W E S T E R N S T A T E S A I R R E S O U R C E S C O U N C I L

W E S T A R

May 11, 2016

U.S. Environmental Protection Agency
EPA Docket Center (EPA/DC)
1200 Pennsylvania Avenue N. W.
Washington, D.C. 20760
Docket ID No: EPA-HQ-OAR-2016-0097

RE: Western States Responses Regarding Background Ozone and Recommendations for Additional Efforts in the Western U.S.

The Western States Air Resources (WESTAR) Council, an association of 15 western state air quality managers, appreciates the opportunity to share our input on aspects of background ozone (O_3) that are relevant to attaining the 2015 NAAQS. WESTAR has several recommendations to share with EPA based on our review of the *Implementation of the 2015 Primary Ozone NAAQS: Issues Associated with Background Ozone White Paper for Discussion* (White Paper). In general, western states are concerned with the characterization of U.S. background (USB) O_3 and the limited CAA regulatory relief mechanisms offered through exceptional event exclusions or area designations.

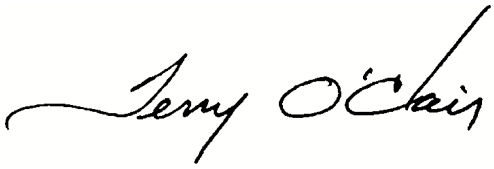
WESTAR herein offers suggestions for EPA's consideration to strengthen the assessment of USB O_3 in the western U.S. As part of the recommendations, WESTAR offers its services in engaging states, EPA, and other stakeholders cooperatively in some of these activities. A summary of WESTAR's recommendations is provided below. A more detailed discussion of these recommendations and WESTAR's concerns is included in WESTAR's responses to questions posed in the White Paper, as found in the Attachment.

- EPA, in coordination with western states, should continue its efforts to characterize USB O_3 in the West. A supplement to the White Paper that specifically addresses high USB O_3 concentrations at high-elevation, rural monitors across the western U.S. that don't respond to regional precursor reductions, would provide a better common understanding of this situation. Guidance on evaluating these concentrations will be beneficial to all affected states, as well as to the understanding of interstate transport of O_3 in general.
- To clarify the relationship between USB O_3 estimates and events that quality for relief through the Exceptional Events Rule, western states would benefit from a clear, explicit statement from EPA regarding the role of models and other data in determining USB O_3.

- Further classification of the components of USB O_3 should be addressed within the definition of USB O_3 and modeling characterization of USB should identify the contribution of each component.
- The needs of EPA and co-regulators for estimating USB O_3 for air quality planning purposes should be identified in order to provide tools and timely "best available" estimates under the CAA. Assessment and re-assessment of USB O_3 in the western U.S. should be routine and ongoing.
- A joint EPA/co-regulator effort should be initiated that builds on existing modeling expertise to refine USB O_3 estimates. This effort could estimate USB O_3 levels as 8-hour averages so they are consistent with how the O_3 NAAQS is characterized and implemented.
- The influence on USB O_3 from site elevation, long-term increases in tropospheric O_3 concentrations, stratospheric intrusion/long-range transport events, and climatic variability (El Niño/La Niña) should be better characterized.
- Boundary conditions from global models that inform U.S. regional models used for estimating O_3 should be further evaluated. This could include:
    - Identification of the criteria for determining the "best" global model for providing boundary conditions to U.S. regional models.
    - Determination of the potential improvements to U.S. regional model performance from the "most robust" and "enhanced global model(s)." This effort could increase confidence in modeled estimates of USB O_3.
- EPA should provide guidance to support and inform Section 179B of the CAA so that states understand how to create a successful international transport area demonstration.
- Two alternative mechanisms to address USB O_3 should be evaluated. These include: 1) assessing the principal contributor concept proposed by BP America; and, 2) considering a more robust natural events policy for USB O_3.
- In its Integrated Review Plan for a future O_3 NAAQS, EPA should include the questions raised in its White Paper, as well as those issues raised in these comments. In addition, the upcoming Clean Air Scientific Advisory Committee O_3 NAAQS Review Panel should include scientists who are actively engaged in background O_3 research and understand the policy implications of background O_3 on state implementation planning.

Thank you for considering WESTAR's recommendations and our responses to the White Paper questions. We hope to continue the important conversations and working relationship with EPA to address USB O_3 in the western U.S. We look forward to working with EPA to better characterize USB O_3 and identify additional CAA mechanisms to address USB.

Sincerely,



Terry O'Clair, President
WESTAR Council

Attachment

Attachment

WESTAR Responses to Questions Proposed by EPA in the White Paper[1]

A. ***Has the EPA properly characterized the current best estimates of background O_3? Are there additional existing data analyses or modeling simulations that need to be folded into the assessment?***

No, EPA has acknowledged that background O_3 is not currently well characterized. In the White Paper, EPA provided a national overview of USB O_3. However, that does not imply that the conclusions apply equally to all states and monitors in U.S. Moreover, the western states are unconvinced that USB O_3 will not prevent attainment everywhere in U.S., particularly in the inter-mountain western U.S. There is large variability in the influence of USB O_3 across the U.S.

EPA noted that modeled USB O_3 estimates reviewed in the Integrated Science Assessment (ISA) "compare reasonably," post-ISA review of modeled USB estimates "show greater variability," and EPA modeling is "roughly consistent with previous estimation exercises."[2] In the inter-mountain west, boundary condition contributions often exceed 50 percent.[3] EPA suggests that "there may also be a limited number of rural areas where USB O_3 is appreciable."[4] However, the White Paper[5] lists seven counties in the inter-mountain western U.S. outside California with 2012-2014 Design Values (DV) greater than 70 ppb and fractions of 2017 DVs from manmade U.S. sources less than or equal to 15 percent. All of these counties have fractions of 2017 DV from manmade in-state sources less than 10 percent and five additional counties have contributions from in-state sources less than or equal to 10 percent. These twelve counties with less than or equal to 10 percent contribution from in-state sources are located across six states encompassing much of the inter-mountain western U.S.

USB O_3 is enhanced by naturally occurring stratospheric intrusions (SI) and long-range transport (LRT) of international emissions, both natural and anthropogenic. The results of the Las Vegas Ozone Study[6] suggest contributions resulting from these events are much more frequent than EPA has acknowledged, but as EPA states, models "are not capable of precise background estimates on a daily level."[7] In many cases, the high USB O_3 in the western U.S. leaves little margin for contributions resulting from manmade U.S. sources or manmade in-state sources without exceeding the 2015 O_3 NAAQS. The potential stigma associated with having large areas of the inter-mountain western U.S. designated as nonattainment will stifle potential economic

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[1] U.S. EPA, *Implementation of the 2015 Primary Ozone NAAQS: Issues Associated with Background Ozone White Paper for Discussion,* referred to as White Paper throughout this document

[2] Ibid. at 4 – 5.

[3] Ibid. at 24, Table 2c.

[4] Ibid. at 7.

[5] Ibid. at 24, Table 2c.

[6] Langford, A.O., et al, 2015. *An overview of the 2013 Las Vegas Ozone Study (LVOS): Impact of stratospheric intrusions and long-range transport on surface air quality*. Atmos. Environ, http//dx.doi.org/10.1016/atmosenv.2014.08.040.

[7] White Paper, supra note 1, at 4.

growth and presents immense interstate planning challenges towards meaningful implementation of CAA requirements.

States and locals will address the requirements of CAA § 110 in their 2015 O_3 NAAQS infrastructure state implementation plans (i-SIPs) due October, 2018 and attainment plans due in December, 2020. EPA modeling will be critical to better characterize USB O_3 and inform planning for these SIPs. Robust model performance evaluations and identification of the strengths, as well as limitations of model performance will be of great value, especially in light of the interstate transport "good neighbor" provisions.[8]

Since the western region is most affected by high USB O_3 in ways that are not completely understood, WESTAR suggests additional data analyses and modeling are necessary to develop a more comprehensive assessment of the role of USB. WESTAR appreciates the engagement with EPA during the recent USB Workshop[9] and requests EPA continue its efforts to address USB O_3 and transport across the western U.S., similar to EPA's long-standing efforts in the eastern U.S. involving the Ozone Transport Commission, NO_x SIP call, and Cross-State Air Pollution Rule. Preparation of a white paper documenting further evaluation of USB O_3 and transport in the inter-mountain west where monitors do not respond to regional reductions in O_3 precursor emissions would be a good first step.

Ozone and O_3 background are at the forefront of atmospheric research activities and the level of scientific understanding is expanding at a rapid pace. For example, the journals Science of the Total Environment and Atmospheric Environment have recently published issues with sections dedicated to furthering the understanding of O_3 in rural United States, titled "The Nevada Rural Ozone Initiative: A Framework for Developing an Understanding of Factors Contributing to Elevated Ozone Concentrations in Rural and Remote Environments" (October, 2015) and "Observations and source attribution of O_3 in rural regions of the Western United States," (May, 2015), respectively. NOAA conducts numerous field campaigns to investigate O_3 (e.g., CalNex, FRAPPE / DISCOVER-AQ, CABOTS, etcetera). A Western Regional Air Partnership (WRAP) webpage[10] provides links to presentations to Western States Air Council's (WESTAR) Ozone Background Workgroup by experts in the field, presentations related to O_3 by WRAP technical staff, and O_3-related workshops or forums hosted by others. Consideration of these and other technical resources documenting the advancements in the state of the science may assist EPA with further characterizing O_3 background.

In summary, WESTAR offers the time, expertise, and leveraged resources of its technical and planning committees, and working groups of topical experts, in coordination and collaboration with EPA, to support furthering the understanding of USB O_3 through the development of a white paper regarding the role of ozone background specific to the western U.S.

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[8] Memorandum from Stephen D. Page to Regional Air Directors, *Information on the Interstate Transport "Good Neighbor" Provisions for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) under Clean Air Act (CAA) Section 110(a)(2)(D)(i)(I)*, 2015.

[9] U.S. EPA Workshop to Advance the Collective Understanding of Technical and Policy Issues Associated with Background Ozone, February 24-25, 2016, Phoenix, AZ. Referred to as Workshop throughout this document.

[10] http://www.wrapair2.org/WestJumpAQMS.aspx

B. *What additional data elements and/or modeling improvements are needed to improve characterization of background O_3 levels across the U.S.?*

Although EPA has used state-of-the-art modeling to assess USB O_3, large uncertainties and errors remain. Additional research and development are required to improve the models and results, as EPA acknowledged during the Workshop. WESTAR appreciates EPA's efforts in this area. Clearly this is a long-term process, but the current limitations should be acknowledged.

EPA suggests monitored concentrations are not indicative of USB O_3 because of the effects of U.S. anthropogenic emissions.[11] WESTAR notes there are two O_3 monitoring sites located on or near the coast of California and Oregon that should be appropriate to use for determining USB O_3 resulting from long-range transport. These two sites are Trinidad Head, California (operated by NOAA) and Mt. Bachelor, Oregon (operated by the University of Washington). Data from these sites have been widely used in the past as indicators of Asian transport and could also be used for global model validation efforts. There are likely other sites along the West Coast and the Mexican or Canadian borders that could be utilized to evaluate USB O_3 impacts.

Evaluation of the temporal variability of U.S. emissions contributions to monitored O_3 concentrations could be used as part of a weight of evidence approach that integrates observational data, including satellite and other remote sensing information, along with modeling to assist EPA in identifying USB O_3. It may be that for remote monitors the contributions by U.S. anthropogenic emissions to the observed O_3 may fall below the errors and biases of model estimates of USB O_3.

There are several areas in which EPA might conduct additional assessments and evaluations to better understand the role of USB O_3 in the western U.S., including: global model evaluation (i.e., boundary conditions); assessing the significance of increasing mid-tropospheric O_3 concentrations over the last two decades; the role of site elevation and climatic variability in USB O_3; and, development of more precise hourly and daily estimates of USB O_3.

Boundary Conditions and Global Models

WESTAR has previously provided comments[12] suggesting the need of further evaluation, including sensitivity testing, of the global models used to inform boundary conditions for the CONUS modeling domain. The comments also addressed EPA's practice of holding boundary conditions constant when conducting CONUS modeling exercises for projected future conditions. These comments remain germane to furthering the understanding of the role of boundary conditions in modeling USB O_3.

WESTAR appreciates the efforts EPA has made to refine estimates of background O_3, especially its outreach to the global modeling community. A robust review of global model performance at rural monitors across the West would inform sensitivity analyses using a number of the best

[11] White Paper, supra note 1, at 3.
[12] WESTAR letters to Chet Wayland, OAQPS, dated April 9, 2014 and June 11, 2014 regarding the 2011/2018 modeling platforms.

performing global models to inform boundary conditions for CONUS modeling, leading to better understanding of where CONUS modeling efforts to address USB O_3 could be improved.

The White Paper does not cite important modeling work on background in the western U.S. A large study sponsored by western states and the BLM, the West-wide Jumpstart Air Quality Modeling Study[13] (WestJumpAQMS) conducted extensive and well-documented modeling studies for calendar year 2008, reaching very different conclusions as to the quantities of USB O_3 transported to rural and urban sites across the West. The WestJumpAQMS is on par with EPA national modeling platform studies and has been thoroughly evaluated on its own by western states, federal land managers, western EPA regional offices, and other western air quality agencies.

In addition, recent work by the WRAP investigated sensitivity of CONUS models to two global models[14] and estimated USB O_3 employing zero-out modeling techniques.[15] The Intermountain West Data Warehouse-Western Air Quality Study[16] will conduct additional evaluations along these lines for the new 2014 base year modeling platform in the coming summer. An evaluation of the AM3 global model is being performed through Lamont Doherty under a separate project. The State of Colorado and Denver/Northern Front Range Regional Air Quality Council have also conducted source apportionment and sensitivity studies of USB O_3 transport for the Denver metro O_3 nonattainment area.[17] Finally, EPA OAQPS and western EPA regional offices have been closely involved in the biannual WRAP-EPA Modeling Workshops[18] in 2011, 2013, and 2015.

It is hard to understand why results from western modeling studies and workshop were not included in EPA's White Paper. Consideration of these resources and that of others may be of assistance to the EPA in their efforts to improve CONUS model performance, particularly in the West.[19] Understanding global model performance will aid understanding of CONUS model performance and increase confidence in model results by all users.

Increasing USB Ozone Trends

EPA has noted the increase in mid-troposphere O_3 concentrations in remote areas over the last two decades, which could result in USB O_3 increases of up to 7 ppb by 2025.[20] Owen Cooper, NOAA, suggested during the Workshop that this trend is likely to persist for another 10 to 20 years, the result of long-lived atmospheric processes, in spite of any reductions in international emissions. The White Paper's discussion of future O_3 levels in 2025 suggests most areas in the U.S. will have design values less than the current NAAQS of 70 ppb based on modeling

[13] Available from: http://www.wrapair2.org/WestJumpAQMS.aspx
[14] Available from: http://vibe.cira.colostate.edu/wiki/wiki/1043/bc-sensitivity-modeling-results
[15] Available from: http://vibe.cira.colostate.edu/wiki/wiki/1020/background-air-quality-modeling-results
[16] Link: http://views.cira.colostate.edu/tsdw/
[17] Noted in Summary at: https://www.epa.gov/sites/production/files/2016-03/documents/bgo3-high-level-summary.pdf
[18] Available from: http://www.wrapair2.org/ozone.aspx
[19] See: Feb 19, 2007: *Multi-Scale Modeling of the Effects of Global Change upon Regional Air Quality*
[20] White Paper, supra note 1, at 8.

projections using current boundary conditions.[21] However, the current O_3 NAAQS is at the high end of CASAC's recommended range, the O_3 NAAQS will be subject to another periodic review prior to 2025, and EPA's assessment is based on holding global model boundary conditions constant which is inconsistent with current measured trends.

Further evaluation of the role of increasing concentration trends and the influence of projected future boundary conditions on USB O_3 will be critical for the preparation of i-SIPs and informing O_3 nonattainment planning, especially with the potential for a lower future O_3 NAAQS. International emission inventories have a high degree of uncertainty. An evaluation of international emissions would identify where the inventories are most uncertain, and additional sensitivity analyses would determine the significance of how changes in the international emissions influence CONUS model results. Border states are particularly concerned with proper characterization of emissions from Canada and Mexico. Since future international emissions are extremely difficult to project, sensitivity analysis is one method to bracket O_3 impacts under differing growth and economic assumptions.

Assessing Site Elevation and Climatic Conditions

Ozone concentrations in the inter-mountain western U.S. are strongly influenced by high site elevations and high mixing heights that enhance O_3 concentrations through natural stratospheric-tropospheric exchange and downward mixing. EPA acknowledges natural atmospheric exchange processes can transport high-O_3 stratospheric air into the troposphere and under certain meteorological conditions can displace discreet plumes of stratospheric air into the troposphere[22] (i.e., SI). Recent work in Nevada[23] documents that high elevation O_3 monitored values do not show the daily variation of O_3 concentrations typically recorded by other monitors, suggesting a very limited contribution from local emissions sources. It is unclear what the role of natural atmospheric exchange processes are on high elevation monitors without the enhancements resulting from SI and LRT events. A better understanding of these processes is important for implementation planning in the inter-mountain western U.S.

The White Paper does not discuss the contributions of LRT of Asian pollution via the subtropical jet stream to USB O_3 identified by researchers. Several researchers have noted the frequency with which SI and LRT events contribute to USB O_3 at high elevation western sites. Recent NOAA research[24] suggests these processes are frequent contributors to USB O_3 at high elevation sites. It is critical to both EPA and states for EPA to further the understanding of these processes and quantify the resulting contributions to USB O_3.

Lin et al 2015[25] documented the variations in background O_3 resulting from climate variability. Evaluating changes in boundary conditions generated by global models for La Niña and El Niño years while holding global emissions constant would provide valuable information regarding the

[21] Ibid. at 9.
[22] Ibid. at 3.
[23] Gustin, M.S., Fine, R., Miller, M., Jaffe, D., Burley, J., 2015, *The Nevada Rural Ozone Initiative (NVROI): Insight to understanding air pollution in complex terrain*, Science of the Total Environment, 530-531, 455-470.
[24] Overview of 2013 LVOS, supra note 6.
[25] Lin, M. et al. *Climate variability modulates western US ozone air quality in spring via deep stratospheric intrusions.* Nat. Commun, 6:7105 soi: 10.1038/ncomms8105 (2015)

influence of climate variations on USB O_3 at high elevation sites in the western U.S. and further inform attainment and maintenance planning.

Hourly and Daily Estimates of USB Ozone

EPA suggests that there is general consistency between zero out and source apportionment modeling approaches and thus an increased confidence in the model findings.[26] Since the two approaches used the same boundary conditions and meteorology, this is not surprising and only supports the idea that the internal algorithms in the two models are performing similarly and/or the contributions of boundary conditions are so large. However, this does not confirm the models are producing the "right" USB O_3 estimates.

The contributions to USB O_3, which can be enhanced by specific events, have not been assessed by U.S EPA on an hourly or 8-hour timeframe. EPA has only considered the values of USB O_3 on possible O_3 NAAQS exceedance days in detail via a re-analysis of zero-out modeling.[27] Zero-out modeling perturbs the complex atmospheric chemistry of O_3 formation and may not be an appropriate tool to estimate USB. The significant contributions of boundary conditions may suppress perturbations of the complex atmospheric chemistry resulting from zeroing out U.S. emissions (i.e., one possibility is that the contributions from transported pollutants is far greater than the contributions of U.S. anthropogenic pollutants so the system remains relatively stable even in the absence of U.S. anthropogenic emissions).

The form of the 2015 O_3 standard is the annual fourth-highest daily maximum 8-hour concentration averaged over three years. EPA has acknowledged the uncertainty in regional modeled estimates of USB O_3, the difficulties with temporal resolution experienced by the global models, and the reported seasonal average estimates of USB O_3. If the available modeling tools are not analyzing USB O_3 consistent with the current form of the NAAQS, then EPA should either make the modeling consistent with the 8-hour form of the standard or consider implementation of the NAAQS on a seasonal basis. Consistency between the modeling and the form of the standard allows for more accurate estimates of state contributions and the sources of controllable emissions. Successful planning requires that states clearly understand the contributions from controllable emissions from sources they can control. Thus, the modeling should be informed by a complete year of meteorological data along with improved temporal resolution. States should not be held to implementation of the "good neighbor" provisions when the contributions are based on seasonal averages with limited temporal resolution, especially given the uncertainties in the estimates of USB O_3. In addition, the form of the O_3 NAAQS suggests modeling assessments should be multi-year to account for the inter-annual variability of the processes that influence USB O_3, as well as the influence of transported O_3.

In summary, WESTAR has suggested several data elements and model improvements in an effort to improve USB O_3 characterization. WESTAR offers its assistance through its technical and planning committees, as well as working groups of topical experts, in coordination and collaboration with EPA to support further characterization of USB O_3, as follows:

[26] White Paper, supra note 1, at 5.
[27] Ibid. at 4.

- Development of consensus, well-documented, and reproducible inputs and assumptions for key western U.S. natural uncontrollable sources, regulated anthropogenic sources, and international sources; as well as addressing these same inputs and assumption with respect to global modeling platforms for base year and ranges of future projections.
- Development of forecasting tools for regional and jurisdiction-specific use in warning the public about poor air quality, for international transport, wildfire impacts, of both PM and O_3, and stratospheric intrusions of O_3, building on the tools used by states and other agencies.
- Continuation of the biannual series of Western Modeling Workshops as a forum to discuss comparisons of model performance and needed improvement for various models used by EPA, western U.S. air agencies, and others.
- Continuation of the development of a modeling approach based on regional consensus and refined inventories, linking the work products to planning requirement timelines for both O_3 and regional haze, while providing frequent updates to background assessments.
- The efforts should be guided by a consensus process involving western U.S. air agencies, EPA OAQPS and EPA Regional Offices with reports out to biannual Western Modeling Workshops.

C. EPA has focused on USB in this white paper. Are there other definitions of background ozone that concern stakeholders?

Yes. From a pragmatic point of view, the current definition works well. The definition of USB serves the purpose of providing a consistent framework for analyses and modeling. However, from the point of view of an agency that needs to assess what is causing violations of the NAAQS, the current definition presents several issues and is of limited utility for air quality planning. In particular, the current estimate of USB includes all contributions except those of U.S. anthropogenic emissions. It would be helpful to states if the USB estimates distinguished the contributions of different sources. For instance, it is confusing to include wildfire and SI in USB, when these events are allowed to be excluded from the calculation of design values with appropriate demonstrations under the Exceptional Events Rule (EER). Contributions from international biogenic and geogenic emissions should also be estimated separately. Characterization of the contributions from both international anthropogenic emissions, as well as interstate transport of anthropogenic emissions would facilitate the identification of long-range transport events which may qualify for EER relief under certain meteorological conditions.

Model estimates of USB O_3 are not well characterized on a local scale or at temporal resolutions consistent with the form of the NAAQS. In addition, the models do not robustly address episodic SI, LRT, and large fire events - events that may qualify under the EER. Western states would benefit from a clear, explicit statement from EPA regarding the role of models and other data in determining USB O_3. Such a statement would clarify the relationship between USB O_3 estimates and events that quality for relief through the EER. This statement could provide the basis for formulation of guidance for the estimation of the contribution to USB O_3 from events falling under the umbrella of the EER that are not well captured by model estimates, as well as estimation of the contribution from local emission sources to observed concentrations. Guidance of this sort would assist states and locals with implementation planning and identifying meaningful emission reductions that could contribute to attaining the NAAQS.

D. ***Does the EPA preliminary conceptual model of O_3 attainment planning align with stakeholder perspectives on the O_3 planning process?***

No, the conceptual models for O_3 attainment planning do not align with states' needs for regulatory relief from nonattainment designations resulting from emission sources beyond their control. As noted previously, monitors in six states have contributions to DVs from in-state manmade sources of less than or equal to 10 percent. Western states are boxed-in by the policy relief and conceptual models for O_3 attainment proposed in the White Paper. Preparation of exceptional event (EE) demonstrations is an onerous, resource-intensive task that may or may not be sufficient for approval by EPA. Moreover, if a state does develop and submit an EE demonstration, there is no guarantee that EPA will review much less approve such a demonstration. The provisions under CAA § 182(h) for rural transport areas and CAA § 179B for international transport are only applicable to nonattainment areas, complete with all the consequences of such designations. These conceptual models do not provide relief for many inter-mountain western states where in-state contributions to DVs are less than 10 percent.

E. ***Has the EPA identified all of the CAA mechanisms available to address areas influenced by background O_3?***

No, stakeholders and agencies are exploring other potential CAA approaches to account for USB O_3 that might provide some degree of regulatory relief. Some of these avenues would require policy changes. This effort might be similar to previous collaborative efforts between WESTAR and EPA in the development of the 1996 Natural Events Policy. Discussion of these mechanisms is provided under the next question (F).

WESTAR disagrees that even in areas with the highest seasonal mean background concentrations "anthropogenic sources within the U.S. are largely responsible for the 4th highest 8-hour MDA8 concentrations."[28] Western air agencies have pursued EE demonstrations to eliminate high MDA8 values resulting from nature events to lower design values. The 2015 O_3 NAAQS became effective in December, 2015 and agencies are just now evaluating the tradeoff between preparing EE demonstrations and the resulting regulatory relief, and in many cases are finding the level of effort to prepare an EE demonstration is too onerous. It is important for the EPA to evaluate whether the EER is a realistic mechanism to address areas influenced by high USB O_3 by excluding data influenced by wildfire, SI, and LRT events from regulatory consideration, given the frequency of events and difficulty of demonstrating their roles, especially as the O_3 NAAQS approaches USB at rural western sites and even small contributions from these events may interfere with attainment.

WESTAR notes 40 CFR Part 50.1 allows for exclusion of data affected "by human activity that is unlikely to recur at a particular location," including both interstate and international transport events of anthropogenic emissions occurring under unique meteorological conditions. The unique meteorological conditions being the "event" that qualifies for exclusion. This concept is discussed in the preamble of the recently proposed draft EER revisions[29] under section V.F.1.b

[28] Ibid. at 6.
[29] *Treatment of Data Influenced by Exceptional Events*; Proposed Rule. 80 FR 72840, 20 November 2016.

and warrants more refined interpretation and evaluation as one of the regulatory relief policies identified by the White Paper. Exclusion of contributions from these types of events in the monitoring data over the inter-mountain West has the potential to allow areas primarily impacted by USB O_3 and interstate transport with little contribution from in-state emissions to remain in attainment of the NAAQS.

Additional EPA EE guidance will help reduce this level of effort and streamline the process. Agencies are concerned that EPA's policy to not review EE demonstrations without regulatory significance may skew the historical record higher, making future demonstrations more difficult to approve. Furthermore, additional EE demonstration guidance should facilitate weight of evidence tools incorporating easily accessible observational data for successful demonstrations.

*F. **What other approaches (consistent with CAA provisions) should be considered to deal with background O_3 in implementing the 2015 O_3 NAAQS?***

The White Paper identified three additional mechanisms for accounting for background O_3: 1) revising data handling procedures to exclude exceedances attributable to background O_3; 2) deferring designations in locations impacted by background O_3; and/or, 3) designating area influenced by background O_3 as unclassifiable.[30] These mechanisms were not included in the overview of policy tools due to legal or other deficiencies. A more thoughtful discussion of these deficiencies and possible solutions from the EPA might spur identification of alternative proposals that overcome these deficiencies.

WESTAR would like to continue dialogue with EPA and investigate other CAA mechanisms to account for background O_3. Below are two additional concepts or policies for further discussion, 1) principal contributor concept and, 2) natural events policy. WESTAR looks to EPA to initiate a process to collaborate and further explore these concepts and policies.

Stakeholders have proposed a mechanism[31] to address areas with high USB O_3 through the concept of principal contributor[32] where all background contributions, regardless of origin, are excluded by either a change in the form of the standard or via the EER from attainment/nonattainment designation following a demonstration that background is the principal contributor to monitored exceedances. This would require revisions to Appendix U of 40 C.F.R. Part 50 or as part of the revisions to the EER. This concept should be further explored.

In the 1990's WESTAR worked in conjunction with EPA to develop a natural events policy for PM_{10} (see http://www.westar.org/Docs/NEPolicy.pdf). This effort resulted in a more black and white policy as an alternative to excluding monitor data through EER demonstrations and allows agencies to note the occurrence of natural events and subsequently remove their influence on design values without further identification of the source of the event. WESTAR would like to

[30] White Paper, supra note 1, at 12, footnote 41.
[31] BP American Production Company, August 20, 2015 presentation to WESTAR Planning Committee, available from http://www.wrapair2.org/pdf/Backgroundpresentation%2008192015.pdf and briefing paper available from http://www.wrapair2.org/pdf/High%20Ozone%20Levels%20%207_8_15.pdf
[32] Also referred to as the "total background" framework, see Comment submitted by Robert L. Stout, Jr., Vice President and Head of Regulatory Affairs, BP America, available from: https://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2016-0097-0027

build on its experience with the Natural Events Policy, collaborating with EPA to identify needed policy changes or options and determine the level of effort for the analysis supporting natural events policy for O_3. Both of these mechanisms would assist states by preventing nonattainment designation resulting from emissions beyond their control.

G. ***Are sufficient technical tools, data, and EPA guidance available to make the demonstrations necessary to invoke relevant CAA provisions?***

No, EPA must continue to identify tools, methods, and data sources to inform agencies' EE demonstration packages so states can streamline the process of developing an approvable demonstration. WESTAR appreciates EPA's efforts regarding O_3 implementation with the release of designation guidance, release of a mapping tool, and guidance for wildfire EE. Contributions to monitored O_3 from fires, SI, and LRT events may be excluded by demonstrations under the EER, which is one of the policy relief mechanisms identified by EPA. However, it's not clear the technical tools to inform EE demonstrations for these events are commonly agreed upon or available,[33] in spite of the recent release of draft guidance for wildfire event demonstrations[34].

Distinguishing contributions between SI and LRT is difficult to ascertain at the best instrumented sites and very difficult at CASTNET sites with limited instrumentation, which includes many of the impacted sites. WESTAR requests EPA devote resources to assessing contributions by SI and LRT to USB. It would be of great assistance to states for EPA to develop a toolbox of criteria, methods, and data resources to identify and prepare EE demonstrations for both SI and LRT events.

The tools and data sources should be publically available and of the appropriate technical sophistication to address the event. EPA staff should lead and focus efforts to identify, apply, and document the appropriate tools to meet the requirements of EE demonstrations for SI and LRT events, building on the state-lead efforts of the Stratospheric Intrusion Workgroup coordinated by EPA Region 8. WESTAR appreciates EPA efforts to release guidance for developing demonstrations for SI EE with proposed release for external review in late summer 2016.

WESTAR also strongly supports development of comprehensive guidance relevant to international transport demonstrations under CAA section 179B, which is critical, based on discussions during the Workshop. These provisions appear to be one of the primary ways under the CAA for regulatory relief and as such needs immediate attention. Approvals for the use of the 179B provisions to date have involved direct international border areas and have taken years to finalize. In contrast, the inter-mountain west states do not necessarily adjoin an international border, but are impacted by international emissions based on monitoring studies, source apportionment modeling, and zero-out modeling. Another concern for western states relates to

[33] WESTAR comments on U.S. EPA *Exceptional Events Proposed Rule* and the *Draft Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations*. February, 2016

[34] U.S. EPA, *Draft Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations*. November 2015

the treatment of transport of emissions from other states located upwind and how interstate transport is characterized independent of international transport. Appropriate and comprehensive guidance is needed to provide states with the information EPA will need for approval determinations to ensure the 179B provisions can be utilized in a timely manner.

One point of particular interest is how states can leverage EPA modeling, both existing and future, to support 179B demonstrations. This would relieve the burden on states and allow agencies without photochemical modeling capability the opportunity for regulatory relief under this CAA mechanism. It is known that international emissions vary over time and impacts change, even on a daily basis. The same can be said for emissions from states upwind of the inter-mountain west region. In general, states do not have the resources to conduct regional modeling on a daily basis to determine impacts from long-range interstate and international transport and look to EPA to assist or provide this critical information.

In summary, EPA cannot say, without much further and sustained, coordinated analysis with western air agencies, that the current understandings of background O_3 described in the White Paper are sufficient. Analyses cited in this document convey the scope, scale, and complexity of the background O_3 issue in the West. EPA must apply expertise and provide resources for western air agencies to be involved in developing an understanding of background O_3 for air quality analyses and planning required under the CAA. WESTAR offers the time, expertise, and leveraged resources of its technical and planning committees, and working groups of topical experts, in coordination and collaboration with EPA, to support furthering our understanding of USB O_3 on an ongoing basis related to above EPA questions C, D, E, F, and G.

H. ***Do states want or need additional assistance from the EPA to develop the demonstrations necessary to invoke relevant CAA provisions?***

Yes, states look to EPA to characterize USB O_3, not only the amounts but also the mechanisms of the contribution of USB O_3 to observed concentrations. This characterization is a high priority for western states, preferably on an hourly basis. WESTAR recognizes the challenges facing EPA and that the issues noted here and by others will not be resolved quickly. However, in the interim states must continue planning and implementation of the 2015 O_3 NAAQS. State programs are struggling to meet the CAA nonattainment requirements without knowledge of whether reductions of local emissions will actually lower monitored concentrations and without having the benefit of a full understanding of the role of USB O_3 and its planning implications.

Based on recent monitoring data, (2013-2015, or 2014-2016) few areas would be designated non-attainment because USB O_3 is causing or will cause exceedances of the standard based on EPA projection modeling using relative response factors to the 2025 timeframe. However, there is a possibility that future monitoring data will record higher concentrations, just as air agencies are preparing their i-SIPs and developing approaches to address the CAA requirements for any potential nonattainment areas. To effectively manage implementation of the 2015 O_3 NAAQS, timely and improved analyses are needed from EPA:

- By all states to robustly evaluate interstate/inter-jurisdictional transport that includes USB O_3;

- By states and other upwind jurisdictions contributing to nonattainment and/or interfering with maintenance at downwind sites; and,
- To help states and other jurisdictions manage day-to-day exposures at urban and rural/Class I sites to high O_3, regardless of which source is the principal cause – "background as defined by models," wildfire, stratospheric intrusion, contributions from sources in Mexico and Canada, and even U.S. anthropogenic. Any of these days could be "Ozone Alert Days."

WESTAR requests better tools and guidance for demonstrating EEs including large wildland fires, SI, and LRT events, and especially interstate transport. The regional nature of these events suggests a regional approach spanning multiple jurisdictions and EPA regions, perhaps led by RPOs. WESTAR supports this idea and is actively exploring this option, including identification of potential sources of funding. Regional EE demonstrations would provide consistent demonstration packages and streamline regional office approvals, a clear benefit for both states and EPA.

EPA can play another important role in advancing the understanding of the role of USB O_3 in the western U.S. Current federal research efforts appear to lack a coordinated effort to reach shared research goals with individual agencies pursuing important work without the benefit of a more holistic view. Such coordination might engage EPA's federal partners, the federal land managers, as well as federal research partners such as NOAA and NASA. Identification of common research goals would assist coordination of research efforts, optimize funding, and fast track a better understanding of USB O_3.

Building further on the idea of coordinated efforts, some strategically located monitors might be designated as "sentinel" monitors, providing real-time data to inform health advisories resulting from O_3 events that exceed the NAAQS or alert agencies to collect additional information to inform EE demonstrations for SI or LRT events. For example, the CASTNET monitor located at Great Basin National Park might act as a sentinel for SI/LRT events while the CASTNET monitor at Rocky Mountain National Park might act as a sentinel for health-threatening O_3 events impacting the greater Denver metro area.

Federally operated CASTNET monitors are often located far from state offices and only provide basic measurements. Sentinel monitors might be equipped with the more sophisticated monitoring instrumentation required to support EE demonstration packages, such as water vapor and research-grade CO instrumentation. Identification of sentinel monitors might be incorporated in EPA's efforts to coordinate with its Federal research partners. EPA could also facilitate USB O_3 research efforts by coordinating state access to lidar and other sophisticated monitoring equipment on a temporary "loaner" basis for limited periods as agencies develop better conceptual understanding of the important sources of O_3 at its monitors.

I. What are stakeholders' perspectives on existing programs and cooperative agreements to reduce levels of background O_3 entering the U.S.?

The White Paper only devoted one paragraph to the subject of controlling international emission sources and provided scant details of EPA's engagement on this front or the results thereof.

Therefore, WESTAR has not assessed existing programs and international agreements to reduce O_3 entering the U.S. from international emission sources. During the Workshop, one California agency noted its engagement with international entities in its effort to curtail the impacts resulting from long-range transport of anthropogenic emissions. WESTAR supports this peer-to-peer engagement and suggests the EPA provide all support possible to allow agencies to engage the international community and facilitate reduction of anthropogenic O_3 precursor emissions.

However, as noted above by Owen Cooper at the Workshop, despite reductions in international emission and due to long-lived atmospheric processes, the trend of increasing global O_3 entering the U.S. he has documented will persist for the foreseeable future.