

Technical Support Document for 2008 Ozone NAAQS Designations

California Area Designations for the 2008 Ozone National Ambient Air Quality Standards

Technical Analysis for Nevada County (Western part)

Figure 1 is a map of the Nevada County (Western part), CA nonattainment area. The map provides other relevant information including the locations and design values of air quality monitors, county names and boundaries, and indicates EPA's nonattainment designation. Also shown is the boundary of the existing area that is designated nonattainment for the 1997 ozone NAAQS.

Nevada County (Western part), CA

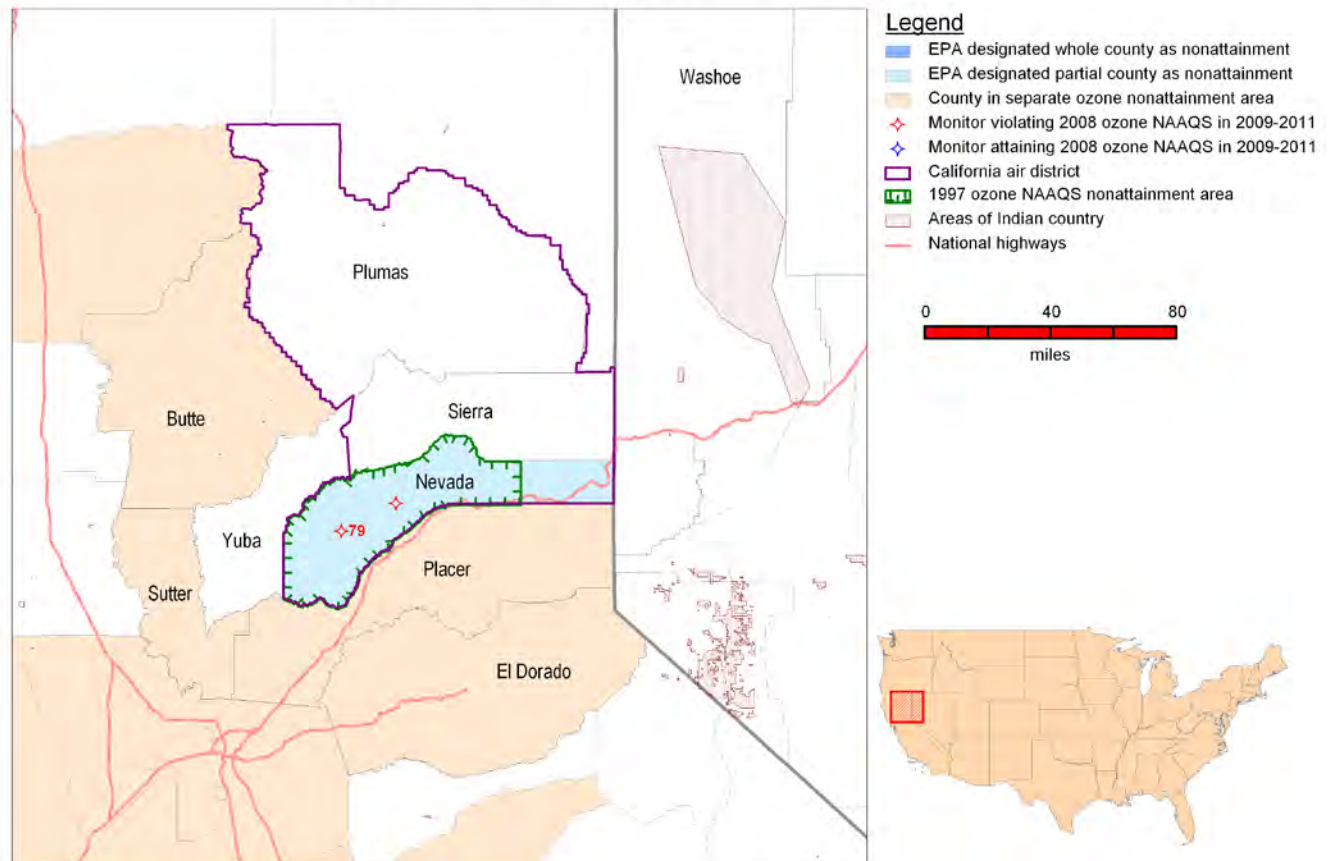


Figure 1

Note: The map shown in Figure 1 provides 8-hour ozone design values in parts per billion (ppb) based on data from 2009-2011 (i.e., the 2011 design value, or DV), which are the most recent years with fully-certified air quality data. For each particular area, Factor 1 and Appendix 3 describe the air quality data relevant for our nonattainment decisions.

For purposes of the 1997 8-hour ozone NAAQS, this area was designated nonattainment. The boundary for the nonattainment area for the 1997 ozone NAAQS included the same western portion of Nevada County.

In March 2009, California recommended that the same partial-county area be designated as “nonattainment” for the 2008 ozone NAAQS based on air quality data from 2006-2008 (letter from James Goldstene, Executive Officer, California Air Resources Board, to Laura Yoshii, Acting Regional Administrator, U.S. EPA Region IX, dated March 11, 2009). California provided an update to the original recommendation in October 2011 based on air quality data from 2008-2010 and preliminary 2009-2011 data, and indicating to EPA that it intended to early-certify data for 2011 so that it could be used for the final designations, but did not change its recommendation for Nevada County. These 2009 and 2011 recommendations are based on data from Federal Equivalent Method (FEM) monitors sited and operated in accordance with 40 CFR Part 58 (letter from Lynn Terry, Deputy Executive Officer, California Air Resources Board, to Deborah Jordan, Director, U.S. EPA Region IX Air Division, dated October 12, 2011).

After considering these recommendations and based on EPA's technical analysis described below, EPA is designating western Nevada County, California (identified in Table 1 below) nonattainment for the 2008 ozone NAAQS.

Table 1. State's Recommended and EPA's 2008 ozone NAAQS Nonattainment Counties or Areas of Indian country for Nevada County (Western part).

Nevada County (Western part)	State-Recommended Nonattainment Counties or Areas of Indian country	EPA's Nonattainment Counties or Areas of Indian country
Nevada County, CA	Nevada County (p)	Nevada County (p)
No areas of Indian country in nonattainment area		

p = partial

Factor Assessment

Factor 1: Air Quality Data

For this factor, we considered 8-hour ozone design values for air quality monitors in counties in the existing Nevada County nonattainment area, based on data from the most recent three-year period for which we had timely submitted certified air quality data. Northern Sierra Air Quality Management District (AQMD) and California Air Resources Board (ARB) submitted certified air quality data for 2011 before February 29, 2012 for this area; thus, for purposes of the final designations, we are considering air quality from the 2009-2011 period (i.e., the 2011 DV) for this area. A monitor's DV is the metric or statistic that indicates whether that monitor attains a specified air quality standard. The 2008 ozone NAAQS are met at a monitor when the annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years, is 0.075 parts per million (ppm) (75 parts per billion (ppb)) or less. A DV is only valid if minimum data completeness criteria are met. See 40 CFR part 50 Appendix P. Where several monitors are located in a county (or a designated nonattainment area or maintenance area), the DV for the county or area is determined by the monitor with the highest level.

[Note: Monitors that are eligible for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are sited in accordance with 40 CFR Part 58, Appendix D (Section 4.1) and operating with a federal reference method (FRM) or federal equivalent method (FEM) monitor

that meets the requirements of 40 CFR part 58, Appendix A. All data from a special purpose monitor (SPM) using an FRM or FEM which has operated for more than 24 months is eligible for comparison to the NAAQS unless the monitoring agency demonstrates that the data came from a particular period during which the requirements of Appendix A (quality assurance requirements) or Appendix E (probe and monitoring path siting criteria) were not met.]

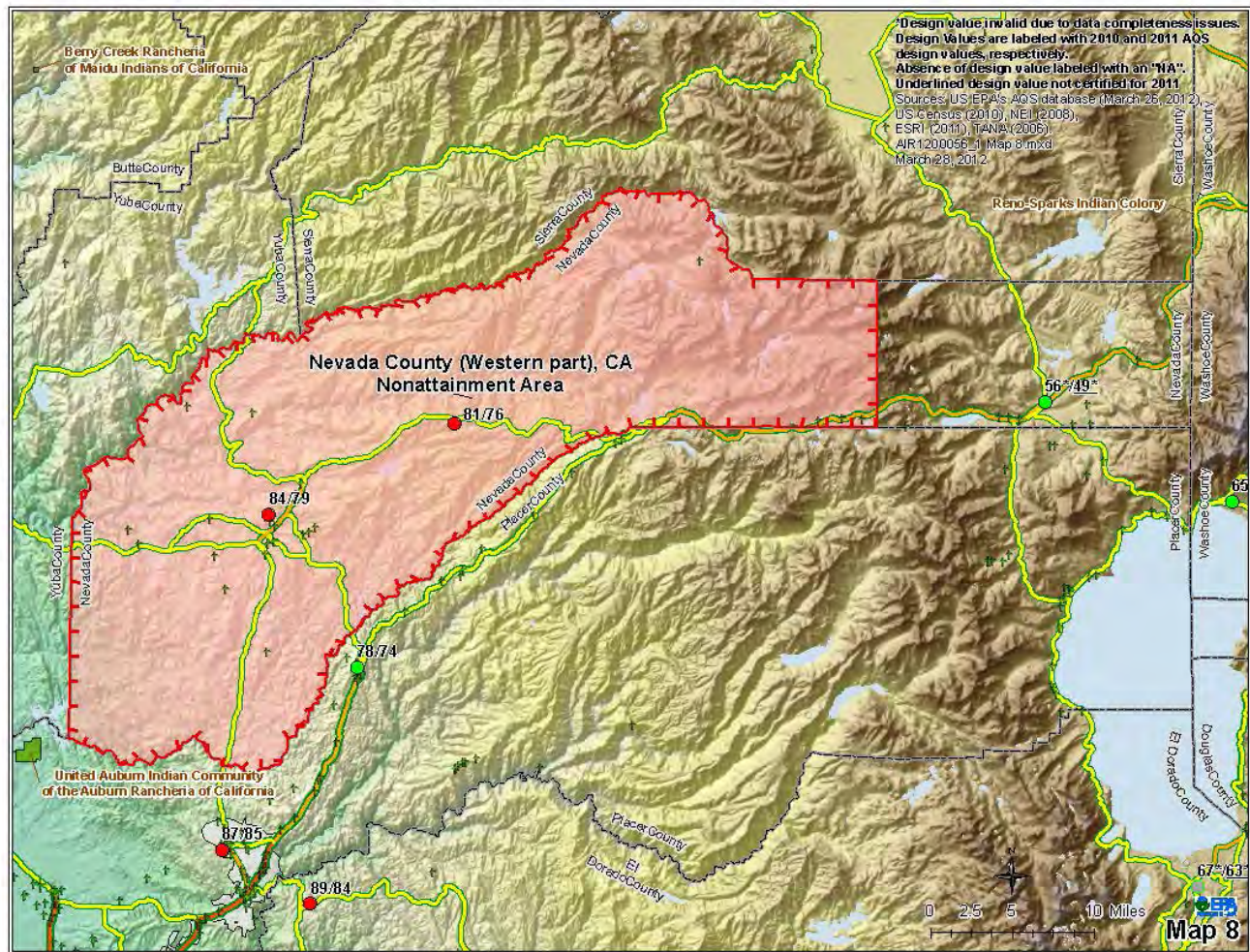
Certified, quality assured data are available in EPA’s Air Quality System (AQS) for all areas through calendar year 2010. California’s ozone season encompasses the entire year, but some ozone monitors in the Nevada County nonattainment area have been approved to operate on a seasonal schedule per 40 CFR part 58, Appendix D, section 4.1(i). Preliminary, non-certified data from calendar year 2011 is available in AQS for most areas. States are required to certify data by May 1st of the following year. Northern Sierra AQMD and ARB certified 2011 data by February 29, 2012 for Nevada County. EPA’s designation for this area is therefore based on 2009-2011 data. As shown in Table 2, air quality data from 2009-2011 data indicate that Nevada County is violating the 2008 ozone NAAQS. Nevada County’s 2010 DV was 84 ppb. Ozone monitors relevant for comparison to the NAAQS and information from additional data sources within the existing Nevada County nonattainment area are shown in Appendix 1, Map 8 (also inserted below).

Table 2. Air Quality Data.

County	State Recommended Nonattainment?	2009-2011 Design Value (ppb)
Nevada, CA	Yes (partial)	79

Maps contained in Appendix 1 show the geographic distribution of monitors. For each monitor, Appendix 1 lists the monitor, the 2008-2010 DV (certified and quality assured in AQS. These were the most recent data available at the time we notified the State of our intended designation) and the 2009-2011 DV (which has been certified and which we are relying on for our final designation decisions for this area). Absence of a DV is symbolized with an “x”.

Appendix 3 lists 2009-2011 DVs for Nevada County. Monitors shown in bold are the DV monitors (i.e., the monitor with the highest DV) for each individual county. Monitors shown in red font are the DV monitor for the nonattainment area. Values with an asterisk do not meet data completeness, and therefore those DVs are not relevant for comparison to the NAAQS and are solely provided for informational purposes.



From Appendix 1, Map 8: For map legend describing monitors, emissions, traffic, population, and boundaries, see Appendix 1

Monitors in the existing Nevada County nonattainment area (which includes the western part of Nevada County) show a violation of the 2008 8-hour ozone standard based on 2009-2011 data. Therefore, this area is included in the Nevada County (Western part) nonattainment area.

Factor 2: Emissions and Emissions-Related Data

EPA evaluated emissions of ozone precursors, 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

EPA evaluated county-level emission data for NO_x and VOC derived from the 2008 National Emissions Inventory (NEI), version 1.5. This is the most recently available NEI. (See <http://www.epa.gov/ttn/chief/net/2008inventory.html>.) Emissions in a nearby area indicate the potential for the area to contribute to observed violations. Table 3 shows emissions of NO_x and VOC (given in tons per year) for Nevada County.

Table 3. Total 2008 NO_x and VOC Emissions.

County	State Recommended Nonattainment?	NO _x (tpy)	VOC (tpy)
Nevada County, CA	Yes (partial)	3,761	4,626
Areawide:		3,761	4,626

Nevada County has a low level of ozone precursor emissions relative to the larger Sacramento Metro area to the south-southwest. EPA is designating the Sacramento Metro area as a separate nonattainment for the 2008 ozone NAAQS.

Population density and degree of urbanization

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 ozone-creating emissions from on-road and off-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, which contribute to ozone formation. Rapid population or vehicle miles traveled (VMT) growth (see below) in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that it may be appropriate to include the area associated with area source and mobile source emissions as part of the nonattainment area. Table 4 shows the population, population density, and population growth information for Nevada County.

Table 4. Population and Growth.

County	State Recommended Nonattainment?	2010 Population	2010 Population Density (1000 pop/sq mi)	Absolute change in population (2000-2010)	Population % change (2000-2010)
Nevada County, CA	Yes (partial)	136,484	0.17	11,946	+10%
Areawide:		136,484	0.17	11,946	+10%

Sources: U.S. Census Bureau population estimates for 2010 as of August 4, 2011

(http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_PL_GCTPL2.STO5&prodType=table)

Maps 8 and 8a in Appendices 1 and 2, respectively show population for this area. Nevada County has experienced growth, yet overall it has a small population relative to the rest of the Sacramento Metro area, to the south-southwest.

Traffic (VMT) data

EPA evaluated the commuting patterns of residents in the area, as well as the total VMT for each county. In combination with the population/population density data and the location of main transportation arteries (see above), this information helps identify the probable location of non-point source emissions. A county with high VMT indicates the presence of motor vehicle emissions that may contribute to ozone formation and nonattainment in the area. Rapid population or VMT growth in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. Table 5 shows total 2008 VMT for Nevada County.

Table 5. Traffic (VMT) data.

County	State Recommended Nonattainment?	2008 VMT* (million miles)
Nevada, CA	Yes (partial)	1,374
Areawide:		1,374

* MOBILE model VMTs are those inputs into the NEI version 1.5.

Map 8 in Appendix 1 shows that annual average daily non-truck traffic in Nevada County is light (less than 25,000 non-truck vehicles per day), with a five-mile stretch of roadway that experiences comparatively heavier traffic (25,000 - 50,000 non-truck vehicles per day).

Factor 3: Meteorology (weather/transport patterns)

EPA evaluated available meteorological data to help determine how meteorological conditions, such as weather, transport patterns and stagnation conditions, would affect the fate and transport of precursor emissions contributing to ozone formation.

Previous assessments of pollution transport found that the broader Sacramento area (roughly equivalent to the non-mountainous portions of the Sacramento Metropolitan ozone nonattainment area) can have an overwhelming impact on counties of the Mountain Counties Air Basin, including Nevada County.¹

The Nevada County air flow is most frequently from the south-southwest according to the 30-year average direction frequencies computed by EPA, as shown in the “radar”-style wind rose diagram below (Figure 2). This is consistent with the orientation of the river valleys and ridges in Nevada County, and with the shape of the western portion of the county itself. See Map 8, Appendix 1.

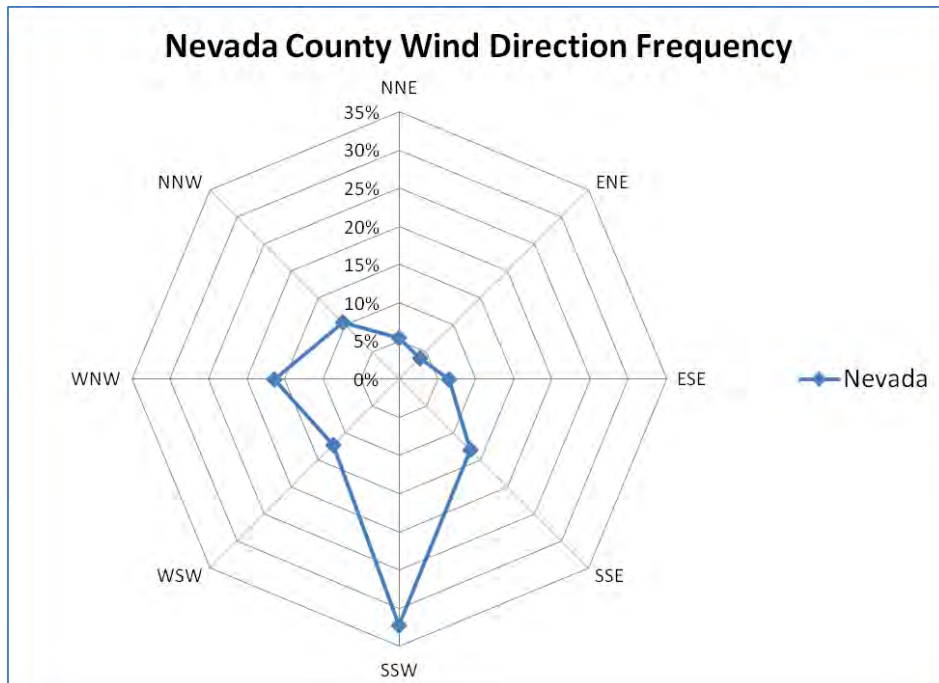


Figure 2

¹ “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 western portion of the county is likely also subject to the meteorology conditions of, and flow from, the neighboring Sacramento Valley to the south-southwest, such as from the Sacramento Metro area. See Map 10, Appendix 1. However, even at its western end the county is within the foothills of the Sierra Nevada mountain range, rather than in the flats of Sacramento Valley, and on the whole the county is more rural and largely mountainous. In contrast to the Sacramento Valley, it is more dominated by upslope and downslope flows of the strongly sloped landscape, as well as enhanced dispersion due to turbulence in the rough terrain. The eastern portion of the county is not expected to be subject to conditions in or transport from the Sacramento Valley, since it is on the eastern side of the crest of the Sierra Nevada mountain range (4,200 meters or 14,000 feet high).

Factor 4: Geography/topography (mountain ranges or other air basin boundaries)

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

Nevada County is in the north central portion of the “Mountain Counties Air Basin” as defined by California Air Resources Board (ARB)². 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 their better air quality, more pronounced topography, and rural character as compared to the more polluted, flatter, and more populous areas to the west--the broad Sacramento and San Joaquin valleys of central California. Nevada County is in the foothills and mountains proper of the Sierra Nevada mountain range. Elevations increase from roughly 300 feet above mean sea level (MSL) in the west to over 1,400 feet in the east, at the Sierra crest (100 meters to over 4,200 meters).

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 allow east-west upslope and downslope flow. The eastern portion of the county would not be expected to be influenced 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 (14,000 feet or 4,200 meters high).

Factor 5: Jurisdictional boundaries

For each potential nonattainment area, we considered existing jurisdictional boundaries to provide a clearly defined legal boundary and to help identify the areas appropriate for carrying out the air quality planning and enforcement functions for nonattainment areas. Examples of jurisdictional boundaries include existing/prior nonattainment area boundaries for ozone or other urban-scale pollutants, county lines, air district boundaries, township boundaries, areas covered by a metropolitan planning organization, state lines, areas of Indian country, and urban growth boundaries. Where existing jurisdictional boundaries were not adequate or appropriate to describe the nonattainment area, other clearly defined and permanent landmarks or geographic coordinates were considered.

The Nevada County (Western part) area has previously established nonattainment boundaries associated with the 1997 8-hour ozone NAAQS. The state has recommended the same boundary for the 2008 ozone NAAQS. 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

² <http://www.arb.ca.gov/ei/maps/statemap/abmap.htm>

the Lake Tahoe watershed and the watersheds to the west. The entire county is under the air quality management jurisdiction of the Northern Sierra AQMD, along with Plumas and Sierra Counties to the north of Nevada County. Nevada County is a micropolitan statistical area within the Sacramento–Arden-Arcade–Yuba City Combined Statistical Area or CSA.

Nevada County is not part of the Sacramento Area Council of Governments (SACOG) transportation planning agency and MPO (metropolitan planning organization) that has jurisdiction within the Sacramento Metro area. As such, Nevada County is in a different regulatory regime with respect to transportation planning. The county does not have its own MPO. This fact formed part of the basis for EPA accepting the state’s request to exclude the west Nevada County area from the Sacramento Metro area in our designations for the 1997 ozone NAAQS. We believe this jurisdictional difference is still relevant to our current ozone designations for the Sacramento Metro and Nevada County (Western part) nonattainment areas.

Conclusion

Based on the assessment of factors described above, EPA is designating the western part of Nevada County as the Nevada County (Western part), CA nonattainment area because it is violating the 2008 ozone NAAQS.

The Clean Air Act requires EPA to designate any area as nonattainment if it violates a NAAQS or if it contributes to a violation in a nearby area. Air quality data (Factor 1) show that monitors in the western part of Nevada County show a violation of the 2008 8-hour ozone standard based on 2009-2011 data. Therefore, Factor 1 supports designating the western part of Nevada County as “nonattainment.”

EPA’s review of emissions and emission related data (Factor 2), as well as meteorology and weather or transport patterns (Factor 3), and geography and topography (Factor 4), show a distinction between the western and eastern parts of the county in terms of sources of ozone precursor emissions as well as meteorology resulting from topography (Sierra Nevada mountain range).

In considering jurisdictional boundaries (Factor 5), EPA believes that although there is justification to include western Nevada County in the Sacramento Metro nonattainment area, based on the county’s inclusion in the Sacramento–Arden-Arcade–Yuba City CSA and the degree of economic interconnectedness indicated by such inclusion, we nonetheless believe that the state’s recommendation to make this area a separate nonattainment area is reasonable. All areas that are violating and any nearby contributing areas are being designated nonattainment.

Based on the preceding discussion, EPA concurs with the state’s recommendation and is designating Nevada County (Western part), CA nonattainment for the 2008 ozone NAAQS.