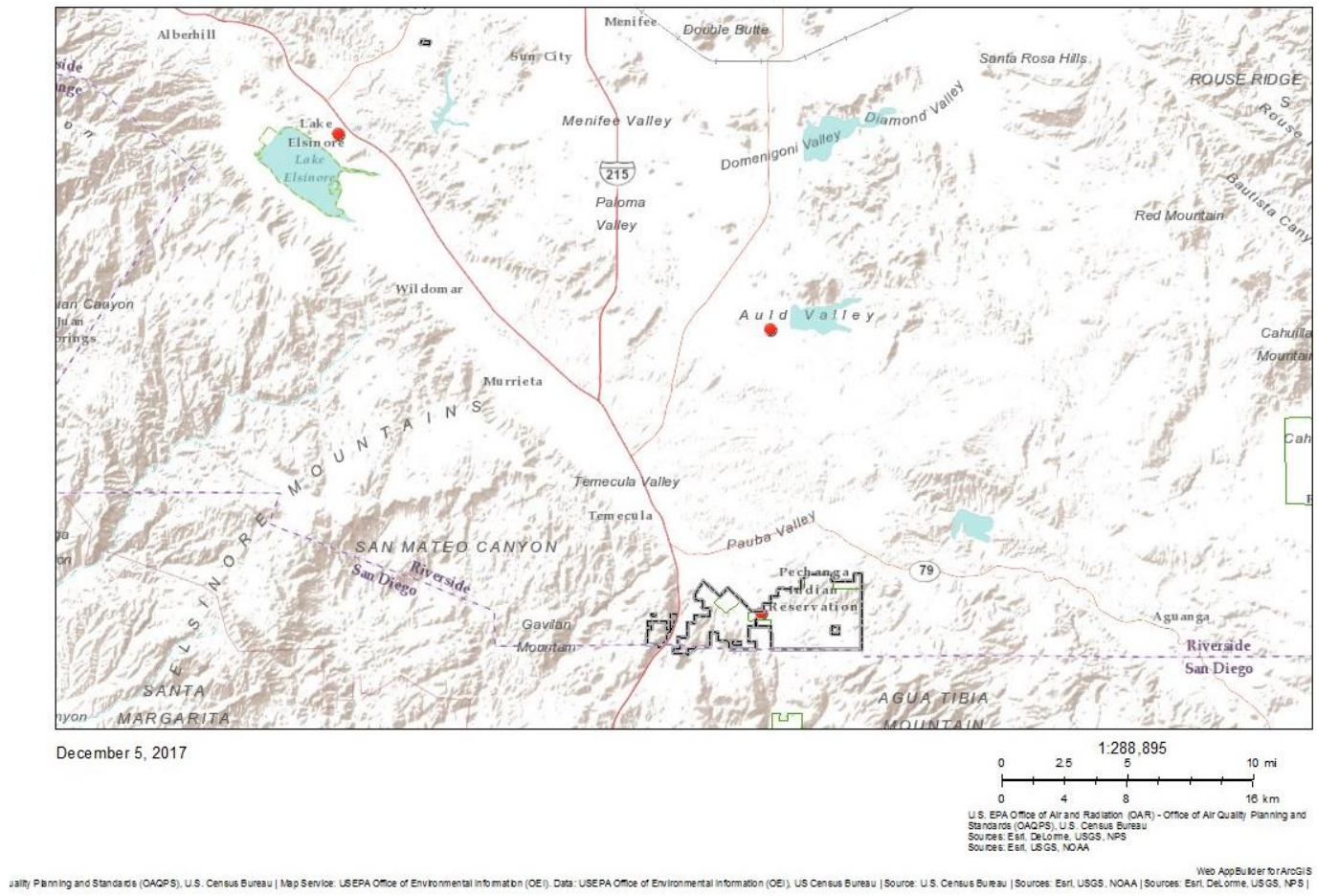


Figure 23.7 shows the topography in the area of analysis for Pechanga Band. The EPA's nonattainment boundary for the Pechanga Band, CA is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Please refer to the master legend near the beginning of this document.

Factor 5: Jurisdictional boundaries

Once the geographic extent of the violating area and the nearby area contributing to violations is determined, the EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary to carry out the air quality planning and enforcement functions for nonattainment areas. In defining the boundaries of the Pechanga Band nonattainment area, the EPA considered existing jurisdictional boundaries, which can provide easily identifiable and recognized boundaries for purposes of implementing the NAAQS. Examples of jurisdictional boundaries include, but are not limited to: counties, air districts, areas of Indian country, metropolitan planning organizations, and existing nonattainment areas. If an existing jurisdictional boundary is used to help define the nonattainment area, it must encompass all of the area that has been identified as meeting the nonattainment definition. Where existing jurisdictional boundaries are not adequate or appropriate to describe the nonattainment area, the EPA considered other clearly defined and permanent landmarks or geographic coordinates for purposes of identifying the boundaries of the designated areas.

Figure 23.8 shows the relevant jurisdictional boundaries for the Pechanga Band. As discussed above, the Pechanga Band has previously established nonattainment boundaries associated with the one-hour, 1997 eight-hour and 2008 eight-hour ozone NAAQS.

The Pechanga Band's lands are located in the northern portion of the San Diego-Carlsbad CBSA and the southern part of the Los Angeles-Long Beach CSA.

The Pechanga Band's lands include the main body of the reservation (as identified in the 2008 ozone NAAQS designation and the EPA's April 3, 2015 action on the 1997 ozone NAAQS) as well as the Pu'eska Mountain and Meadowbrook lands. The Pechanga Band's reservation land, the Pu'eska Mountain lands, and the Meadowbrook lands are all under the Pechanga Band's jurisdiction.

As noted above, the Pu'eska Mountain lands are to the immediate west of the Reservation land. The Meadowbrook lands are near the City of Lake Elsinore in the South Coast Air Basin, approximately 30 miles northwest of the northern boundary of the Pechanga Band's reservation land.

The EPA is designating Los Angeles-South Coast Air Basin and San Diego County nonattainment for the 2015 ozone NAAQS as well. More information on these areas can be found in the technical analysis sections for these areas.

Figure 23.8: Jurisdictional Boundaries

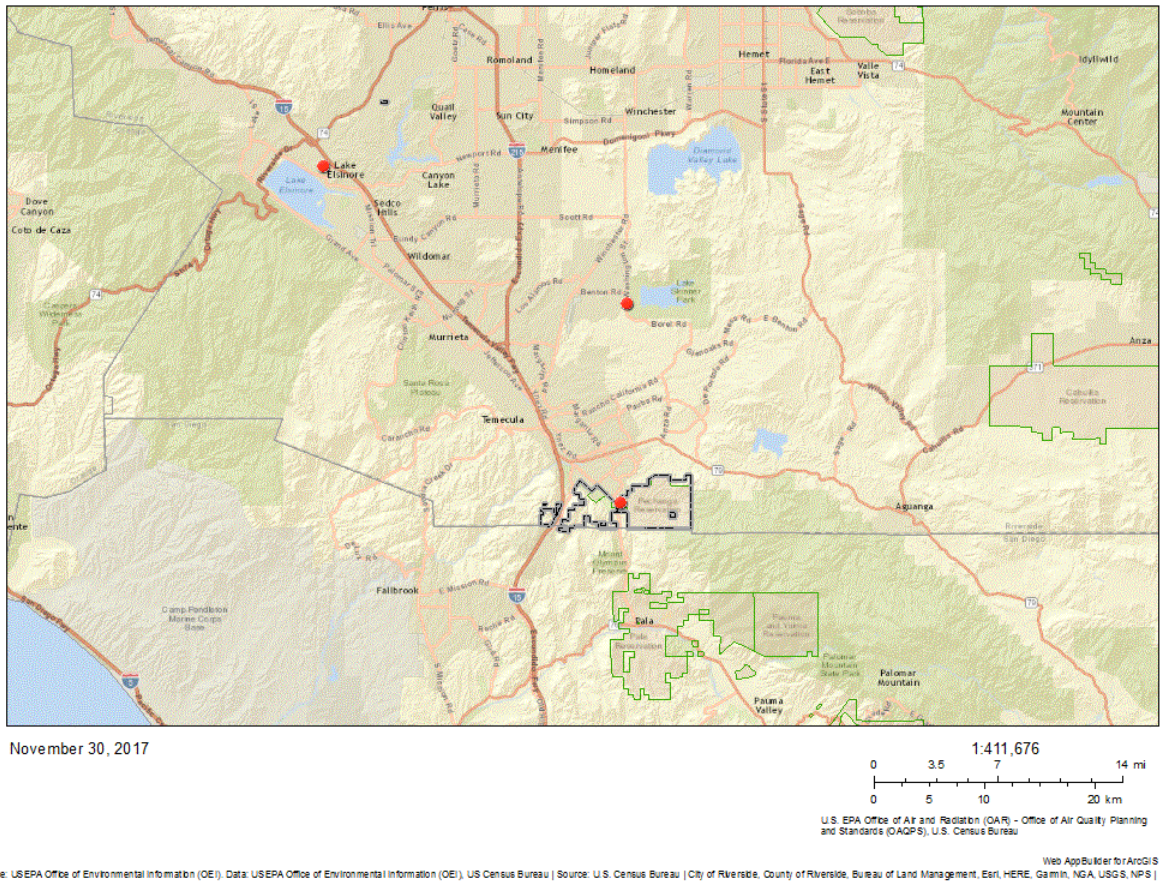


Figure 23.8 shows jurisdictional boundaries, in the area of analysis for the Pechanga Band. The EPA's nonattainment boundary for the Pechanga Band, CA is shown as a gray line with a dashed black center. The Meadowbrook parcel is also shown as it is within the Pechanga Band's jurisdiction but is not included in the EPA's Pechanga Band nonattainment area. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. Please refer to the master legend near the beginning of this document.

As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." The EPA recognizes the sovereignty of tribal governments, and has attempted to take the input of the tribes into account in establishing appropriate nonattainment area boundaries.

The EPA's assessment of the jurisdictional factor was performed in accordance with the Tribal Designations Policy. The policy stresses the importance of recognizing tribal sovereignty and the jurisdictional status of Indian country in the decision-making process. It also articulates circumstances under which the jurisdictional boundaries factor could bear the most weight when evaluating a tribe's multi-factor analysis.

The policy states that it may be appropriate to apply the most weight to the jurisdiction factor in a situation where a Tribe recommends being designated as a separate nonattainment area from an adjacent nonattainment area when an analysis of the factors indicates that there are no sources in Indian country contributing to nonattainment in the adjacent area. As with prior designations analyses, taking into account the relative amount of emissions associated with activities within the Pechanga Band's jurisdictional area and corresponding minimal contribution to regional ozone violations, we believe that under the circumstances present here, it would be appropriate to assign particular weight to the jurisdictional boundaries factor with respect to all of the Pechanga Band's lands with the exception of the Meadowbrook parcel for which there is no on-site regulatory monitoring. The Meadowbrook parcel is included in the Los Angeles-South Coast Air Basin nonattainment area. The Meadowbrook parcel is under the Pechanga Band's jurisdiction and will be identified as such in 40 CFR Part 81.

Conclusion for the Pechanga Band of Luiseno Mission Indians, CA

The Pechanga Band recommended that all lands within their jurisdiction be designated in two separate nonattainment areas for the 2015 ozone NAAQS: one area comprised of all tribal lands except for the non-contiguous Meadowbrook lands[8], and a separate nonattainment area comprised of just the Meadowbrook lands. The EPA is modifying parts of this recommendation.

Based on the assessment of the factors described above, and assigning particular weight to the jurisdiction factor, the EPA is not modifying the Pechanga Band's recommendation to establish a separate nonattainment area for the Pechanga Band's jurisdictional area except as that recommendation also applies to the non-contiguous Meadowbrook lands under the Pechanga Band's jurisdiction. The Pechanga Band nonattainment area is the same nonattainment area as established for the 1997 and 2008 ozone NAAQS, with the addition of the proximate non-contiguous Pu'eska Mountain lands over which the Pechanga Band has jurisdiction. The air quality monitor in the main body of the Pechanga Band's jurisdictional area, just east of the Pu'eska Mountain lands, indicates a violation of the 2015 ozone NAAQS based on the 2016 design values.

[8] Both the Pu'eska Mountain and Meadowbrook lands are subject to development restrictions that will not allow for any future development.

We are designating as nonattainment the main body of the Pechanga Reservation along with the proximate non-contiguous Pu'eska Mountain lands. The air quality monitor in the Pechanga Band's jurisdictional area indicates a violation of the 2015 ozone NAAQS based on the 2016 design values. NOx and VOC emissions are less than 100 tpy each and there are very few stationary and mobile sources of ozone precursor emissions within the area of analysis. There are approximately 44 people per square mile within the Pechanga Band's jurisdictional area. Interstate Highway I-15 runs between the main body of the reservation and the Pu'eska Mountain parcel. HYSPLIT results show that the winds during exceedance days are predominately from the west. The Pechanga Band and Pu'eska Mountain parcel are located between the Los Angeles-South Coast Air Basin, CA nonattainment area to the north and the San Diego County, CA nonattainment area to the south. Designating this area separately from adjacent non-tribal lands is consistent with prior ozone designations and the EPA's Tribal Designations Policy.

The EPA therefore is designating the main body of the Pechanga Band reservation and the Pu'eska Mountain parcel as "nonattainment" separate from the adjacent Los Angeles-South Coast Air Basin and the San Diego County nonattainment areas.

With respect to the Meadowbrook parcel, there is no on-site regulatory monitoring data. The non-contiguous Meadowbrook lands are 30 miles northwest of the main body of the Pechanga Band's jurisdictional area. The Meadowbrook lands are surrounded by the Los Angeles-South Coast Air Basin nonattainment area, which is under the air quality planning jurisdiction of the SCAQMD. For the Meadowbrook parcel, based on the five factors, especially the lack of on-site regulatory monitoring, the lack of sources, the geographic separation, and the small size of the area, the EPA is designating the non-contiguous Meadowbrook lands under the Pechanga Band's jurisdiction as "nonattainment" as part of the South Coast Air Basin nonattainment area and not part of the Pechanga Band nonattainment area. This is consistent with how the Meadowbrook lands are designated for the 1997 and 2008 ozone NAAQS.