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ARIZONA MANUFACTURERS COUNCIL

HABOOBS, NEIGHBORS & OTHER FACTORS BEYOND ARIZONA'S CONTROL

How Federal Ozone Regulations Impact Arizona

Snell & Wilmer

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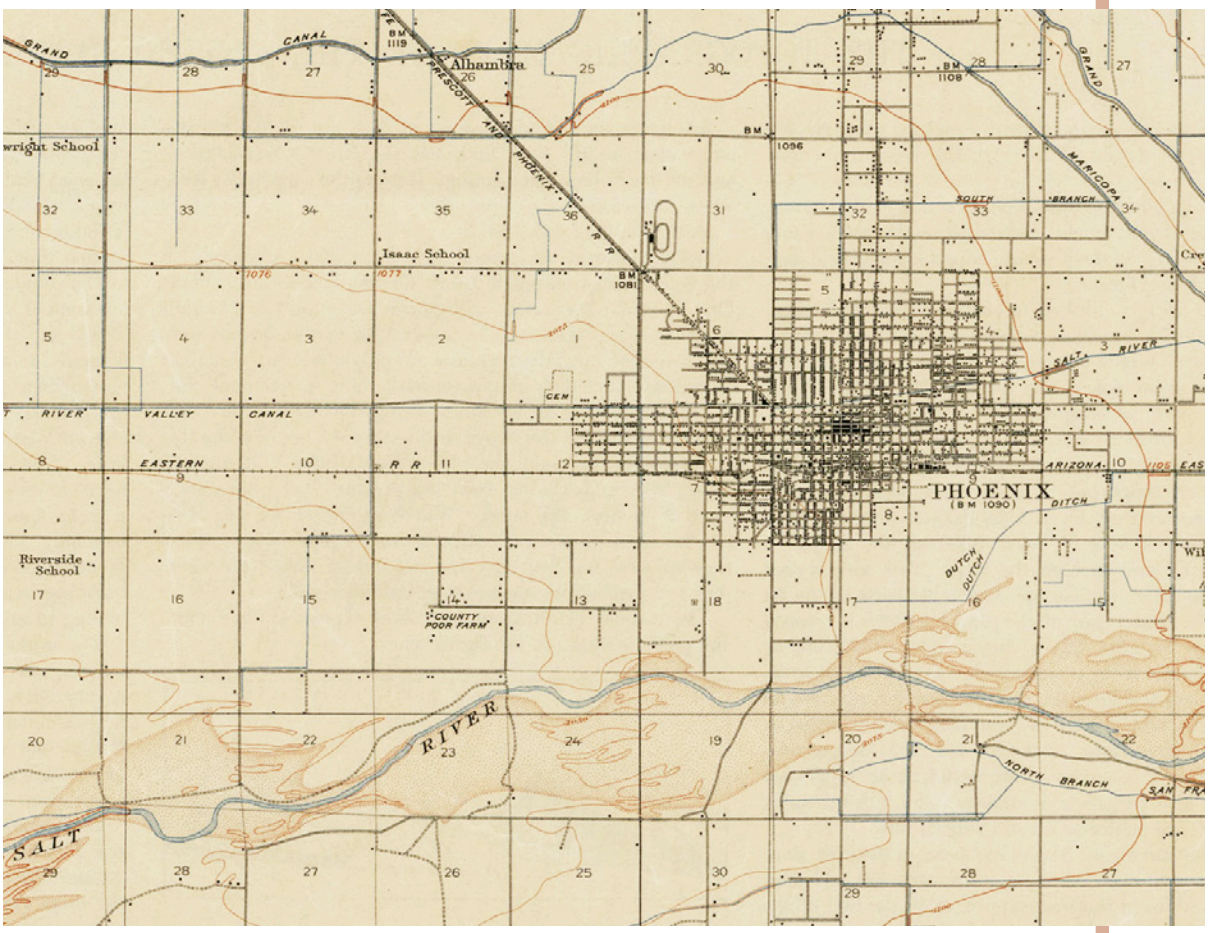


Valley areas surrounded by mountains – particularly those with high temperatures as is the case in Arizona – are more likely to retain pollutants than other regions.

What's at stake?

Due to Arizona's arid climate, geography and other circumstances beyond the state's control, parts of the state are unable to meet certain federal air quality standards including ground-level ozone requirements. Running afoul of the EPA's ozone caps, known as being in "nonattainment," can come with harsh penalties, like losing federal funding for roads, requiring emission offsets from new or modified major sources, and implementing more cumbersome permitting requirements.

Imposing additional regulations and hefty new permitting fees on industrial users would be a major setback for Arizona manufacturers and the 170,000 men and women employed by the industry in the state. More importantly however, these actions will have minimal effectiveness in protecting the health and welfare of Arizona residents; because they do nothing to address the real issues at the heart of the state's challenges with ozone.

WHY IS ARIZONA UNIQUE?

Ground-level ozone is a harmful pollutant that forms above the earth's surface when certain pollutants react with intense sunlight. Air quality is primarily driven by weather and geographic factors.

- Valley areas surrounded by mountains – particularly those with high temperatures as is the case in Arizona – are more likely to retain pollutants than other regions.
- Mobile sources including cars, trucks and machinery also present a unique challenge for Arizona due to the unusually long life spans of vehicles operating in the state. While Arizona's dry conditions allow drivers to keep vehicles longer, older vehicles often have outdated technology and less effective emissions controls compared to newer models.
- Exacerbating these issues is the lack of emissions reductions credits, also known as emissions offsets, available for manufacturers operating in Maricopa County (Phoenix), Pima County (Tucson) and other parts of the state.

WHAT CAN WE DO?

Modernizing and updating the Clean Air Act is the best solution. Recognizing that federal action is considered unlikely in the near-term, the following minimal steps should be taken promptly:

- Mitigate the negative impact on Arizona manufacturers by increasing the number of emissions reductions credits available.
- The state can submit a 179B demonstration showing that these areas would be in attainment "but for" international emissions. Collecting the necessary modeling and monitoring data will require coordination and cooperation between state agencies, county officials, Native American leaders and stakeholder groups.
- Lastly, state and local agencies should endeavor to find non-traditional offsets to increase the number of emissions reductions credits available. Examples of non-traditional offsets include paving dirt roads and converting combustible engine-powered vehicles and machinery to electric.

BACKGROUND

By lowering the national air standard for ground-level ozone to 70 parts per billion ("ppb") in 2015, the United States Environmental Protection Agency ("USEPA") caused great concern for Arizona and other Intermountain Western States[1] attempting to maintain the already low standard. USEPA's action accentuates the critical issues hampering the functionality and effectiveness of the Clean Air Act ("CAA") and highlights the need to assess the USEPA's authoritative discretion in establishing the air quality standards. The consequences of failing to meet any new established attainment goals, or being in nonattainment of the standard, can be dramatic for any state. For Arizona, where primary contributors to ozone pollution do not fall under the regulatory authority of the state and/or local pollution control agencies, the situation is considerably challenging.

With years of experience in addressing ozone and other air standards, Arizona's state and local pollution control agencies recognize that the State's unique climate, environment and geographic location in the Intermountain Western region of the United States are chief among the obstacles to realistically achieving the lower ozone standard of 70 ppb. These challenges have been the impetus of Arizona's business community, elected officials, regulatory agencies, technical professionals, and others working together, alongside the USEPA, for over ten years, addressing various concerns with the CAA and the administration thereof.

While the final decision on the ozone standard in 2015 exacerbates the existing frustrations with the USEPA; appreciating the origins of the CAA and the USEPA, as well as the purpose both serve, provides direction as we seek a path forward to address community concerns surrounding the fear of nonattainment. Additionally, better understanding the nature of ozone and the unique challenges associated with regulating and controlling ozone pollution remains key in order to facilitate thoughtful discourse and to work in service of shaping commonsense solutions which both protect the public health and welfare and foster the community's responsible economic stability and growth.

2015 OZONE NAAQS

It is a demonstrable fact that a nonattainment designation of an area can be dramatic to the local economy and public health; just as it is also a reality that not all air pollution is attributable to sources under federal and/or local regulatory control. The CAA is a remarkable doctrine that has guided the U.S. to cleaner, healthier air for all to breathe; but, it largely gives consideration only to those anthropogenic pollutants originating within our borders.[2] There are ozone-forming pollutant sources within and outside the U.S. borders that simply do not fall under the regulatory authority of the USEPA and/or state and local pollution control agencies. These sources significantly impact the air quality and are an impediment to our ability to adequately protect the public health and welfare, the environment, and Arizona's local economies.

1 "Intermountain Western U.S." refers to the states of Arizona, Colorado, New Mexico, Nevada, Utah, and Wyoming, as well as the high-elevation portions of eastern California. See U.S. Environmental Protection Agency. (2015) Implementation of the 2015 Primary Ozone NAAQS: Issues Associated with Background Ozone – White Paper for Discussion, at p.3 fn.10, Docket ID: EPA-HQ-OAR-2016-0097-004. Retrieved from https://www.regulations.gov/document?D=EPA-HQ-OAR-2016-0097-0004.

2 The Clean Air Act specifically clarifies "that air pollution prevention (that is, the reduction or elimination…of pollutants produced or created at the source) and air pollution control at its source is the primary responsibility of States and local governments;" See CAA §101(a)(3); 42 USC §7401(a)(3).

The National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), among others, found "that the western United States reduced its production of ozone-forming pollutants by a whopping 21 percent between 2005 and 2010; but ozone in the atmosphere above the region did not drop as expected in response;" which is attributed to "a combination of naturally occurring atmospheric processes and pollutants crossing the Pacific Ocean from China."[3] While these sources of ozone pollutants originate from differing sources that are well-outside the regulatory authority of any State in the Intermountain Western U.S., states like Arizona are held accountable for a problem quite literally out of their control, despite its consequential impact on the state's economic stability and growth, as well as on public health and welfare.

Equally as frustrating and outside of the authority of state and local regulatory agencies, is the USEPA's discretionary authority in establishing the air standards and their implementation. Discussions and studies were ongoing long before 2015 regarding the implications of international long-range pollutant transport and naturally-occurring background ozone;[4] yet the USEPA Administrator chose to tighten the standard without giving these impediments due consideration. In fact, two months *after* issuing the 2015 ozone standard, the USEPA published a Background Ozone White Paper and agreed to hold a two-day workshop at the Arizona Department of Environmental Quality ("ADEQ") in February 2016 – four months *after* issuing the new standard – to discuss these concerns with stakeholders from the Intermountain Western U.S.[5]

In another display of "discretion," the USEPA admits that in setting this lower standard "the Administrator is seeking not only to prevent pollution levels that have been demonstrated to be harmful, but also to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree."[6] Remarkably, the USEPA immediately follows that admission with the acknowledgement that legal precedence confirms that "[t]he CAA does not require the Administrator to establish a primary NAAQS at a zero-risk level or at background concentrations."[7]

However, the best example of frustration with the discretion of the Administrator in establishing the NAAQS, is the fact that the ozone standard had just been reduced seven years earlier in 2008 to 75 ppb;[8] yet the final rule for implementing the 2008 standard was not issued by the USEPA until March 2015[9] – nearly three months *after* the USEPA released its proposal to further reduce the ozone standard to between 65 and 70 ppb.[10] States were failed to be provided with an opportunity to come into compliance with the 2008 standard before being faced with a far more stringent

3 Rasmussen, C. (2015, August 10). Nature, Chinese Pollution Offset U.S. West Ozone Gains (T. Greicius, Ed.). Retrieved from https://www.nasa.gov/jpl/nature-chinese-pollution-offset-us-west-ozone-gains.

4 See documentation provided by: Association of Air Pollution Control Agencies ("AAPCA"), available at https://www.cleanairact.org/; Western States Air Resources Council ("WESTAR"), available at http://www.westar.org/downloads.html; and Western Regional Air Partnership ("WRAP"), available at https://www.wrapair2.org/.

5 U.S. Environmental Protection Agency. (2016, March 16). Ground-level Ozone Pollution: Background Ozone Workshop and Information. Retrieved from https://www.epa.gov/ground-level-ozone-pollution/background-ozone-workshop-and-information.

6 U.S. Environmental Protection Agency. (2015, October 26) National Ambient Air Quality Standards for Ozone Final Rule, 80 Fed. Reg. 65292, 65295. RIN2060-AP38. Retrieved from https://www.govinfo.gov/content/pkg/FR-2015-10-26/pdf/2015-26594.pdf.

7 Ibid.

8 U.S. Environmental Protection Agency. (2018, February 20). Ground-level Ozone Pollution: Table of Historical Ozone National Ambient Air Quality Standards (NAAQS). Retrieved from https://www.epa.gov/ground-level-ozone-pollution/table-historical-ozone-national-ambient-air-quality-standards-naaqs.

9 U.S. Environmental Protection Agency. (2015, March 6). Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements Final Rule. 80 Fed. Reg. 12264-12319. RIN 2060-AR34. Retrieved from https://www.govinfo.gov/content/pkg/FR-2015-03-06/pdf/2015-04012.pdf.

10 U.S. Environmental Protection Agency. (2014, December 17). National Ambient Air Quality Standards for Ozone Proposed Rule. 79 Fed. Reg. 75234-75411. RIN 2060-AP38. Retrieved from https://www.govinfo.gov/content/pkg/FR-2014-12-17/pdf/2014-28674.pdf.

ozone standard. Make no mistake, these actions by the USEPA in 2015 are not a mere inconvenience, they present real economic hardships on the states, local economies and industries; and are a hindrance to the public health and welfare.[11]

THE CLEAN AIR ACT AND THE NATIONAL AMBIENT AIR QUALITY STANDARDS

The CAA establishes the authority for the implementation of federal and state regulations limiting air emissions from both mobile and stationary sources (i.e., vehicles and industry).[12] To that end, the CAA as amended in 1970 authorizes the USEPA to establish National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: Carbon Monoxide, Lead, Nitrogen Dioxide, Ground Level Ozone, Particulate Matter, and Sulfur Dioxide.[13] Prior to 1970, the various iterations of the CAA had failed to achieve reductions in air pollution because the government was "not structured to make a coordinated attack on the pollutants."[14]

The Nation's deteriorating air quality prompted President Richard M. Nixon (1969-1974), with the approval of Congress on December 2, 1970, to establish the USEPA – in part, to implement the CAA of 1970 – in an effort to turn the tide on pollution control.[15]

In 1977, Congress further significantly amended the CAA to revise certain provisions of the 1970 Amendments and strengthen the doctrine overall.[16] One of the provisions added is the mandate that the USEPA thoroughly review the NAAQS at five-year intervals and promulgate new standards as appropriate in accordance with the provisions established by the 1970 Amendments.[17] The 1970 Amendments stipulate that the USEPA regulate emissions to the extent that public health is protected as "accurately" reflected by the "latest scientific knowledge."[18] Unfortunately, however, both the 1970 and 1977 Amendments grant the USEPA Administrator with the discretion to determine the standards that "are requisite to protect the public health,"[19] with the only caveat being that the standards allow for "an adequate margin of safety."[20] These provisions, while well-meaning in intent, have led to unintended consequences that can be easily addressed by modernizing the CAA.

11 Association of Air Pollution Control Agencies. (2015). State Environmental Agency Perspectives on Timely NAAQS Implementation: Results of a Survey by the Association of Air Pollution Control Agencies (AAPCA). Retrieved from https://www.cleanairact.org/documents/AAPCA-StateEnvironmentalAgencyPerspectivesonTimelyNAAQSImplementation9-2015.pdf.

12 U.S. Environmental Protection Agency. (2017, January 3). Clean Air Act Overview: Evolution of the Clean Air Act. Retrieved from https://www.epa.gov/clean-air-act-overview/evolution-clean-air-act.

13 Ibid.

14 Nixon, R.M. (U.S. President). (1970, July 9). Reorganization Plan No. 3 of 1970. Retrieved from https://archive.epa.gov/epa/aboutepa/reorganization-plan-no-3-1970.html; U.S. Environmental Protection Agency. (2018, November 19). EPA History: The Origins of EPA. Retrieved from https://www.epa.gov/history/origins-epa; USEPA, Evolution of the Clean Air Act; and Rogers, P. G. (Congressman). (1990) EPA History: The Clean Air Act of 1970. EPA Journal. Retrieved from https://archive.epa.gov/epa/aboutepa/epa-history-clean-air-act-1970.html.

15 USEPA, Origins of EPA; USEPA, Evolution of the Clean Air Act; and Nixon, Reorganization Plan:

16 USEPA, Origins of EPA.

17 Clean Air Act Amendments of 1977, H.R. 6161, 95th Cong. (1977, August 7). (enacted) P.L. 95-95. Retrieved from https://www.govinfo.gov/content/pkg/STATUTE-91/pdf/STATUTE-91-Pg685.pdf, at P.L. 95-95 §106, v.91, p.691. Retrieved from https://uscode.house.gov/statviewer.htm?volume=91&page=691; and CAA §§ 108(a)(2) & 109(d)(1); 42 U.S.C §§ 7408(a)(2) & 7409(d)(1)

18 Clean Air Act Amendments of 1970, H.R.17255, 91st Cong. (1970, December 31). (enacted) P.L. 91-604. Retrieved from https://www.govinfo.gov/content/pkg/STATUTE-84/pdf/STATUTE-84-Pg1676.pdf, at P.L. 91-604 §109, v.84, p.1980. Retrieved from https://uscode.house.gov/statviewer.htm?volume=84&page=1679#; and CAA §109(b)(1); 42 U.S.C §7409(b)(1).

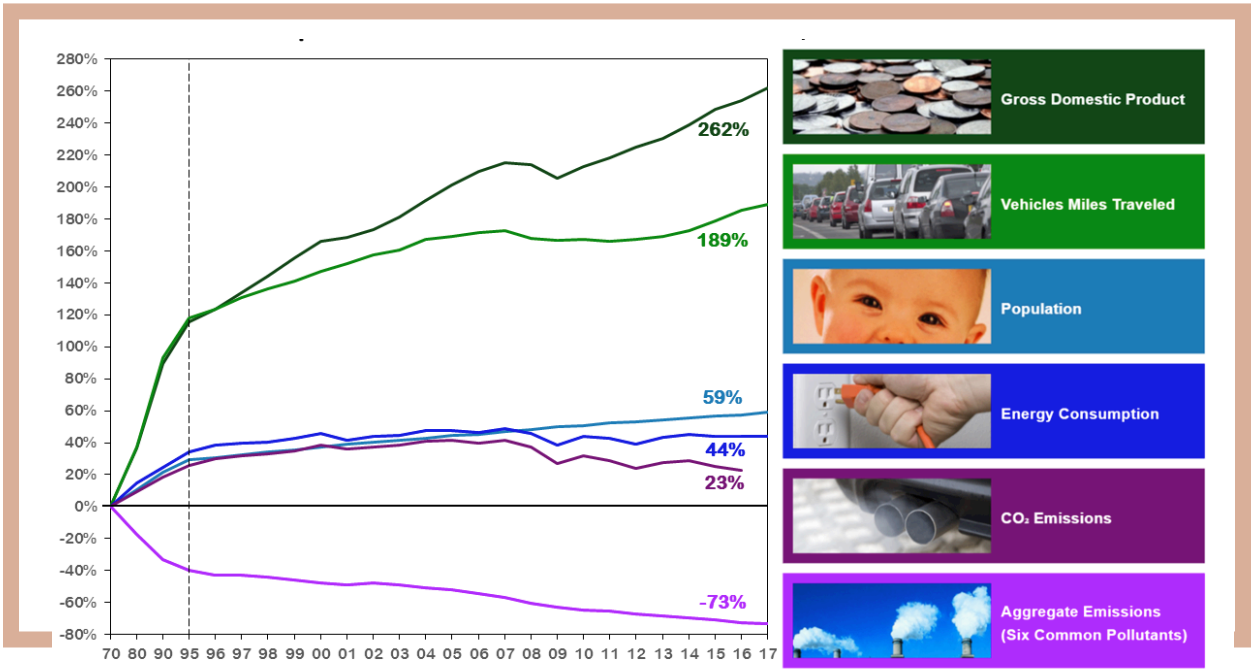
19 CAA §§108 & 109; 42 U.S.C. §§7408 & 7409.

20 When setting NAAQS, the EPA's mandate "is to identify the maximum airborne concentration of a pollutant that the public health can tolerate, decrease the concentration to provide an 'adequate' margin of safety, and set the standard at that level." Whitman v. Am. Trucking Ass'n, 531 U.S. 457, 465 (2001).

The last time the CAA was significantly amended was in 1990 after President George H. Bush (1989-1993) proposed legislation to Congress to comprehensively modify the CAA to address new emerging threats to air quality in the U.S., make the law more workable, and improve the enforcement program.[21] However, the President's proposal nor the final legislation gave proper consideration to one of the most significant emerging threats of the time and which has only compounded in severity since then to now – the impact of international air pollution on air quality in the U.S. This was a detrimental oversight, especially considering former U.S. Representative and co-author of the 1970 and 1977 Amendments to the CAA, Paul G. Rogers (1955-1979), cautioned Congress in early 1990 to "take into account the increasing emphasis on the international nature of air pollution problems" and urged them to "not hesitate to lay the groundwork for international approaches to environmental issues."[22]

The year 1970 serves as a pivotal turning point on the road to controlling the Nation's air pollution. This is substantiated by the 73% reduction in the six criteria air pollutants from 1970 to 2017, even with the drastic increase in population, industrial activity, energy consumption and vehicular use (see **Figure 1**).[23]

FIGURE 1. Comparison of Growth and Air Pollutant Emissions Between 1970 and 2017



Source: U.S. Environmental Protection Agency. (n.d.). Retrieved from https://www.epa.gov/sites/production/files/2018-07/2017_baby_graphic_1970-2017.png.

21 U.S. Environmental Protection Agency. (2017, January 3). Clean Air Act Overview: 1990 Clean Air Act Amendment Summary. Retrieved from https://www.epa.gov/clean-air-act-overview/1990-clean-air-act-amendment-summary.

22 Rogers, The Clean Air Act of 1970

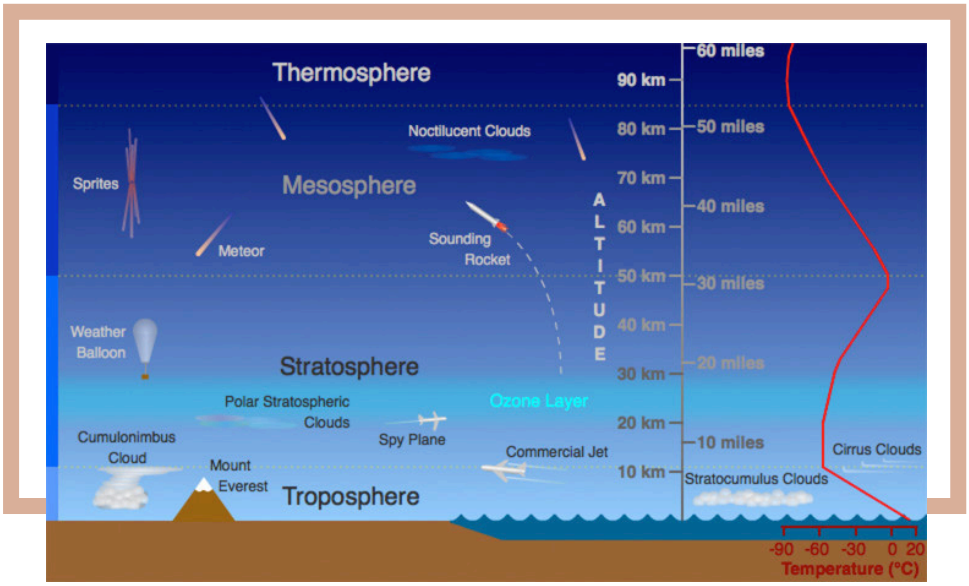
23 U.S. Environmental Protection Agency. (2019, July 8) Air Trends: Air Quality – National Summary. Retrieved from https://www.epa.gov/air-trends/air-quality-national-summary#air-quality-trends at Comparisons of Growth Areas and Emissions, 1970-2017. [Graph]. Retrieved at https://www.epa.gov/air-trends/air-quality-national-summary#air-quality-trends.

FIGURE 2. Ozone: Good Up High, Bad Nearby

Source: Patel, P., (2015, July). Cracking the AQ Code: Ozone - An Invisible Irritant. Arizona Department of Environmental Quality. N-15-38, v1(2) p1. Retrieved from http://static.azdeq.gov/aqd/aqcode1_2.pdf.

Clearly, the CAA has been successful in reducing air pollution from stationary and mobile sources within the United States; but as a doctrine that has not been substantially updated in nearly 30 years, it fails to adequately address contemporary issues as well as those alluded to by the former Congressman. Ground-level ozone is not the only common air pollutant of the six regulated by NAAQS that is impacted by international behaviors and natural occurrences; but it is the one that has finally brought to fruition the need to modernize the CAA. Not to mention that the science and our understanding of air pollution, the advancement of pollution control technologies, and the reality of pollutant sources in the U.S. has progressed considerably in the last decade, let alone the past three – facts that became painfully evident in the wake of the USEPA's decision to tighten the Ozone NAAQS in 2015.[24]

FIGURE 3. Diagram of Earth's Atmosphere Layers



Source: Russell, R. (n.d.). University Corporation for Atmospheric Research Center for Science Education ("UCAR SciEd"). Diagram of Atmosphere Layers. Retrieved from https://scied.ucar.edu/atmosphere-layers-diagram.

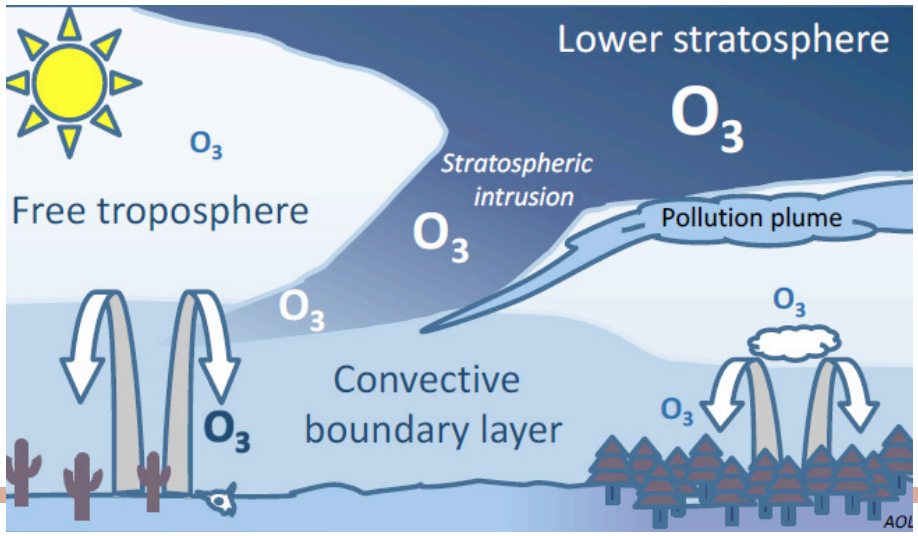
24 Letter from Sean Alteri, President, Association of Air Pollution Control Agencies ("AAPCA"), to the Hons. John Shimkus, Chairman, and Paul Tonko, Ranking Member, U.S. House Energy and Commerce Subcommittee on Environment. (2017, June 14). Retrieved from https://www.cleanairact.org/documents/AAPCA-CAAModernization-6-14-2017-HouseEnvironment-FINAL.pdf; EPA's 2015 Ozone Standard: Concerns Over Science and Implementation Hearing Before the House Committee on Science, Space, and Technology, 114th Cong. (2015). (Statement of Seyes Sadredin, Executive Director/Air Pollution Control Officer, San Joaquin Valley Air Pollution Control District). Retrieved from https://science.house.gov/hearings/epas-2015-ozone-standard-concerns-over-science-and-implementation at https://science.house.gov/imo/media/doc/Sadredin%20Testimony.pdf

UNDERSTANDING OZONE

The complexity of ozone is emphasized best by its very nature of being (see **Figure 2**). For instance, while ozone found in the stratospheric layer (i.e. located approximately seven to ten miles above the surface) of Earth's atmosphere (see **Figure 3**) is good because it protects all living organisms against harmful ultraviolet radiation from the sun; at the tropospheric layer (i.e. Earth's surface to approximately six miles upward), it is detrimental to our health, wellbeing and environment.[25] Although, as is the underlying theme of ozone, even that is not simply the end of the story. The fact is that ozone in the stratospheric layer can, under the right conditions, mix downward into the troposphere (a phenomenon known as "stratospheric intrusion") and impact ground-level ozone concentrations at relatively high levels,[26] thereby actually being quite the detriment to public health. (See **Figure 4**).

Further adding to its complexity, ground-level ozone, unlike other criteria pollutants, is not directly emitted from a source; but rather, it is a secondary pollutant that is created via atmospheric chemical reactions involving a mixture of certain precursor pollutants. The formation of ozone pollution is often expressed by the simplified equation of sun + nitrogen oxides

FIGURE 4. Stratospheric Intrusion Event Illustration



Source: Langford, A.O., Chemical Sciences Division, National Oceanic and Atmospheric Administration Earth System Research Laboratory. (2017). Stratospheric Contribution to High Surface Ozone in the Southwestern U.S.: Characterizing Exceptional Events Using Soundings, Sampling, Satellites, and Simulations. [Presentation]. Background Ozone Scientific Assessment Project and Workshop, March 28-29, 2017. Retrieved from https://www.wrapair2.org/pdf/BOSA_March_28-29_workshop_agenda.pdf *at* https://www.wrapair2.org/pdf/3_Langford_BOSA%2020170329_final.pdf.

25 U.S. Environmental Protection Agency. (2018, September 28). Ozone Layer Protection. Retrieved from https://www.epa.gov/ozone-layer-protection; U.S. Environmental Protection Agency. (2019, June 11). Ground-level Ozone Pollution. Retrieved from https://www.epa.gov/ground-level-ozone-pollution; U.S. Environmental Protection Agency. (1992) Terms of Environment: Glossary, Abbreviations And Acronyms. EPA 175-B-92-001, p.21. Retrieved from https://nepis.epa.gov/Exe/ZyPDF.cgi/200081E1.PDF?Dockey=200081E1.PDF.

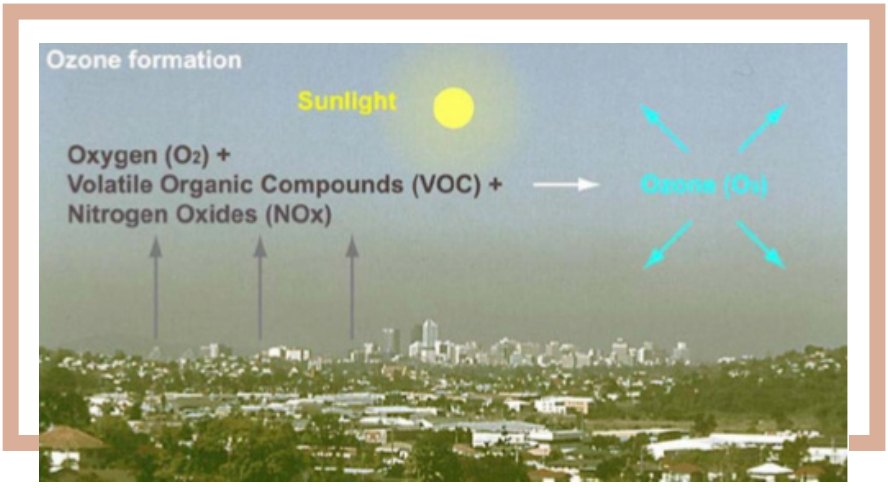
26 Stratospheric intrusions occur when "[d]uring certain meteorological conditions, discrete plumes of stratospheric air can be displaced far into the troposphere and impact ground-level 03 concentrations." See USEPA, Background Ozone White Paper, p.35; Lin, M., Harowitz, L.W., Payton, R., Fiore, A.M., and Tonnesen, G. (2017, March 1). U.S. Surface Ozone Trends and Extremes From 1980 to 2014: Quantifying the Role of Rising Asian Emissions, Domestic Controls, Wildfires, and Climate. Atmospheric Chemistry and Physics. 17, 2943-2970, https://doi.org/10.5194/acp-17-2943-2017; and Nielsen, J.E., Duncun, B., Ott, L., and Pawson, S. (2014) Stratospheric Ozone Impacts Surface Air Quality in a High-Resolutions Global Simulation. National Aeronautics and Space Administration, Global Modeling and Assimilation Office Research Site. Retrieved at https://gmao.gsfc.nasa.gov/research/composition/modeling/stratospheric_intrusions/.

("NOx") + volatile organic compounds ("VOCs")[27] = ozone pollution (See **Figure 5**).[28] However, in addition to VOCs and NOx, other precursor pollutants of ozone pollution, especially over longer time periods, include methane ("CH4") and carbon monoxide ("CO").[29]

Another fascinating intricacy of ozone is a process that is experienced after sunset in which one of the key ingredients required in the formation of ozone pollution (NOx), becomes an ally in the removal of ozone from the air. This process, called "titration," is the occurrence of NOx breaking down ozone into oxygen and nitrogen dioxide ("NO_2"), thereby decreasing the ozone levels substantially.[30] While the presence of NOx and sunlight are two key ingredients in the formation of ozone, the presence of NOx *sans* sunlight is a recipe for its dissolution.

In reality, the science of ozone formation is more complicated anyway; especially when considering the behavior of anthropogenic (human made) and naturally-occurring sources of the precursor pollutants.[31] Anthropogenic sources of ozone pollution include precursor pollutants emitted from stationary point sources (i.e., industrial processes, fuel-combustion, etc.); stationary area/nonpoint sources (i.e., agriculture, solvents, prescribed fires, etc.); and mobile sources (i.e., commercial marine vessels, locomotives, aircraft, on-road and non-road vehicles, etc.). Naturally-occurring sources include biogenic (i.e., vegetation, soil, forests, etc.); meteorological (i.e., lightning, stratospheric intrusion, etc.); geologic (i.e., geysers, volcanoes, etc.); marine (i.e., sea salt spray, etc.); etc. (See **Figure 6**). Further muddling the formation of ozone pollution is the fact that ozone and its precursor pollutants can transport long-range in the atmosphere, thereby impacting the air quality far down-wind of the originating location.[32] (See **Figure 7**).

FIGURE 5. Ozone Formation

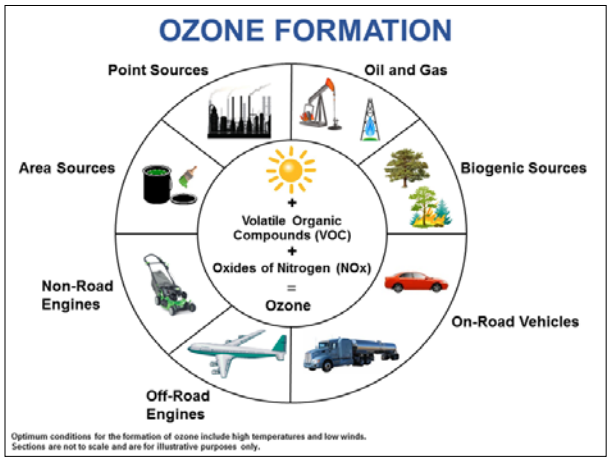


Source: State Perspectives on Regulating Background Ozone: Hearing Before the Subcommittee on Environment of the House Committee on Science, Space, & Technology, 115th Cong. (2018). (Statement of Timothy Franquist, Air Quality Division Director, Arizona Department of Environmental Quality). Attachment C, p.6. Retrieved from https://science.house.gov/hearings/state-perspectives-on-regulating-background-ozone *at* https://science.house.gov/imo/media/doc/Franquist%20-%20Testimony%2C%20Bio.pdf.

27 Volatile Organic Compounds are "any organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity." See USEPA, Terms of Environment, p.30.
28 U.S. Environmental Protection Agency. (2018, October 31). Ground-level Ozone Pollution: Ground-level Ozone Basics. Retrieved from https://www.epa.gov/ground-level-ozone-pollution/ground-level-ozone-basics#formation.
29 USEPA, 2015 Ozone Final Rule, 80 Fed. Reg. 65292, 65299
30 Arizona Department of Environmental Quality Forecast Team. (2017, June) Cracking the AQ Code: Patterns in Phoenix Air Pollution. Arizona Department of Environmental Quality. N-17-04, v3(4)p10. Retrieved from http://static.azdeq.gov/aqd/aqcode3_4.pdf; and Jhun,I., Coull, B.A., Zanobetti, A., and Koutrakis, P. (2015) The Impact of Nitrogen Oxides Concentration Decreases on Ozone Trends in the USA. Air Quality, Atmosphere & Health, v8(3) pp.283-292. Retrieved from https://doi.org/10.1007/s11869-014-0279-2.
31 USEPA, 2015 Ozone Final Rule, 80 Fed. Reg. 65292, 65299
32 USEPA, Background Ozone White Paper, p.2.

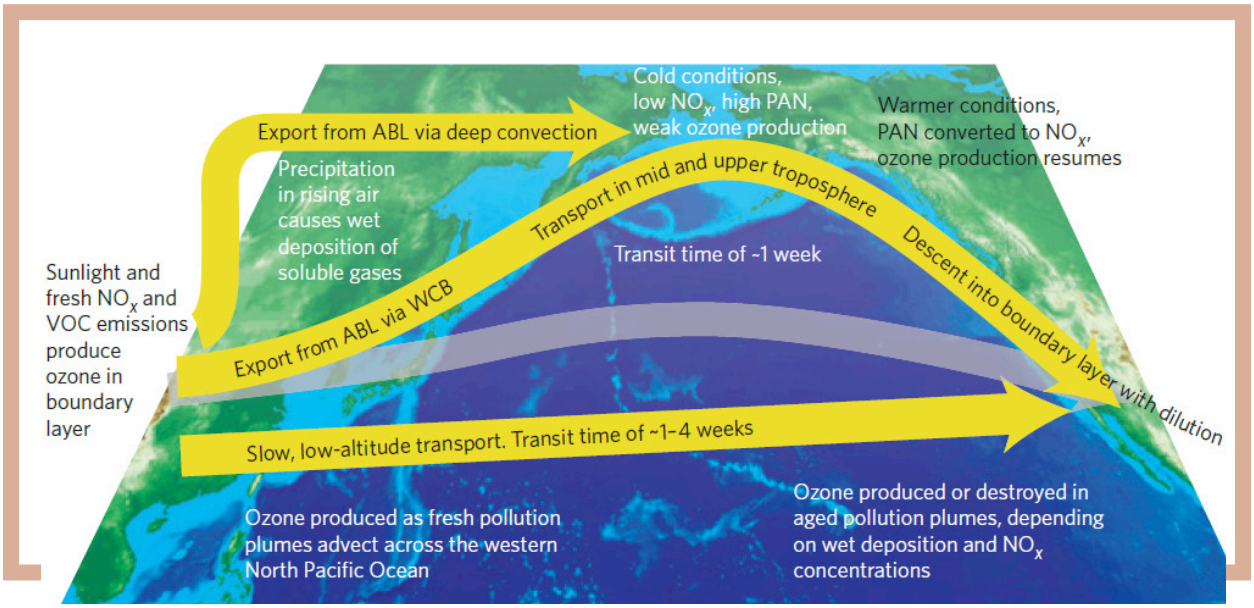
It is important to understand that ground-level ozone that "would exist in the absence of any manmade [ozone] precursor emissions" (i.e., Natural Background[33]) is commonly referred to as background ozone. However, the USEPA, when discussing background ozone is referring to "any [ozone] formed from sources or processes other than U.S. manmade emissions," (i.e., U.S. Background "USB").[34] To be clear, the USEPA accounts for the natural background ozone formed within the U.S. in addition to the ozone pollution originating from international sources.[35] (See **Figure 8**).

FIGURE 6. Contributing Sources to the Formation of Ground-level Ozone



North Central Texas Council of Governments. (2019). Ozone Information. Figure: Ozone Formation. Retrieved from https://www.nctcog.org/trans/quality/air/ozone/ozone-information.

FIGURE 7. Intercontinental Transport Processes



Source: Doherty, R.M. (2015). Ozone Pollution From Near and Far. Nature Geoscience. Figure 1. Retrieved from https://doi.org/10.1038/ngeo2497.

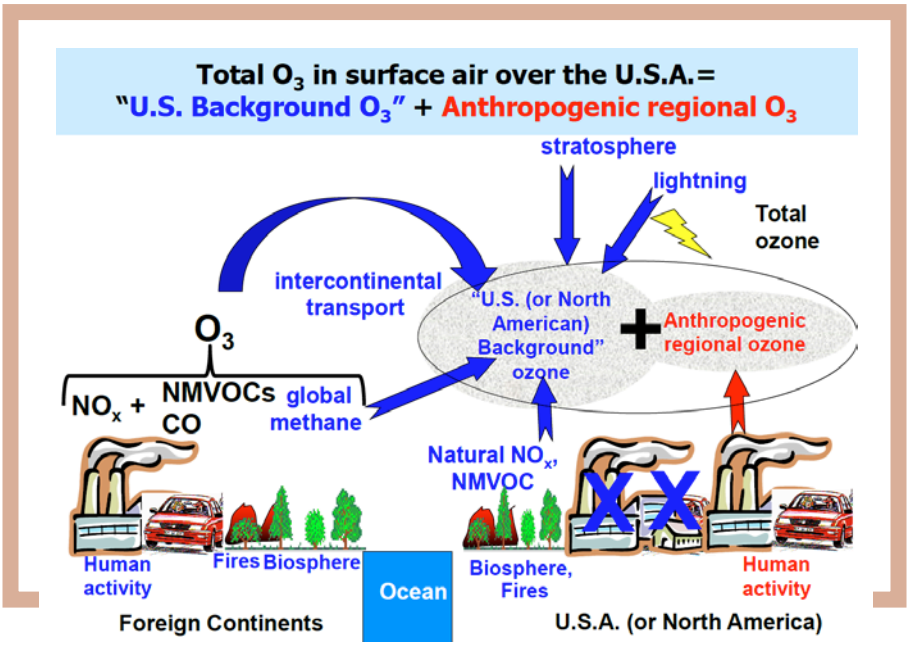
33 The USEPA further distinguishes background ozone that would "exist in the absence of manmade [ozone] precursor emissions from North America" as North American Background ("NAB"); and background ozone that would "exist in the absence of any manmade emissions inside the U.S." as U.S. Background ("USB"). See USEPA, 2014 Ozone Proposed Rule, 79 Fed. Reg. 75234, 75382.

34 USEPA, Background Ozone White Paper, p.2.

35 USEPA, 2015 Ozone Final Rule, 80 Fed. Reg. 65292, 65300

However, "determining which emissions are manmade, or from the U.S., can be difficult," according to the USEPA.[36] As such, some regulators have expressed concerns regarding the accuracy in which the USEPA is accounting for international transport and naturally occurring ozone pollution in its background ozone estimates;[37] especially in light of the USEPA acknowledging that "in some locations in the U.S., sources other than domestic manmade emissions of ozone (O_3) precursors can contribute appreciably to monitored O_3 concentrations."[38]

FIGURE 8. Background Ozone and Anthropogenic Ozone Sources



Source: Fiore, A.M., Lamont-Doherty Earth Observatory, Columbia University. (2017). Estimates of Background Ozone and Its Sources From Global Models. [Presentation]. Background Ozone Scientific Assessment Project and Workshop, March 28-29, 2017. Retrieved from https://www.wrapair2.org/pdf/BOSA_March_28-29_workshop_agenda.pdf *at* https://www.wrapair2.org/pdf/6_Fiore_BOSA_final.pdf.

THE CHALLENGES OF REGULATING OZONE – THE CAA THROUGH THE LENS OF ARIZONA

Arizona's challenges with ozone and the CAA mechanisms are as unique as ozone is complex. The primary sources of ozone precursor pollutant emissions in Arizona fall outside the jurisdictional regulatory authority of the state or local air pollution control agencies. Its unique geography, environment and climate significantly lend to complicating regulatory efforts to bring areas into compliance with the NAAQS. Furthermore, Arizona does not have an unduly heavy industrial presence; nor does it have a robust emissions bank[39].

36 USEPA, Background Ozone White Paper, p.2.

37 U.S. Environmental Protection Agency. (2016, March 15). High-Level Summary of Background Ozone Workshop. EPA-HQ-OAR-2016-0097-0020. Retrieved from https://www.regulations.gov/document?D=EPA-HQ-OAR-2016-0097-0020.

38 USEPA, Background Ozone White Paper, p.1.

39 An emissions bank is essentially a record of certified emission reduction credits ("ERC") that are available for purchase/use to help offset an increase of emissions elsewhere. An ERC is "generated when a company reduces air emissions beyond what is required by permit and rules." In a situation where "a company is expanding, and the expansion will involve a major increase in emissions," that increase in emissions must be offset by more a specific ratio more than the company emits so as to not impede the air quality improvement efforts. See Maricopa County Air Quality Department. (2019, May 08). Emission Reduction Credit Program at MCAQD ERC Flyer. Retrieved from https://www.maricopa.gov/4562/Emission-Reduction-Credit-Program.

These culminating factors provide the "perfect storm" for highlighting the limitations of the CAA, and its so-called "relief mechanisms."

As of 2017, ozone pollution in the U.S. had declined by 32% since 1980;[40] yet, for nearly 30 years, air pollution from China and other Asian countries has been substantially polluting the air in the Western U.S.,[41] and offsetting those gains by approximately 43% in the Intermountain Western U.S.[42] As an Intermountain Western U.S. state that is positioned on the international border with Mexico, Arizona is substantially impacted by international transport from Mexico and Asia.[43] According to the USEPA modeling data, 83% of ozone pollution in Southern Arizona is attributable to international transport.[44] Even prior to finalizing the 2015 ozone standard, the USEPA acknowledged that the predominant source of ozone pollution in Southern Arizona was Mexico and/or California.[45] (See **Figure 9**).

The USEPA points to the CAA Section 179B[46] as the relief mechanism tool for nonattainment areas that are "appreciably affected by international transport."[47] However, even if an area obtains a 179B classification, it still must contend with a

FIGURE 9. Predominant Ozone Influence for Arizona

Table 2A-6. Monitors with Limited Response to Regional NOx and National VOC Emissions Reductions in the 2025 and Post-2025 Baselines

Name	Site ID	State	County	Altitude (m)	Monitor Type	Predominant O3 Sources	2009-2013 DV	Baseline DV
Chiricahua NM	40038001	Arizona	Cochise	1570	CASTNET	Mexican border	72	67
Grand Canyon NP	40058001	Arizona	Coconino	2152	CASTNET	California + Other sources	71	66
Yuma Supersite	40278011	Arizona	Yuma	51	SLAMS	Mexican border + California	75	66

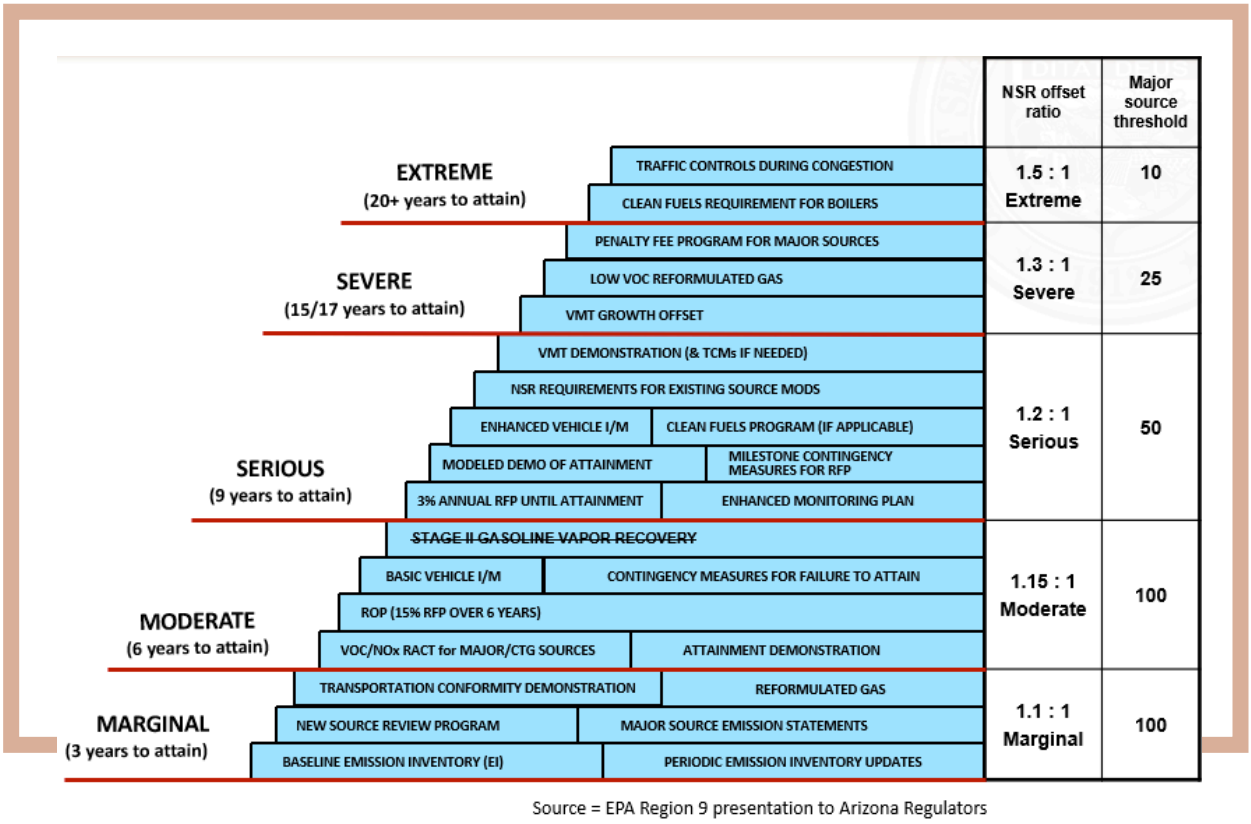
Source: U.S. Environmental Protection Agency. (2015) Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone. EPA-452/R-15-007, Appendix 2A, p.2A-34. Retrieved from https://www3.epa.gov/ttn/naaqs/standards/ozone/data/20151001ria.pdf.

40 USEPA, Air Quality – National Summary.
41 Rice, D. (2017, March 02). Air Pollution in Asia is Wafting Into the USA, Increasing Smog in West. USA Today. Retrieved from https://www.usatoday.com/story/weather/2017/03/02/air-pollution-asia-wafting-into-usa-increasing-smog-west/98647354/.
42 Rasmussen, Chinese Pollution Offset
43 State Perspectives on Regulating Background Ozone: Hearing Before the Subcommittee on Environment of the House Committee on Science, Space, & Technology, 115th Cong. (2018). (Statement of Timothy Franquist, Air Quality Division Director, Arizona Department of Environmental Quality). Retrieved from https://science.house.gov/hearings/state-perspectives-on-regulating-background-ozone at https://science.house.gov/imo/media/doc/Franquist%20-%20Testimony%2C%20Bio.pdf.
44 Id. at Attachment A.
45 U.S. Environmental Protection Agency. (2015) Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone. EPA-452/R-15-007, at Appendix 2A, p.2A-34. Retrieved from https://www3.epa.gov/ttn/naaqs/standards/ozone/data/20151001ria.pdf
46 CAA § 179B; 42 U.S.C. 7509a.
47 USEPA, Background Ozone White Paper, p.13.

nonattainment designation. Thus, it still must: submit a State Implementation Plan ("SIP"), implement the control measures required of a Marginal Nonattainment Area (see **Figure 10**), and demonstrate that the SIP and control measures would be adequate for the area to attain and maintain the standard by the designated attainment date "*but for*" the ozone pollution contributions attributable to international transport. The only relief a 179B designation really provides is the prevention of obtaining a higher nonattainment classification beyond that of "marginal."[48]

Just as with ozone pollution originating from foreign countries ("international transport"), Arizona has no authority to regulate the contributing sources originating from its neighbor states ("interstate transport"). One of the predominant sources contributing to Arizona's ozone pollution is our neighbor to the west – California. As the fifth largest economy in the world,[49] California, not surprisingly, has numerous ozone nonattainment designations from marginal to extreme in severity, some of which have yet to attain the 1997 ozone standard

FIGURE 10. CAA Ozone Nonattainment Control Requirements by Designation Classification



Source: Franquist, T., Air Quality Division Director, Arizona Department of Environmental Quality. (2016, April). AMC Environmental Issues Breakfast. [Presentation]. Arizona Manufacturers Council & Arizona Chamber of Commerce and Industry Environmental Issues Breakfast Meeting. Slide 26. Retrieved from https://azchamber.com/events/presentations/april-2016-environmental-issues-breakfast/.

48 Letter from Eric Massey, President, Western States Air Resources Council ("WESTAR") to the U.S. Environmental Protection Agency. (2015, March 16). OAR-HQ-OAR-2008-0699, p18. Retrieved from http://www.westar.org/Docs/03NAAQS/WESTAR_03-final-signed.pdf.

49 Corcoran, K. (2018, May 5). California's Economy Is Now The 5th-Biggest In The World, And Has Overtaken the United Kingdom. Business Insider. Retrieved from https://www.businessinsider.com/california-economy-ranks-5th-in-the-world-beating-the-uk-2018-5.

of 80 ppb,[50] let alone the 2015 standard of 70 ppb. Arizona's air pollution control agencies confirm USEPA's acknowledgement that "the transport of ozone and ozone precursors from the ozone-rich environment of southern California" has a considerable impact on Arizona's air quality;[51] and as history indicates, it will likely continue to be a problem interfering with Arizona's ability to attain the ozone standard for decades.[52]

The CAA Section 110(a)(2)(D)(i) "Good Neighbor Provision" and the CAA Section 126 "Interstate Pollution Abatement" provision are the designated mechanisms for addressing interstate transport; but are entirely unrealistic tools in practice, especially for Arizona's situation.[53] The Good Neighbor Provision requires that neighboring states are prohibited "from emitting any air pollutants in amounts which will contribute significantly to nonattainment in, or interfere with maintenance by, any other

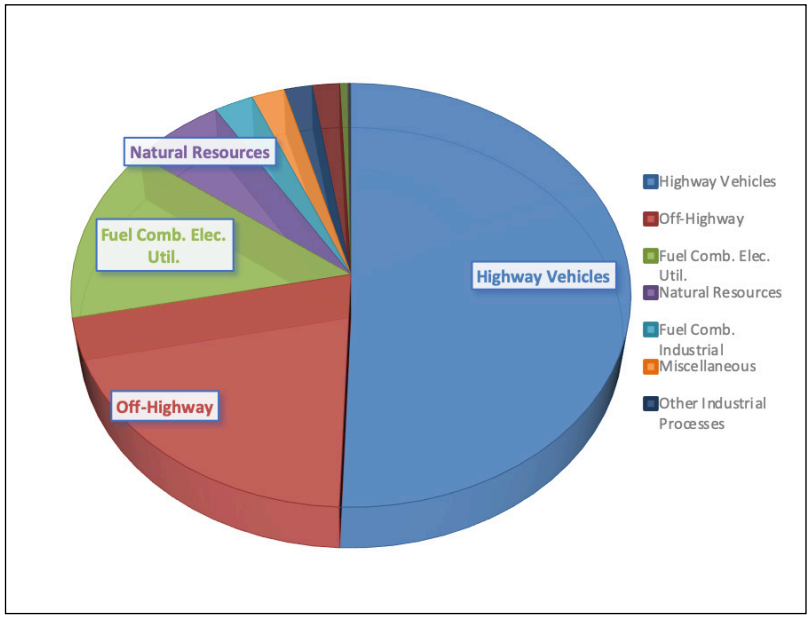
50 U.S. Environmental Protection Agency. (2018, July 24). US EPA Region 9 Air Quality Trends, 1976-2017 8-Hour Ozone (O3) Design Value Concentrations In Nonattainment And Newly Violating Areas. [Graph]. Retrieved from https://www3.epa.gov/region9/air/trends/pdfs/8hour-ozone-trends.pdf.

51 ADEQ Forecast Team, Patterns in Phoenix Air Pollution, p.8.

52 Letter from Eric Massey, Air Quality Division Director, Arizona Department of Environmental Quality, to the U.S. Environmental Protection Agency. (2015, March 17). EPA-HQ-OAR-2008-0699-3176, p8. Retrieved from https://www.regulations.gov/document?D=EPA-HQ-OAR-2008-0699-3176.

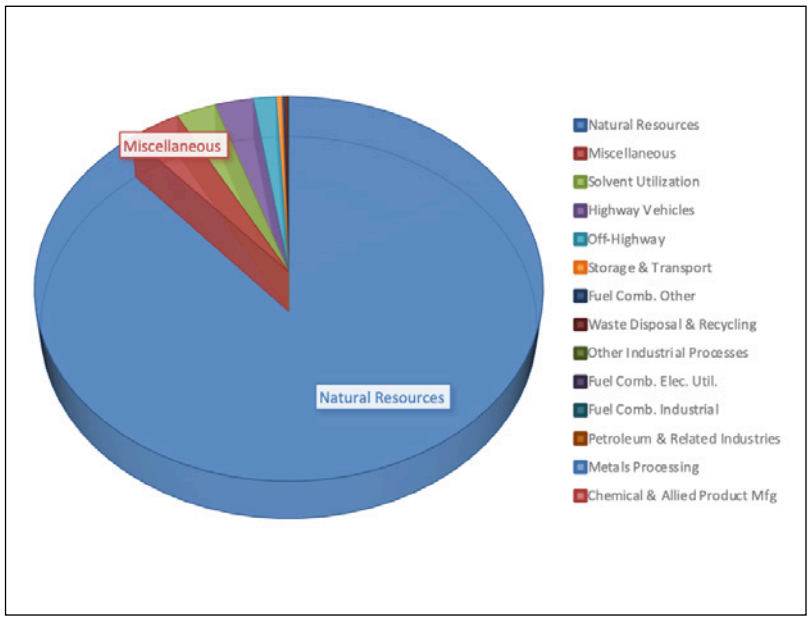
53 Ibid.

FIGURE 11. NOx Emissions Sources for the State of Arizona



Source: U.S. Environmental Protection Agency. (2016, September 30). Air Emissions Inventories, 2014 National Emissions Inventory database. Retrieved from https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data *(data extrapolated from the NEI database was used to create this pie chart).*

FIGURE 12. VOC Emissions Sources for the State of Arizona



Source: U.S. Environmental Protection Agency. (2016, September 30). Air Emissions Inventories, 2014 National Emissions Inventory database. Retrieved from https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data *(data extrapolated from the NEI database was used to create this pie chart).*

State" with respect to attaining and maintaining the NAAQS.[54] Whereas the Interstate Pollution Abatement provision requires the notification to states of potential impact from emissions; and provides for states to petition the USEPA to investigate possible violations of the Good Neighbor Provision. The reality of these two provisions, especially when considering its implementation on California, is that they are a futile endeavor unlikely to provide any relief to Arizona.[55]

"...the predominant contributing sources also do not necessarily fall under the regulatory jurisdictional authority of the state or local air pollution control agencies."

Admittedly, international and interstate transport are not the only contributors to Arizona's ozone pollution. However, of the ozone pollutant precursor emission sources within Arizona, the predominant contributing sources also do not necessarily fall under the regulatory jurisdictional authority of the state or local air pollution control agencies. According to the USEPA's 2014 National Emissions Inventory ("NEI") report containing the most up-to-date data on air pollutant emissions sources, for Arizona, the top two predominant sources of NOx emissions, by far, are mobile sources (See **Figure 11**); and the principal source of VOC emissions is natural resources (see **Figure 12**). The Natural Resources sector of the USEPA's data includes the emissions of biogenic sources but does not account for the emissions from other natural sources such as volcanoes, lightning or sea salt.[56]

Mobile sources emit anthropogenic generated NOx pollutants which are regulated – just not by the state and local air pollution control agencies of Arizona. The USEPA and the National Highway Traffic Safety Administration primarily regulate air emissions of mobile sources via the Corporate Average Fuel Economies ("CAFÉ") and the Tier Standards relating to engines and fuels, etc.[57] As such, these emission reductions occur regardless of an area having an attainment or nonattainment designation. However, the benefits of these regulatory measures are impeded by the growing trend of automobile owners who are keeping their vehicles, many of which are SUVs and trucks, for longer than 15 years and racking up over 200,000 miles on the road, according to a recent study.[58]

Additionally, these regulations do not account for the emissions of foreign-owned vehicles that travel to and from the United States through the various Ports of Entry between Arizona and Mexico (see **Figure 13**); nor those vehicles traveling through Arizona that entered the United States through other international ports of entry.

54 CAA §110(a)(2)(D)(i); 42 U.S.C. 7410(a)(2)(D)(i)
55 Massey, March 17, 2015 ADEQ Letter, p.8.
56 U.S. Environmental Protection Agency. (2018) 2014 National Emissions Inventory, version 2, Technical Support Document. p8-1. Retrieved from https://www.epa.gov/sites/production/files/2018-07/documents/nei2014v2_tsd_05jul2018.pdf.
57 U.S. Environmental Protection Agency. (2019, March 14). Regulations for Emissions from Vehicles and Engines. Retrieved from https://www.epa.gov/regulations-emissions-vehicles-and-engines.
58 ABC15 News. (2019, February 15). Keep Your Used Car In Good Shape For Safety. Retrieved from https://www.abc15.com/news/region-phoenix-metro/central-phoenix/keep-your-used-car-in-good-shape-for-safety; Blackley, J. (2019). The Longest-Lasting Cars to Reach 200,000 Miles and Beyond. Retrieved from https://www.iseecars.com/longest-lasting-cars-2019-study; Blackley, J. (2019). Cars Original Owners Keep for 15 Years or Longer. Retrieved from https://www.iseecars.com/cars-kept-15-years-2019-study.

FIGURE 13. 2018 Border Crossing/Entry Data at Arizona-Mexico Ports of Entry

Measure	Port Name	2018
Buses	Douglas	2,501
	Lukeville	532
	Naco	22
	Nogales	9,569
	San Luis	169
Personal Vehicles	Douglas	1,727,192
	Lukeville	411,228
	Naco	310,106
	Nogales	3,603,601
	San Luis	3,257,990
	Sasabe	24,533
Trains	Nogales	737
Trucks	Douglas	27,804
	Lukeville	298
	Naco	2,997
	Nogales	337,179
	San Luis	28,211

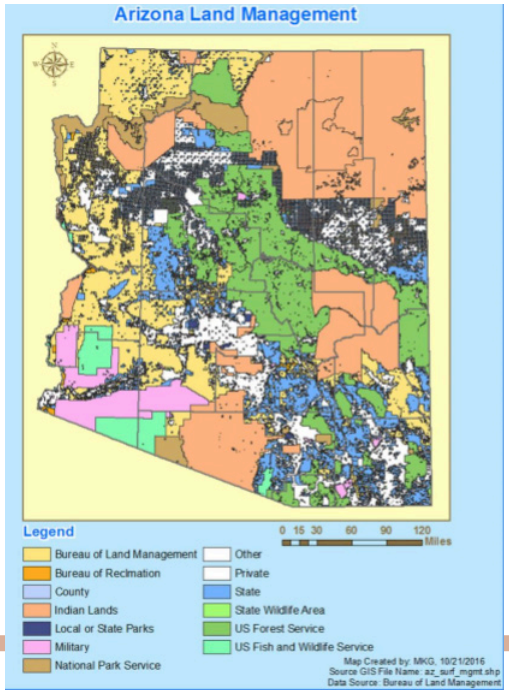
Source: U.S. Department of Transportation. (2018). Border Crossing/Entry Data – Annual Data. Retrieved from https://explore.dot.gov/t/BTS/views/BTSBorderCrossingAnnualData/BorderCrossingTableDashboard

The largest administrator of the lands within Arizona is the federal government; while the State has jurisdictional regulatory authority over the least amount of the land. The state-federal land disparity is another circumstance that is unique to the west; which is the reason that the Governors of the Western U.S. insist on cooperative federalism.[60] The proper management of the lands ought to be a coordinated and collaborative effort involving private and public partnerships at every level.

Aside from the originating sources of ozone precursor pollutant emission, there are other external influences that present enormous challenges to Arizona – one of which is its topography. With its elevation ranging

The even more challenging source of ozone pollution are the natural resources that dominate in emitting VOC pollutant emissions in Arizona. It might be suggested that one way to potentially mitigate these biogenic emissions would be through the enforcement of proper land management. A lofty suggestion, but impractical in Arizona where the land ownership and/or the administration thereof are, approximately, as follows: 17% is privately-held, 7% are other public lands; 13% is held by the State of Arizona, 15% is administered by the U.S. Forest Service, 20% is administered by the Bureau of Land Management, and 28% of the land are designated sovereign territories of various Native American communities.[59] (See **Figure 14**).

FIGURE 14. Arizona Land Ownership and Management

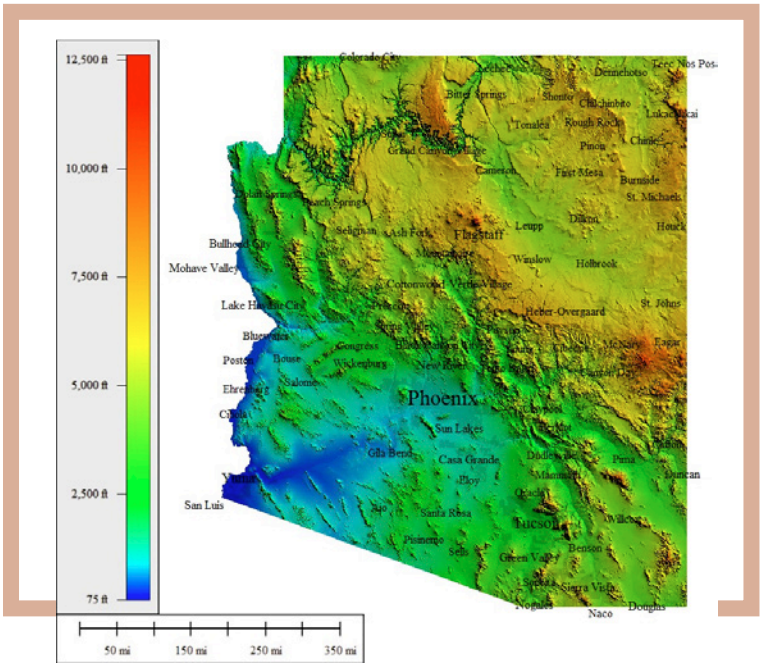


Source: Malloy, J. (2016, November) Cracking the AQ Code: Arizona Prescribed Burns. Arizona Department of Environmental Quality. N-16-09, v2 (9) p6, Figure 6. Retrieved from http://static.azdeq.gov/aqd/aqcode2_9.pdf.

59 U.S. Department of Agriculture. (2006) Land Ownership and Administration: Acreage & Percent of Total by County. [Table]. 2005 Arizona Agricultural Statistics Bulletin. p69. Retrieved from https://www.nass.usda.gov/Statistics_by_State/Arizona/Publications/Annual_Statistical_Bulletin/historical_bulletins/2005FullBulletin.pdf.

60 Western Governors' Association. (2017) Policy Resolution 2017-01: Building a Stronger State-Federal Relationship. Retrieved from http://westgov.org/images/editor/PR_2017-1_State_Federal_Relationship.pdf.

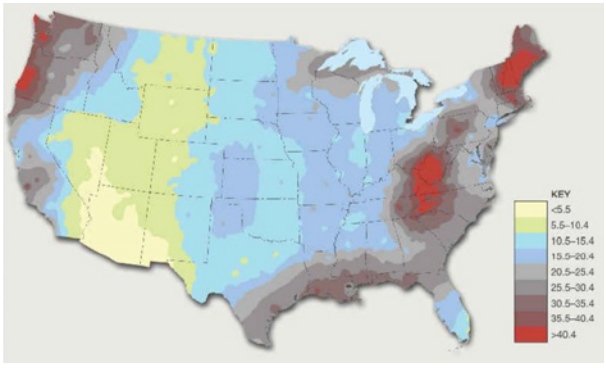
FIGURE 15. Topography of Arizona



Franquist, T., Air Quality Division Director, Arizona Department of Environmental Quality. (2016, April). AMC Environmental Issues Breakfast. [Presentation]. Arizona Manufacturers Council & Arizona Chamber of Commerce and Industry Environmental Issues Breakfast Meeting. Slide 21. Retrieved from https://azchamber.com/events/presentations/april-2016-environmental-issues-breakfast/.

from near sea level to over 10,000 feet in some parts and complex terrain of deserts, mountains, canyons and forests, Arizona's topography plays a significant role in the behavior of the air flow.[61] (See **Figure 15**). In Phoenix alone, the airsheds to the north and northeast of the valley can serve as a funnel that feeds air pollutants into the valley area via its drainages;[62] and the mountain ranges directly surrounding the valley – Phoenix Mountains in Central Phoenix, South Mountain in South Phoenix, and the Estrella Mountains to the southwest of Phoenix – can act as walls that trap in certain pollutants, especially during stagnant wind conditions.[63] Furthermore, the dark blue color on the topography map of Arizona at Figure 15, reveals a delineated path from Yuma into Phoenix with little terrain to break up the flow of air pollutants moving downwind from California through Yuma and into Phoenix.

FIGURE 16. The Average Number of Days of Dense Fog Per Year in The U.S.



Source: Graves, M., (2016, February) Cracking the AQ Code: All About Fog. Arizona Department of Environmental Quality. N-16-02, v2 (2) p4, Figure 5. Retrieved from http://static.azdeq.gov/aqd/aqcode2_2.pdf.

Additionally, Arizona's topography, in conjunction with its unique climate, provides the perfect breeding ground for various unique meteorological events to occur and influence the air quality. Arizona is truly unique in that "[o]ut of all the states [in the country, it] has the least amount of dense fog days per year. ...due to Arizona's dry climate."[64] (See **Figure 16**). Accompanying the arid climate and varying terrain are occurrences of haboobs (i.e., massive dust

61 Malloy, J. (2016, November) Cracking the AQ Code: Arizona Prescribed Burns. Arizona Department of Environmental Quality. N-16-09, v2 (9) pp10-11 and Figure 12. Retrieved from http://static.azdeq.gov/aqd/aqcode2_9.pdf.

62 ADEQ Forecast Team, Patterns in Phoenix Air Pollution, p.3 and Figure 3.

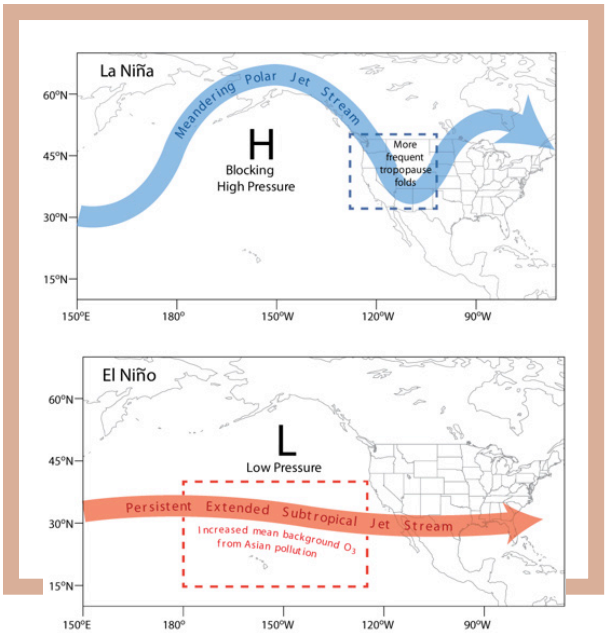
63 Malloy, J., Patel, P., Nicoll, R., and Graves, M. (2016, December) Cracking the AQ Code: PM2.5 in Arizona and Around the World. Arizona Department of Environmental Quality. N-16-10, v2 (10) p14, and Figure 19. Retrieved from http://static.azdeq.gov/aqd/aqcode2_10.pdf.

64 Graves, M., (2016, February) Cracking the AQ Code: All About Fog. Arizona Department of Environmental Quality. N-16-02, v2 (2) p4. Retrieved from http://static.azdeq.gov/aqd/aqcode2_2.pdf.

storms), microbursts, tornados or unusually strong winds; and even wildfires and controlled prescribed burns, the conditions of which the aforementioned can exacerbate greatly. Additionally, the weather and topography of Arizona present conditions resulting in temperature inversions[65] in the winter and monsoons in the summer which are sometimes accompanied by extraordinary lightning and stratospheric intrusion events.[66] Furthermore, the El Nino-Southern Oscillation ("ENSO") cycle, which includes complex weather patterns commonly referred to as El Nino and La Nina, "can have large-scale impacts" on global weather and climate;[67] and impacts Arizona by providing ideal conditions for an increase in stratospheric intrusion and long-range transport of pollutants (See **Figure 17**).

The CAA Section 319(b), "Exceptional Events Exclusion" provision recognizes that these types of events are indeed exceptional in that the occurrence thereof is "not reasonably controllable or preventable" and authorizes the USEPA, in conjunction with state and local air pollution control agencies, to develop "regulations governing the review and handling of air quality monitoring data influenced by exceptional events."[68] The Exceptional Events Rule[69] ("EER") was subsequently developed and published in 2007 providing a mechanism in which a state may prepare an Exceptional Events ("EE") demonstration – proving air pollutant emissions were elevated above the NAAQS due to the occurrence of an event in which the normal planning and regulatory processes

FIGURE 17. **ENSO Influence on Ozone**



Source: Franquist, T., Air Quality Division Director, Arizona Department of Environmental Quality. (2016, April). AMC Environmental Issues Breakfast. [Presentation]. Arizona Manufacturers Council & Arizona Chamber of Commerce and Industry Environmental Issues Breakfast Meeting. Slide 26. Retrieved from https://azchamber.com/events/presentations/april-2016-environmental-issues-breakfast/.

established by the CAA were not sufficient in the controlling or prevention thereof – justifying the exclusion of air quality data from consideration in regulatory decisions and actions. However, as Arizona is intimately familiar, EE demonstrations can be costly, time-intensive and overly-demanding on the resources of a state and/or local air pollution

65 A temperature inversion occurs when the "air closest to the ground cools faster than the air right above it…[resulting] in a layer of cooler air at the surface with warmer air above it….This inversion then acts as a barrier, separating air at the ground from faster-moving air higher in the atmosphere" which can lead to a brown cloud layer of pollutants. See Patel, P., Graves, M., and Nicoll, R. (2015, December) Cracking the AQ Code: Temperature Profiles, Inversions, and NO BURN DAYS. Arizona Department of Environmental Quality. N-15-41, v1(5) p1. Retrieved from http://static.azdeq.gov/aqd/aqcode1_5.pdf.

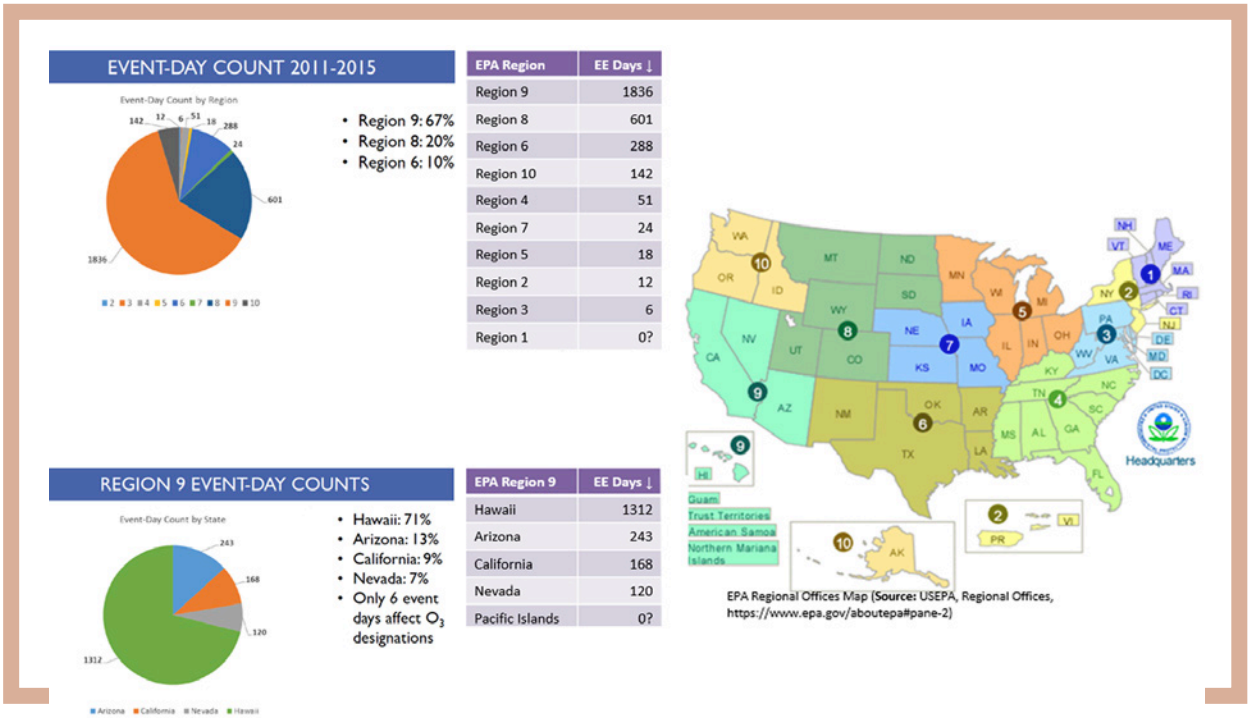
66 ADEQ Forecast Team, Patterns in Phoenix Air Pollution.

67 National Oceanic and Atmospheric Administration. (n.d.). What are El Nino and La Nina? Retrieved from https://oceanservice.noaa.gov/facts/ninonina.html.

68 CAA §319(b); 42 U.S.C. §7619(b)

69 U.S. Environmental Protection Agency. (2007, March 22). Treatment of Data Influenced by Exceptional Events Final Rule. 72 Fed. Reg. 13560-13581. Retrieved from https://www.govinfo.gov/content/pkg/FR-2007-03-22/pdf/E7-5156.pdf.

FIGURE 18. Number of Exceptional Event Days Reported Between 2011-2015



Source: McKaughan, C., Associate Director, Air Division, U.S. EPA Region 9. (2017) Exceptional Events Update. [Presentation]. Association of Air Pollution Control Agencies 2017 Spring Meeting, March 27-29, 2017. Retrieved from https://www.cleanairact.org/events/documents/McKaughan-AAPCASpringMeetingPresentationonExceptionalEvents.final.pdf *(data provided by the graphs was used to create the accompanying tables to more easily and visibly relay the information).*

control agency.[70] This concern is even more prevalent for the states within USEPA Region IX which already experiences the highest number of EE days, with Arizona having the second highest number of EE days, behind Hawaii who has to account for ongoing volcanic activity.[71] (See **Figure 18**).

Arizona's unique challenges in addressing air pollutant emissions have been vital in helping the USEPA recognize and even acknowledge that the EER "is too burdensome, and more streamlining is needed" to make it functional.[72]

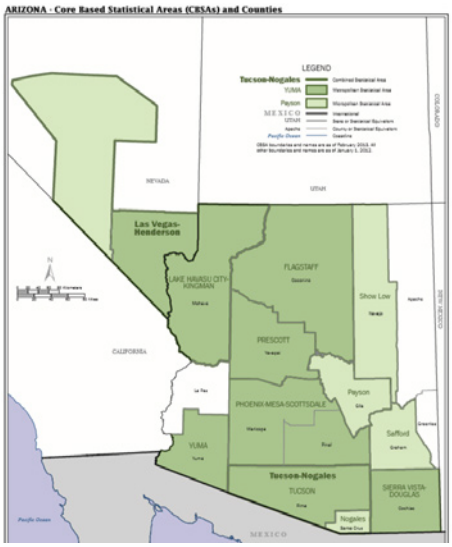
For the states of the Intermountain Western U.S., the concern is that the "frequency of events and difficulty of demonstrating their roles, especially as the [ozone] NAAQS approaches USB at rural western sites" will be "too onerous" for the EER to be a realistic

70 Letter from Greg Remer, President, Western States Air Resources Council to the U.S. Environmental Protection Agency. (2012, August 31). Retrieved from http://www.westar.org/Docs/NEP/WESTAReer083112.pdf; Letter from Terry O'Clair, President, Western States Air Resources (WESTAR) Council to the U. S. Environmental Protection Agency. (2016, May 11). EPA-HQ-OAR-2016-0097. Retrieved from http://www.westar.org/Docs/03NAAQS/WESTAR%20background%20ozone%20white%20paper%20comments_signed_5_12_16.pdf; and Association of Air Pollution Control Agencies. (2015, June). State Environmental Agency Perspectives on Background Ozone & Regulatory Relief. Retrieved from https://www.cleanairact.org/documents/AAPCASurvey-StateEnvironmentalAgencyPerspectivesonBackgroundOzoneandRegulatoryRelief-June201.pdf.

71 McKaughan, C., Associate Director, Air Division, U.S. EPA Region 9. (2017) Exceptional Events Update. [Presentation]. Association of Air Pollution Control Agencies 2017 Spring Meeting, March 27-29, 2017. Retrieved from https://www.cleanairact.org/events/documents/McKaughan-AAPCASpringMeetingPresentationonExceptionalEvents.final.pdf.

72 Id. at pp.5 & 7.

FIGURE 19. Arizona Metropolitan Statistical Areas

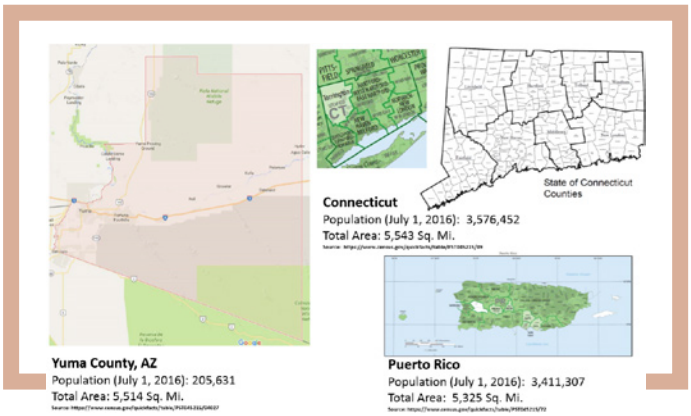


Source: Reeve, A.A. and Davis, B. (2017). What's Next? Clean Air Act Policy Issues. [Presentation]. Association of Air Pollution Control Agencies 2017 Spring Meeting, March 27-29, 2017. Retrieved from https://www.cleanairact.org/events/documents/Davis-ReeveAAPCAPresentation.pdf

relief mechanism.[73] An alternative relief mechanism available to rural areas only is the CAA Section 182(h) "Rural Transport Areas" ("RTA") provision.[74] The RTA provision, much like the International Transport provision, does not provide any real relief for an area because it still receives a marginal nonattainment classification, "complete with all the consequences of such designations."[75]

The RTA provision is not a realistic option anyway; because to qualify as an RTA, "a nonattainment area must not be adjacent to, or include any part of, a Metropolitan Statistical Area (MSA) and must not have sources of NOx and VOC that significantly contribute to the violation in the area or to violations in other areas."[76] Arizona has 15 very large counties, all of which are in or adjacent to an MSA; thus, regardless of population, there is not one county in Arizona, including Yuma, that is able to currently qualify for an RTA designation. (see **Figure 19**). Realistically, however, Yuma County should be able to qualify as an RTA classification, especially as "Yuma is not an urban area that substantially contributes to its own nonattainment on high ozone days."[77] From the perspective of land mass and population, Yuma County's total land area is slightly less than that of the State of Connecticut, and marginally more than that of Puerto Rico; but the population of Yuma County as of 2016, was a total of 205,631 as opposed to the population of more than three million people each for Connecticut and Puerto Rico.[78] (See **Figure 20**).

FIGURE 20. Yuma County Population and Land Mass Comparisons Perspectives



Source: Reeve, A.A. and Davis, B. (2017). What's Next? Clean Air Act Policy Issues. [Presentation]. Association of Air Pollution Control Agencies 2017 Spring Meeting, March 27-29, 2017. Retrieved from https://www.cleanairact.org/events/documents/Davis-ReeveAAPCAPresentation.pdf

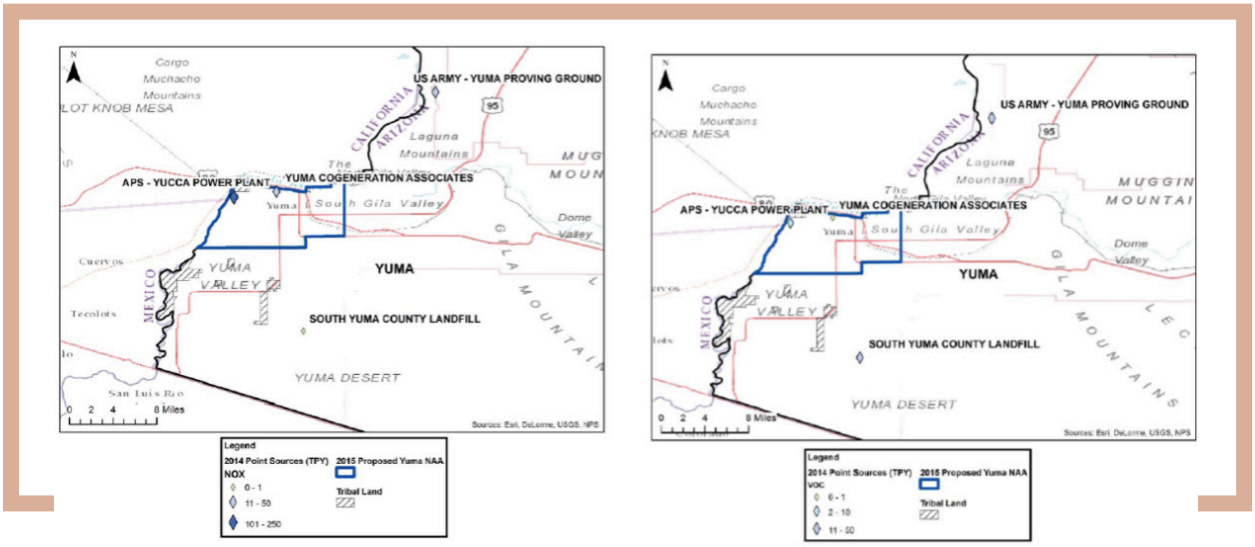
73 O'Clair, May 11, 2016 WESTAR Letter, p.8.
74 CAA §182(h); 42 U.S.C. §7511a(h)
75 O'Clair, May 11, 2016 WESTAR Letter, p.8.
76 USEPA, Background Ozone White Paper, p.13.
77 Arizona Department of Environmental Quality. (2016, August 30). 2015 Ozone NAAQS Boundary Recommendations. p58. Retrieved from http://static.azdeq.gov/aqd/gov_ozone_boundary_rec.pdf.
78 U.S. Census Bureau. (July 1, 2016) Yuma County Quick Facts. Updated statistics for 2018 available at https://www.census.gov/quickfacts/fact/table/yumacountyarizona/PST045218; U.S. Census Bureau. (July 1, 2016) Connecticut Quick Facts. Updated statistics for 2018 available at https://www.census.gov/quickfacts/fact/table/CT/PST045218; U.S. Census Bureau. (July 1, 2016) Puerto Rico Quick Facts. Updated statistics for 2018 available at https://www.census.gov/quickfacts/fact/table/PR/PST045218.

Yuma County is the most notable example provided when discussing the urgency in the calls to modernize the CAA. The USEPA acknowledges that for Yuma County the predominant sources of ozone pollutants are Mexico and California;[79] and their modeling data further indicates that only a mere six percent of the ozone pollutant emissions are "attributable to anthropogenic Arizona emissions."[80] However, even as the USEPA admitted, "determining which emissions are manmade, or from the U.S., can be difficult;"[81] thus it will be a challenging and costly effort for Arizona to quantify the ozone pollutants originating in Mexico versus California should it attempt to obtain an International Transport designation.

The NOx and VOC emission point sources in Yuma County are very minimal. (See **Figure 21**). Thus, it does not have a significant industry presence nor the means to offset emissions to accommodate a new major source or major modifications to its few existing major sources. Even if Yuma had sources from which it could collect ERCs, the minimal quantity would be of little-to-no use – a situation with which Maricopa County is all too familiar.

Furthermore, even though it has a total land area that is as large as the State of Connecticut with only the tiniest fraction of its population, Yuma County does not qualify for an RTA designation. Being that California, one of the predominant sources of Yuma County's ozone nonattainment, still has areas in nonattainment of the previous two ozone standards in addition to the 2015 standard, the Good Neighbor and Interstate Transport Abatement Provisions are not realistic tools for providing relief of any kind to Yuma County. Additionally, as the emissions sources primarily contributing to its ozone nonattainment are international, interstate, biogenic and mobile related, it is unlikely that an EE demonstration will ever be

FIGURE 21. Yuma 2014 Point Sources



Source: Arizona Department of Environmental Quality. (2016, August 30). 2015 Ozone NAAQS Boundary Recommendations. pp. 43-45. Retrieved from http://static.azdeq.gov/aqd/gov_ozone_boundary_rec.pdf.

79 USEPA, Regulatory Impact Analysis, Appendix 2A, p.2A-34.
80 ADEQ, 2015 Ozone NAAQS Boundary Recommendations, p.58.
81 USEPA, Background Ozone White Paper, p.2, fn.8.

useful in providing relief to Yuma County. Finally, while the very purpose of the CAA and the NAAQS is to protect the public health and welfare "and the productive capacity of its population,"[82] in the case of Yuma County, the CAA "creates an incredibly dire situation" on its public health and economy.[83]

The immeasurable burden of being designated a nonattainment area for pollutant emissions that are largely outside the jurisdictional regulatory authority of the state air pollution control agency is not a new experience for Yuma County. However, as the county with the highest unemployment rate of all 15 counties in Arizona (see **Figure 22**), the urgency to modernize the CAA is a devastating reality if it is to continue serving its purpose of protecting the health and welfare of the public.[84]

FIGURE 22. Arizona 2019 Unemployment Rates by County

County	May 2019
Apache County	8.9
Cochise County	5.5
Coconino County	5.0
Gila County	5.3
Graham County	4.7
Greenlee County	4.2
La Paz County	5.8
Maricopa County	3.9
Mohave County	5.5
Navajo County	6.8
Pima County	4.4
Pinal County	4.8
Santa Cruz County	6.7
Yavapai County	4.3
Yuma County	17.1

Source: U.S. Department of Labor, Bureau of Labor Statistics. (2019, May). Local Area Unemployment Statistics Map. Retrieved from https://data.bls.gov/lausmap/showMap.jsp;jsessionid=23B3DDD92FC39BC3EB1198D22DE4050B.

The USEPA is required to set the pollutant standard at a level requisite to protect human health and welfare; but the very existence of background ozone is evidence that it is impossible to eliminate all risk of health effects – a fact even acknowledged by the courts in *Mississippi v. EPA*, 744 F.3d 1334, 1343 (D.C. Cir. 2013).[85] Furthermore, as "[a] growing body of research confirms the existence of a powerful connection between socioeconomic status and health,"[86] not only does the USEPA's decision to tighten the ozone standard fail to protect the public health and welfare of Yuma County because it is unable to control the international and interstate sources of the pollutant emissions contributing to its nonattainment; but the USEPA's nonattainment designation of Yuma prevents economic growth in an area that has 19% of its residents already living below the poverty line, thereby all but ensuring the worsening state of the public health and welfare.[87]

ARIZONA LEADS THE WAY: DEVELOPING PRACTICABLE SOLUTIONS

Ozone is certainly not the first air pollutant to be causing Arizona great angst. For decades, Arizona's unique geography, climate and circumstances have been presenting daunting challenges to attaining and maintaining the NAAQS for numerous criteria pollutants. One only needs to spend a few hours combing through the USEPA Region IX website's Air Actions for Arizona,[88] to begin developing an

82 CAA §101(b)(1) and CAA §109(b)(1); 42 U.S.C. §7401(b)(1) and 42 U.S.C. §7409(b)(1)
83 Franquist, 2018 Cong. Statement.
84 Ibid.
85 Massey, March 17, 2015 ADEQ Letter, p.2, fn7.
86 McCally, M. (1998). Poverty and Ill Health: Physicians Can, and Should, Make a Difference. Annals of Internal Medicine. 129. 726. 10.7326/0003-4819-129-9-199811010-00009. Retrieved from https://www.researchgate.net/publication/271239213_Poverty_and_Ill_Health_Physicians_Can_and_Should_Make_a_Difference; and Franquist, 2018 Cong. Statement, Attachment E.
87 Franquist, 2018 Cong. Statement, pp.2-3.
88 U.S. Environmental Protection Agency. (2018, January 09). Air Actions, Arizona. Retrieved from https://www3.epa.gov/region9/air/actions/az.html.

appreciation for the state's plight and efforts in air quality. As such, Arizona – through collaborative stakeholder partnerships with Arizona's professional and trade associations; private and public organizations; business and industry; federal, state and local elected officials and regulatory agencies; universities; etc. – has been developing practicable solutions and approaches to address the state's air quality issues. These efforts are being done on four fronts through litigation, legislation, regulation, and innovation.

With the USEPA considering a lower standard for ozone, and Arizona already struggling with a functionally-lacking EER – a regulatory tool that is important to the western states' efforts in attaining the NAAQS – it was quickly evident that pushing to have the EER revised to be more practicable and efficient was the immediate priority for Arizona.

After having a national-newsworthy haboob roll through the Greater Phoenix Area in July 2011 (see **Figure 23**), for which Arizona spent approximately $675,000 and 790 staff hours preparing a 250-page EE demonstration to prove to the USEPA's satisfaction that the dust storm was indeed exceptional,[89] it became increasingly difficult for the USEPA to not undertake the revising of the EER.

FIGURE 23. July 2011 Dust Storm Event, Phoenix, Arizona

Source: Massey, E., Air Quality Division Director, Arizona Department of Environmental Quality. (2012) Exceptional Events: Lessons Learned. [Presentation]. WESTAR Fall 2012 Business Meeting. Retrieved from http://www.westar.org/Docs/Business%20Meetings/Fall12/Fall12agenda.html.

While Arizona alone is not responsible for the USEPA finally taking action on the EER in 2012; it certainly helped that Arizona Congressman Jeff Flake introduced the Commonsense Legislative Exceptional Events Reform Act of 2012 ("CLEER Act") – a product of labor by Congressman Flake and "Arizona-based, regional and national air quality stakeholders."[90] To encourage action on revising the EER be taken by the USEPA, Congressman Flake remarked that "[w]hile EPA 'is deferring a decision on whether to revise the Exceptional Events Rule,' I would urge the agency to take a supportive posture towards legislation I have introduced

89 Massey, E., Air Quality Division Director, Arizona Department of Environmental Quality. (2012) Exceptional Events: Lessons Learned. [Presentation]. WESTAR Fall 2012 Business Meeting. Retrieved from http://www.westar.org/Docs/Business%20Meetings/Fall12/Fall12agenda.html; U.S. Environmental Protection Agency. (2013, November 20). Arizona-Only Exceptional Event Listening Session in Advance of Rule Revisions. EPA-HQ-OAR-2013-0572-006. Retrieved from https://www.regulations.gov/document?D=EPA-HQ-OAR-2013-0572-0006.

90 Letter from Jeff Flake, Arizona U.S. Congressman, to the U.S. Environmental Protection Agency. (2012, September 4). EPA-HQ-OAR-2011-0887-0040. Retrieved from https://www.regulations.gov/document?D=EPA-HQ-OAR-2011-0887-0040.

and that would provide the Legislative authority for a greater degree of transparency, predictability, accountability, and state deference for the exceptional events process."[91]

Continuing to exert pressure on the USEPA to act on the EER revisions, and in response to Arizona stakeholders' expressed frustrations with feeling unheard and misunderstood by the USEPA Headquarters regarding the issues unique to the Western U.S. and the urgent need for a functional EER, U.S. Senator Jeff Flake (the former Congressman having been elected in November 2012 to the U.S. Senate) arranged for an Arizona-Only Exceptional Event Listening Session telephone conference between Arizona stakeholders and the leadership at USEPA Headquarters and Region IX.[92]

Arizona's persistence paid off when the USEPA finalized its substantial revisions to the EER.[93] The revisions simplified and clarified the core EER requirements pertaining to the criteria that air pollution control agencies must meet in its EE demonstration; and promoted the engagement of regular communications between the federal and air pollution control agency, thereby ensuring more timely decisions with an increased likelihood of approval. However, it is a concern that the process implemented to ensure the occurrence of this increased communication may have an unintended consequence of delaying decisions.[94] Not incorporated in the final rule, despite having been continually requested are: (1) a dispute resolution component permitting states to appeal a USEPA decision disapproving an EE demonstration; and (2) the implementation of a "preponderance of evidence" as opposed to the "weight of evidence" being used in approval determinations, thereby permitting the USEPA to approve an EE demonstration as long as states provide sufficient evidence to prove the event was more likely than not to be exceptional or natural.[95]

"Arizona's persistence paid off when the USEPA finalized its substantial revisions to the EER."

The revisions to the EER were still being finalized when the USEPA decided to tighten the ozone standard in 2015. All the discussions and issues raised with the USEPA over the four years regarding the unique characteristics of the Western U.S. that affect air quality and regulatory abilities; and the severity of impact more stringent standards, especially ozone, will have on the Intermountain West had, it appeared, been in vein. With the new ozone standard being so close to background levels and the concerns of the Intermountain Western states seemingly being disregarded by the USEPA, the urgency in responsibly modernizing the CAA has become a focus for Arizona. However, making any type of modification to the CAA is clearly an uncomfortable task for Congress. As such, identifying the immediate, short-term and

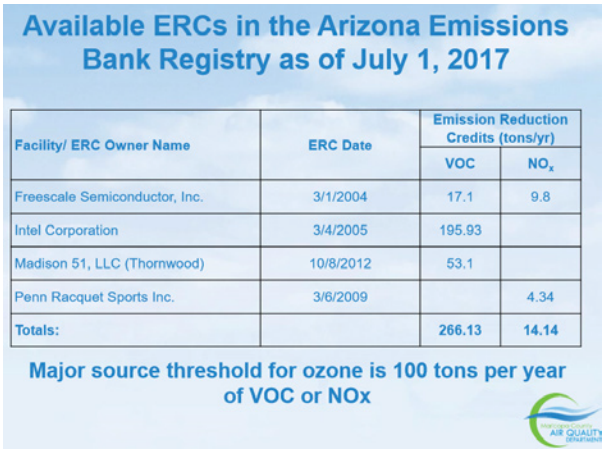
91 Ibid.
92 USEPA, Arizona-Only Exceptional Event Listening Session; and Letter from Glenn Hamer, President & CEO, Arizona Chamber of Commerce and Industry and Jim Norton, Executive Director, Arizona Manufacturers Council, to Gina McCarthy, Administrator, the U.S. Environmental Protection Agency. (2016, February 3). EPA-HQ-OAR-2013-0572-0172. Retrieved from https://www.regulations.gov/document?D=EPA-HQ-OAR-2013-0572-0172.
93 U.S. Environmental Protection Agency. (2016, October 3). Treatment of Data Influenced by Exceptional Events Final Rule. 81 Fed. Reg. 68216-68282. RIN 2060-AS02. Retrieved from https://www.govinfo.gov/content/pkg/FR-2016-10-03/pdf/2016-22983.pdf.
94 Hamer, February 3, 2016 Letter.
95 Ibid.

long-term issues impacting Arizona's ability to attain the 2015 ozone NAAQS has been crucial for Arizona stakeholders in developing and pursuing efforts to address each.

Arizona's overarching primary goal is to work towards attaining and maintaining all of the NAAQS. For the Maricopa Nonattainment Area, it is important to find even more ways to reduce emissions of ozone precursor pollutants; while also trying to find emission offsets thereby enabling the permitting of new and existing Major Sources. For Yuma County, however, the options available are extremely limited. While Maricopa County has an industrial presence that Yuma County is lacking, both nonattainment areas have mobile sources as the primary emitter of NOx and natural resources as the predominant source of VOC's. The situation is certainly troubling for Maricopa County and absolutely dire for Yuma County. As such, Arizona's Attorney General Mark Brnovich took the lead in suing the USEPA on November 30, 2015, challenging the validity of its decision to tighten the ozone NAAQS.[96] However, seeing that this litigation would not be resolved immediately; Arizona stakeholders considered legislative options.

While many provisions of the CAA are in need of being modernized, the immediate concern for Arizona is providing some sort of relief to Yuma County as expeditiously as possible. Arizona drafted a fairly innocuous piece of legislation that U.S. Senators Jeff Flake and John McCain jointly sponsored and introduced on May 10, 2018, S.2825, known as the Air Designation Actions in Areas of Pollutant Transport ("ADAAPT") Act.[97] The provisions of the ADAAPT Act establish assurances of timely decisions on states seeking designations pertaining to international transport or RTA; removes the MSA criteria from

FIGURE 24. Available ERC in Maricopa County



Facility/ ERC Owner Name	ERC Date	Emission Reduction Credits (tons/yr)	
		VOC	NO_x
Freescale Semiconductor, Inc.	3/1/2004	17.1	9.8
Intel Corporation	3/4/2005	195.93	
Madison 51, LLC (Thornwood)	10/8/2012	53.1	
Penn Racquet Sports Inc.	3/6/2009		4.34
Totals:		**266.13**	**14.14**

Source: Valenzuela, H., Senior Planner, Maricopa County Air Quality Department. (n.d.). Development of Maricopa County's Emission Reduction Credit Program. [Presentation]. Slide 13. Retrieved from https://www.maricopa.gov/4562/Emission-Reduction-Credit-Program.

the RTA provision thereby giving more flexibility to the USEPA in determining if an area meets the RTA qualifications; and permits the substitution of the level of control technology required for sources in an a nonattainment area with an international transport or RTA designation. This legislation does not eliminate the burden on Yuma County, nor does it minimize the burden greatly; but it would at least be something to help ease the burden slightly. However, to provide any real relief to Yuma and Maricopa Counties, Arizona turned to more innovative measures.

In order to permit a new major source or to modify an existing major source in a nonattainment area, the emissions from the major source must be offset so as not to impede air quality improvement efforts. To achieve this offset, a major source could obtain emission reduction credits ("ERC") stored in the Arizona Emissions Bank. When a major source

96 State of Arizona v. EPA, No. 15-1392, Petitioners' Non-Binding Statement of Issues (Nov. 30, 2015, D.C. Cir.)
97 Air Designation Actions in Areas of Pollutant Transport ("ADAAPT") Act, S. 2825, 115th Cong. (2018, May 10). Retrieved from https://www.congress.gov/115/bills/s2825/BILLS-115s2825is.pdf.

reduces its emissions, either by implementing new control technology, retiring certain operations, or the like, it can bank its emissions – these are known as traditional offsets - and sell them to a major source that needs the emissions reductions to offset its emissions.

While most states have substantial ERCs in the bank for major sources to use, Maricopa County as a whopping 14 tons of NOx traditional offsets in its bank (see **Figure 24**); which isn't enough to help one major source even a little. Thus, Arizona decided to explore the possibility of pursuing non-traditional offsets (see **Figure 25**). This innovative measure actually required legislative authority. In 2017, Arizona stakeholders drafted legislation and worked with the state legislature to pass House Bill 2152 "Emissions Credits; Voluntary Emissions Bank,"[98] which Arizona Governor Doug Ducey signed into law on May 1, 2017.[99]

Arizona's state and local air pollution control agencies and Arizona stakeholders are working to implement the regulatory processes for securing, certifying and obtaining USEPA's approval of non-traditional ERCs. Simultaneously, Arizona stakeholders are working with U.S. Senators Kyrsten Sinema and Martha McSally to pick up where Senator Flake left off on moving the ADAAPT Act forward. Additionally, Arizona stakeholders continue collaboration efforts on community outreach programs geared towards helping the public understand the impact they have on the air quality and encourage them to modify their behaviors accordingly.[100] Further, Arizona stakeholders are working on drafting legislation to address other problematic provisions within the CAA in an effort to modernize it for the purpose of ensuring its future success and viability. Lastly, Arizona stakeholders will continue urging Congress to pursue judicious and practicable legislation modernizing the CAA; and advocating for cooperative federalism that includes robust stakeholder collaboration in pursuit of meaningful innovative solutions.

FIGURE 25. Potential Sources of Non-Traditional Offset for Arizona

Source: Valenzuela, H., Senior Planner, Maricopa County Air Quality Department. (n.d.). Development of Maricopa County's Emission Reduction Credit Program. [Presentation]. Slide 22. Retrieved from https://www.maricopa.gov/4562/Emission-Reduction-Credit-Program.

98 Emissions Credits: Voluntary Emissions Bank, H.B. 2152, 53rd Leg, 1st Reg. Sess. (Ariz. 2017). (enacted). Retrieved from https://apps.azleg.gov/BillStatus/GetDocumentPdf/453807.

99 Arizona Department of Environmental Quality. (2017). Passage of Voluntary Emissions Bank HB2152 Creates Incentives for Arizona's Business Economy and Improved Air Quality. [Press Release]. Retrieved from https://azdeq.gov/press-releases/press-release-passage-voluntary-emissions-bank-hb-2152-creates-incentives-arizona's.

100 Maricopa County Air Quality Department. Clean Air Make More: Maricopa County's Initiative to Promote Cleaner Air and Healthier Lives. Retrieved from http://cleanairmakemore.com/.

"Arizona stakeholders will continue urging Congress to pursue judicious and practicable legislation modernizing the CAA"

Prepared by Amanda Reeve, Environmental & Regulatory Policy Advisor, Snell & Wilmer and the Arizona Manufacturers Council for:

Arizona Manufacturers Council
Arizona Chamber of Commerce & Industry
3200 North Central Avenue, Suite 1125
Phoenix, AZ 85012
602-248-9172
www.azmanufacturerscouncil.com

Snell & Wilmer
One Arizona Center
400 East Van Buren Street, Suite 1900
Phoenix, AZ 85004
602-382-6000
www.swlaw.com

Prosper Foundation
3200 North Central Avenue, Suite 1125
Phoenix, AZ 85012
602-529-1204
www.prosperfoundationhq.org

Edwin Barbey Charitable Trust
Arizona Community Foundation
2201 East Camelback Road, Suite 405B
Phoenix, AZ 85016
602-381-1400

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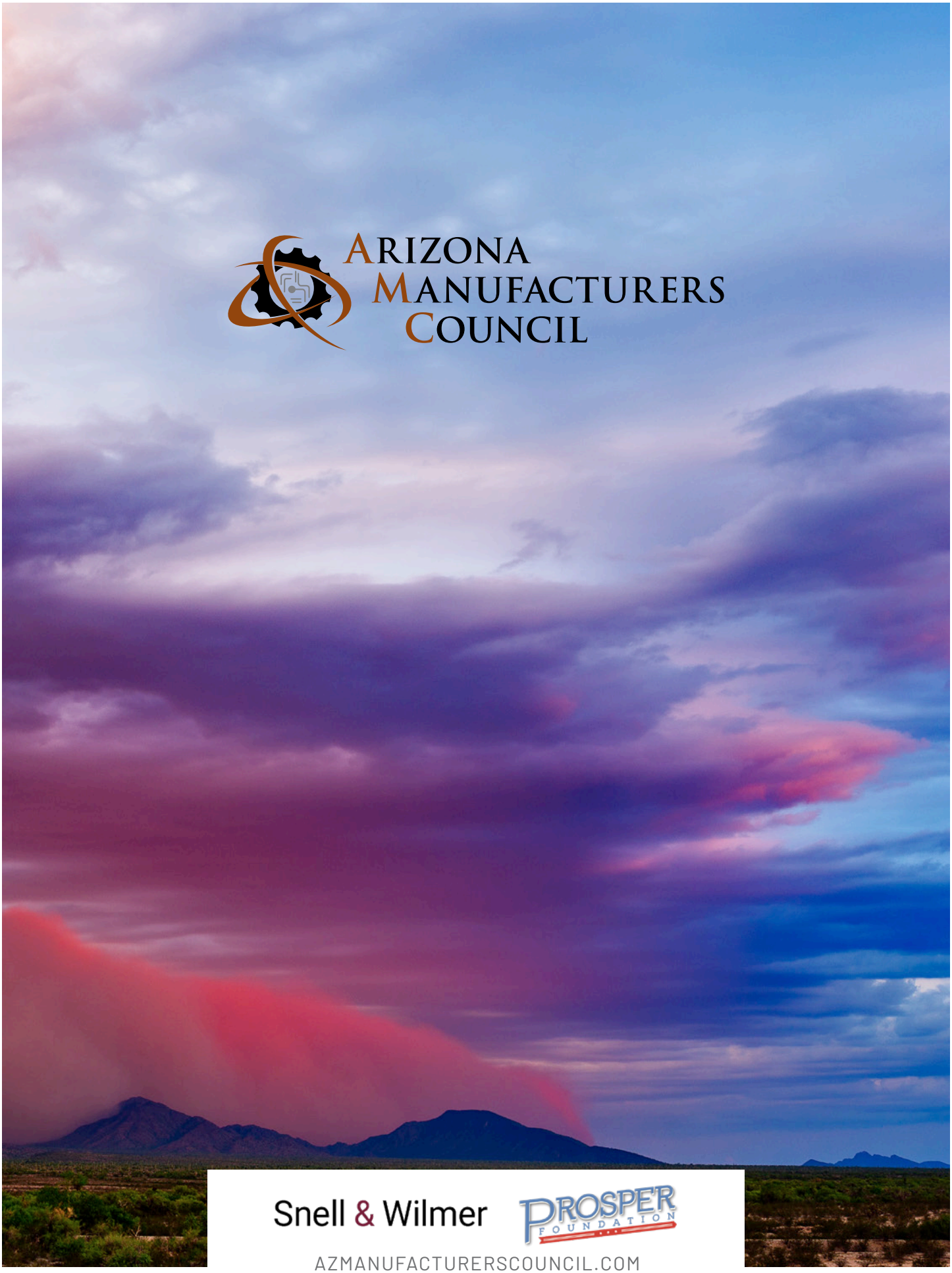
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