

NEVADA
Las Vegas Nonattainment Area
Intended 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 intent to designate Las Vegas in Nevada 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. The EPA must complete this process within two years of promulgating the NAAQS, unless the Administrator has insufficient information to make the initial designations decisions in that time frame. In such circumstances, the EPA may take up to one additional year to complete the designations.

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 September 22, 2016, Nevada recommended that portions of Clark County be designated nonattainment for the 2015 ozone NAAQS based on air quality data from 2013-2015.² Nevada also recommended that all areas in Washoe County be designated attainment based on data from 2013-2015 and the EPA's potential concurrence with exceptional event demonstrations that were under development. On May 30, 2017, the EPA concurred with exceptional events demonstrations submitted by the Washoe County Health District.³ The EPA's concurrence on these events brought Washoe County's 2014-2016 design value below the level of the 2015 ozone NAAQS. Accordingly, we intend to designate all of Washoe County, together with other areas in Nevada, attainment/unclassifiable for the 2015 ozone NAAQS.

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 intends to designate 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 David Emme, Administrator, Nevada Division of Environmental Protection to Alexis Strauss, Acting Regional Administrator, U.S. EPA Region 9, September 22, 2016.

³ Exceptional events demonstrations were submitted on November 11, 2016, March 17, 2017, and April 14, 2017, by the Washoe County Health District. These demonstrations document that six exceedances of the 2015 ozone NAAQS that occurred in 2015 and 2016 at the Reno3 monitoring station were caused by emissions from wildfires. The EPA reviewed these demonstrations according to the provisions in the Exceptional Events Rule (see 40 CFR 50.14 and 40 CFR 51.930) and communicated the EPA's concurrence on these exceptional events to the Washoe County Health District via letter on May 30, 2017. Documents related to this action, including the demonstrations, the EPA's concurrence letter, and the EPA's TSDs evaluating the demonstrations, are included in the docket to this action.

After considering these recommendations and based on the EPA’s technical analysis as described in this TSD, the EPA intends to designate the area 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 NAAQS in a nearby area. Detailed descriptions of the intended nonattainment boundaries for these areas are found in the supporting technical analysis in Section 3.

Table 1.1 Nevada State and Tribal Recommended Nonattainment Areas and the EPA’s Intended Designated Nonattainment Areas for the 2015 Ozone NAAQS.

Area	Nevada’s or Tribe’s Recommended Nonattainment Counties [or Areas of Indian Country]	EPA’s Intended Nonattainment Counties [or Areas of Indian Country]
Las Vegas, NV*	Clark County (partial)	Clark County (partial)
<ul style="list-style-type: none"> • Las Vegas Tribe of Paiute Indians 	<ul style="list-style-type: none"> • did not submit recommendation 	<ul style="list-style-type: none"> • Las Vegas Tribe of Paiute Indians

EPA modifications to state or tribal recommendations are shown in **bold**.

*Las Vegas is a multi-jurisdictional nonattainment area that include areas of Indian country of federally-recognized tribes. The areas of Indian country of each tribe that the EPA intends to designate as part of the nonattainment area are discussed in Section 3, Technical Analysis for Las Vegas, NV.

In its recommendation letter, Nevada recommended that the EPA designate as “unclassifiable/attainment” all other areas in the state of Nevada 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 designating the counties listed in Table 1.2 below as attainment/unclassifiable.⁴ At this time, with the exception of the modifications to State recommendations for partial counties identified in Table 1.1, the EPA does not intend to modify Nevada’s recommendation and the EPA intends to designate the remainder of Nevada areas not listed in Table 1.1 or Table 1.2 as attainment/unclassifiable based on Nevada’s recommendation; ambient monitoring data collected during the 2014-2016 period, where available, showing compliance with the 2015 ozone NAAQS; and, the EPA’s assessment that these areas are not contributing to a violation in a nearby area.⁵ EPA explains in section 2.0 the approach it is now taking to designate the remaining areas in the State.

⁴ See Federal Register, vol. 82, p. 54232.

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.

Table 1.2 Nevada Counties Designated on November 16, 2017.

County	Designation
Churchill County	Attainment/Unclassifiable
Elko County	Attainment/Unclassifiable
Esmeralda County	Attainment/Unclassifiable
Eureka County	Attainment/Unclassifiable
Humboldt County	Attainment/Unclassifiable
Lander County	Attainment/Unclassifiable
Lyon County	Attainment/Unclassifiable
Mineral County	Attainment/Unclassifiable
Pershing County	Attainment/Unclassifiable
Storey County	Attainment/Unclassifiable
White Pine County	Attainment/Unclassifiable

The EPA will designate 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 Intended Boundary Determination

The EPA evaluated and determined the intended 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 intends to designate 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 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

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>

⁸ The EPA issued guidance on February 25, 2016 that identified important factors that the EPA intends to evaluate 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>

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, the EPA issued attainment/unclassifiable designations for approximately 85% of the United States and one unclassifiable area designation. At that time, consistent with statements in the designations guidance regarding the scope of the area the 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, the 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. 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 adjacent counties for which EPA previously deferred action. We intend to designate 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 “Intended Designations for Deferred Counties and Partial Counties Not Addressed in the Technical Analyses.” which is available in the docket. The EPA’s analytical approach is detailed in Table 2.1 below and further discussed in Sections 3 and 4 of this technical support document.

Table 2.1 Area of Analysis for Intended Nonattainment Areas in Nevada

Intended Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Las Vegas, NV	Clark County	Las Vegas-Henderson-Paradise, NV CBSA	Las Vegas-Henderson, NV-AZ CSA (partial)*

*Only the Las Vegas-Henderson-Paradise, NV CBSA portion of the Las Vegas-Henderson, NV-AZ CSA was included in the area of analysis. See Section 3 of this document for more information.

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.

Master Legend

Ozone monitoring site with 2014-2016 design value

-  No valid value
-  0 - 0.070 parts per million (ppm)
-  0.071 and above

National Emissions Inventory (NEI) 2014 v1

-  Large Point Sources (VOC or NOx >= 100 gross tons)
-  Small Point Sources

Hysplit

Elevation (Meters)

-  100
-  500
-  1,000



EPA's Intended Nonattainment Area Boundary



Federal American Indian Reservations and Off Reservation Lands



State Boundaries



County Boundaries



CSAs - Combined Statistical Areas



CBSAs - Metropolitan Statistical Areas



CBSAs - Micropolitan Statistical Areas

NAAAs-8 Hour Ozone (1997 NAAQS)



Maintenance (NAAQS revoked)



Nonattainment (NAAQS revoked)

NAAAs-8 Hour Ozone (2008 NAAQS)



Nonattainment



Maintenance

County Population (2010)



> 5,194,675 to 9,818,605



> 2,035,210 to 5,194,675



> 744,344 to 2,035,210



> 220,000 to 744,344



0 to 220,000

Census Tracts Population (2012)



0 to 2,825



> 2,825 to 4,481



> 4,481 to 6,373



> 6,373 to 10,145



> 10,145 to 39,143

Vehicle Miles Traveled - 2014



0 - 36,071,088



36,071,088.01 - 52,484,020



52,484,020.01 - 88,659,368



88,659,368.01 - 204,018,496



204,018,496.01 - 5,247,588,352

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

3.0 Technical Analysis for Las Vegas, NV

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 3.1 identifies the area of analysis for the Las Vegas intended nonattainment area. For the EPA's intended nonattainment boundary for Las Vegas, the area of analysis included all of Clark County, which has the same boundary as the Las Vegas-Henderson-Paradise Core Based Statistical Area (CBSA). Clark County is one of three counties in the Las Vegas-Henderson Combined Statistical Area (CSA), however the other two counties (Nye County, NV and Mohave County, AZ) were not included in the area of analysis because Clark County itself encompasses over 8,000 square miles with the major population, sources, and violating monitors located within or near the center of the county. In addition, the two other counties together comprise only approximately 10% of the total population of the CSA across a combined 31,000 square miles (Nye County is over 18,000 square miles, Mohave County is over 13,000 square miles) and have no violating monitors or major stationary sources. Clark County was therefore used as the area of analysis.

The intended nonattainment area is smaller than the existing 1997 Las Vegas maintenance area.

Table 3.1 Area of Analysis.

Intended Nonattainment Area	Area of Analysis	Associated CBSA	Associated CSA
Las Vegas, NV	Clark County	Las Vegas-Henderson-Paradise, NV	Las Vegas-Henderson, NV-AZ (partial)*

*Only the Las Vegas-Henderson-Paradise, NV CBSA portion of the Las Vegas-Henderson, NV-AZ 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

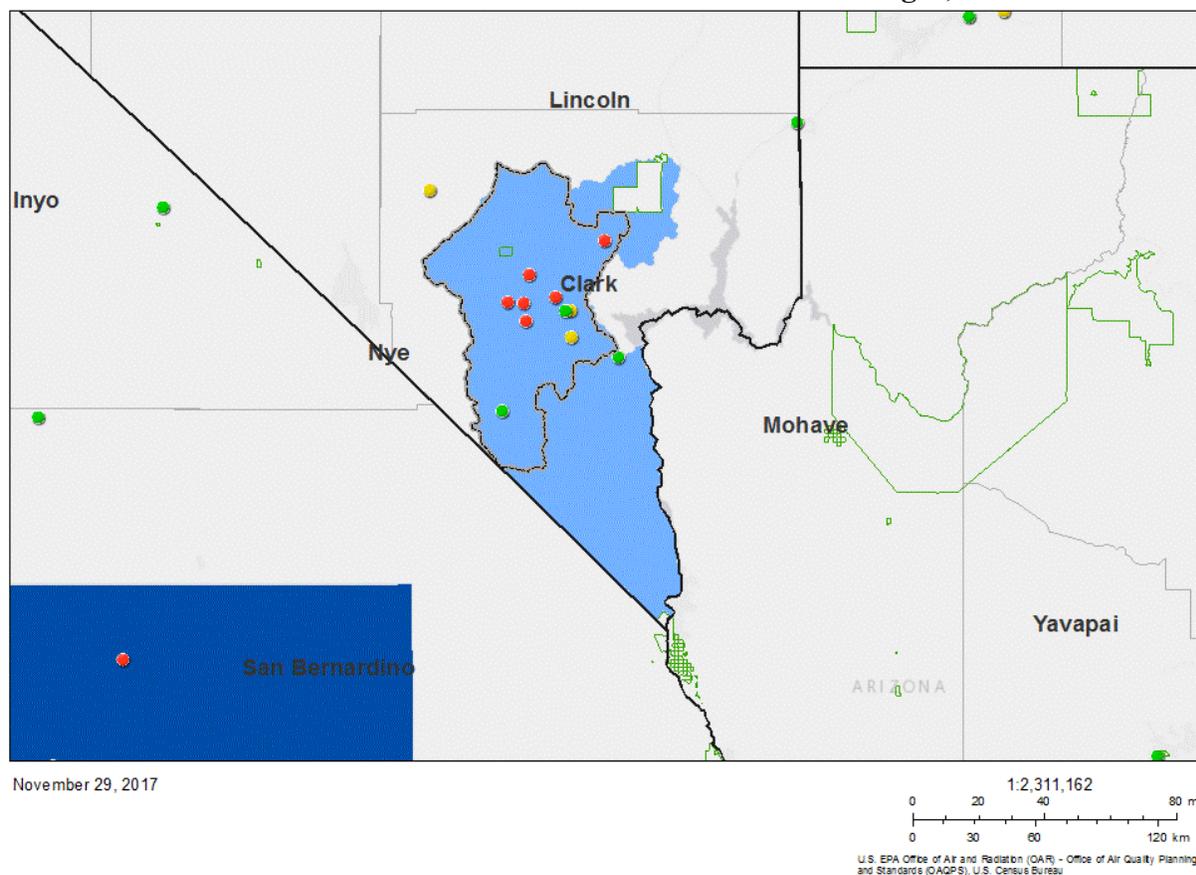
¹ The EPA's Ozone Designations Guidance and Data web page can be found at <https://www.epa.gov/ozone-designations/ozone-designations-guidance-and-data>.

5. Jurisdictional Boundaries (e.g., counties, air districts, existing nonattainment areas, areas of Indian country, Metropolitan Planning Organizations (MPOs)).

Figure 3.1 is a map of the EPA’s intended nonattainment boundary for the Las Vegas intended nonattainment area. The map shows the location of the ambient air quality monitors, county boundaries, tribal boundaries, and existing 1997 ozone NAAQS nonattainment boundaries.

For purposes of the 1997 ozone NAAQS, portions of Clark County were designated nonattainment. In 2013, the EPA approved the maintenance plan for and redesignated the Las Vegas, NV 1997 ozone NAAQS nonattainment area from nonattainment to maintenance. For purposes of the 2008 ozone NAAQS, the EPA designated the entire State of Nevada as unclassifiable/attainment. The Las Vegas area also includes areas of Indian country belonging to the Las Vegas Tribe of Paiute Indians (Las Vegas Paiute Tribe). The intended nonattainment area boundary for the 2015 ozone NAAQS is smaller than the corresponding boundary for the 1997 ozone NAAQS.

Figure 3.1 The EPA’s Intended Nonattainment Boundaries for Las Vegas, NV.



Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS), U.S. Census Bureau | Map Service: USEPA Office of Environmental Information (OEI), Data: USEPA Office of Environmental Information (OEI), U.S. Census Bureau | Source: U.S. Census Bureau | Web App Builder for ArcGIS

Figure 3.1 shows the EPA’s intended nonattainment boundary for Las Vegas, NV as a gray line with a dashed black center. Nonattainment areas 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 EPA must designate as nonattainment any area that violates the NAAQS and any nearby areas that contribute to the violation in the violating area. Clark County has monitors in violation of the 2015 ozone NAAQS, therefore portions of this county are included in the intended 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 Clark County, NV 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 Rule⁵ 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 parts of 2014 and 2015 in Clark County which cannot be used to determine a violation because it was discontinued within 24 months of start-up, but which the EPA considered in the context of the

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>.

proposed boundary for the Las Vegas area. This monitor (Logandale, AQS ID 32-003-7780) is located outside the intended Las Vegas nonattainment area approximately 40 miles northeast of the Las Vegas urban area, and approximately 28 miles northeast of the nearest violating regulatory monitor; it measured one exceedance of the 2015 ozone NAAQS in 2014 and one exceedance in 2015.

The 2014-2016 design values for counties in the area of analysis are shown in Table 3.2.

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

County, State	State Recommended Nonattainment?	AQS Site ID	2014-2016 DV	2014 4 th highest daily max value	2015 4 th highest daily max value	2016 4 th highest daily max value
Clark, NV	Yes (partial)	32-003-0022	0.072	0.076	0.072	0.068
		32-003-0023	0.062	0.065	0.065	0.058
		32-003-0043	0.073	0.077	0.073	0.071
		32-003-0071	0.071	0.074	0.068	0.073
		32-003-0073	0.073	0.077	0.072	0.072
		32-003-0075	0.075	0.079	0.071	0.077
		32-003-0298	N/A	N/A	0.070	0.068
		32-003-0538	N/A	0.068	N/A	N/A
		32-003-0540	0.070	0.073	0.069	0.069
		32-003-0601	0.067	0.073	0.068	0.062
		32-003-1019	0.070	0.074	0.071	0.066
		32-003-2002	0.073	0.075	0.073	0.073
		32-003-7772	N/A	N/A	0.070	0.068

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

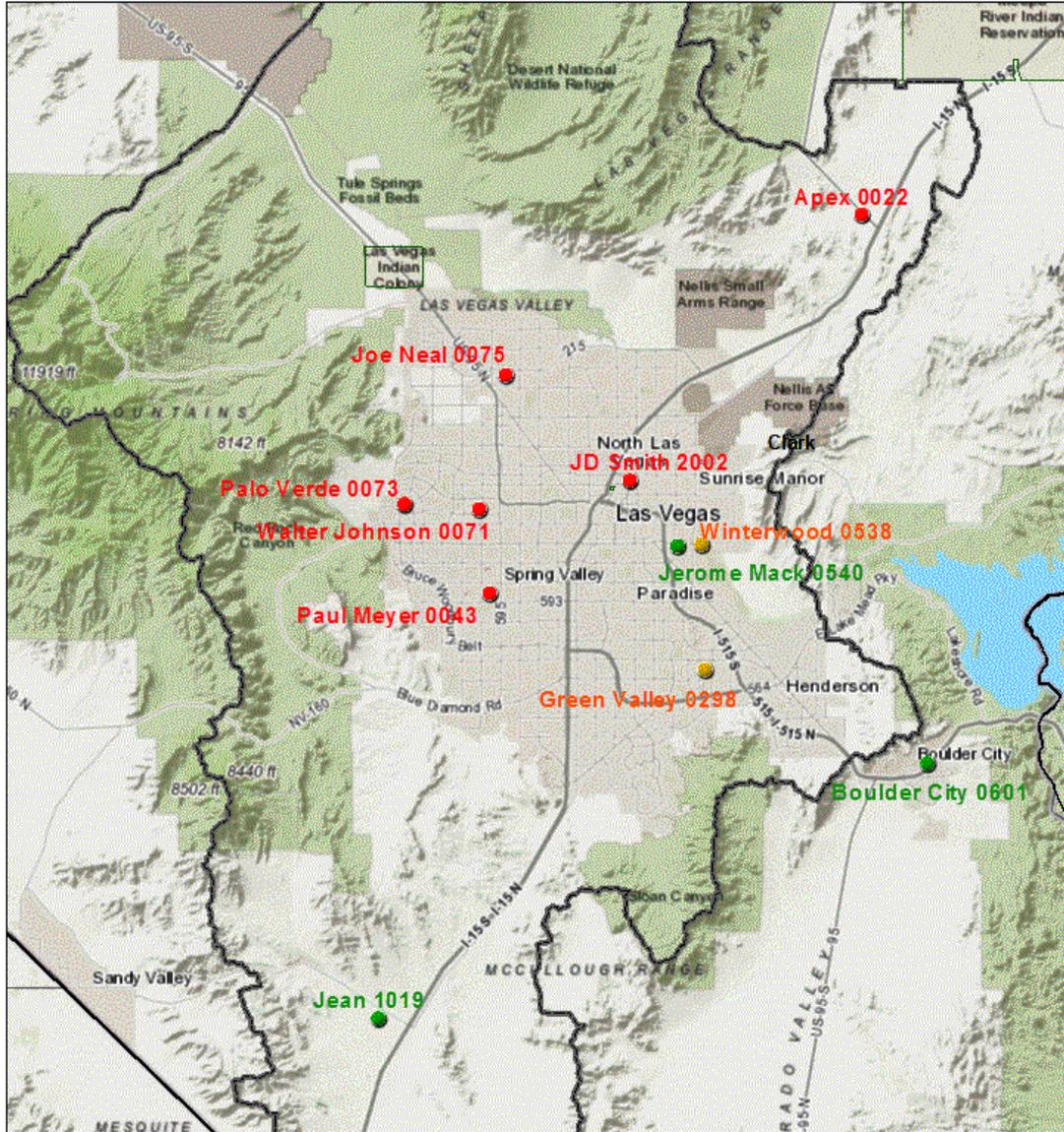
N/A means that the monitor did not meet the completeness criteria described in 40 CFR part 50 Appendix U, or no data exists for the county.

Clark County shows a violation of the 2015 ozone NAAQS, therefore portions of this county are included in the intended 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 Las Vegas intended nonattainment area and the violating monitors. Figure 3.1a provides a more detailed map of the ambient air quality monitor names and locations relative to the Las Vegas urban area.

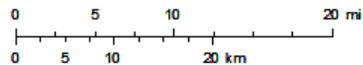
Table 3.2 identifies the design values for all monitors in the area of analysis. Figure 3.2 shows the historical trend of design values for the violating monitors. As indicated on the map, there are six violating monitors that are located in Clark County. The violating monitors are generally located within the western and northeastern portions of the Las Vegas urban area in Clark County, as well as to the northeast of the Las Vegas urban area, while monitors that are attaining the 2015 ozone NAAQS are located in the southeastern portion of the Las Vegas urban area and elsewhere in Clark County outside of the Las Vegas urban area. Regulatory and non-regulatory monitoring data available in the northeast and northwest portions of the county and the towns of Mesquite and Moapa Valley, including data from the Logandale non-regulatory SPM, are below the NAAQS or, when non-regulatory or incomplete, have low numbers of exceedances.

Figure 3.1a Las Vegas Valley Ozone Monitors.



November 30, 2017

1:577,791



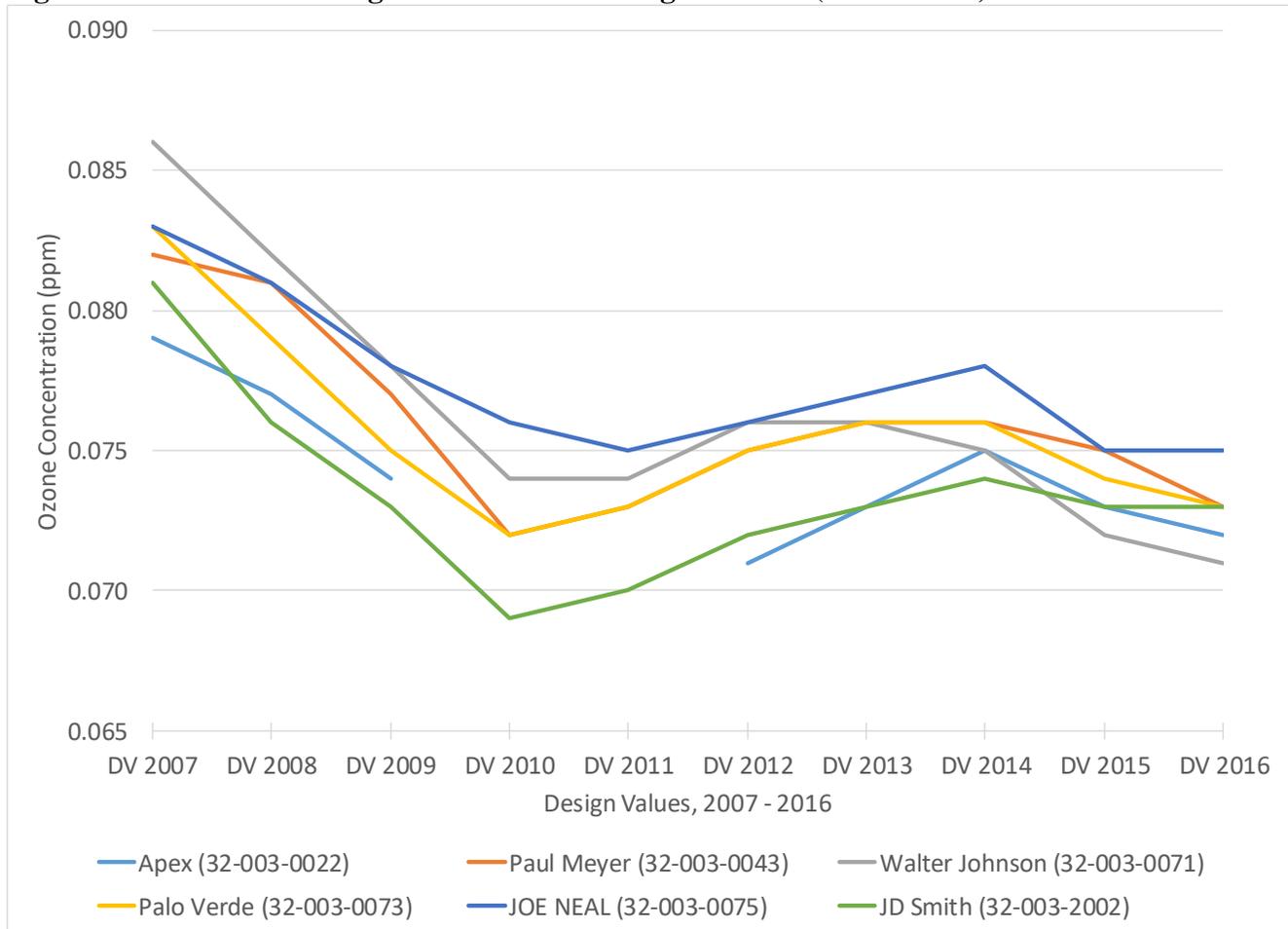
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeBCO, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
 U.S. EPA Office of Air and Radiation (OAR) - Office of Air Quality Planning

© USEPA Office of Environmental Information (OEI). Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS | Web App Builder for ArcGIS

Figure 3.1a shows the EPA’s intended nonattainment boundary for Las Vegas, NV 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; monitor names are followed by the last four-digits of their AQS ID numbers, all of which start with 32-003 (e.g. the JD Smith site has AQS ID 32-003-2002). Please refer to the master legend near the beginning of this document. The urbanized portion of Las Vegas is shown as the light gray area in the center of the figure, with gray lines representing the road network grid.

As shown in Figure 3.2, the trends for previous design values at violating monitoring sites located within the area of analysis have shown no clear trend in the past seven years, although concentrations trended down between 2007 and 2010.

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



Clark County has six monitoring sites showing a violation of the 2015 ozone NAAQS based on 2014-2016 data. These violating monitors are located within portions of Clark County that were included as part of the designated nonattainment area for the 1997 ozone NAAQS. The State’s recommended boundary for the 2015 ozone NAAQS did not include the violating Apex monitor (AQS ID 32-003-0022). Factor 1 supports including the locations of all of the violating monitors in Clark County, including the Apex monitor, within the EPA’s intended nonattainment boundary for Las Vegas.

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 intended Las Vegas 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)
Clark, NV	Yes (partial)	48,112	42,558
	Area wide:	48,112	42,558

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 3.3 below. The intended nonattainment boundary is also shown.

Figure 3.3 Large Point Sources in the Area of Analysis.

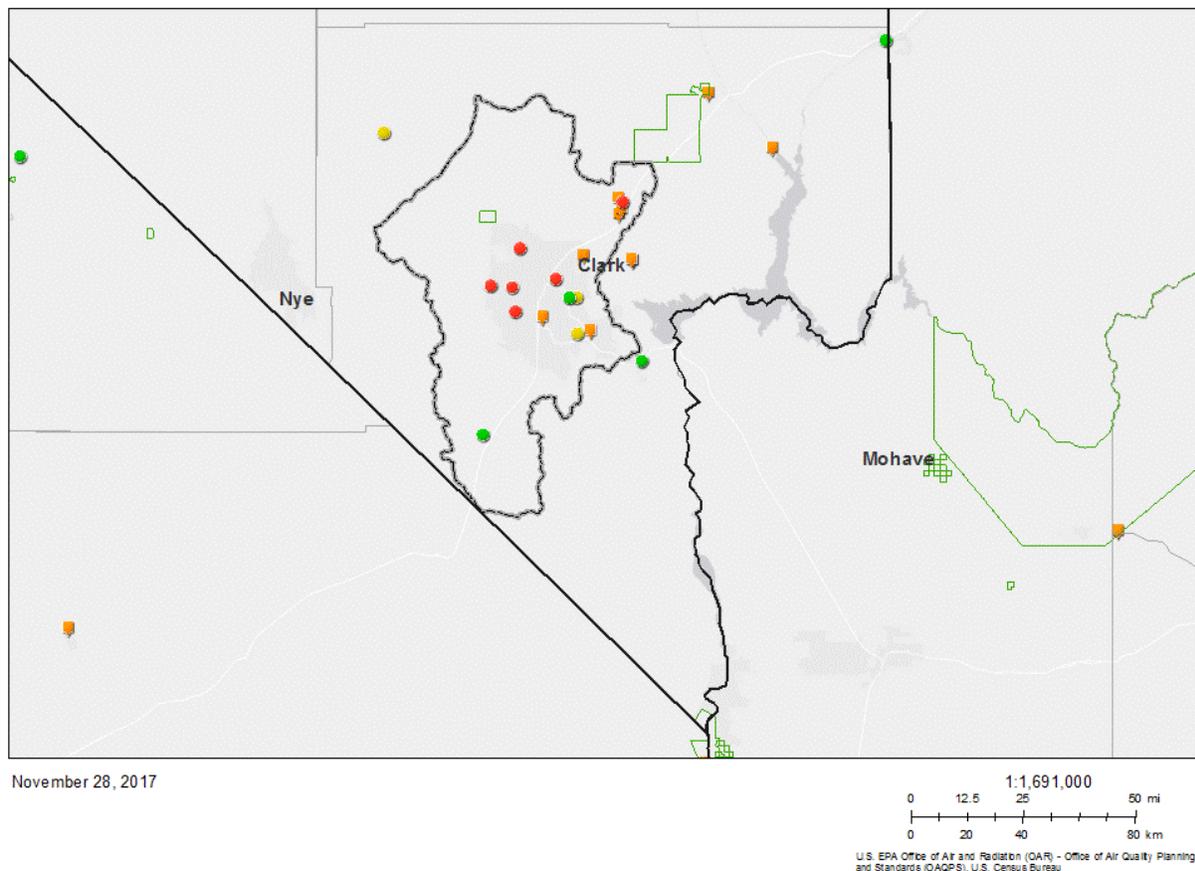


Figure 3.3 shows large point sources in the area of analysis for Las Vegas, NV as orange squares. The EPA’s intended nonattainment boundary for Las Vegas, NV is shown as a gray line with a dashed black center. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 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 Clark County has emission levels of 48,112 tpy of NO_x and 42,558 tpy of VOC, based on the 2014 NEI. Most of the large point sources of ozone precursors are located within the Las Vegas urban area in Clark County or to the northeast in the Apex Valley (Hydrographic Area 216). Some additional sources are located farther to the northeast. The largest of these sources, Reid Gardner Generating Station, is located approximately 24 miles to the northeast of the violating Apex monitor (AQS ID 32-003-0022). While it has the largest emissions of the sources located outside of the intended nonattainment area in the 2014 NEI, three of its four units were closed at the end of 2014 and the fourth unit was closed in 2017. 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.

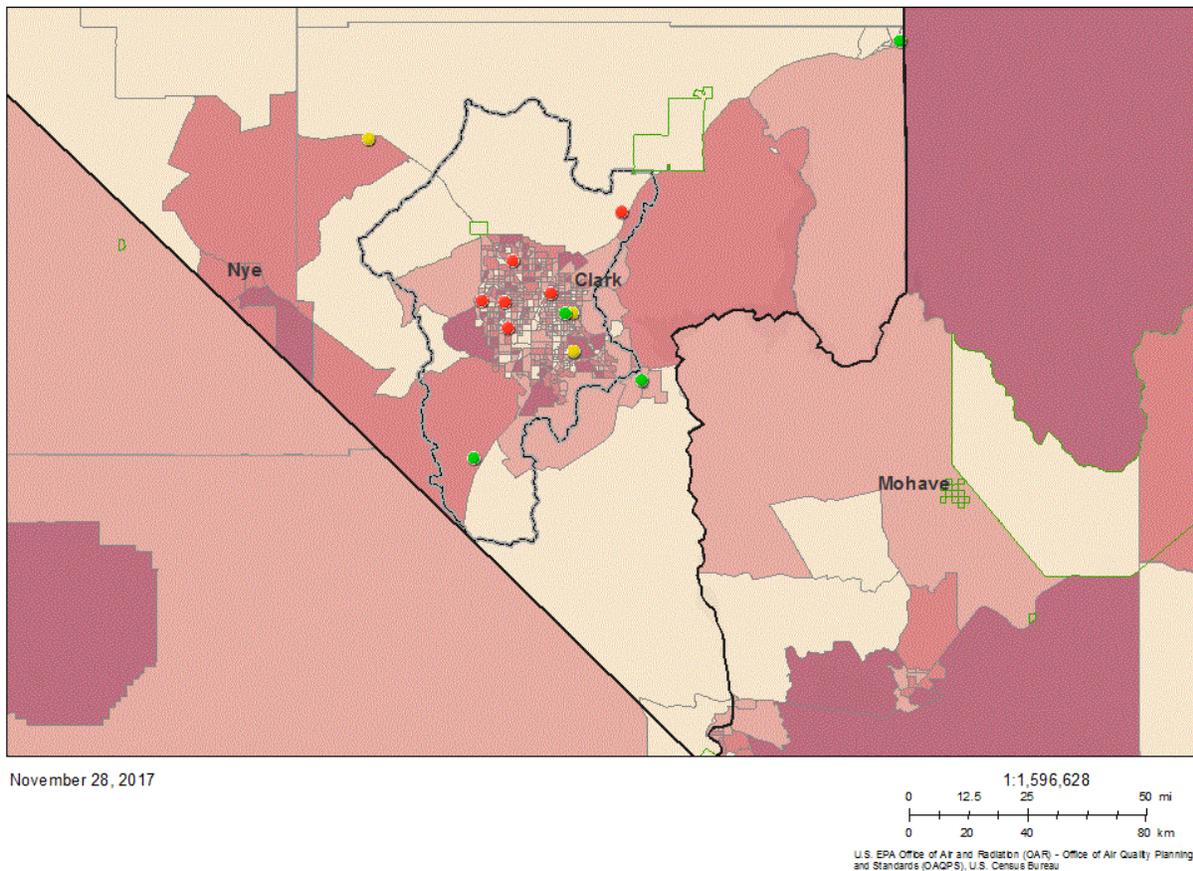
County, State	State Recommended Nonattainment?	2010 Population	2015 Population	2015 Population Density (per sq. mi.)	Absolute Change in Population (2010-2015)	Population % Change (2010-2015)
Clark, NV	Yes (partial)	1,951,269	2,114,801	268	163,532	8%
	Area wide:	1,951,269	2,114,801	268	163,532	8%

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 3.4 shows the 2012 census tract-level population information for Clark County. The census tracts in the figure show population, not population density, but some information about population density can be inferred by the relative size of the census tracts. The most densely populated area in Clark County is within the urban core of the Las Vegas urban area in the center of the county; this area is visible in the figure as the center of the county, where census tracts are much smaller than elsewhere in the county. This area also contains the census tracts with the highest population in the county. Census tracts to the east and west of the Las Vegas urban area cover much larger areas and have moderate total populations as compared to other census tracts in the county. Areas in the north and south of Clark County are generally sparsely populated, with census tracts covering a large area and with low total populations, as compared to other regions in the central, eastern, and western portions of the county. 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.

Figure 3.4 Census Tract-Level Population.



Office of Air and Radiation (OAR) - Office of Air Quality Planning and Standards (OAQPS), U.S. Census Bureau | Map Service: USEPA Office of Environmental Information (OEI), Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Web App Builder for ArcGIS

Figure 3.4 shows census tract population in the area of analysis for Las Vegas, NV. Lighter shades of red indicate areas with smaller populations; darker shades of red indicate areas with larger populations. The EPA's intended nonattainment boundary for Las Vegas, NV 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 Clark 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 3.5 are 2014 data.

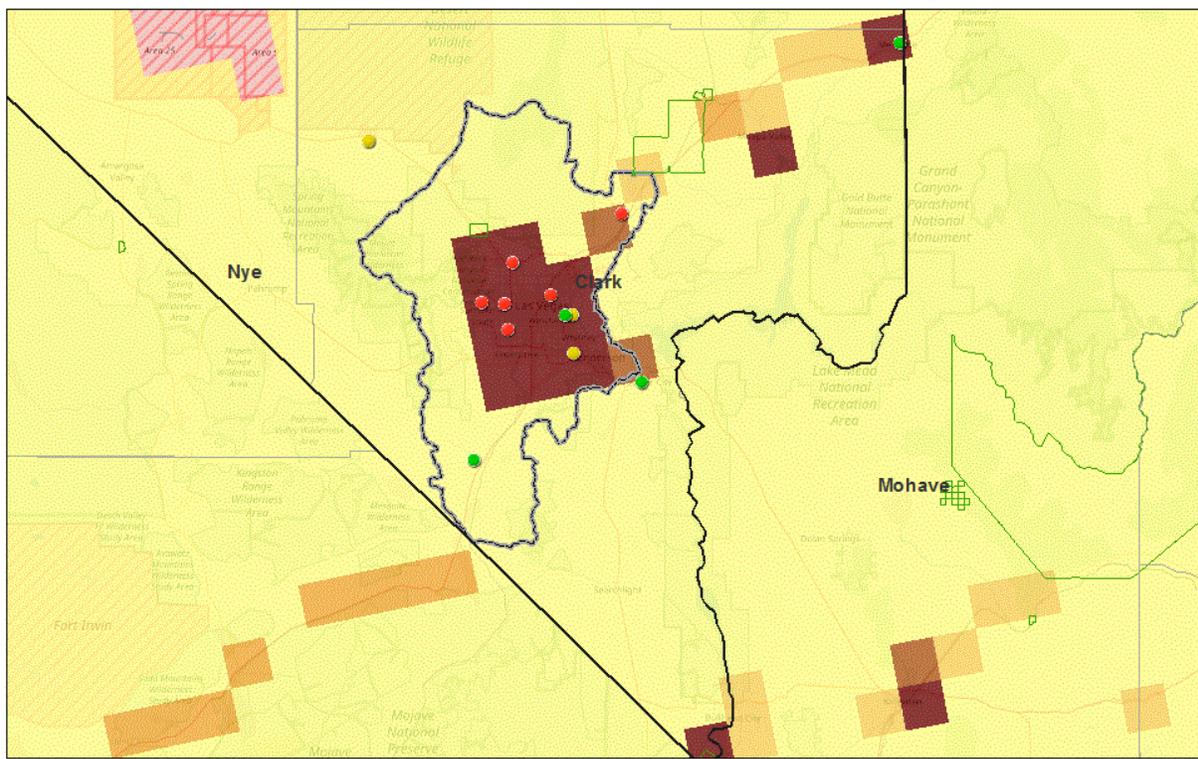
Table 3.5 Traffic and Commuting Patterns.

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
Clark, NV	Yes (partial)	17,414	859,408	821,500	95.6%
Area wide:		17,414	859,408	821,500	95.6%

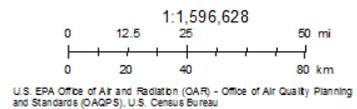
For state-recommended partial counties, the data provided are for the entire county.
 Counties with a monitor(s) violating the NAAQS are indicated in bold.

To show traffic and commuting patterns, Figure 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.



November 28, 2017



Planning and Standards (OAQPS), U.S. Census Bureau | Map Service: USEPA Office of Environmental Information (OEI). Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Map data © OpenStreetMap contributors, CC-BY-SA | Web AppBuilder for ArcGIS

Figure 3.5 shows gridded VMT in the area of analysis for Las Vegas, NV. Lighter shades of yellow indicate areas with lower VMT; darker shades of red indicate areas with higher VMT. The EPA’s intended nonattainment boundary for Las Vegas, NV 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.

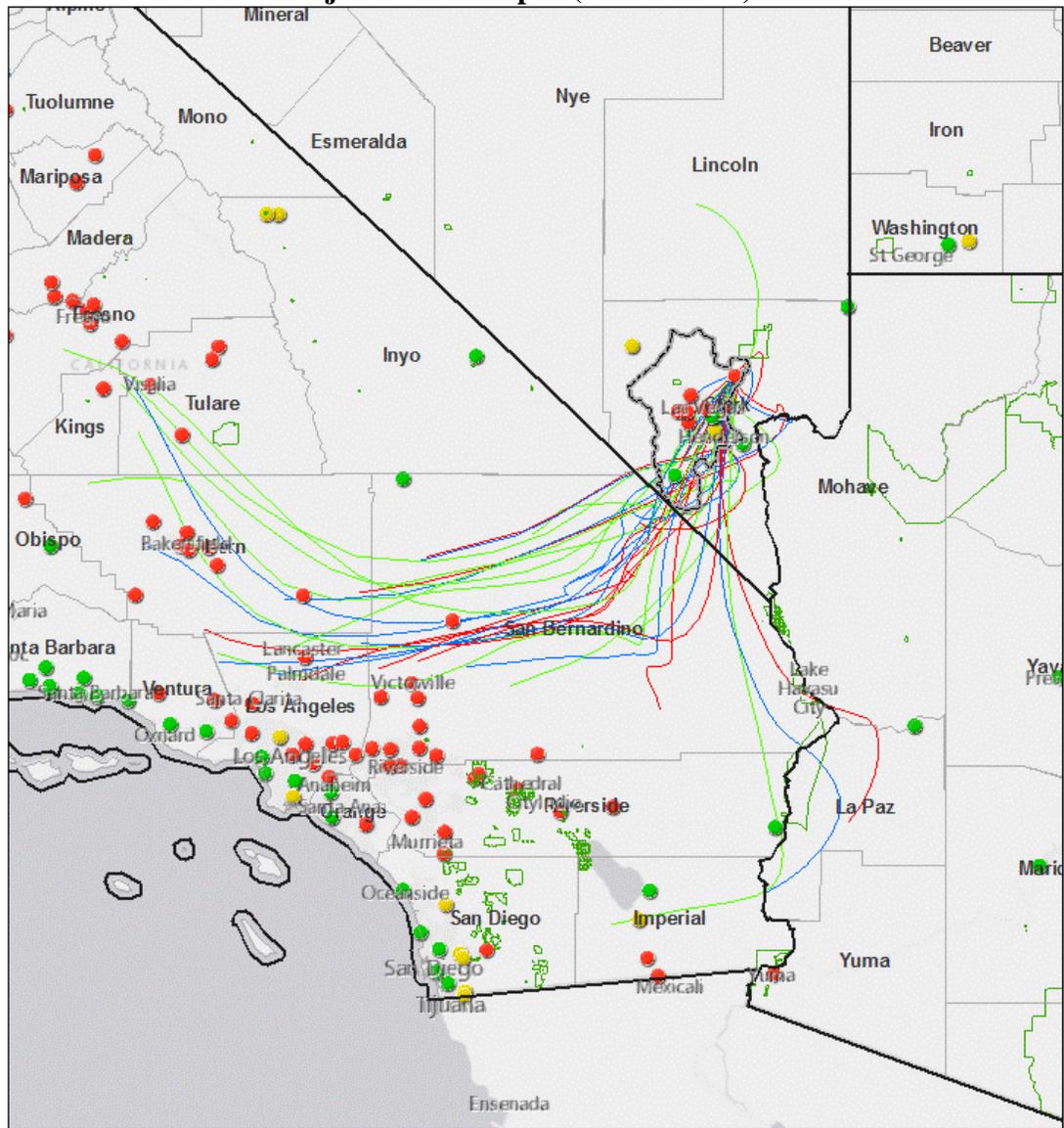
The EPA's analysis of traffic and commuting patterns is based on data from the VMT spreadsheet on the Ozone Designations webpage (see footnote 1) and On the Map data from the Census Bureau⁶ and shows that the Las Vegas urban area has the highest total VMT levels within the area of analysis. There is also relatively high VMT between the Las Vegas urban area and the area around the violating Apex monitor. The data also show that over 95 percent of residents who work in Clark County are commuting to or within the area of analysis. Some areas in the northeastern corner of the county contain isolated areas of high VMT relative to other areas in the county, located near Moapa Valley and Mesquite (visible as dark brown squares in Figure 3.5). The isolated nature of these areas of relatively high VMT suggest that this is primarily local traffic, not commuter traffic to the Las Vegas urban area. 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.

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 3.6a through 3.6f 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 each of the violating monitors.

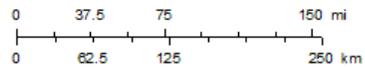
⁶ The Census Bureau's On The Map web page can be found at <https://onthemap.ces.census.gov/>

Figure 3.6a. HYSPLIT Back Trajectories for Apex (32-003-0022).



November 30, 2017

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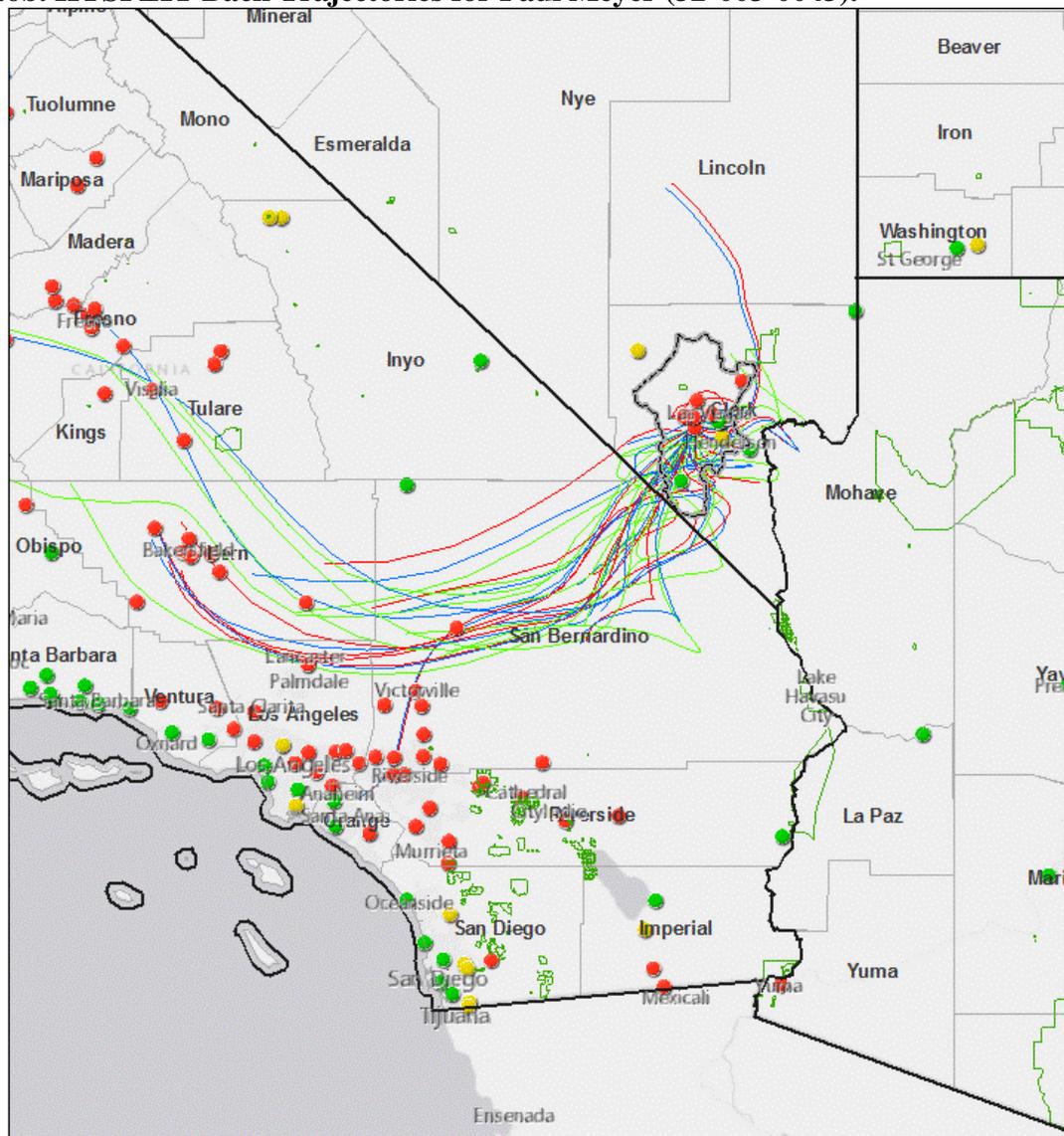
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EPA Office of Environmental Information (OEI). Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Esri, HERE, NPS | Esri, HERE, Garmin, NGA, USGS, NPS |

Web App Builder for ArcGIS

Figure 3.6a 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 intended nonattainment boundary for Las Vegas, NV 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 3.6b. HYSPLIT Back Trajectories for Paul Meyer (32-003-0043).



November 30, 2017

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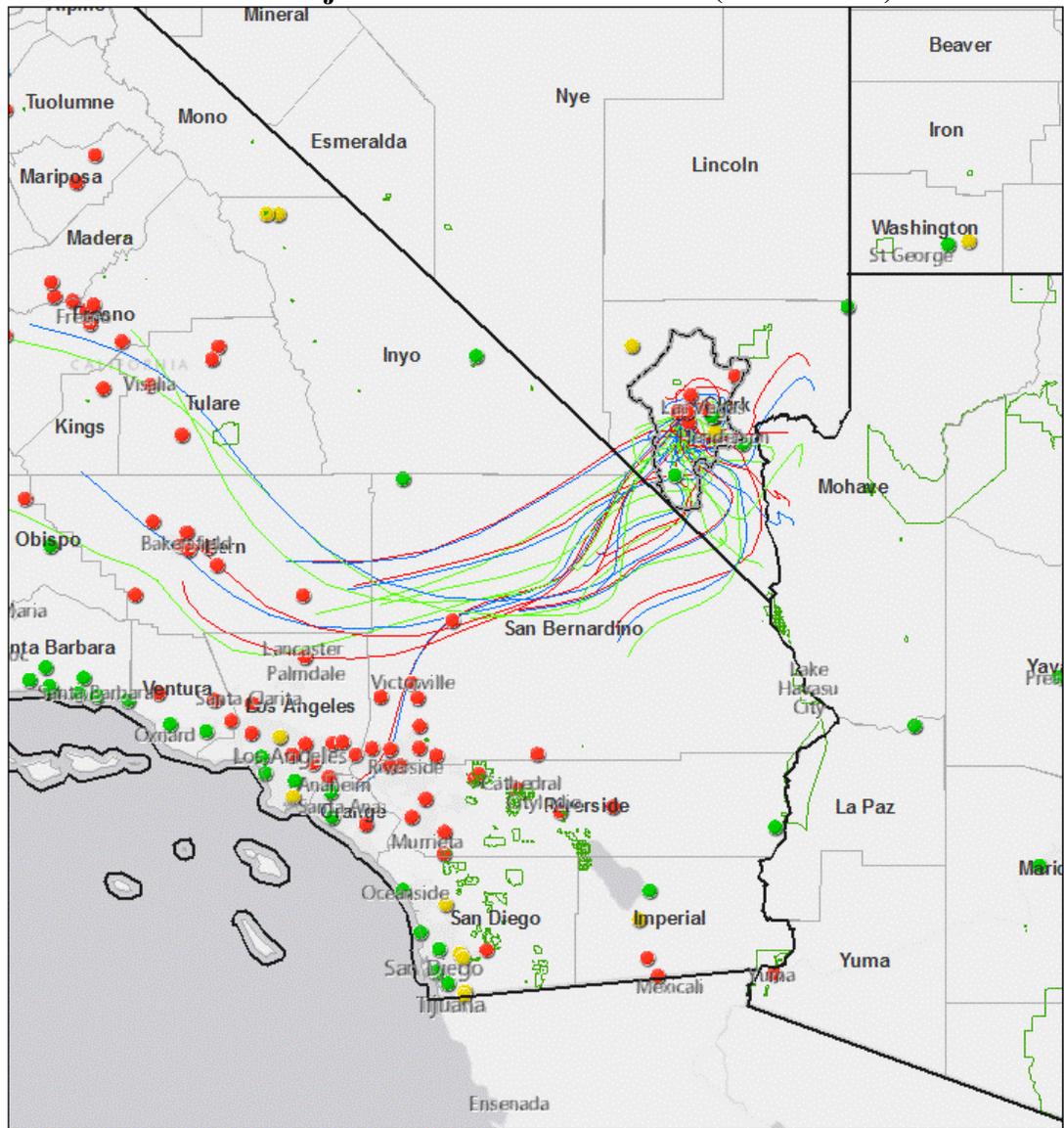
0 37.5 75 150 mi
0 62.5 125 250 km

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EPA Office of Environmental Information (OEI). Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Esri, HERE, NPS | Esri, HERE, Garmin, NGA, USGS, NPS |

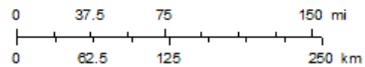
Figure 3.6b shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's intended nonattainment boundary for Las Vegas, NV is 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 3.6c. HYSPLIT Back Trajectories for Walter Johnson (32-003-0071).



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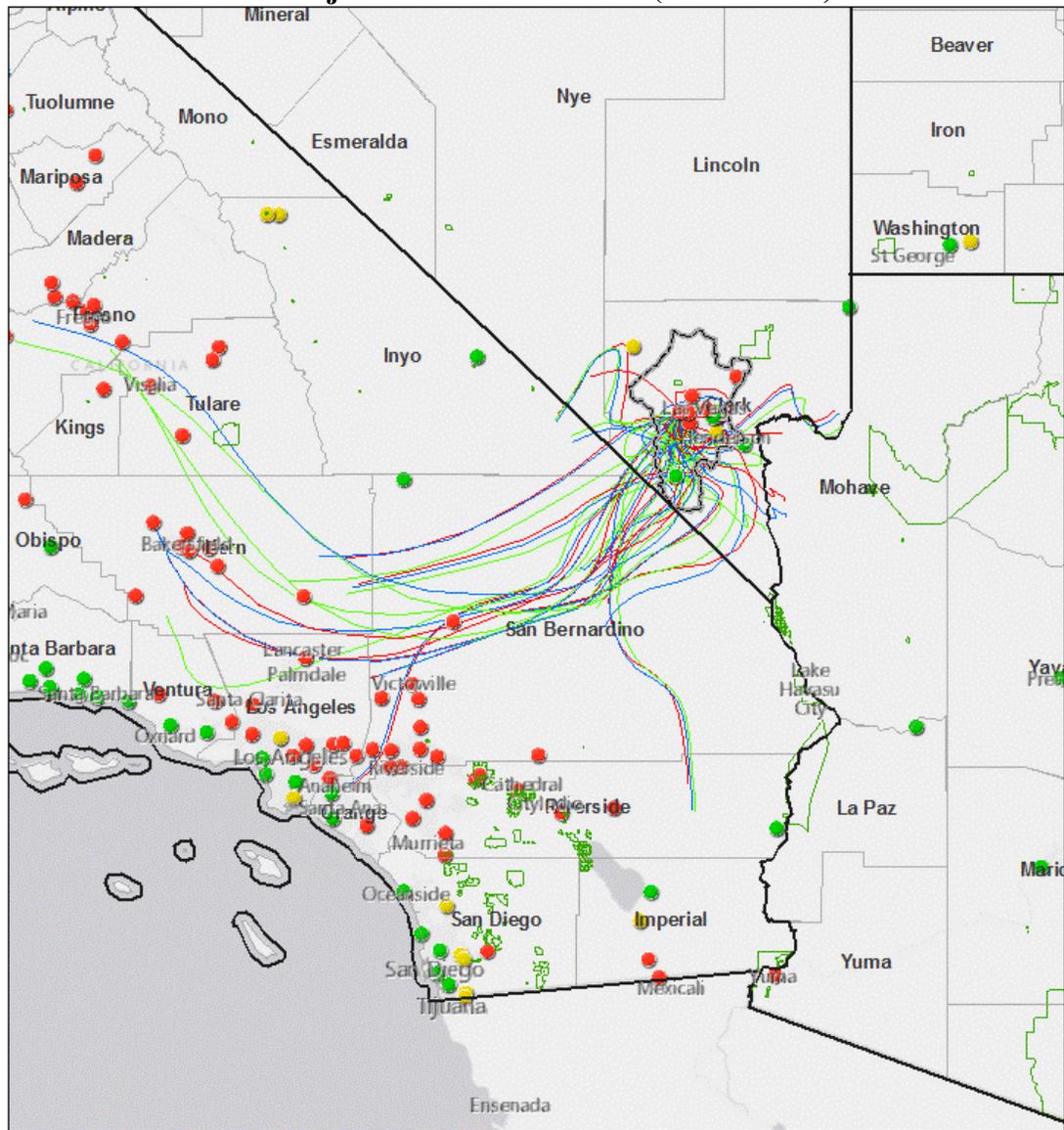
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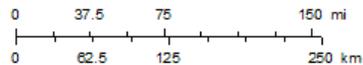
Figure 3.6c shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA's intended nonattainment boundary for Las Vegas, NV is 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 3.6d. HYSPLIT Back Trajectories for Palo Verde (32-003-0073).



November 30, 2017

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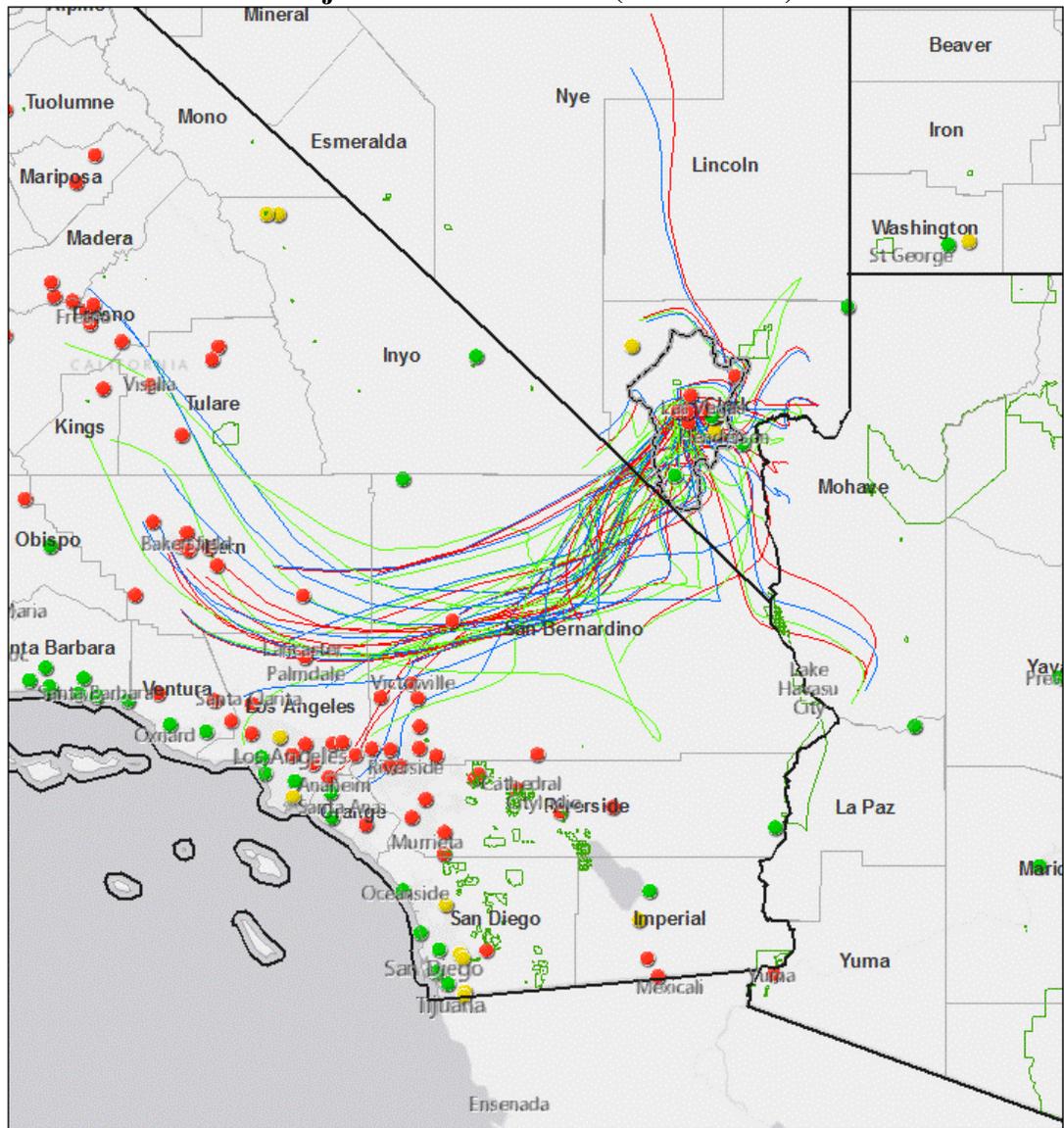


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 EPA Office of Environmental Information (OEI). Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Esri, HERE, NPS | Esri, HERE, Garmin, NGA, USGS, NPS |

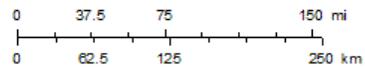
Figure 3.6d shows HYSPLIT back-trajectories starting at 100 (red lines), 500 (green lines), and 1000 (blue lines) meters above ground level, respectively. Trajectories extend back in time 24 hours from 6 p.m. on the day of the exceedance. The EPA’s intended nonattainment boundary for Las Vegas, NV is 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 3.6e. HYSPLIT Back Trajectories for Joe Neal (32-003-0075).



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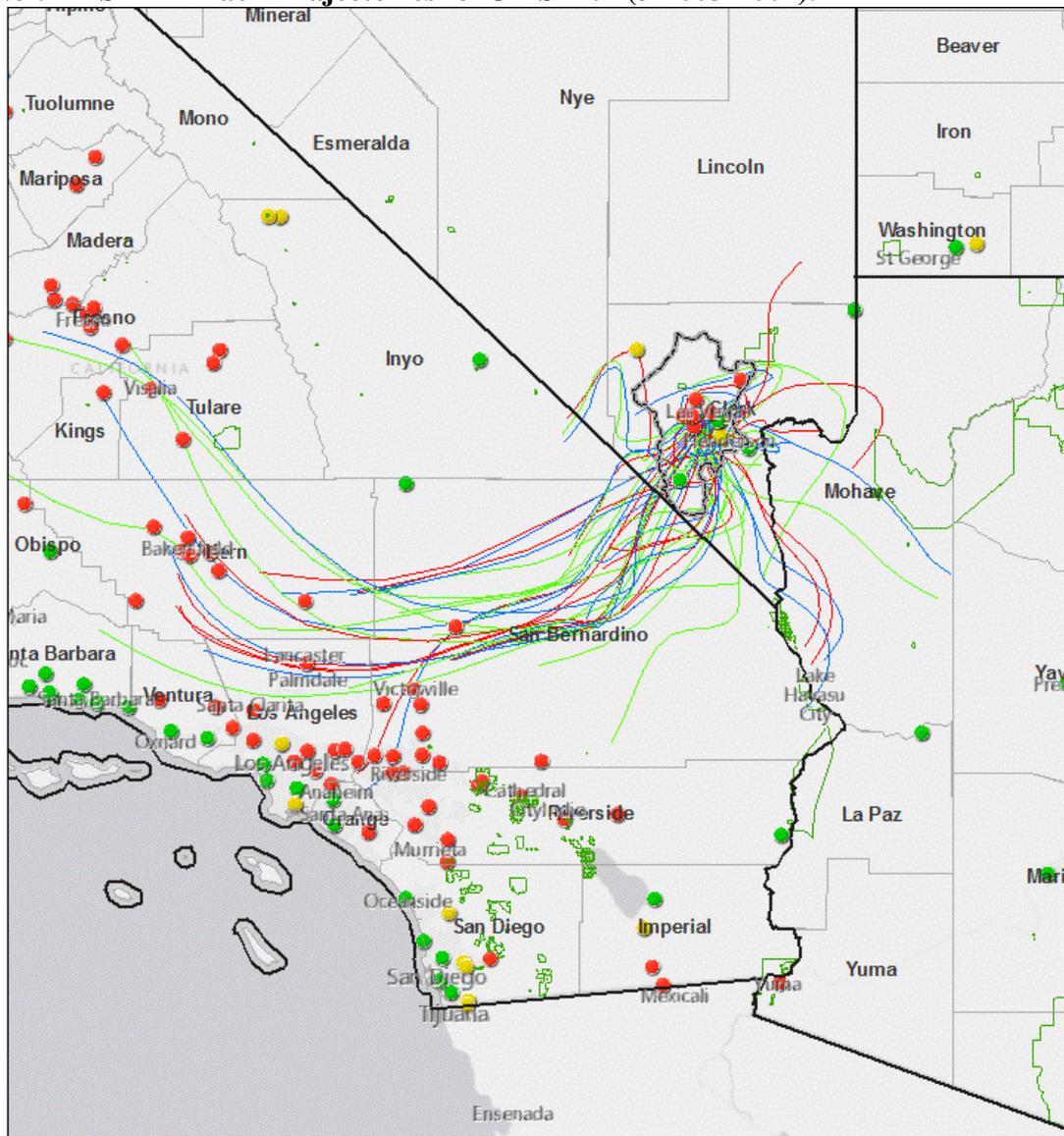


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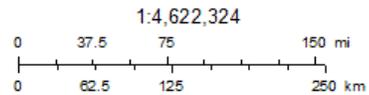
EPA Office of Environmental Information (OEI). Data: USEPA Office of Environmental Information (OEI), US Census Bureau | Source: U.S. Census Bureau | Esri, HERE, NPS | Esri, HERE, Garmin, NGA, USGS, NPS |

Figure 3.6e 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 intended nonattainment boundary for Las Vegas, NV 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 3.6f. HYSPLIT Back Trajectories for JD Smith (32-003-2002).



November 30, 2017



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EPA Office of Environmental Information (OEI) | Data: USEPA Office of Environmental Information (OEI) | US Census Bureau | Source: U.S. Census Bureau | Esri, HERE, NPS | Esri, HERE, Garmin, NGA, USGS, NPS | Web AppBuilder for ArcGIS

Figure 3.6f 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 intended nonattainment boundary for Las Vegas, NV 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 the southern half of the Clark County area of analysis, which indicates that sources in the Las Vegas urban area previously discussed in Factor 2 in Clark County may be contributing to exceedances or violations of the 2015 ozone NAAQS. The data also show that the winds during exceedance days are predominately from the southwest, passing over the locations in the southern half of Clark County, but originating in southern California, including the Los Angeles area and southern San Joaquin Valley. For a few individual days the trajectories extend northwest, northeast, or southeast, into regions in Nevada or Arizona with low population density. The back trajectories imply that locations in the southwest of the county may be more frequent contributors to exceedances than other sub-areas within Clark County, such as the Apex area and locations farther northeast.

The documentation in the State's designation recommendation included a discussion by the Clark County Department of Air Quality of wind patterns in the Las Vegas Valley.⁷ The Department discussed the predominant wind flow from the southwest and showed day and night wind roses consistent with daytime upslope flow and nighttime downslope flow that were appropriate to the mountains nearest each respective monitoring station. The winds were also consistent with what the Department calls a "transport corridor," with winds generally from the southwest into the low elevation area of the Las Vegas Valley, and continuing to exit toward the northwest. As discussed below under Factor 4 Geography/topography, the area to the northwest has the widest gap in the mountains that generally surround the Las Vegas Valley.

This predominant wind flow is not consistent with a contribution to violations from sources in Hydrographic Area 215, such as the point source indicated in Figure 3.3 (at northern end of Lake Mead), though it does not preclude HYSPLIT trajectories aloft from passing above HA 215. HA 215 is addressed further under Factor 4, below.

Additional information is available from an earlier analysis undertaken by the Moapa Band of Paiute Indians (MBPI) during the 2004 designation process for the 1997 ozone NAAQS, and reviewed by the EPA.⁸ The analysis was undertaken to examine whether existing and future sources in and near the Moapa River Indian Reservation, northeast of Apex in Hydrographic Areas⁹ 216 and 218, might contribute to ozone NAAQS exceedances. For 14 ozone episodes, MBPI and the EPA examined hourly wind speed and direction from five meteorological stations: Apex, Nellis Air Force Base, Clark County Regional Flood Control District "California Wash 3" monitor (southeast of the reservation), and at two stations at the Reid Gardner Generating Station (northeast of the reservation). These data were examined in conjunction with hourly ozone concentrations in the Las Vegas Valley. The analysis showed that winds generally blew from the southwest (i.e., from the valley toward the reservation). During the few periods that wind blew from the northeast (i.e., from the reservation area toward the valley), the flow was intermittent and inconsistent between the meteorological stations so there was not coherent transport flow toward Las Vegas Valley. At other such periods the timing of the northeast winds made it unlikely that emissions from the reservation or beyond could contribute to elevated ozone concentrations at locations southwest of the reservation. For example, northeast winds at Apex occurred only after locations northeast of Apex had northwest or south winds; that is, emissions from possible emission sources northeast of Apex would have been blown away southeast or north before the flow toward Las Vegas Valley began. This analysis indicates that the Moapa River Indian Reservation, and more generally Hydrographic Area 218, are not likely to contribute to ozone NAAQS violations at monitors in the Las Vegas Valley.

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, and thus can play an important role in assessing which areas are contributing to monitored violations of the NAAQS.

Figure 3.7 shows the topography for Clark County, including Hydrographic Areas. The Las Vegas urbanized area is located in a broad valley, the Las Vegas Valley, bordered by a number of mountain ranges: the Sheep Range and Las Vegas Range lie to the north; the Sunrise and Frenchman Mountains to the east; McCullough Range to the southeast, and the Spring Mountain Range to the west. The heights of these ranges vary, with peaks ranging from 1,235 m (4,052 ft) to 3,633 m (11,918 ft). These are much higher than the city of Las Vegas at 610 m (2,001 ft). The surrounding mountains follow the boundary of Nevada Hydrographic Area (HA) 212, and impede pollutant transport.

There are some gaps in the mountain ranges surrounding Las Vegas Valley. The widest gap is in the northwest, some 12 km across; U.S. Highway 95 follows this into neighboring HA 211. Flow is not impeded in this direction. There are several narrow mountain passes 1 km wide or less in the south and southeast. Interstate 15 crosses one at about 900 m (2950 ft) elevation on the way south to Ivanpah Valley in neighboring HAs 164A and 165; the Jean monitor (AQS ID 32-003-1019) is in HA 164A. There is also a 2 km wide gap in the southeast that the Las Vegas Wash follows into Lake Mead, leading to HA 215. Although there are two major sources of ozone precursors in HA 215, Nevada Cogeneration Associates #2 (104 tpy NO_x) and PABCO Building Products (200 tpy NO_x), they are separated from Las Vegas Valley by Sunrise Mountain, Frenchman Mountain, and several smaller several general north-south tending ridges.

Finally, there is a 1 km wide pass in the surrounding mountains in the northeast, where Interstate 15 passes through Apex on the way to neighboring HA 216. That is where the Apex monitor (AQS ID 32-003-0022) is located, and also a number of industrial sources. The pass rises to only 750 m (2,460 ft), so is only a weak barrier to transport into or out of the Las Vegas Valley. Therefore, factor 4 is

⁷ Attachment D, "Area Designation Recommendations for the 2015 Ozone NAAQS for Clark County, Nevada, Clark County Department of Air Quality, September 2016, Section 4 "Meteorology", p.4-1ff; and Section 5. "Geography/Topography", pp. 5-3 – 5-4

⁸ 69 FR 55956, September 17, 2004; "Technical Support Document, the Las Vegas 8-Hour Ozone Nonattainment Area," EPA Region 9, September 8, 2004

⁹ Hydrographic Areas refers to areas as shown on the State of Nevada Division of Water Resources' map titled "Water Resources and Inter-basin Flows" (September 1971). Hydrographic areas were originally designed for water management (State of Nevada, Division of Water Resources - Hydrographic Regions and Basins, <http://water.nv.gov/hydrographicregions.aspx>), but since the topographic features separating them into different drainages also form barriers to air flow, they are also typically used in the State of Nevada for Air Quality Control Regions and designations under Clean Air Act section 107(a).

consistent with including HA 212, and all or portions of HAs 164A, 165, and possibly 211, 215, and 216 within the EPA's intended nonattainment boundary for Las Vegas.

Figure 3.7. Topographic Illustration of the Physical Features.

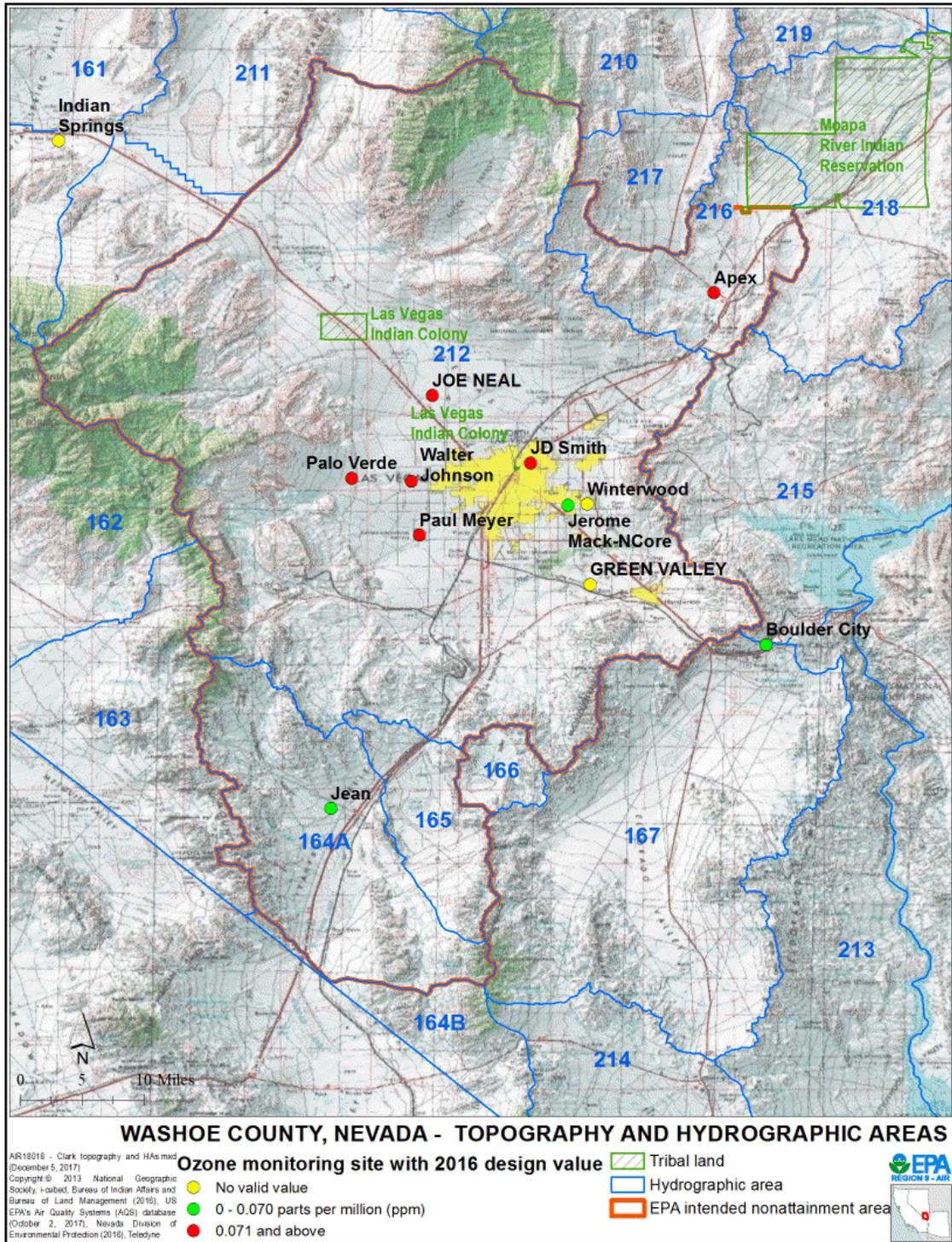


Figure 3.7 shows the topography and Hydrographic Area boundaries in the area of analysis for Las Vegas, NV. The EPA’s intended nonattainment boundary for Las Vegas, NV is shown as a red line. Monitors are shown as red (violating), green (attaining), or yellow (invalid) dots based on 2014-2016 design values. City limits for the City of Las Vegas are shown in yellow. Hydrographic area boundaries are shown in blue, and land belonging to the Las Vegas Tribe of Paiute Indians (labeled as “Las Vegas Indian Colony”) and Moapa Band of Paiute Indians (labeled as “Moapa River Indian Reservation”) are outlined in green.

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 intended Las Vegas 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 intended designated areas.

Figure 3.8 shows the relevant jurisdictional boundaries for the Las Vegas area, including the Clark County, the Las Vegas-Henderson-Paradise CBSA (Clark County), and the Las Vegas-Henderson CSA (Clark and Nye Counties, NV and Mohave County, AZ), as well as the location of Indian country. Figure 3.8 also shows the State-recommended nonattainment area boundary and the EPA's intended nonattainment area boundary for the 2015 ozone NAAQS, as well as the maintenance area boundary for the 1997 ozone NAAQS.

Figure 3.8 Jurisdictional Boundaries.

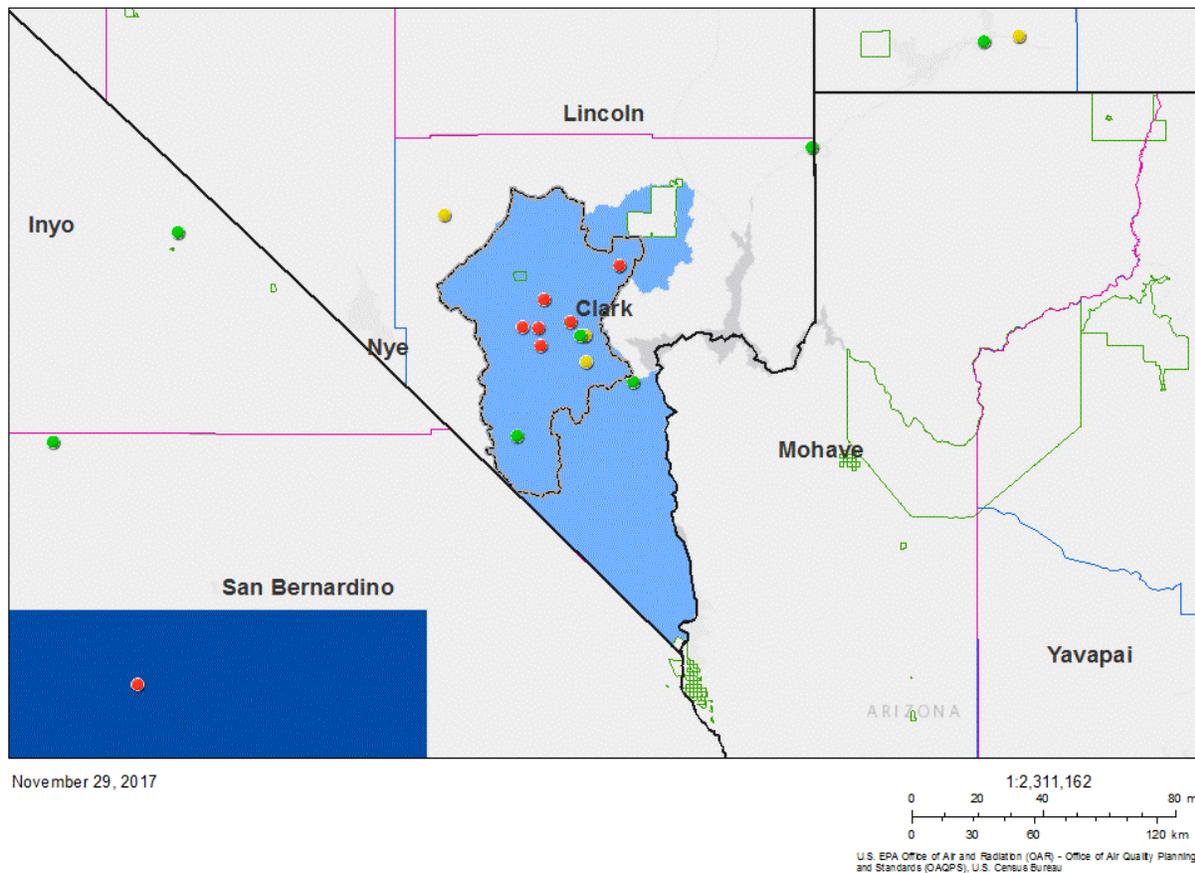


Figure 3.8 shows jurisdictional boundaries, including state boundaries (black lines), combined statistical areas (pink lines), metropolitan statistical areas (dark blue lines), and micropolitan statistical areas (light blue lines) in the area of analysis for Las Vegas, NV. The EPA's intended nonattainment boundary for Las Vegas, NV 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 Las Vegas area has a previously established nonattainment/maintenance boundary associated with the 1997 ozone NAAQS. The State has recommended a different boundary for the 2015 ozone NAAQS. In defining the boundary for the 2015 ozone NAAQS, the State has followed its longstanding practice of using Hydrographic Areas (see footnote 9 above) as the basis for defining nonattainment area boundaries.

The boundary for the 1997 ozone NAAQS, and both the State-recommended and the EPA-intended boundary for the 2015 ozone NAAQS, are all partial county areas but differ in their spatial extent. The boundary for the 1997 ozone NAAQS extended farther into the northeast and southeast of Clark County to include emissions sources that are no longer in operation. The sources that are no longer in operation include the Reid Gardner Generating Station, which closed in 2017, and Mohave Generating Station, which closed in 2005. The State-recommended boundary for the 2015 ozone NAAQS included Hydrographic Areas 164a, 165 and 212. The EPA-intended boundary adds a portion of Hydrographic Area 216. This is illustrated in Figure 3.7 above.

The Clark County Department of Air Quality has air quality planning jurisdiction throughout Clark County and the intended nonattainment area. The Regional Transportation Commission of Southern

Nevada is the metropolitan planning organization responsible for transportation planning in Clark County.

The Las Vegas intended nonattainment area also includes portions of Indian country belonging to the Las Vegas Paiute 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 Las Vegas, NV

Based on the assessment of factors described above, the EPA has concluded that portions of Clark County meet the CAA criteria for inclusion in the intended Las Vegas nonattainment area. The EPA is disagreeing with the State’s recommended boundary for the area, which included HAs 164A, 165, and 212. As discussed in Factor 1, this boundary excludes the violating Apex Valley monitor and sources located in HA 216. Consequently, based on the analysis of the factors described above, the EPA-intended nonattainment boundary for the 2015 ozone NAAQS includes all areas within the State-recommended boundary (Hydrographic Areas 164A, 165, and 212) and also includes the southern portion of HA 216. More specifically, the EPA-intended nonattainment boundary includes the portion of HA 216 that lies south of a line common to Townships 16 South and 17 South. The boundary includes land in Nevada HA 212 of the Las Vegas Tribe of Paiute Indians, but excludes land in Nevada HA 216 of the Moapa Band of Paiute Indians.

Six air quality monitors in Clark County indicate violations of the 2015 ozone NAAQS based on the 2016 design values, therefore portions of this county are included in the EPA’s intended nonattainment area (HAs 212, 164A, 165, and portions of 216). Emissions and emission-related data and meteorological data support the intended nonattainment area boundary. The city of Las Vegas and surrounding areas in the proposed boundary comprise a densely populated urban area with large point sources and other sources of ozone precursor emissions that contribute to violations. Other areas of Clark County outside of the intended boundary are generally sparsely populated with only small population centers below 20,000 and with only a few isolated emission sources (point sources and VMT) that do not contribute to violations. The portion of HA 216 included in the intended nonattainment area includes the violating Apex monitor and emission sources (point sources and VMT); the portion of HA 216 not included does not include emission sources and is northeast of all violating monitors in the County. Geographic and topographic features surrounding the Las Vegas Valley further support restricting the boundary to the hydrographic areas described above. Although air flow between Las Vegas Valley and HA 211 (to the northwest) and portions of HA 215 (to the east) is not much impeded by topographic features, HA 211 has no large point sources and the portion of HA 215 containing two large point sources is separated from the Las Vegas Valley by topography. Also, wind does not generally flow from those hydrographic areas toward the Las Vegas Valley, they are sparsely populated, and neither hydrographic area has any violating monitors. As discussed in Factor 3, wind speed and direction analysis indicates that the Moapa River Indian Reservation, and more generally HA 218, are not likely to contribute to ozone NAAQS violations at monitors in the Las Vegas Valley. With a few exceptions, the preponderance of HYSPLIT trajectories are from the south or southwest; this generally supports the proposed boundary. Overall, the factors do not support the

inclusion of HAs 211, 215, or 218 in the intended nonattainment area. Jurisdictional considerations support this boundary, as the area is located fully within Clark County, within the jurisdiction of the Clark County Department of Air Quality, and the boundary largely follows hydrographic boundaries, which have been the typical basis for designations in Nevada.

Based on consideration of all five factors, the EPA intends to designate a portion of Clark County as the Las Vegas, NV nonattainment for the 2015 ozone NAAQS.