Response to Comments on the Revisions to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Revisions to Model Input Recommendations

November 20, 2024

Table of Contents

1.0 Introduction

On Thursday, October 12, 2023, the Environmental Protection Agency (EPA) proposed to revise Appendix W to 40 CFR part 51, generally referred to as the *Guideline on Air Quality Models* (*Guideline*) (88 FR 72826). The *Guideline* is incorporated into the EPA's regulations, satisfying a requirement under the Clean Air Act (CAA) for the EPA to specify, with reasonable particularity, models to be used in the Prevention of Significant Deterioration (PSD) program. It provides the EPA-preferred models and other recommended techniques, as well as guidance for their use in estimating ambient concentrations of air pollutants. The proposed rule included enhancements to the formulation and application of the EPA's preferred near-field dispersion modeling system, AERMOD (American Meteorological Society (AMS)/EPA Regulatory Model), and revisions to the recommendations regarding the determination of appropriate model input data, specifically background concentration, for use in NAAQS implementation modeling demonstrations. Additionally, the EPA released in parallel the *Draft Guidance on Developing Background Concentrations for Use in Modeling Demonstrations* (*Draft Guidance*) (U.S. EPA, 2023).

A public hearing was conducted on the proposed rule in association with the Thirteenth Conference on Air Quality Modeling, which was held on November 14-15, 2023, at the EPA Campus Auditorium in Research Triangle Park, NC. The public hearing was held on the second half of November 15. A total of 4 public presentations were given at the public hearing. These presentations are included in the docket (ID No. EPA-HQ-OAR-2022-0872) for the rule.[1]

Additionally, the EPA provided a 90-day public comment period that closed on December 23, 2023. A total of 20 public comments were received and are included in the docket for the rule. Table 1 has a listing of the public comment Docket numbers and commenter names. A list of acronyms and frequently used abbreviations are contained in Table 2.

The final rulemaking signed by the Administrator presents the EPA's final regulatory conclusions and rule text and includes summaries of and responses to several of the public comments received during the public comment period. This Response to Comments document presents further discussion of the public comments received and provides additional responses to those comments by the EPA. In some cases, the responses presented in this document provide more detail or elaboration than do corresponding responses in the final rulemaking. In other cases, the responses in this document repeat or refer to the final rulemaking as providing the EPA's complete response to the public comment at issue.

[1] https://www.regulations.gov/docket/EPA-HQ-OAR-2022-0872.

Table 1. Docket and Public Comments

Docket Number	Commenter
EPA-HQ-OAR-2022-0872-0024	Anonymous
EPA-HQ-OAR-2022-0872-0025	City of Albuquerque Air Quality Program, New Mexico
EPA-HQ-OAR-2022-0872-0026	Iowa Department of Natural Resources (IDNR)
EPA-HQ-OAR-2022-0872-0027	Missouri Department of Natural Resources - Air Pollution Control Program (MODNR)
EPA-HQ-OAR-2022-0872-0028	South Coast Air Quality Management District (SCAQMD)
EPA-HQ-OAR-2022-0872-0029	Indiana Department of Environmental Management, Office of Air Quality (IDEM-OAQ)
EPA-HQ-OAR-2022-0872-0030	Ohio Environmental Protection Agency (Ohio EPA)
EPA-HQ-OAR-2022-0872-0031	Arizona Department of Environmental Quality (ADEQ)
EPA-HQ-OAR-2022-0872-0032	American Association of State Highway and Transportation Officials (AASHTO)
EPA-HQ-OAR-2022-0872-0033	American Chemistry Council (ACC), the American Fuel & Petrochemical Manufacturers (AFPM), and the American Petroleum Institute (API)
EPA-HQ-OAR-2022-0872-0034	NAAQS Regulatory Review and Rulemaking (NR3) Coalition
EPA-HQ-OAR-2022-0872-0035	Georgia Environmental Protection Division (GAEPD)
EPA-HQ-OAR-2022-0872-0036	Wisconsin Department of Natural Resources (WDNR)
EPA-HQ-OAR-2022-0872-0037	Electric Power Research Institute, Inc. (EPRI)
EPA-HQ-OAR-2022-0872-0038	National Council for Air and Stream Improvement (NCASI)
EPA-HQ-OAR-2022-0872-0039	Texas Commission on Environmental Quality (TCEQ)
EPA-HQ-OAR-2022-0872-0040	Minnesota Pollution Control Agency (MPCA)
EPA-HQ-OAR-2022-0872-0041	The Aluminum Association
EPA-HQ-OAR-2022-0872-0042	Earthjustice, Sierra Club – Lonestar Chapter, Sierra Club, Air Alliance Houston, Midlothian Breathe, Environment Texas, Coalition for Responsible Environmental Aggregate Mining (CREAM), and Texas Health and Environment Alliance, Inc.
EPA-HQ-OAR-2022-0872-0043	City of Albuquerque Air Quality Program, New Mexico
EPA-HQ-OAR-2022-0872-0068	Bob Paine, AECOM
EPA-HQ-OAR-2022-0872-0072	Chris Rabideau, American Petroleum Institute (API) Air Modeling Group
EPA-HQ-OAR-2022-0872-0079	Michael Hammer, A&WMA Atmospheric Modeling and Meteorology (APM) Committee
EPA-HQ-OAR-2022-0872-0086	Chris Wan, GHD

Table 2. Explanation of Acronyms and Frequently Used Abbreviations

Acronym	Long Name
AERMET	Meteorological data preprocessor for AERMOD
AERMIC	AMS/EPA Regulatory Model Improvement Committee
AERMOD	AMS/EPA Regulatory Model
AERSURFACE	Land cover data tool in AERMET
AERSCREEN	Screening model based on AERMOD
AirToxScreen	Air Toxics Screening Assessment tool
AMS	American Meteorological Society
Appendix W	Appendix W to 40 CFR Part 51
AQS	Air Quality System
ArcGIS	Client, server and online geographic information system software
AWMAENTRAIN	Air & Waste Management Association building downwash option keyword in AERMOD
BGSECTOR	Background sector keyword in AERMOD
BPIPPRM	Building Profile Input Program for PRIME
BUOYLINE	Buoyant line source type in AERMOD
CAA	Clean Air Act
CAL3QHC	Screening version of the CALINE3 model
CEM	Continuous Emission Monitoring
CFR	Code of Federal Regulations
COARE	Coupled Ocean-atmosphere Response Experiment
CO	Carbon monoxide
Draft Guidance	Draft Guidance on Developing Background Concentrations for Modeling Demonstrations
EPA	Environmental Protection Agency
EJ	Environmental justice
EMVAP	Emissions Variability Processor
ESRI	Environmental Systems Research Institute Inc.
FEM	Federal Equivalent Method
GRSM	Generic Reaction Set Method
Guidance	Guidance on Developing Background Concentrations for Modeling Demonstrations
Guideline	*Guideline on Air Quality Models*
HBP	Highly Buoyant Plume
km	Kilometer
MERPs	Model Emissions Rates for Precursors
MOVES	MOtor Vehicle Emission Simulator
MRLC	Multi-Resolution Land Characteristics Consortium
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act
NLCD	National Land Cover Database
NO_X	Nitrogen oxides

Acronym	Long Name
NO_2	Nitrogen dioxide
OCD	Offshore and Coastal Dispersion Model
OLM	Ozone Limiting Method
PM	Particulate Matter
$PM_{2.5}$	Particles less than or equal to 2.5 micrometers in diameter
PM_{10}	Particles less than or equal to 10 micrometers in diameter
PRIME	Plume Rise Model Enhancements algorithm
PSD	Prevention of Significant Deterioration
PVMRM	Plume Volume Molar Ratio Method
RHC	Robust Highest Concentration
RLINE	Research LINE source 33 model for near-surface releases
RLINEXT	Research LINE source 33 model for near-surface releases extended
SCRAM	Support Center for Regulatory Atmospheric Modeling
SIL	Significant impact level
SIP	State Implementation Plan
SO_2	Sulfur dioxide
TEMPO	Tropospheric Emissions Monitoring of Pollution
TIBL	Thermal internal boundary layer
URL	Uniform Resource Locator
USGS	United States Geological Survey
Q-Q plot	Quantile-quantile plot

2.0 Final Action

2.1 Support of Proposal

Support of Proposal

Comment:

Multiple commenters (0024, 0027, and 0033) supported the EPA's efforts to revise the *Guideline*.

Response:

The EPA appreciates the stated support and is adopting all of the proposed changes to the *Guideline* with some revisions that are described in the preamble to the final rule and elsewhere in this document.

Model Conservatism

Comment:

Two commenters (0034 and 0041) expressed their general support of the proposed enhancements to the EPA-preferred near-field dispersion modeling system, AERMOD. However, they believe additional work is needed to address the accuracy and conservatism of the model. Additionally, one commenter (0034) urged "EPA to issue a supplemental proposal that will address continuing issues with the overly conservative treatment of emissions, background air quality, and combining predicted ambient concentrations for primary and secondary $PM_{2.5}$."

Response:

The EPA appreciates the support of the proposed enhancements to the AERMOD modeling system. While these enhancements will continue to improve the accuracy of AERMOD, the EPA recognizes the challenges permit applicants and reviewing authorities may face given the more stringent level of the annual primary NAAQS for $PM_{2.5}$. To begin to address these challenges, the EPA is finalizing the proposed revisions to the *Guideline*, section 8.3, on the development of representative background concentrations to provide a framework of stepwise considerations to assist applicants and reviewing authorities in characterizing more representative background concentrations. Additionally, the EPA is completing, with refinements, the *Guidance on Developing Background Concentrations for Modeling Demonstrations,* which provides further guidance on the proposed framework of stepwise considerations. At this time, the EPA will not be issuing a supplemental proposal to the *Guideline* to address the concerns expressed by the commenter (0034); however, the EPA will continue to provide guidance on the treatment of emissions and the development of background concentrations for modeling demonstrations in addition to working with permit applicants and reviewing authorities to address new source permitting challenges on a case-specific basis.

2.2 Updates to the EPA's AERMOD Modeling System

2.2.1 Incorporation of COARE Algorithms into AERMET for use in Overwater Marine Boundary Layer Environments

Support for Proposal

Comment:

Multiple commenters (0033, 0034, and 0039) supported the incorporation of COARE algorithms into AERMET as a regulatory option.

Response:

The EPA appreciates the stated support and is adopting the proposed changes to the *Guideline* to incorporate the COARE algorithms into AERMET as a regulatory option.

2.2.2 Addition of GRSM as a New Tier 3 Detailed Screening Technique for NO_2

Support of Proposal

Comment:

Multiple commenters (0033, 0034, 0037, 0038, 0039, 0072, and 0079) supported the addition of a new Tier 3 detailed screening technique for NO_2 into AERMOD as a regulatory option.

Response:

The EPA appreciates the stated support and is adopting the proposed changes to the *Guideline* to add a new Tier 3 detailed screening technique for NO_2 into AERMOD as a regulatory non-default option.

Comments on Regulatory Text

Comment:

Commenter (0039) contends that consultation requirements under 4.2.3.4(e) for Tier 3 options "should" be optional. Commenter requests that "shall" be changed to "should" based on Tier 3 options PVMRM and OLM have been regulatory Tier 3 NO_2 screening options for the past seven years (since the previous 2017 App W revisions) and that other sections of the *Guideline* do not have the same strict requirements (*e.g.*, $PM_{2.5}$ and ozone).

Response:

As discussed under the requirements section 4.2.3.4(e) Models for Nitrogen Dioxide, "...Because of the additional input data requirements and complexities associated with the Tier 3 options, their usage shall occur in consultation with the EPA Regional office in addition to the appropriate reviewing authority." Those model input data requirements and complexities are specific to in-stack NO_2/NO_X ratios, background hourly NO_x and ozone, urban and rural atmospheric chemistry environments, and ultimately the project sources and locations under consideration. Consultation with the Regional office and reviewing authority encourages early engagement, establishment, and consensus on a Tier 3 NO_2 modeling protocol, and more efficient regulatory review and comment on the final NO_2 modeling demonstration provided in permit modeling application submittals or other regulatory air quality planning proposals.

The *Guideline* requires consultation with the EPA Regional offices and reviewing authority for all screening modeling approaches, as discussed in section 2.2(d). Screening modeling approaches discussed in the *Guideline* consistently require consultation with the EPA Regional office and reviewing authority. For example, section 4.2(c) discusses requirements for NAAQS and PSD increment modeling beyond 50 km in Class I protected areas where "*...applicants shall reach agreement on the specific model and modeling parameters on a case-by-case basis in consultation with the appropriate reviewing authority (paragraph 3.0(b)) and EPA Regional office.*"

Comments on NO_2 Modeling Guidance

Comment:

Three commenters (0033, 0039, and 0079) request further guidance on regulatory application and suitability of GRSM versus the other two existing Tier 3 NO_2 screening options, OLM and PVMRM.

Commenter (0079) requests clarification on the effects of temporally adjusted background NO_X inputs for GRSM.

Response:

The EPA plans to draft NO_2 modeling guidance in the future to respond to these comments.

Comments on Technical Support Document

Comment:

Commenter (0079) notes that the GRSM supporting documentation is unclear on what assessment or evaluation was conducted that supports the assertion that the AERMOD version 23132 updates to the GRSM code addresses NO_2 model overpredictions farther downwind, thereby improving model performance.

Response:

The GRSM NO_2 concentration overpredictions at locations farther downwind of multiple plumes affected by building downwash was the prime motivation for evaluating reformulation of the multiple plume and buildings factorization treatment as proposed in the GRSM code implemented in AERMOD version 23132. Prior to version 23132, the GRSM multiple plumes, or ensemble plume, and building factors treatment in AERMOD version 22112 showed some positive biases for some NO_2 testcase field database monitors such as the Balko Field and Wainwright receptors located at 400 m and 500 m, respectively, where multiple plumes affected by building downwash and ensemble plume lateral dimensions play an important role in total NO_x plume concentrations dispersing and competing for entrained ozone farther downwind. As such, the Technical Support Document (TSD) has been updated with a supplemental appendix showing the improved model performance for receptors located farther downwind (U.S. EPA, 2024a).

2.2.3 Addition of RLINE as Mobile Source Type

Support of Proposal

Comment:

Multiple commenters (0032, 0034, and 0039) expressed their support for the addition of RLINE as a mobile source type in AERMOD as a regulatory option.

Response:

The EPA appreciates the stated support and is adding RLINE into AERMOD to address the modeling of mobile sources.

Use of Modeling Options with RLINE

Comment:

Commenter (0079) asked if the EPA has a development plan for the expansion of RLINE for use with NO_2, deposition, and other currently unsupported options.

Response:

The EPA will consider expanding RLINE with other options to appropriately meet regulatory needs as we proceed with model updates. At this time, RLINE is expected to be used mainly for PM Hot-spot analyses for transportation conformity where NO_2 options and deposition are not used.

Retaining RLINEXT Source Type as Alpha Option

Comment:

Commenter (0032) supported the retaining of the RLINEXT source type as an alpha option until validated by an evaluation.

Response:

The EPA agrees that the RLINEXT source type remain alpha as further evaluation and testing occurs.

2.3 Model Input Data

2.3.1 Background Concentration

General Support

Comment:

Multiple commenters (0028, 0029, 0031, 0035, 0037, and 0079) expressed their general support of the revisions to section 8.3 of the *Guideline* and the EPA's efforts to provide more clarity and flexibility on developing background concentrations for regulatory modeling purposes. Commenter (0035) specifically expressed their support of the proposed revisions to sections 8.3.2(c)(ii) and 8.3.3(d) and commenter (0079) supported the removal of section 8.3.2(d) and its inclusion into section 8.3.2(a).

Response:

The EPA appreciates the support and is adopting the proposed revisions to section 8.3 of the *Guideline* regarding the development of background concentrations.

Significant Concentration Gradient

Comment:

Two commenters (0030 and 0034) expressed their support of the removal of the term "significant concentration gradient" from the *Guideline* due to its ambiguity. Commenter (0034) agreed the term is poorly defined and resulted in uncertainty and confusion when determining nearby sources to explicitly model.

Response:

The EPA appreciates the commenters' support and is removing the term "significant concentration gradient" from the *Guideline*.

Framework of Stepwise Considerations for Background Concentration

Comment:

Commenter (0030) expressed their concern that the proposed stepwise approach for determining background concentrations would limit the flexibility that has been historically afforded to permitting authorities.

Response:

The proposed framework of stepwise considerations recommended in the *Guideline*, section 8.3, is intended to offer the same level of flexibility that is allowed for in the current version of the *Guideline.* The proposed framework continues to rely upon the inherent discretion of defining a representative background concentration using a combination of ambient monitor data and explicit modeling of nearby sources through a more structured and transparent process that should be documented in the permit record. The application of this framework calls for the exercise of best professional judgement by the reviewing authority and each step should be considered on a case-by-case basis.

Comment:

Commenter (0030) stated that although the stepwise framework was developed to avoid overly conservative background concentrations, these conservative background concentrations may be preferable because it strengthens the permit record by ensuring that the air quality standards will not be exceeded. Additionally, this commenter stated that the proposed approach "does little to change the conservative nature of how background concentration has been determined and applied historically but adds significantly to the already complex and cumbersome nature of a cumulative impact analysis."

Response:

The EPA recognizes that using conservative background concentrations may provide greater assurance; however, the EPA's objective in adopting the stepwise framework is to provide a method for developing representative background concentrations to appropriately characterize local air quality for regulatory modeling applications. The steps of identifying a representative ambient monitor and selecting a few nearby sources to explicitly model in the cumulative impact analysis will reduce potential double counting of nearby source impacts and lead to more representative estimates of the background concentration in the modeling domain. The EPA is finalizing the stepwise framework in section 8.3 of the *Guideline* to more clearly document the process of developing background concentrations and promote national consistency in addressing these case-specific assessments. Considering that the steps under the

recommended framework may already be used in practice by many, the process of documenting those steps in the permit record should add very little burden to the cumulative impact analysis.

Comment:

Two commenters (0034 and 0079) stated that the framework of steps that have been proposed formally documents the steps that have unofficially been used by agencies and modelers for many years. However, the steps do not fully remove the ambiguity in the process or provide specific metrics to aid in determining which sources are represented in the ambient monitor data and will not likely cause change in the existing practices used by States.

Response:

One aim of the framework of stepwise considerations is to document the common practice used by air agencies and modelers. However, given the case-by-case nature of permit modeling, the EPA does not consider it appropriate to provide prescriptive metrics for determining whether a nearby source is adequately represented by the selected ambient monitor data for the modeling analysis. The EPA recommends the exercise of professional judgement by the permit applicant and reviewing authority to ensure nearby sources in the vicinity of the proposed new or modifying source are adequately represented either through the ambient monitor data or explicit modeling of those sources. While the framework may not resolve all ambiguities in practices used by States, it is a step towards providing clear documentation of the process for developing a representative background concentration. As more experience is gained under the guidance, the EPA will consider how best to update the document and what illustrative examples may be appropriate to include.

Quality Assurance of Monitoring Network

Comment:

Commenter (0028) expressed their concern that the recommendation made in the *Guideline*, section 8.3.1(b) stating "the monitoring network used for developing background concentrations is expected to conform to the same quality assurance and other requirements as those networks established for PSD purposes", rules out the use of low-cost sensors in developing a representative background concentration. Additionally, the commenter suggested that the EPA update section 2.2(2)(a) of the [*Draft Guidance*] to include "appropriately calibrated and quality-controlled sensor data", among the examples listed.

Response:

The EPA appreciates the commenter's perspective on the use of low-cost sensor data in developing background concentrations. The EPA is not proposing revisions to the recommendations in the *Guideline*, section 8.3.1(b) on the quality assurance requirements for the monitoring network and, therefore, will not finalize revisions to these recommendations. Given that the monitoring network is expected to meet the requirements established for PSD purposes, the EPA does not recommend the use of sensor data in the final version of the *Guidance*. The EPA acknowledges the availability of remote sensing data, including low-cost sensors that may be useful for developing background concentrations and will consider such use on a case-by-case basis with potential updates in future guidance and/or revisions to the *Guideline*.

Comment:

Commenter (0031) recommended that the EPA consider recommending the use of historical data from deactivated monitors in certain cases, considering that some ambient monitors have been deactivated due to low monitored concentrations.

Response:

The *Guideline*, section 8.3.1(b) recommends that "the monitoring network used for developing background concentrations is expected to conform to the same quality assurance and other requirements as those networks established for PSD purposes." Considering this recommendation, the EPA does not recommend the use of historical data from deactivated monitors given that this historical data would not be representative of the current state of air quality in a given area. Additionally, the reviewing authority may not have the appropriate information to distinguish the reasoning as to why an air agency (*i.e.*, the EPA, State, or local) made the decision to deactivate a specific monitor.

Pairing Air Quality Monitoring Data

Comment:

Two commenters (0025 and 0031) bring to question the use of hourly or daily pairing of monitored background and modeled concentrations as an alternative for modeling PM_{10}. Additionally, commenter (0028) stated that the referenced method for temporally pairing air quality monitoring data in the *Guideline*, section 8.3.2(c)(iii) should not be the only recommended approach and the EPA should consider probabilistic methods for combining paired-by-month background and source contributions as they have been published in peer reviewed scientific literature.

Response:

The EPA appreciates these comments which present alternative methods and unique modeling situations. The EPA did not propose revisions to the recommendations in the *Guideline*, section 8.3.2(c)(iii) on the pairing of monitored and modeled concentrations for background concentrations and, therefore, have not finalized revisions to these recommendations. However, these recommendations provide permit issuers flexibility in their application of air quality modeling. The EPA encourages consultation with the appropriate reviewing authority and EPA Regional office to determine an appropriate pairing methodology for particular permit actions.

Representative Design Value

Comment:

Commenter (0025) presented a unique scenario for developing a background concentration for PM_{10} in cases where the current design value may not be representative of the local air quality.

Response:

For cases where the current design value may not be appropriately representative of the background concentration, the current version of the *Guideline*, section 8.3.2(c)(ii) states that "there may also be cases where it may be appropriate to scale (multiplying the monitored concentrations with a scaling factor) or adjust (adding or subtracting a constant value the monitored concentrations) data from specific days or hours. Such adjustments would make the monitored background concentrations more temporally and/or spatially representative of the area around the new or modifying source for the

purposes of the regulatory assessment." The EPA encourages consultation with the appropriate reviewing authority and EPA Regional office while developing a representative background concentration.

Significant Impact Level

Comment:

Commenter (0035) stated that "SIL" is used in section 8.3.3(b)(ii) of the proposed *Guideline* but is not explicitly defined.

Response:

The insertion of the acronym "SIL" in the proposed revisions of section 8.3.3(b)(ii) of the proposed *Guideline* was inadvertent. It was not the intention of the EPA in the proposed regulatory action to recommend or require use of Significant Impact Levels (SILs) in the *Guideline*. As such, the EPA removed the acronym "SIL" from section 8.3.3(b)(ii) in the final rule. The final rule should state, "The EPA recommends evaluating any modeling, monitoring, or emissions data that may be available for the identified nearby sources with respect to possible exceedances or violations to the NAAQS."

PM_{10} Design Value

Comment:

Commenter (0031) expressed that the proposed version of the *Guideline* is unclear on how to incorporate the design value into a modeling analysis for PM_{10} given that it is based on the number of exceedances rather than a specific concentration level.

Response:

The *Guideline* provides details on the development of "design concentrations" in sections 8.3 and 9.2 of which design values are a component. The *Guideline* does not, however, include details on how any specific NAAQS design value should be incorporated into the design concentration given the various forms of each standard and routine updates to each NAAQS that would potentially cause inconsistencies between regulatory revisions of the *Guideline*. Details on how specific NAAQS design values should be incorporated into design concentrations are typically addressed in modeling guidance or clarification memoranda. Permit applicants are encouraged to engage with the appropriate reviewing authority and EPA Regional offices for additional information.

Modifying Monitored Background Concentrations

Comment:

Commenter (0034) supports the recommendations in section 8.3.2 of the *Guideline* regarding the flexibilities available when selecting a representative ambient monitor and modifying the monitored background concentration to be representative of emissions in the modeling domain.

Response:

The EPA appreciates the commenter's support of the flexibilities available under the current and proposed versions of the *Guideline* to develop a representative background concentration. The EPA recognizes that these flexibilities to determine a representative rather than overly conservative

background concentration is the objective of the *Guideline* and increasingly important as permit applicants and reviewing authorities face more stringent NAAQS levels.

Definition of an Isolated Source

Comment:

Commenter (0035) recommended that the EPA define an isolated source in section 8.3.2(a) of the *Guideline* as "a point source located in area where no permitting point sources are within 10 km of the subject source."

Response:

The EPA did not propose changes to the term "isolated source" in section 8.3.2(a) and, therefore, did not revise this section in the final rule but will consider appropriately defining this term in future.

2.3.2 Draft Guidance on Developing Background Concentrations for Use in Modeling Demonstrations

Support of Draft Guidance

Comment:

Two commenters (0033 and 0034) expressed their support of the EPA's efforts to develop the *Draft Guidance on Developing Background Concentrations for Use in Modeling Demonstrations*.

Response:

The EPA appreciates the commenter's support of the development of the *Draft Guidance on Developing Background Concentrations for Use in Modeling Demonstrations* (further referred to as *Draft Guidance).* The information and feedback gained through the public comments received have been considered while finalizing the *Guidance on Developing Background Concentrations for Use in Modeling Demonstrations* (further referred to as *Guidance*) (U.S. EPA, 2024b).

Review of Proposed Revisions to the Draft Guidance

Comment:

Multiple commenters (0033, 0034, and 0079) expressed that they would like the EPA to allow for an opportunity for comments on any proposed revisions to the *Draft Guidance*.

Response:

The EPA did not allow for additional comments on the revisions to the *Draft Guidance* outside of the comment period associated with the proposed rule. The EPA may make future revisions to the *Guidance* as we gain feedback on its implementation through the triennial Modeling Conferences, annual EPA Regional, State, and Local Modelers' Workshops, and other engagements with the stakeholder community. Any future revisions to the *Guidance* will go out for an informal public review similar to reviews done for previous modeling guidance documents.

Requests for Additional Details and Examples

Comment:

Two commenters (0035 and 0041) recommended that the EPA provide additional guidance and clarifications regarding the development of background concentrations. Commenter (0035) stated that the *Draft Guidance* "is not sufficient and additional details should be added to the document." Commenter (0041) stated that the *Draft Guidance* as it is currently presented will potentially increase the workload of the reviewing authorities and could lead to delays in application review times. The commenter goes on to suggest that the EPA provide hypothetical site-specific examples for both single and multi-source scenarios to limit potential ambiguities during the review process.

Response:

The EPA agrees that additional clarification in the *Draft Guidance* would be helpful. The EPA has revised the *Guidance* to incorporate select examples to assist permit applicants and reviewing authorities in applying the framework of stepwise considerations. The EPA may make future revisions to the *Guidance* to include additional examples as we gain experience and information as permitting authorities implement the framework of stepwise considerations to develop background concentrations for modeling demonstrations.

Comment:

Multiple commenters (0027, 0029, 0033, 0037, 0072, and 0079) recommended that the EPA incorporate examples into the final version of the *Guidance*. Commenter (0029) stated that actual assessments and completion time estimates should be incorporated into the *Guidance*.

Response:

The EPA agrees with the commenters' recommendations of incorporating examples into the *Draft Guidance* and has incorporated hypothetical examples in the *Guidance* regarding the selection of a representative ambient monitor and determining the representativeness of the ambient monitor. The EPA will continue to work with the stakeholder community to identify real-life examples through the implementation of this recommended framework.

Additionally, the *Guidance* does not provide information regarding timeline estimates due to the case-by-case nature of cumulative modeling. Each project will have vastly different timelines depending on the level of cumulative modeling necessary for the appropriate compliance demonstration.

Comment:

Two commenters (0043 and 0079) pointed out that the fourth sentence on page 30 of the *Draft Guidance* needs revision. The sentence states, "An initial approach to determine whether to explicitly model those sources identified in step 3 as not being represented in the selected monitoring data that are in close proximity to the project source and the area where the project source impacts exceed the SIL."

Response:

The EPA agrees that this sentence is confusing in its wording and has revised it to be clearer. This sentence in the final version of the *Guidance* now reads, "An initial approach to determine whether to explicitly model those sources identified in step 3 as not being represented in the selected monitoring

data would be to explicitly model sources that are in close proximity to the project source and the area where the project source impacts exceed the SIL."

Application of the Draft Guidance to Mobile Sources

Comment:

Commenter (0036) commented that the EPA should state how the *Guidance* will impact section 8 of the PM Hot-spot Guidance (U.S. EPA, 2021) and commenter (0032) recommended that the EPA clarify how the *Guidance* applies to transportation sources.

Response:

The EPA notes that the draft and final versions of the *Guidance* do not affect PM hot-spot analyses because this guidance is for cumulative impact analyses such as PSD permitting for stationary sources. The EPA will evaluate if any of our guidance needs to be updated in the future.

Framework of Stepwise Considerations for Background Concentrations

Comment:

Commenter (0041) supported the general framework for single and multi-source scenarios presented in the *Draft Guidance* where one of the first steps is to determine the availability and representativeness of the ambient monitoring data and then to use that data well as emissions and other data to inform what nearby emission sources may need to be explicitly modeled to best characterize local air quality in cumulative regulatory applications.

Response:

The EPA appreciates the commenter's support and is retaining this general structure of the framework in the *Guidance*.

Comment:

Commenter (0079) states that the questions presented on pages 19 and 31 of the *Draft Guidance* highlight important considerations but it is not necessarily clear which answers dictate which actions on the part of the stakeholder. Additionally, the commenter highlights that the last sentence of the *Draft Guidance* leaves the door open for screening approaches (*i.e.*, 20D) and other methods but maybe needs to be more clearly stated.

Response:

The questions presented on pages 19 and 31 of the *Draft Guidance* are not presented in a way that a concrete decision may be made by answering them; however, by considering these questions from a holistic standpoint, the permit applicant or reviewing authority should be able to determine what the ambient monitor represents and whether a nearby source is represented in that data. The commenter is correct in that the final sentence of the guidance does allow for permit applicants to consider approaches that are readily used by specific air agencies. The EPA intends to continue to gain feedback and identify examples from the stakeholder community to continue to improve the documentation around the determination of nearby sources to explicitly model.

Defining the Scope of the Cumulative Impact Analysis

Comment:

Commenter (0040) requested that the EPA provide further guidance on the process of defining the modeling area as isolated or multi-source. The commenter states that because this step is presented prior to the collection of available air quality data, it is unclear what factors or information should be considered here. The commenter goes on to ask, "is proximity alone sufficient to determine if a project source is in an isolated or multi-source area? Can air quality data for other known sources, like emission rate, stack height, and impacts estimated from existing modeling, be considered when determining whether an area is isolated or multi-source?" Commenter (0079) also stated that definitions and examples of isolated and multi-source are not given and the discussion of the two scenarios is mixed in section 2.

Response:

The determination of whether a source is an isolated source or is located in a multi-source area has historically been determined during the modeling for the single source impact analysis. When this analysis is performed, some collection of available air quality data has already occurred, and the permit applicant is generally aware as to whether the air quality in the vicinity of the proposed source is impacted by any nearby sources. The permit applicant is able to visually map out the locations of emission sources with respect to the proposed source to inform this determination. In the cases where an emission source(s) cannot be visually ruled out, it may be beneficial to reference additional air quality data such as those listed by the commenter to make the determination as to whether an emissions source would be considered a nearby source for the cumulative impact analysis. The EPA has revised section 2.2 of the *Guidance* to provide clarification on the determination of whether the proposed source is an isolated source or located in a multi-source area.

Identifying Relevant and Available Emissions, Air Quality and Environmental Data

Comment:

Commenter (0029) stated, "the additional efforts under this recommendation seem unnecessary. Pulling from recent or ongoing permits is labor intensive. Appendix A is overkill to look at everything."

Response:

The EPA recognizes that in some cases it may be labor intensive to identify relevant emissions and modeling information from available permits; however, this information can be useful in determining what nearby sources are represented by the selected ambient monitor data. Permit applicants are not required to identify and assess all information that is detailed in Appendix A, rather this section provides relevant links and information on data sources that may be useful for the permit applicant and reviewing authority.

Comment:

Commenter (0079) recommended considering the use of pre-existing modeling.

Response:

The EPA agrees with this commenter's recommendation. Section 2.2 of the draft and final versions of the *Guidance* recommend the use of "pre-existing dispersion modeling for potential nearby sources (*e.g.*, from previous permit actions or for similar type sources)."

Determining Representativeness of Ambient Monitoring Data

Comment:

Commenter (0029) supported the EPA's recommendations for background data selection. Additionally, two commenters (0033 and 0072) supported the recommendation that the monitoring network used for background concentrations is expected to conform to the same quality assurance requirements as those established for PSD purposes.

Response:

The EPA appreciates the commenter's support and is retaining these recommendations.

Comment:

Commenter (0036) believed that the EPA should remove from the *Guidance* any reference to a specific timeframe in describing what constitutes "current" ambient monitoring data. The commenter goes on to state that the timeline recommendation decreases flexibility in achieving a representative dataset given variability introduced by factors such as meteorology, emissions profile, and monitor startup/shutdown.

Response:

The EPA has maintained the recommendation in the final version of the *Guidance* that, "the selected ambient monitoring data should be current (*i.e.*, measured in the previous three years)." This recommendation is consistent with the recommendations for the collection and processing of ambient air data for PSD compliance demonstrations as stated in the "Ambient Monitoring Guidelines for Prevention of Significant Deterioration" (U.S. EPA, 1987). Using ambient monitor data from the most recent three years ensures that in most cases, the data is representative of the current state of the atmosphere in a given area. In cases where the ambient monitor data may not be representative due to atypical events, permit applicants may use the various flexibilities recommended under section 8.3.2(c) of the *Guideline*.

Comment:

Commenter (0072) stated that the *Draft Guidance* should explicitly state that the ambient monitoring data should represent normal conditions like it calls for regarding emissions data.

Response:

While the *Draft Guidance* does not explicitly use the term "normal" to describe what the ambient monitoring data should represent, it does recommend that 'the key to determining the representativeness of available ambient air quality data is to consider the "extent to which ambient air impacts of emissions from [the project and] nearby sources are reflected in the available ambient measurements, and the degree to which emissions from those background sources during the monitoring period are representative of allowable emission levels under the existing permits."' Considering this statement, the final version of the *Guidance* does not adopt the term "normal" to describe the conditions the ambient monitor data should represent.

Comment:

Commenter (0029) recommended using land use data as a means to determine appropriate monitoring sites for representative monitoring data, stating that this approach would be consistent with the Auer rural/urban determination references in section 7.2.1(1) of the *Guideline*.

Response:

The EPA agrees that land use data is a key resource in evaluating the modeling domain and identifying a representative monitor. The draft and final versions of the *Guidance* recommend in a footnote, "Google Earth can be used to evaluate land use throughout the modeling domain, identify terrain features, as well as map out the locations of sources, weather stations and monitors. ESRI ArcGIS may be used to plot terrain data from the USGS National Map and the NLCD land cover data from the MRLC."

Comment:

Commenter (0038) expressed that the use of the phrases 'visual analysis' and 'professional judgement' in the proposed *Guideline* and *Draft Guidance* lack clarity and adds uncertainty. The commenter stated, "the lack of clear guidance . . . for performing visual and qualitative analyses could potentially undermine the nearby source selection process and ultimately impact background monitor selection."

Response:

The proposed revisions to the *Guideline* and release of the *Draft Guidance* were developed in a way that allows for the same level of flexibility and discretion afforded to the reviewing authority as previous versions of the *Guideline*. The EPA hopes that the inclusion of examples in the final version of the *Guidance* will provide clarity on what is meant by using visual and qualitative analysis to determine the representativeness of ambient monitor data.

Comment:

Commenter (0040) requested that the EPA provide additional information on selecting an ambient monitor in situations where monitors are not located in the vicinity of the project source in a multi-source area. The commenter referenced section 4.3 of the *Draft Guidance* stating, "a degree of conservatism may be used to select a monitor that is biased high with respect to the project area in cases where it is unclear or uncertain what source mix a monitor is representing" and requested that the EPA explain how this approach may be used to represent the source mix around the proposed source.

Response:

The EPA recognizes the challenges the ambient monitoring network presents for air quality permitting in some areas of the country. The proximity of a monitor is not always the best indicator of whether a monitor is representative of the local air quality; therefore, the EPA is emphasizing the need to determine the monitor's representativeness of the area in which the new or modifying source is located. Additionally, to generally address situations like this, the EPA has provided an example in the final version of the *Guidance* that outlines using a monitor located in a different area to represent the source mix around a proposed source that does not have a monitor within the modeling domain. close by.

Comment:

Commenter (0043) requested that the EPA provide a recommendation or guidance on distances that would be appropriate for searching for a representative monitor in sections 2.2, 3.3, and 4.3 of the *Draft Guidance*.

Response:

The EPA does not recommend distances with regards to identifying a representative monitor in the draft or final versions of the *Guidance* because the proximity of a monitor is not directly tied to a monitor's representativeness. It is up to the discretion of the permit applicant and reviewing authority to determine whether a monitor at a further distance may be representative of the source mix and dispersion environment of the project source. In cases where nearby monitors are not available or may not be representative, the draft and final versions of the *Guidance* recommend that "a degree of conservatism may be used to select a monitor that is biased high with respect to the project area in cases where it is unclear or uncertain what source mix a monitor is representing."

Monitoring Objectives

Comment:

Commenter (0038) stated that the role of "monitoring objectives" in the determination of the representativeness of ambient monitoring data is unclear. The commenter highlights that the *Draft Guidance* recommends using this information to inform the selection of a representative monitor. However, neither the *Draft Guidance* nor the proposed *Guideline* make specific recommendations on how to address the ambiguity associated with monitoring objectives considering that many existing monitoring sites were established to serve multiple objectives.

Response:

The EPA appreciates the commenter's request for clarification on how to consider monitoring objectives while selecting a representative ambient monitor. The EPA does not explicitly state which monitoring objectives should be considered when determining the representativeness of a monitor because of the case-by-case nature of monitor selection. There may be scenarios where a monitor is defined as "General/background" for an area but is not representative of the background at the location of the project source, whereas the other nearby "population exposure" monitor is more representative. If the EPA were to explicitly define how monitoring objectives may be used while selecting a monitor, it limits the discretion allowed by the reviewing authority to ensure the most representative monitor is used.

Pollution Roses

Comment:

Commenter (0028) mentioned that pollution roses may be used in addition to wind roses and terrain maps to help diagnose contributions from upwind sectors or isolate regional background from local background.

Response:

The EPA appreciates the commenter bringing attention to specifying the use of pollution roses when characterizing background concentrations. The EPA has revised the *Guidance* to mention the use of pollution roses when determining the representativeness of the ambient monitor data.

Temporally and Spatially Varying Background Concentrations

Comment:

Commenter (0028) pointed out that the *Draft Guidance* does not provide additional information on scenarios with spatially varying background concentrations which is mentioned in the *Guideline*, section 8.3.2(c)(iv).

Response:

The EPA appreciates this comment and has included brief information in the *Guidance* on how to utilize spatially varying background data. The EPA will continue to collaborate with the stakeholder community on developing more specific examples for scenarios where spatially varying background data may be appropriate.

Comment:

Commenter (0029) supported the use of diurnal and seasonal patterns for background data stating that it offers a truer representation of modeled impacts as hourly, daily, or seasonal variations occur. This commenter also supported the use of monitoring data from multiple monitors as it is appropriate to accurately characterize the air shed surrounding a proposed project.

Response:

The EPA appreciates the commenters support and agrees that the selected monitored background concentration should be representative of spatial and temporal variations throughout the modeling domain.

Modifying Monitored Background Concentrations

Comment:

Commenter (0029) wished the EPA would consider methods in which data substitution is allowed so that data from multiple monitoring sites could be used to meet representative data completeness criteria. The commenter stated that this would make this process more manageable given the limited monitoring network present in their State.

Response:

Numerous methods for modification of monitored background data are available under section 8.3.2(c) of the *Guideline*. The determination of how these flexibilities apply to each permitting application calls for the exercise of professional judgement by the permit applicant in consultation with the appropriate reviewing authority.

Comment:

Commenter (0034) expressed that the *Draft Guidance* should include steps for considering the removal of impacts from emissions sources that impact a monitor and are not representative of the air quality in the modeling domain. Additionally, the commenter called for specific guidance on what should be included in a cumulative modeling inventory to ensure the EPA's agreement on those determinations. The commenter stated that the EPA should provide more concrete language on the criteria to determine nearby sources for explicit modeling to encourage regulating agencies to limit the extent of their offsite inventories.

Response:

The EPA appreciates the commenters perspective but believes that the process for removing impacts from a monitor should be performed on a case-by-case basis in consultation with the reviewing authority. Therefore, there is not one single stepwise process that may be recommended to make that determination across all situations. Additionally, the contents of a nearby source inventory are up to the discretion of the regulating agency. Permit applicants may work with their appropriate reviewing authority to determine what nearby sources from the inventory are appropriately represented in the ambient monitor data and, therefore, may not need to be explicitly modeled as part of the cumulative impact analysis.

Comment:

Commenter (0043) would like the EPA to clarify whether temporal pairing of monitor and modeling data is recommended or acceptable for pollutants and averaging periods other than 1-hour NO_2 and SO_2, which is all the *Draft Guidance* currently cites.

Response:

The EPA appreciates the commenter's request for clarification. Section 8.3.2(c)(iii) of the *Guideline* states, "for short-term standards, the diurnal or seasonal patterns of the air quality monitoring data may differ slightly from the patterns associated with the modeled concentrations. When this occurs, it may be appropriate to pair the air quality monitoring data in a temporal manner that reflects these patterns." The *Guidance* and the *Guideline* reference the guidance on Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Standard (U.S. EPA, 2011) because it provides additional relevant information on the temporal painting of data for the 1-hour NO_2 and SO_2 standards. This reference does not limit the discretion of the reviewing authority to allow for temporal pairing of data with respect to other short-term standards.

Determination of Nearby Sources to Explicitly Model

Comment:

Commenter (0029) stated that the recommendation for determination of nearby sources to be explicitly modeled and the time and resources required to document these steps would be burdensome. The commenter goes on to describe a look-up table approach based on conservative modeling is used to determine if a nearby source would have a significant modeled impact.

Response:

The EPA recommends in the proposed version of the *Guideline*, "Nearby sources not adequately represented by the ambient monitor through visual assessment should undergo further qualitative and quantitative analysis before being explicitly modeled." Therefore, rather than determining if the source has a significant modeled impact, the permit applicant and reviewing authority should first identify nearby sources that are not adequately accounted for in the selected monitor data to then be further analyzed to determine whether they should be explicitly modeled as part of the cumulative impact analysis. Pre-existing modeling may be used as part of the additional qualitative and quantitative analysis on the identified nearby sources as the draft and final versions of the *Guidance* additionally states, "When using pre-existing modeling, one should use their best professional judgement to determine whether the nearby source and dispersion environment are properly represented in the

modeling that was previously performed." The *Guidance* goes on to state, "In general, consideration of quantitative approaches to inform the determination of which nearby sources to explicitly model should be determined in consultation with the appropriate reviewing authority and fully described in the modeling protocol and technical documentation of the cumulative impact analysis." Therefore, it is the discretion of the reviewing authority to determine whether the additional analysis performed satisfies the compliance demonstration at hand.

Comment:

Commenter (0029) does not believe that downwash considerations for nearby sources is necessary when determining nearby sources to explicitly model unless the nearby sources are located within the proposed source's modeled significant impact area. The commenter stated that in many cases, building parameters are not readily available to determine downwash considerations.

Response:

The EPA appreciates the commenter's perspective on considering downwash with respect to nearby sources. The draft and final versions of the *Guidance* recommend considering downwash while assessing the representation of emissions from a nearby source with the question, "would downwash play a role in the dispersion of a pollutant from the nearby sources such that they may cause elevated concentrations in the vicinity of the project source?" The EPA continues to believe that permit applicants may consider downwash for nearby sources in order to develop a representative, rather than overly conservative, background concentration. Therefore, downwash may be considered for those nearby sources in the vicinity of the project source that may be the reason for elevated concentrations not adequately represented by the ambient monitor data.

Comment:

Commenter (0079) stated that the first sentence on page 30 of the *Draft Guidance* stating, "the nearby sources under consideration will typically be within the first 10 to 20 km from the project source and the area where the project source's impacts equal or exceed the SIL" may be conflicting for standards such as the 1-hour SO_2 and NO_2 NAAQS where concentrations drop off quickly with distance from the source. The commenter stated that if modeled concentrations are still above the SIL, many sources could be included conflicting with the EPA's goal of modeling few sources. The commenter also stated that there is a heavy reliance on engineering judgement to make these determinations and many agencies may hang on to old school approaches to sort out contributions.

Response:

The pull quote mentioned by the commenter is a general recommendation that may be applicable in many cases, but the EPA recognizes that there may be exceptions to these "broadly applicable" recommendations. The permit applicant in consultation with the reviewing authority maintains the discretion to determine whether to explicitly model a nearby source given the cumulative exercise at hand. Although the revisions to the *Guideline* allow for the same level of professional judgement as previous versions, the *Guidance* aims to clearly document the process of developing background concentrations so that air agencies may adapt their usual methods to better align with this recommended process.

Additional Considerations Section of the Draft Guidance

Comment:

Multiple commenters (0026, 0033, and 0072) expressed that the "Additional Considerations" section of the *Draft Guidance* is not necessary in the determination of background concentrations and should be removed from the guidance. Commenter (0029) stated they do not believe additional modeling steps are necessary to address environmental justice considering that modeling results are compared against health-based standards that are protective of air quality standards for all areas.

Commenter (0034) stated that the EPA "should include a specific definition of what constitutes an EJ community for modeling purposes, and the requirements around the consideration of EJ in the permitting context." Additionally, commenter (0036) stated that the EPA should develop more specific recommendations on how EJ tools may inform characterizing representative background concentrations and allow the public to comment on the revised recommendations. Both commenters go on to say that if the EPA does not add information related to these topics in the final version of the Guidance, the section should be removed all together. Finally, commenter (0036) stated, 'if consideration of EJ remains in the final *Guidance*, the EPA should clearly distinguish when it is discussing "cumulative impact assessments" in the context of NAAQS implementation modeling demonstrations and when it is doing so in the context of EJ, as "cumulative impact assessment" has a unique meaning in each context.'

Response:

The EPA appreciates the commenters' perspective but has chosen to leave the "Additional Considerations" section in the final version of the *Guidance*. Through recent permit actions, the EPA has noticed an increase in public comments related to performing analyses or considering environmental justice concerns as part of the permit demonstration. This section is included in the *Guidance* to highlight the tools currently available to those permit applicants who may be requested or required by their State or reviewing authority to perform an EJ analysis with their modeling demonstration. The inclusion of this section in the *Guidance* does not require the permit application to include such analysis but rather provides useful references to existing tools that may assist in doing so. The information presented in the *Guidance* does not create any rights or obligations enforceable by any party or impose binding, enforceable requirements; therefore, the decision to perform such analysis is up to the discretion of the appropriate reviewing authority.

The EPA recognizes that the term "EJ community" has different definitions across various tools and programs; however, the specifics of the EJ communities that the permit applicant may consider will differ on a case-by-case basis given variability in local population demographics. The EPA does not currently require the consideration of EJ communities under the PSD permitting program and, therefore, does not define requirements in the "Additional Considerations" section of the *Guidance*. While the EPA does not provide specific examples on how EJ may be considered in determining background concentrations in the final version of the *Guidance*, it maintains the recommendation that "additional considerations. . . may include accounting for at-risk communities in ensuring the adequacy of local air quality characterization in these communities, especially in the case of multi-source areas where the potential for modeled violations of the NAAQS or PSD increment as part of the cumulative impact assessment." The EPA will continue to collaborate with the stakeholder community to identify clear examples of how EJ may be considered within the framework of determining background concentrations. Finally, the EPA appreciates the commenter's recognition of the different contexts of

the term “cumulative impact assessment” and has made note of this distinction in the final version of the *Guidance*.

Appendix A

Comment:

Commenter (0079) stated that Appendix A in the *Draft Guidance* is very useful, but the EPA should be prepared to continually support the document since URLs may change.

Response:

The EPA appreciates the commenter’s support of the information presented in Appendix A. The EPA will do its best to revise the Appendix in a timely manner as URLs change.

Double Counting Emissions

Comment:

Commenter (0072) supported the wording and language used in the *Draft Guidance* that is aimed at being clear to reduce the possibility of double counting emissions.

Response:

The EPA appreciates the commenter’s support of the clear language used in the draft and is retaining that language in the final version of the *Guidance* to ensure permit applicants are not double counting emissions.

Comment:

Commenter (0038) expressed their concern that the *Draft Guidance* does not present a clear procedure on determining whether an off-site emission source should be explicitly modeled. The commenter states, “EPA has indicated that the need to include nearby emission sources in a facility-level modeling exercise should be rare, but it appears that several states require a number of off-site emission sources be included.”

Response:

The EPA recognizes the commenter’s concern regarding the possibility of double counting nearby emission sources (*i.e.*, off-site emission sources). While the final version of the *Guidance* does not provide a prescriptive procedure for determining whether a nearby source should be explicitly modeled, it does present numerous considerations that may be further investigated and documented in the permit record to make a case as to whether or not a nearby source is adequately represented in the selected background monitored concentration. Clear documentation of any decisions made regarding nearby sources should allow for better communication with the reviewing authority and, therefore, reduce the number of nearby sources that are double counted.

The EPA recognizes that the selection of nearby sources to explicitly model is a challenging procedure that is case-by-case in nature and, therefore, it would be unreasonable to define a single procedure for the process. The EPA will continue to work with the stakeholder community on identifying real-world examples to share with permit applicants and reviewing authorities to aid in this decision-making process.

PSD Increments

Comment:

Commenter (0026) recommended that the EPA either eliminate references to PSD Increments throughout the final version of the *Guidance* or provide additional explanation on how background should be considered as part of an increment analysis.

Response:

The EPA appreciates the commenters recommendation with regard to the references of PSD Increments throughout the *Draft Guidance*. The EPA has kept the references to PSD Increments in the final version of the *Guidance* because the framework of stepwise considerations is broadly applicable to PSD increment analysis. For cases where it is unclear as to how the framework applies to the specific increment analysis, the EPA recommends consultation with the appropriate reviewing authority and EPA Regional office.

Flow Chart

Comment:

Commenter (0026) stated that the flow chart in the *Draft Guidance* does not conform to the standard way diagrams are presented and should be reformatted to follow flow chart standards.

Response:

The EPA appreciates the commenter pointing this out and has adjusted the flow chart to better align with flow chart standards.

Emissions from Nearby Sources

Comment:

Commenter (0037) supported the recommendation in the *Draft Guidance* that allows for consideration of actual emissions as opposed to potential emissions from nearby sources. The commenter stated that specific examples with proposed approaches to calculate emissions for the project source and nearby background sources would be a helpful supplement to the *Draft Guidance*. Additionally, the commenter requested clarification on the definition of a nearby source as it pertains to existing facility sources not part of the modification.

Response:

The EPA appreciates the commenter's support regarding the use of emissions that represent normal operating conditions for nearby sources. In the final version of the *Guidance*, the EPA has not provided examples with approaches to calculate emissions for project and nearby sources, but we will continue to collaborate with the stakeholder community on the development of additional guidance regarding this topic. Finally, the EPA has provided additional clarification in the final version of the *Guidance* on defining a nearby source located at the existing facility but is not part of the modification.

2.3.3 Mobile source modeling

Updates to $PM_{2.5}$ Hot-spot Guidance

Comment:

Commenter (0028) stated that the proposed changes in Appendix W, including the addition of RLINE as a mobile source type should be incorporated into EPA's Guidance on PM/CO Hot-spot Analyses, Conformity, and NEPA analyses. The EPA should explain how these changes, including the background contributions from nearby sources in Appendix W, would impact guidance on NEPA and transportation projects. The commenter's recommendation is that the EPA to provide new guidance or, at the very least, update the 2019 Guidance on New R-LINE Additions to AERMOD 19191 for Refined Transportation Project Analyses for NEPA and transportation projects. Additionally, commenter (0079) commented on the need for clear guidance on the expected usage of RLINE.

Response:

The EPA agrees that practitioners will need guidance for using RLINE and plans to update relevant guidance with the addition of RLINE as a regulatory mobile source type and other Appendix W updates pertaining to transportation projects. The EPA also will be including information about using the RLINE source type in the User's Guide for the AMS/EPA Regulatory Model (AERMOD) (U.S. EPA, 2024a).

Clarification of CAL3QHC use for Carbon Monoxide Hot-spot Analyses

Comment:

Commenter (0028) stated that it was unclear whether CAL3QHC and its guidance can still be used in CO Hot-Spot Analyses. Another commenter (0032) also wanted the EPA to confirm that CAL3QHC can continue to be used for CO screening analyses.

Response:

The EPA confirms that the EPA's 1992 CO Guidance that employs CAL3QHC for CO screening analyses is still an available screening approach for CO hot-spot analyses of transportation projects (U.S. EPA, 1992a). In the EPA's January 17, 2017 final rule, section 4.2.3.1(b) of the *Guideline* was modified, and the 1992 technical guidance (with CAL3QHC) remains in place as the recommended approach for CO screening analyses (82 FR 5192).

3.0 Editorial Changes

General Editorial Comments

Comment:

Commenter (0027) identified that the heading for "section 8.4.1(D)" should be changed to section 8.4.1(d).

Response:

The EPA appreciates the commenters identifying these needed corrections. The text has been revised accordingly.

Comment:

Commenter (0079) stated that Addendum A (formerly Appendix A) is very useful, but the EPA needs to be prepared to continually support the document since URLs may change.

Response:

The EPA appreciates the feedback regarding a need to support continual website reference updates to Addendum A and foresees this to be an ongoing issue with the website references throughout the *Guideline*. The EPA is considering developing an online *Guideline* bibliography and/or reference guide and posting on the EPA's SCRAM website to assist in frequently changing URLs between subsequent revisions to the *Guideline*.

Grammatical Change

Comment:

Commenter (0035) requested that the EPA remove "could" and insert "an" from the second sentence in section 8.3.3(c)(ii) of the *Guideline* so that it reads as "Accordingly, it is not necessary to model impacts of a nearby source that does not, by its nature, operate at the same time as the primary source or have an impact on the averaging period of concern, regardless of an identified significant concentration gradient from the nearby source."

Response:

The EPA appreciates the commenter's recommended revisions to section 8.3.3(c)(ii) of the *Guideline*; however, because revisions to this section were not proposed, no changes will be made in the final rule. The EPA will consider this grammatical change in future revisions to the *Guideline*.

4.0 Statutory and Executive Orders

Protection for at-risk communities

Comment:

One commenter (0042) highlighted the portion of the proposed rule preamble that states "this action does not have disproportionate and adverse human health or environmental effects on communities with environmental justice concerns because it does not establish an environmental health or safety standard . . . While EPA does not expect this action to directly impact air quality, the proposed revisions are important because the *Guideline* is used by air permitting authorities and industry to prepare and review NSR permits and serves as a benchmark of consistency across the nation. This consistency has value to all communities including communities with environmental justice concerns." The commenter then suggested that "EPA must expand its assessment of cumulative impacts to be required in communities that have been identified as having environmental justice concerns."

Response:

The revisions to the *Guideline* made in this action, including enhancements to the formulations and application of the EPA's near-field dispersion modeling system, AERMOD, assist with and expand analytical capabilities to better inform PSD compliance demonstrations and air quality assessments for communities with Environmental Justice concerns. Further, the incremental formulation improvements to AERMOD and other preferred models will increase the public confidence that compliance demonstrations are accurately assessing air quality in areas of concern and projecting when and where a new or modifying source could be causing or contributing to a potential NAAQS and PSD increment violations.

The *Guideline*, section 9.2.3 recommends a multi-stage approach for making NAAQS and PSD increments compliance demonstrations for new or modifying sources. Each stage involves increasing complexity and details, as required, to fully demonstrate that a new or modifying source will not cause or contribute to a violation of any NAAQS or PSD increment. The section 9.2.3 recommendations are universal and are equally applicable to all ambient air receptors, including areas having environmental justice concerns. Under the PSD program, there is discretion for permit review authorities to proceed to a cumulative analysis in an area where there are environmental justice concerns, even if the first stage in the analysis produces information suggesting that the source will not cause or contribute to a violation[2].

[2] *See* EPA Legal Tools to Advance Environmental Justice, pp 44-46 (May 2022), https://www.epa.gov/ogc/epa-legal-tools-advance-environmental-justice.

5.0 General and Non-specific

AERMET Surface Roughness Length

Comment:

Commenter (0033) recommended that the EPA address the difference in representativeness of the surface roughness length around the meteorology tower compared to emission source location stating that roughness length estimated for the modeling application is often underestimated (lower) than what is representative of the source location. The commenter recommended that the EPA use an approach that considers the enhanced mechanical turbulence from nearby structures to the plume dispersion in the near field. The commenter cites an approach that enforces a minimum Monin-Obukhov Length under stable conditions. The commenter also suggested that the EPA consider a different averaging method implemented in AERSURFACE to estimate surface roughness length.

Response:

The EPA appreciates the commenter's suggestions and is happy to collaborate with the stakeholder community on these enhancements to possibly implement them in future versions of AERMOD and AERSURFACE.

AERMOD Future/Succession Planning

Comment:

Multiple commenters (0034, 0041, 0079) provided comments related to the future of AERMOD as a regulatory model. Commenter (0034) noted that AERMOD has been the preferred regulatory model for nearly 20 years and progress on improvements has slowed, and the modeling system is increasingly showing its age. The commenter raised that the EPA has not made mention of long-term plans for AERMOD, and the white papers introduced with the 2017 revisions to AERMOD have not been updated. The commenter stated that the EPA should chart out and publish its plan for the future of AERMOD, including what and when significant revisions will be made, what models may be considered as its successor, and other planned changes.

Commenter (0041) also expressed the need for the EPA to consider the long-term future for the EPA-preferred near-field dispersion model system, AERMOD, as well as the possibility of another model eventually taking its place as the EPA-preferred dispersion modeling system that would focus upon near-field dispersion and could potentially have regional modeling capabilities as well.

Response:

The EPA appreciates the commenters' feedback and suggestions about the future of AERMOD as a regulatory model and long-term future of the EPA's preferred models in general. The EPA will consider such long-term updates in response to the modeling requirements and needs under the applicable programs under the CAA. At present, we believe that the AERMOD modeling system along with screening approaches within the *Guideline* are sufficient to meet those needs. The EPA welcomes engagement with the stakeholder community on this topic as part of the triennial Modeling Conferences, annual EPA Regional, State, and Local Modelers' Workshops, and other stakeholder engagements and looks forward to such discussion with potential implications for considering future changes to the *Guideline* and the EPA's preferred models and related technical guidance.

Comment:

Commenter (0079) stated the core AERMOD code is going to become increasingly more complex and will need to be overhauled/rewritten. The commenter suggested this might require input from the broader modeling community and suggested the possibility of an AERMIC2 committee similar to the AERMIC committee that originally formed and developed AERMOD.

Response:

The EPA appreciates the commenter's observation about the AERMOD code and will be considering how best to update the AERMOD code in the future.

AERSCREEN Averaging Factors

Comment:

Commenter (0035) requested references or evidence for the scaling factors for 8-hour, 24-hour, and annual average concentrations from 1-hour concentrations calculated by AERSCREEN.

Response:

While this comment is outside the scope of the rulemaking, scaling factors are based on guidance in section 4.2 (page 4-16) of the EPA's document on "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources – Revised" (U.S. EPA, 1992b).

Alpha-Beta Framework and Alternative Models

Comment:

Multiple commenters (0033 and 0041) expressed support for the alpha-beta framework for introducing and vetting new model options in AERMOD. Commenter (0033) stated there are alpha options in AERMOD that are mature and have been vetted through peer-reviewed journal articles and have shown improvement in model performance against evaluation databases. Commenter (0033) further stated it would be helpful to the modeling community if the EPA could identify what is missing or "holding back" these "mature" alpha options from being classified as beta. Additionally, comments include that alpha options that have already been evaluated based on field data and that have peer-reviewed journal articles should be considered acceptable to use in site-specific alternative model demonstrations.

Commenter (0041) recommend the EPA seek out methods to streamline the framework to reduce delays in implementing model improvements. The commenter (0041) also requests greater clarity and transparency on the status of each alpha and beta model option with a frequency of at least once per year, with consideration of public review and comment on the status of these options each year, perhaps in conjunction with the annual EPA Regional, State, and Local Dispersion Modelers' Workshop. The commenter (0041) also suggested that the EPA provide a document similar to the Model Change Bulletin with each new release of AERMOD that briefly lists each alpha and beta option and its status. In addition, the commenter (0041) recommended that the EPA add to the *Guideline*, a description of the model development framework in section II.C of the preamble, including alpha and beta option definitions. The commenter requested that the EPA reconsider the restriction of alpha options cannot be used as an alternative model and allow consideration on a case-by-case basis with an appropriate modeling demonstration.

Response:

Though out of scope for the rulemaking, the EPA appreciates the commenters' feedback and suggestions on improving and streamlining the alpha-beta model development framework as applied to the evaluation of existing and future AERMOD alpha and beta options. The EPA evaluates alpha and beta options for regulatory use with particular focus on scientific peer review and the availability and adequacy of field testcase databases. The EPA resources devoted to the evaluation of alpha and beta options is based on model improvements that would address immediate regulatory modeling priorities in balance with the scientific merit of the alpha or beta option addressing a specific modeling system deficiency (*e.g.*, inappropriate overpredictions and underpredictions, model biases) for the problem at hand. With those model development criteria in mind, the EPA values community feedback (*e.g.*, during the triennial Modeling Conferences and annual EPA Regional, State, and Local Dispersion Modelers Workshops), regular communications (as needed), and overall collaboration on developing new and existing alpha options with the main objective of focusing limited EPA resources on promoting the most viable and relevant scientific formulation updates from alpha to beta in AERMOD based on the urgency and importance of the intended regulatory application.

Atypical & Exceptional Events

Comment:

Commenter (0034) stated their support of the availability to modifying the monitored background concentration for atypical events as stated in the 2019 EPA guidance on Additional Methods, Determinations, and Analyses to Modify Air Quality Data Beyond Exceptional Events. However, the commenter states that many agencies do not use the flexibilities recommended in the guidance because they lack clear steps to determine what constitutes an exceptional event.

Response:

The EPA appreciates the commenter's recognition of the flexibilities available under the *Guideline* and the 2019 EPA Guidance on Additional Methods, Determinations, and Analyses to Modify Air Quality Data Beyond Exceptional Events (U.S. EPA, 2019a). We would like to point out that atypical events differ from the exceptional events in that atypical events are those identified by the permit applicant or reviewing authority who which may modify the monitored background concentration without undergoing the formal exceptional events process. Separately, exceptional events are unusual or naturally occurring events that can affect air quality but are not reasonably controllable using techniques that air agencies may implement in order to attain and maintain the NAAQS. The 2016 Exceptional Events Rule (81 FR 68216) establishes criteria and procedures for determining if air quality monitoring data has been influenced by exceptional events.

Despite the difference in atypical and exceptional events, the EPA recognizes that States may not be exercising these flexibilities, so the EPA will continue to collaborate with the stakeholder community on implementing the recommendations made in the *Guideline* and the 2019 EPA guidance through engagements such as the Regional, State, and Local Dispersion Modelers' Workshop.

Background Monitors

Comment:

Commenter (0068) stated that to determine accurate or representative background monitor for a project, it would be helpful to have maps that have concentrations patterns for the pollutant of interest. This would enable you to take the relative magnitude of the concentration estimate at the monitor from whatever database from which the map is developed and compare it to the project site. Commenters (0037 and 0068) both recommended that the hybrid modeling methods used for AirToxScreen could be extended to criteria pollutants. Further, commenter (0068) suggested satellite data as another option for generating maps (*i.e.*, TEMPO satellite).

Response:

The EPA appreciates the commenters' request for the EPA to develop mapping tools to assist in determining a representative background monitor and extending existing modeling methods to criteria pollutants. While this comment is out of scope with regards to the Appendix W final rule, the EPA is currently investigating options for developing such tools and will continue to collaborate with the stakeholder community on this topic. The EPA would be happy to continue to collaborate with the stakeholder community on this topic.

Building Downwash

Comment:

Multiple commenters (0033, 0034, 0037, 0041, and 0072) stated the importance of making needed improvements to treatment of building downwash in AERMOD, acknowledging the different alpha options that have been added over recent years and the mixed results in attempts to evaluate the options.

Commenters (0033, 0034, and 0041) suggested that two possible reasons for the mixed results could be the need for improvements to the building preprocessor BPIPPRM in determining reasonable building dimensions by wind direction and the lack of plume meander for plumes subject to building downwash.

Commenters (0033 and 0041) specifically discussed the AWMAENTRAIN alpha option as a needed update which modifies the beta entrainment coefficient from a default value of 0.6 to 0.35, citing the original studies on which the value of 0.6 is originally based, recent tunnel experiments, and the aluminum industry as characterized by substantially buoyant plumes which result in high plume rise.

Commenter (0072) presented results of an evaluation of the PRIME algorithm dispersion and wake computations versus using data collected in the field in Balko, OK and reproduced in a wind tunnel simulation. The commenter stated that changes to the PRIME algorithm, implemented as alpha options, demonstrate improvement in evaluation results when compared to wind tunnel and field observations. The commenter also listed additional changes that need to be made to the PRIME downwash algorithm, and once made and evaluated, the changes should replace the current PRIME algorithm.

Response:

Though out of scope for this action, the EPA appreciates the commenters' feedback, recommendations, and acknowledgement of past efforts by the EPA and others with respect to improving the treatment of the effects of building downwash in AERMOD. The EPA is committed to continued review of the related

alpha options and to the assessment of the scientific formulation and evaluation results of these options in accordance with the criteria set forth in the *Guideline*. Improvement of the building downwash algorithm and the building related parameters that are input to AERMOD continue to be a priority in our ongoing development of AERMOD.

Buoyant Line Source

Comment:

Given the applicability of the BUOYLINE source type to aluminum facilities, commenter (0041) expressed appreciation for the EPA's efforts to include a buoyant line source into AERMOD and supports the further integration of the BUOYLINE source type such as allowing BUOYLINE sources to use the same wind and temperature profiles used by AERMOD for all other source types. The commenter also expressed the need to for the BUOYLINE source to utilize AERMOD's more advanced treatment of terrain.

Response:

Though out of scope for this action, the EPA acknowledges and appreciates the commenter's suggestions related to harmonizing the buoyant line source type with AERMOD's more advanced treatment of meteorology and terrain.

Clarification of Volume Source Spacing for Mobile Source Modeling

Comment:

Commenter (0035) recommended the EPA provide clarification about what is meant by "appropriately spaced" in the statement in section 7.2.3(c) "If volume sources are used, it is particularly important to ensure that roadway emissions are appropriately spaced when using volume sources so that the emissions field is uniform across the roadway."

Response:

The EPA has provided such clarification in resources available on Project-Level Conformity and Hot-Spot Analysis[3]. First, appendix J of the PM Hot-spot Guidance gives more details on characterizing emissions using volume sources and spacing. In short, the volume sources should not be spaced so widely such that there are gaps between sources. Another resource available on that same website is a presentation titled, "PM Hot-Spot Modeling: Lessons Learned in the Field."[4] This presentation includes graphics that illustrate correct and incorrect volume source spacing.

Emissions Variability and Intermittent Sources

Comment:

Multiple commenters (0033, 0034, and 0038) stated that the EPA should develop and promote statistical modeling approaches to address sources that operate intermittently with highly variable emission rates. Commenter (0033) specifically offered, as an example, sources with periods of infrequent high emission events are primarily caused by excess emission during periods of startup,

[3] https://www.epa.gov/state-and-local-transportation/project-level-conformity-and-hot-spot-analyses.

[4] https://www.epa.gov/sites/default/files/2016-06/documents/hotspot-leasons-learned-trb.pdf.

shutdown, or malfunctions. These scenarios, especially with the random nature of the emissions, present a unique challenge for modelers, given the stringency of 1-hour air quality standards and the uncertainty of when the high emissions will occur.

Two commenters (0034 and 0038) cited specific examples where statistical approaches have been used and State agencies that allow statistical approaches, such as a Monte Carlos analysis. Commenter (0034) recommended that the EPA revise section 8 of the *Guideline*, and specifically Table 8-2, to allow and promote alternative approaches that characterize variability in emissions for new and modified emission units as part of PSD analyses, including statistical evaluations of variable emissions rates at a given source. Additionally, commenter (0034) stated that statistical approaches and Monte Carlo-style randomization techniques, and post processing of modeling results using the Emissions Variability Processor (EMVAP) or other similar postprocessors can be used to generate many thousands of modeling scenarios representative of the true operating conditions of a source and show that none, or an extremely small percentage of those scenarios will result in exceedances of the NAAQS being considered.

Response:

The characterization of intermittent modeled emission scenarios is outside the scope of the proposed revisions to the *Guideline* and the EPA's preferred regulatory modeling system, AERMOD.

FEM Bias

Comments:

Two commenters (0034 and 0038) stated that the proposed *Guideline* does not address or present a methodology for correcting the known biases present in the FEM monitors.

Response:

The EPA is aware of and has provided a solution to correct the known biases present in the Teledyne T640 PM mass monitors. Addressing the known biases present in the FEM PM monitors is outside of the scope of the *Guideline on Air Quality Models* and, therefore, was not proposed given it is more appropriately addressed through other communication avenues. On May 13, 2024, the EPA released a Notice of Availability[5] regarding the approved modification of the FEM designation for the Teledyne Advanced Pollution Instrumentation Model T640 particulate matter mass monitor which corrects the known biases. The EPA provided modified data through AQS[6] rather than issuing guidance on how to correct the biases in the Teledyne T640 PM monitors to ensure national consistency in the methodology used for the correction. On August 9, 2024, the EPA also released the 2023 $PM_{2.5}$ design values on the Air Quality Design Values page[7] that included the modified AQS data.

[5] Information regarding the Update of $PM_{2.5}$ Data for the T640/T640X PM Mass Monitors can be found under docket ID EPA-HQ-OAR-2023-0642. https://www.regulations.gov/docket/EPA-HQ-OAR-2023-0642.

[6] Information on the EPA's Air Quality System can be found at: https://www.epa.gov/aqs.

[7] https://www.epa.gov/air-trends/air-quality-design-values.

Field Studies

Comment:

Commenter (0038) stated a significant area of needed research is the collection of additional field data for model development and evaluations.

Response:

While the EPA would agree that additional field studies and data would be beneficial for continued model development and evaluation, we do not offer any additional response because it is outside the scope of the rulemaking.

Highly Buoyant Plumes

Comment:

Multiple commenters (0033, 0035, and 0037) expressed support for the Highly Buoyant Plume (HBP) alpha option that was added in AERMOD version 23132. Commenters (0033 and 0037) referenced results from recent published research and stated that the HBP option had met the criteria to become a beta option.

Response:

The EPA appreciates the commenters' expressed support of the HBP alpha option. While out of scope for this action, the EPA is committed to review and test the alpha option and assess the scientific formulation and evaluation results in accordance with the criteria set forth in the *Guideline*.

Hourly Varying Stack Height and Diameter

Comment:

Commenter (0086) stated there is a need to be able to vary stack height and diameter hour by hour in the hourly emissions file for a source such as a flare.

Response:

Though out of scope for this action, the EPA acknowledges and appreciates the suggestion to vary stack height and diameter hourly.

Long-Range Transport

Comment:

Commenter (0079) stated we still have a lack in Appendix W of addressing long range transport. There is a flexible system in place. It doesn't have to be a full alternative model demonstration that has been made clear. But AERMOD clearly cannot be a long-range transport model. So, we have to look at other options and could there be options out there that could be formally promulgated into Addendum A accordingly.

Response:

Though out of scope for this action, the EPA acknowledges and appreciates the comments on how the *Guideline* addresses long-range transport modeling for receptors located greater than 50 km from the source. As the commenter discusses, and more specifically stated here, sections 4.2(c)(ii) and 4.2.1(e) of

the *Guideline* provide a flexible screening approach that does not require reliance upon Addendum A preferred models (*i.e.*, AERMOD) or alternative model approvals as per sections 3.0(b) and 3.2.2.(e), and rather specifies that regulatory application of long-range transport models, such as Lagrangian or other appropriate models, *e.g.*, Eulerian chemical transport grid models, for screening purposes requires consultation with the EPA Regional office. Additionally, and as per section 4.2(d), cumulative modeling of source impacts beyond 50 km to demonstrate compliance with the NAAQS and/or PSD increments requires alternative model approval as per section 3.2.2(e).

Low Wind

Comment:

Commenter (0033) stated the current AERMOD formulation of vertical wind profiles in stable conditions results in overly biased high concentrations that remain unaddressed - with technical comments of vertical wind profiling issues, minimum turbulence levels, minimum sigma-w option, and highly buoyant plumes. The commenter expressed support for addressing low wind speed issues through the use of changes to minimum sigma-v and sigma-w parameters.

Response:

The EPA appreciates the commenters feedback and support for the need to address AERMOD's treatment of dispersion in low wind conditions. Though not germane to this action, the EPA agrees there is a need to continue working to improve AERMOD's performance in low winds scenarios. The EPA is committed to review and test the current low wind alpha options and assess evaluation results in accordance with the criteria set forth in the *Guideline*.

Maximum Potential to Emit

Comment:

One commenter (0042) stated that "EPA should retain the recommendation for facilities to model emissions based on allowable emissions instead of reported actual emissions, because they reflect facilities' maximum emissions without violating emissions standards."

Response:

Consistent with CAA requirements, the *Guideline* requires that the proposed new or modifying source must model their "maximum allowable emissions limit or federally enforceable permit limit" to demonstrate that such emissions will not cause or contribute to a violation of a NAAQS or PSD increment. *See*, 40 CFR part 51, Appendix W, section 8.2.2. and Table 8-2. Thus, there is no inconsistency with the commenters statement and the *Guideline* in that respect. The *Guideline*, as updated in 2017, was revised to allow for nearby sources to be modeled consistent with their actual operations along with their enforceable emissions limits consistent with CAA requirements.

The EPA proposed minor typographical revisions to the footnoting in Table 8-2 of the *Guideline* but did not make any proposed revisions to the point source model emissions inputs (*i.e.*, emissions limits, operating level, and operating factor) for a proposed new or modifying source. The EPA finalized the typographical revisions as proposed.

Model Bias

Comment:

With respect to the use of alternative models, commenter (0035) expressed disagreement with footnote "a" in section 3.2.2(e)(iv) which states that the "model should not be biased toward overestimates." The commenter (0035) stated that biases in different directions in a base year and a future year are much more problematic than consistent overestimations or underestimations in both years for relative reduction factor calculations.

Response:

The EPA appreciates the commenters' feedback with respect to footnote "a" in section 3.2.2(e)(iv). The commenter is correct that there are multiple ways in which the biases in base and future year model projections used for the development of relative reduction factors used in SIP attainment demonstrations could be problematic and adversely impact the appropriateness of the demonstration. While not specifically stated, the footnote is generally interpreted to mean that there should not be bias toward overestimates of model projections, which would be a combination of the base and future year and/or relative reduction factor-based projections. The EPA will consider revisions to this footnote for clarity in future regulatory updates to the *Guideline*.

Model Evaluation Criteria

Comment:

Commenter (0033) stated the evaluation criteria are not consistent with the form of the ambient standards such as SO_2, NO_2, and $PM_{2.5}$ which rely on the 99th or 98th percentile daily 1-hour maximum concentrations over a full year rather than the highest concentrations and the Robust High Concentration (RHC). In addition, current evaluation software relies on stability classes which AERMOD does not use as inputs. The commenter suggested the use of Q-Q plots and a review of meteorological conditions associated with the top predicted and observed concentrations.

Response:

This comment is outside the scope of the currently proposed revisions to the *Guideline* and the EPA's preferred regulatory modeling system, AERMOD. However, the EPA will point out that we have followed standardized and peer-reviewed model evaluation procedures for the promulgation of all regulatory models for at least the past 25 years, *e.g.*, the Cox-Tikvart procedure. These model evaluation procedures are independent from the form of a NAAQS and are focused on ensuring accuracy and no systematic bias to underpredict of the regulatory air quality models in the policy relevant range of modeled concentrations.

Modeling Offshore Sources

Comment:

Multiple commenters (0033, 0068, and 0079) commented on issues associated with the eventual goal to replace the Offshore Coastal Dispersion (OCD) model with AERMOD as a preferred *Guideline* model for estimating impacts from offshore sources. Commenter (0033) listed challenges associated with the replacement of OCD with AERMOD that will need to be addressed, including: 1) characterizing both overland and overwater boundary layers; 2) defining the coastline for interpretation by the model; 3)

treatment of plumes above the thermal internal boundary layer (TIBL); 4) influence of coastal terrain; and 5) downwash effects from offshore platforms and other porous structures. The commenter (0033) suggested that the EPA form a workgroup to identify modeling databases to use for evaluating offshore sources. Commenter (0068) also warned of the challenges related to shoreline geometry. Commenter (0079) also stated the need to address the transition from overwater to overland and a focus is needed on field data from offshore sources.

Response:

The EPA appreciates the commenters' feedback on issues associated with a future goal to replace OCD with AERMOD as a preferred EPA model for estimating impacts from offshore sources. While out of scope for this action, we acknowledge that each of the issues mentioned in the summary above is an important aspect that will need to be sufficiently addressed by the EPA in conjunction with the modeling community to consider AERMOD as a replacement for OCD for offshore sources.

New Options/Model Conservatism

Comment:

Commenter (0034) expressed support for the proposed new regulatory options (*i.e.*, RLINE source type, COARE in AERMET, and GRSM for NO_2 conversion), but also stated that the proposed revisions fail to address the many layers of conservatism that exist in current air dispersion modeling approaches. The commenter suggested the EPA address a number of unlikely scenarios, including ambient air and likelihood of exposure consistent with the modeling period; PRIME building downwash; known issues with AREA and VOLUME source types; secondary and primary $PM_{2.5}$.

Commenter (0038) also stated that the performance of the AREA source algorithm in AERMOD tends to be highly variable while VOLUME sources appear to often overestimate concentration impacts. Commenter (0038) expressed that the EPA should continue to pursue additional research and development.

Commenter (0041) expressed that more focus is needed on model advancements to reduce the layers of conservatism for regulatory modeling applications.

Response:

The EPA appreciates the commenters' support received for the proposed new regulatory options. While out of scope for this action, the EPA also appreciates the commenters' feedback and suggestions related to the areas they have identified that potentially result in model conservatism. The EPA continues with our ongoing efforts to identify aspects of AERMOD that need improvement with the goal of applying scientific updates that will result in improved model performance.

Ongoing Model Development

Comment:

Commenter (0032) supported ongoing model development for the development of mobile source modeling and collaboration with the EPA on the development of a field study to use for model development and evaluation.

Response:

The EPA appreciates the commenter's suggestion of collaborating on the development of a field study for use in model development and evaluation and looks forward to possible collaborations in the future. The addition of a new field study will be a valuable addition to the databases already utilized by the EPA for model development and evaluation for mobile sources, including the 2008 Idaho Falls roadway study, the early 1980's Caltrans99 highway study, the 1975 GM-Sulfate study, 2006 I-440 study in Raleigh, NC and the Berkeley Freeway Experiment.

Point Source Model Emissions Inputs (Tables 8-1 and 8-2)

Comment:

Commenter (0035) recommended that, instead of accounting for "actual operations" in developing the emissions inputs for dispersion modeling of nearby sources, the EPA consider using National Emissions Inventory (NEI) data and develop a way to include short term emission rates (*e.g.*, maximum hourly rate) as part of the NEI too (section 8.2.2(b)). Similarly, another commenter (0038) stated that when modeling nearby sources, actual emissions should be used instead of maximum allowable emissions for source characterization.

Commenter (0028) stated that obtaining the "actual operating factor" from nearby sources mentioned in Table 8-2 has proven to be extremely challenging. Permitting staff spend a lot of time estimating operating factors, despite not knowing if such approximations yield representative data. The commenter recommended reworking Table 8-2 is to allow for the use of two years of representative actual emissions (obtained from CEMs for instance) so that nearby sources' background contributions are accounted for in the same way irrespective of whether (a) the nearby source operated a very representative ambient monitor (which responds to actual emissions), or (b) their emissions were explicitly modeled. The same reasoning could apply to SIP revisions for stationary sources. The commenter recommended removing the "actual operating factor" requirement from Table 8-2 to make it consistent with Table 8-1.

Commenter (0041) stated Table 8-2 of Appendix W needs to more clearly indicate that actual or representative high actuals should be used for nearby sources including in a PSD demonstration. Additionally, this commenter (0041) recommended the EPA consider clarifying in Tables 8-1 and 8-2 that an overall more appropriate approach for all nearby background sources is to use documented typical emissions during high utilization periods.

Response:

With the 2017 revision to the *Guideline*, Tables 8-1 and 8-2 were updated to allow for the development of temporally representative emissions for nearby sources, when actually operating, that replaced the previous requirement to use maximum allowable or federally enforceable emissions, assuming continuous operation. While this shift was intended to better account for nearby source emissions with representative background air quality levels, the EPA felt it was inappropriate to allow nearby facilities that had lengthy outages or maintenance cycles to not have their typical operational emissions considered in the compliance demonstration. If fully actual emissions that included a prolonged outage for a nearby facility were used in a compliance demonstration, then the background air quality concentrations would be underestimated for more normal periods when the nearby facility was operating as permitted. Clearly, this would not be adequately protective and not allow the compliance

demonstration to appropriate justify that the new or modifying source will not cause or contribute to a violation of a NAAQS or PSD increment. Thus, the EPA is not considering further revisions to Tables 8-1 or 8-2 to allow for the use of fully actual emissions (*e.g.*, direct CEM data).

The EPA appreciates the feedback that aspects of the 2017 revisions to Table 8-1 and 8-2 have proven to be challenging or required significant additional effort to gather or develop nearby source emissions. The EPA further appreciates the comments that additional clarity is needed on the development of nearby source emissions, specifically with the development of appropriate temporally representative emissions during actual operations. It is the intention of the EPA in the near future to develop and take informal public comment on draft guidance specific to point source emissions data (primary/modify source and nearby sources) in Tables 8-1 and 8-2. Through the development of this guidance and the additional feedback that the EPA receives, the EPA may consider future regulatory updates to Tables 8-1 and 8-2 and sections 8.2 and 8.3 of the *Guideline*.

Preconstruction air quality monitoring

Comment:

One commenter (0042) contended that the proposed rule disregards the explicit requirement for preconstruction monitoring by the owner or operator of a proposed facility to determine the effect which emissions from any such facility may have, or is having, on air quality in any area which may be affected by emissions from such source. The commenter stated that, "It is plainly not the case that existing monitoring networks are usually sufficient to adequately characterize background."

Response:

The revisions to the *Guideline* do not alter or make any changes to existing pre-construction monitoring requirements, which are reflected in the EPA's PSD regulations at sections 51.166(m) and 52.21(m). The EPA has historically recognized that a permit applicant may comply with these preconstruction monitoring requirements by using existing monitor data gathered for other purposes (such as state air quality planning) or from monitors that are not in the immediate area of the proposed facility (*i.e.*, that are not "site-specific"). As observed by the EPA Environmental Appeal Board, "EPA has long implemented the PSD program pursuant to the understanding that representative data may be substituted where circumstances warrant." *In re: Northern Michigan University Ripley Heating Plant*, PSD Appeal No. 08-02, slip op. at 58 (Feb. 18, 2009). However, the EPA has only supported this practice where existing ambient data is "deemed sufficiently representative of air quality in the targeted area – in terms of the sufficiency of the monitoring locales selected and the quality and currentness of the monitoring data – to legitimately be substituted for site-specific data." *Id.* at 58. The three "critical criteria" are (1) monitor location; (2) quality of the data; and (3) currentness of the data. *In re: Hawaii Commercial Sugar & Co*., 8 E.A.D. 66, 97 (EAB 1998). In evaluating monitor location, "the use of offsite data must be based on a determination that the data are reasonably representative of the air quality in the location to be affected by the source." *Id.* at 105. It is not sufficient for an applicant or permitting authority to simply assert that use of a regional site is appropriate without explaining why. *Id.* at 104. The EPA has generally considered data collected in the 3-year period preceding the submission of a permit application to be current. Id. at 101. In the *Northern Michigan University* and *Hawaii Commercial* cases, the EAB remanded PSD permits because the record did not adequately demonstrate that the criteria used by the EPA to support using existing data in lieu of collecting new monitoring data had been satisfied. Where a permit applicant does not gather new site-specific monitoring data and seeks to use

other representative data, a permitting authority should ensure that its administrative record contains a sufficient demonstration that monitoring data meet the criteria described in these EAB decisions and the guidelines in the EPA document titled, "Ambient Monitoring Guidelines for Prevention of Significant Deterioration." *See also*, EPA NSR Workshop Manual, pp C.16 to C.21 (October 1990).

Even when existing data is shown to be representative in this manner or new site-specific data is collected, the EPA recognizes that the monitoring alone may not appropriately characterize the background concentration for the purpose of evaluating a PSD permit application. For this reason, the EPA recommends the use of ambient monitoring data supplemented with modeling of nearby sources that may not be adequately represented. Additionally, the current and proposed versions of the *Guideline* recommend, "In those cases where adequately representative monitoring data to characterize background concentrations are not available, it may be appropriate to use results from a regional-scale photochemical grid model, or other representative model application, … in consultation with the appropriate reviewing authority."

PVMRM

Comment:

Commenter (0079) noted what they believe are formulation issues within PVMRM that need correction. The commenter stated the corrections would satisfy section 2.1.1(d) of the *Guideline* in building confidence that the model predictions are accurate for the right reasons. These issues are the PVMRM use of minimum plume sizes for computing the plume volume as opposed to using the AERMOD dimensions, and when buildings are present, the PRIME computed plume dimensions should be used.

Response:

Though out of scope for this action, the EPA acknowledges and appreciates the comments on PVMRM potential formulation corrections and improvements to plume dimensions assumed for NO_2 concentration calculations in building downwash near wake and building cavity zones. These plume dimensions determine the total volume for NO_x plume and ambient ozone entrainment and titration reactions to predict NO_2 concentrations at receptors affected by building downwash. The EPA plans to address improvements and/or corrections to PVMRM formulation in future releases of the AERMOD modeling system.

Regulatory Approval / Concurrence versus Consultation

Comment:

Commenter (0079) noted that the *Guideline* has extensive references to the requirement or recommendation of consultation with the appropriate reviewing authority under section 3.0 (b). The commenter believes that the proposed revisions to the *Guideline* add to the inputs that could be challenged in the case of any permitting action and, therefore, the use of approval or concurrence in place of consultation could provide further clarity and encourage authorities to act more decisively.

Response:

The EPA appreciates the feedback from the stakeholder community with respect to considering more aspects of the *Guideline* to require regulatory approval or concurrence from an appropriate reviewing authority over general consultation on a particular compliance demonstration approach or issue. In the

current and proposed versions of the *Guideline*, the only circumstances where regulatory approval or concurrence are required are also bound by additional regulations elsewhere in the federal code (*e.g.*, 40 CFR, part 52, section 52.21(l)(2) with respect to alternative models). Elsewhere, the majority of the circumstances where consultation with a reviewing authority is recommended in the *Guideline* are associated with a decision or modeling demonstration setup option to which the permit applicant has several regulatory options to consider and must determine which option is the most appropriate for their case-specific situation. Thus, the consultation recommendation is to promote better coordination between the permit applicant and the reviewing authority prior to submittal of the regulatory package for formal review and comment. At this time, we are not considering making further revisions to either the areas of required regulatory approval or recommended consultation in the *Guideline*.

Retired Sources

Comment:

Commenter (0068) suggested impacts be excluded from retired sources from monitoring data using a similar approach as used for excluding data from certain wind directions.

Response:

Under the 2019 EPA guidance on *Additional Methods, Determinations, and Analyses to Modify Air Quality Data Beyond Exceptional Events* (U.S. EPA, 2019a), the monitor data may be adjusted if it is not representative to characterize background concentrations. Therefore, the ambient monitor data may be modified in cases where the source's permit has been terminated but this adjustment should be done in consultation with the appropriate reviewing authority.

Representative Air Quality Monitoring Data

Comment:

One commenter (0042) suggested "that EPA does not provide any evidence to support its continued allowance on monitors that are located within 50 km of an impacted area or even beyond." The commenter then provided some cited evidence that distances of 1.5-2 km in urban areas can experience elevated levels of pollutants that a monitor upwards of 50 km away could not represent. Such situations could disproportionately affect low-income communities and communities of color because of living proximity to freeways and residing away from monitoring sites. The commenter then stated that "permit applicants should be required to determine if they and other adjacent sources within a radius of 10-20 km are within at least 50% of the NAAQS increment in the absence of localized air monitors."

Response:

The EPA agrees with the underlying concept of the comment and believes that the revisions to the *Guideline* and accompanying guidance support an approach that emphasizes situations where the distant monitor used as "background" would need to be supplemented by explicit modeling of nearby sources to better represent air quality in closer proximity to the new source. The framework put forth in the guidance would lead the permit applicant to consider the need for such explicit modeling of nearby sources and to document when done or when not done as part of the permit record. That promotes both consistency and transparency in the process. The EPA believes, consistent with the use of best professional judgement under the *Guideline*, that overly prescriptive requirements are not necessary

and will not lead to an appropriate representation of background concentration for the variety of circumstances in which new source permitting actions occur.

Revision of Modeling Guidance Documents

Comment:

Commenter (0033) stated further investigation is needed to account for the influence on particulate matter from roadside vegetative barriers, and it is not clear what work the EPA has ongoing or planned for the future.

Response:

Within AERMOD, there is already algorithms to account for solid noise barriers (alpha option RBARRIER keyword). Building on that, the EPA has begun working on incorporating vegetative barriers as an input to AERMOD and plans to incorporate into AERMOD as an alpha option in the near future.

Comment:

Commenters (0033 and 0068) stated, in reference to the finalized 2022 Guidance for Ozone and $PM_{2.5}$ Permit Modeling, the Tier 1 secondary $PM_{2.5}$ analysis should account for the reduction of precursors. These commenters (0033 and 0068) further commented that the Tier 1 approach in the guidance is silent on the scenario that involves a reduction of emissions for one of the precursor emissions and an increase in emissions for the other (*e.g.*, NO_X and SO_2 for $PM_{2.5}$) and how to then estimate the reduction in secondary-formed concentrations without having to conduct a Tier 2 photochemical grid modeling demonstration. Both commenters (0033 and 0068) offered a suggestion for treating reductions in precursor emissions.

Commenter (0034) stated the overly conservative requirement to estimate and add secondary $PM_{2.5}$ concentrations to primary $PM_{2.5}$ impacts should be eliminated. The commenter stated the MERP guidance shows that secondary formation peaks 7-10 km downwind, and guidance should be revised to add secondary impacts only at a set distance from the source. The commenter (0034) also stated concerns about requiring all components of $PM_{2.5}$ to be considered should any component, including NO_X, SO_2, or primary $PM_{2.5}$ trigger review under the PSD program as outlined in the Revised DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling. Commenter (0034) offered the example where the conservatism built into modeling requirements and potentially overpredicted impacts could trigger PSD review for only SO_2 for a boiler modification and then be required to model primary $PM_{2.5}$ due to very small emission increases near the fenceline which could exceed the SIL.

Commenter (0039) encouraged the EPA to re-examine the MERPs guidance to address PSD modifications and short-term emissions which occur frequently in PSD permitting but are lacking from the MERPs Guidance. The commenter (0039) encouraged the EPA to develop discussion points for purposes of conducting a PSD increment analysis (similar to that provided for NAAQS analysis and develop discussion and examples for sources that are undergoing a PSD modification review, with a particular focus on how contemporaneous emissions (increases and decreases) are addressed within the MERPs framework). In addition, the commenter (0039) encouraged the EPA to develop discussion on ways to address situations where there is no direct relationship between the short-term and long-term emissions, particularly since ozone and $PM_{2.5}$ have short-term NAAQS (and a short-term increment for $PM_{2.5}$). The commenter also suggested the photochemical modeling results determined for the

hypothetical sources documented in the MERP guidance are based on model platforms that are becoming dated and a review to determine the appropriateness/representativeness of the photochemical modeling results for current conditions is more desirable sooner than later.

Response:

While the EPA greatly appreciates the feedback provided by these stakeholders specific to the 2022 Guidance for Ozone and Fine Particulate Matter Permit Modeling and the 2019 Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program (U.S. EPA, 2019b), we do not offer any responses because they are outside the scope of the proposed revisions to the *Guideline* and the EPA's preferred regulatory modeling system, AERMOD. At such time in the future that we consider any revisions to these two guidance documents, we will take the commenters feedback into consideration.

Safeguards for Full Accounting of Cumulative Impacts

Comment:

One commenter (0042) stated that the current Guideline's approach on determining background concentrations 'lacks specificity' and 'is used and referenced inconsistently.' The commenter then asserts that the EPA's response is insufficient because "the proposed revisions to the Guideline on Air Quality Models and incorporated Guidance also lack specificity and are riddled with vague, undefended terms, qualitative analyses, subjective visual assessments, and off-ramps. A number of key decisions are left to the 'judgement' of the permit applicants and regulators without meaningful limitations on the exercise of that judgement . . . the proposal gives far too much discretion to the permit applicants and regulators over quantification of background levels." The commenter further suggests that "EPA's reliance on non-regulatory guidance for this purpose not only fails to assure air quality protection for impacted communities, but also violates the agency's statutory duties."

Response:

The EPA agrees that the current approach for determining background concentrations lacks degrees of specificity and has been prone to overly subjective interpretation. For these reasons, the EPA proposed through this action to revise the *Guideline*, specifically section 8.3 regarding the development of background concentrations. To supplement the *Guideline*, the EPA has provided the *Draft Guidance* that puts forth a structured framework for developing background concentrations to promote more consistency and transparency in the approach with degrees of discretion, as appropriate.

The EPA has provided a degree of particularity in the *Guideline* for PSD permitting applications that is reasonable under the specified circumstances, including the revised language in section 8.3. The EPA has avoided creating a prescriptive modeling "cookbook" on this and other topics because it would never be responsive to the wide variety of circumstances across the country and has allowed for levels of discretion by the permit reviewing authority in determining the appropriateness of the representative model input data. Both the 2017 final and 2023 proposed versions of the *Guideline* emphasize in section 8.3.3(b)(iii) the use of best professional judgement by the appropriate reviewing authority and that it should be consistent with appropriate EPA modeling guidance. In keeping with this long-standing approach, the addition of EPA guidance on this topic of developing background concentrations promotes consistency through use of a common framework and sequence of decisions in appropriately exercising the inherent discretion and flexibility within the *Guideline*. It also promotes clear and

transparent documentation of the approach and decisions made in each permit action that facilitates public review and comment on their appropriateness in exercising that discretion and flexibility under the *Guideline*.

Comment:

Commenter (0042) listed six directives that it argues should be in the *Guideline* for the quantification of background levels to assure compliance with NAAQS and increments.

Response:

In the first of these items, the commenter urged the EPA to establish that "[b]ackground levels must be determined for each pollutant at the location where emissions from the new and all existing sources will combine to cause maximum impact on ambient levels." The EPA has emphasized, through its proposed revisions to the *Guideline* and the accompanying guidance document, that the cumulative impact assessment should best account for such situations to appropriately determine if a NAAQS or PSD increment violation potentially exists and reflect that in conducting the PSD compliance demonstration. The *Draft Guidance* states, "a cumulative impact analysis needs to appropriately characterize the spatial nature of air quality near a new or modifying PSD source to identify the potential for NAAQS or PSD increment violations and inform the PSD compliance decisions. Characterization of local air quality… for each pollutant and averaging period necessitates a full and comprehensive account for all source contributions." Therefore, the EPA is retaining recommendations in section 8.3 of Appendix W that provide for background levels to be determined based on an appropriate combination of monitoring and air quality modeling at all locations affected by proposed construction subject to the PSD program. Thus, the EPA's *Guideline* and guidance work towards this stated goal by the commenter.

The second of these recommended directives repeats the PSD preconstruction monitoring requirement reflected in section 165(a)(7) of the CAA (42 USC 7475(a)(7)). This requirement is implemented in greater detail in the EPA's PSD regulations at 40 CFR 51.166(m) and 40 CFR 52.21(m). Thus, these requirements are covered sufficiently elsewhere and not part of the current *Guideline*. The EPA does not believe it would be appropriate to incorporate these requirements into the *Guideline* as the PSD compliance demonstration is the focus of the *Guideline*.

In its third recommended directive, the commenter urged the EPA to require that all sources within a 50 km radius of the proposed facility be explicitly modeled unless the applicant makes a strong showing that a source's emissions are already fully reflected in representative monitoring. Similarly, in the fourth item on it list, commenter urged the EPA to require that the impact of all minor and mobile sources be included in background and that such impact be modeled where such impact is not fully captured by monitors. The EPA is retaining language throughout section 8.3. of the revised *Guideline* that reflects the fundamental principles advanced by the commenter that background concentration should be determined based on both explicit modeling of sources and emission impacts on air quality represented by monitored data, and that these two components are interconnected. For example, the EPA is retaining the recommendation in section 8.3.3 that "all sources in the vicinity of the source(s) under consideration for emissions limits that are not adequately represented by ambient monitoring data should be explicitly modeled." This maintains the burden on the applicant and permit reviewing authority to assure all nearby sources are appropriately included in the compliance demonstration, whether explicitly or via representative monitoring data. Section 8.3.3 of the *Guideline* continues to recognize that "the question of which nearby sources to include in the cumulative modeling is

inextricably linked to the question of what the ambient monitoring data represents within the project area." Given the complexity of this relationship in each case, the EPA does not consider it appropriate to create a rebuttal presumption that all sources within a specific distance (*e.g.*, 50 km) be explicitly modeled or to establish specific requirements for only minor or mobile sources. The language in the version of the *Guideline* that the EPA is finalizing in this action makes clear that one should ensure that the effects of all sources on background concentrations is adequately represented through either monitored data or explicit modeling, while retaining flexibility to determine how best to capture the impact of each type of source across the varied situations being addressed under the PSD permitting program. However, the EPA will continue to consider whether more specific directives are warranted in future revisions of the *Guideline.*

Additionally, the commentor goes on to highlight that the proposed version of the *Guideline* no longer includes the following statement from the 2017 version of the *Guideline*: "Since an ambient monitor is limited to characterizing air quality at a fixed location, sources that cause a significant concentration gradient in the vicinity of the source(s) under consideration for emissions limits are not likely to be adequately characterized by the monitored data due to the high degree of variability of the source's impact." The EPA is removing this statement from the *Guideline* as proposed and recommending a framework of stepwise considerations to replace the narrow recommendation of explicitly modeling nearby sources that cause a significant concentration gradient (SCG). As stated in the proposal preamble, the removal of the SCG reference was necessary because it had not been formally defined and was not being consistently applied in practice. The EPA put forth the recommended framework because it maintains the SCG concept in determining which nearby sources to explicitly model in a more coherent and consistent manner by determining which nearby sources are represented in the ambient monitor data based on the scale, location, and dispersion environment around the monitor. Further, the framework provides that, in cases where those ambient impacts may not be adequately represented, then the applicant should consider explicit modeling of those sources.

The commentor also urged the EPA to provide more specific direction regarding public participation on air quality impact assessments. In the fifth item on the list, the commenter argued that "EPA needs to require regulators to conduct public notices and opportunity to comment before proposed monitoring and modeling protocols are agreed on for any PSD permit application." In the sixth item, the commenter urged the EPA to ensure that it comments on all monitoring and modeling protocols in cases where a State or local agency is the permitting authority. These aspects of new source permitting under the PSD program are appropriately addressed separately and not appropriate for incorporation into the *Guideline*. The EPA regulations at 40 CFR 51.166(q) provide detailed requirements for public notice and an opportunity to comment on available data and information supporting a permit application, including that reflecting the air quality impact of the source. This paragraph (q) implements section 165(a)(2) of the CAA. The latter explicitly recognizes that the EPA ("representatives of the Administrator") may submit comments during the comment period, and the EPA Regional offices routinely do so when State and local agencies are the PSD permitting authority.

Suggested Approach for Determining Nearby Sources in a Multi-source Area

Comment:

Commenter (0035) recommended that the EPA implement the approach described in section 8.3.2(e) into section 8.3.3(c)(ii) of the *Guideline*.

Response:

While the use of results from a regional-scale photochemical grid model, or other representative model application, as background concentrations for compliance demonstration modeling in a multi-source area is not expressly prohibited, there are numerous unique challenges that need to be considered in a multi-source area that are not present in an isolated single source area. For example, grid scale considerations would likely make photochemical modeling only applicable for representative ozone and $PM_{2.5}$ (secondary formation only) background concentration development, especially in multi-source areas where near-field impacts from numerous local sources for other NAAQS pollutants would need to be developed through other methods. Additionally, there is a greater chance that representative background monitoring exists in the multi-source area, which would be preferred in most cases over model derived background concentrations. In any case where photochemical modeling is being considered to supplement the development of background concentrations, early engagement with the appropriate reviewing authority and EPA Regional office is strongly advised. The EPA appreciates the commenter's suggested revision to section 8.3.3(c)(ii) and will consider it in future revisions of the *Guideline*.

Transition Period for Applicability of Revisions to the Guideline

Comment:

Commenter (0032) supported the provision of a transition period but recommended the EPA revise to more than one year. The commenter recommended a two-year minimum, consistent with the grace period typically provided for major updates to the EPA MOVES model.

Response:

The EPA appreciates the commenters' feedback regarding the two-year grace period of the EPA MOVES emissions model. The EPA notes that the historical recommendation of the transition period for regulatory models promulgated through the *Guideline* and used in the PSD program has been one year. Given the lack of further public desire or recommendations for alternate transition periods and time sensitivities with compliance demonstration requirements within the PSD program, the EPA will retain the one-year transition period recommendation with the final rule.

Use of AERSCREEN for NO_2 Modeling

Comment:

Commenter (0035) requested clarification if section 4.2.3.4(c) precludes the use of AERSCREEN for NO_2 modeling.

Response:

For the purposes of screening a single source of NO_2 or for sensitivity testing of NO_2 inputs such as background zone or NO_2/NO_X in-stack ratios, AERSCREEN could be used since it runs AERMOD in screening mode. Obviously, for a multi-source area (whether multiple facilities or a single facility with multiple emission sources), stand-alone AERMOD would be used and AERSCREEN would not be used.

Comment:

Commenter (0031) supported a 1-year transition period after a revision of the *Guideline* for PSD permit applications and SIP modeling.

Response:

The EPA appreciates the support of a 1-year transition period to transition to the use of new models, techniques, and procedures in the context of PSD permit applications and other regulatory modeling applications. The EPA continues to encourage the transition to the revised 2024 version of the *Guideline* by no later than 1-year after signature and publication of the final rule. All applicants are encouraged to consult with their respective reviewing authority and EPA Regional Office as soon as possible to assure acceptance of their modeling protocols and/or modeling demonstration during this period of regulatory transition.

Use of Significant Impact Levels

Comment:

One commenter (0042) says that "EPA has no legal authority to adopt SILs, and their use conflicts with 42 U.S.C. §7475(a)(3), which requires permit applicants to demonstrate compliance with NAAQS and increments."

Response:

The updated EPA *Guideline* does not adopt or promulgate Significant Impact Levels (SILs). In the October 2023 proposed revisions to the *Guideline*, the EPA did not propose to adopt SILs or include them in the *Guideline*. The *Guideline* provides a recommended procedure for permit applicants to use to demonstrate compliance with NAAQS and increments, as required by 42 U.S.C. §7475(a)(3). This is reflected in section 9.2.3 of the *Guideline*, which describes a multi-stage approach. Each stage of this approach involves increasing complexity and details, as required, "to fully demonstrate that a new or modifying source will not cause or contribute to a violation of any NAAQS or PSD increment." The insertion of the acronym "SIL" in the proposed revisions of section 8.3.3(b)(ii) of the proposed *Guideline* was inadvertent. It was not the intention of the EPA in the proposed regulatory action to recommend or require use of SILs in the *Guideline*. There was also no reference to SILs in any previous version of the *Guideline*.

Comment:

Commenter (0042) asserted that "the [Draft Guidance on Developing Background Concentrations for Use in Modeling Demonstrations] relied on in the proposed rule provides that ambient impacts less than the SIL in a given area can be disregarded in the cumulative impact analyses." The commenter argues that "[s]uch an approach has no legal or rational basis" and that "[t]he SIL bears no lawful or rationale relationship to the accurate quantification of background levels and certainly isn't a threshold below which source contributions to background can be ignored."

Response:

After considering public comment, the EPA is completing the Draft Guidance with some revisions and the inclusion of hypothetical examples. One part of this document provides guidance on identifying nearby sources to explicitly model. The Guidance recommends the following two criteria for identifying nearby sources to explicitly model: (1) sources that may be located in the area surrounding the new or modifying source; and (2) sources located in areas for which the new or modifying source has modeled impacts above the applicable SIL. The second category is in addition to the first, and not the sole circumstance in which the EPA recommends explicitly modeling nearby sources. Further, to develop

representative background concentrations, the EPA encourages that permit applicants and permitting authorities consider other factors such as the location of the selected ambient monitor(s), the local dispersion environment, and source/emissions characteristics of nearby sources. Thus, the EPA does not agree with commenters claims that the guidance supports disregarding or ignoring background concentrations in areas where the proposed source does not impact air quality by an amount greater than a SIL. Rather, in the *Guidance* the EPA has recommended a focus, or emphasis, on consideration of nearby sources located in areas where the new or modifying source has modeled impacts above the SIL to ensure that the background concentration is appropriately represented in the cumulative impact analysis to inform the demonstration (*i.e.*, presence of a NAAQS or PSD violation).

Urban/Rural Classification of Sources

Comment:

Commenter (0035) recommended that the EPA adopt NLCD land use classification codes instead of Auer's classification codes or develop a cross walk table to translate codes between Auer's classification and NLCD land use classification. Commenter (0035) also recommends that the EPA provide updates when newer versions of NLCD codes are available and recommends that the subsection 7.2.2.1(b)(ii), Population Density Procedure, be removed from the *Guideline*.

Commenter (0041) requested that the EPA consider how AERMOD would continue to support modeling urban dispersive environments for non-population based highly industrialized areas such as aluminum facilities where significant heat is generated through industrial processes and has been demonstrated to cause urban heat island effects. While the commenter (0041) referenced urban research presented at the 13th Conference on Air Quality Modeling and is encouraged that the EPA is exploring the use of satellite-derived temperature data, the commenter urged the EPA to ensure that the urban option can continue to be used by sources in areas with non-population based urban heat island effects.

Response:

The EPA appreciates the comments regarding the determination of the urban/rural status of sources and continues work in this area, as noted in the presentation on urban research at the 13th Conference on Air Quality Modeling. The EPA may consider guidance on the Auer classifications and NLCD land use classes. Any changes to guidance on the urban/rural status of sources, such as removing the population density procedure, would require a future rulemaking.

With regards to the use of the urban option in non-populated industrial settings, the EPA offered recommendations in the 2017 update to the *Guideline* in section 7.2.1.1(d) that has carried through the current update of the *Guideline*.

Varying Background Concentrations

Comment:

Commenter (0031) recommends that the EPA explore enhancements to the AERMOD modeling system to allow for user to specify varied background concentrations tailored to different receptors considering that background concentrations may display noteworthy variation in certain cases.

Response:

The EPA appreciates the commenter's recommended enhancement to the AERMOD modeling system. AERMOD currently allows user input to account for both spatial and temporal varying background concentrations. While AERMOD does not currently allow users to specify varied background concentrations on a receptor-by-receptor basis for cases where multiple monitors outside of the modeling domain are available, the user may define sector-varying background concentrations through the BGSECTOR keyword. This keyword allows users to define sectors where the background concentration from the selected upwind monitor will be applied to the entire modeling domain (*i.e.*, all receptors) during times that the wind is blowing from that direction. The EPA recommends referring to the User's Guide for the AMS/EPA Regulatory Model (AERMOD) (U.S. EPA, 2024c) for more information on using the BGSECTOR keyword.

For cases where multiple monitors are available within the modeling domain, multiple model runs or post-processing may be used to develop a spatial varying background concentration. If there are questions about how to best reflect such varied background concentrations for a particular demonstration, then the permit applicant should discuss the situation with the appropriate permit reviewing authority for input and clarity on appropriate approaches.

6.0 References

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U.S. EPA. (1992a). Guideline for modeling carbon monoxide from roadway intersections. EPA-454/R-92-005.

U.S. EPA. (1992b). *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources - Revised.* EPA-454/R-92-019.

U.S. EPA. (2011). *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard.* U.S. EPA, Office of Air Quality Planning and Standards.

U.S. EPA. (2019a). Additional Methods, Determinations, and Analyses to Modify Air Quality Data Beyond Exceptional Events. EPA-457/B-19-002.

U.S. EPA. (2019b). *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and PM2.5 under the PSD Permitting Program.* 454-R-19-003.

U.S. EPA. (2021). *PM Hot-spot Guidance.* EPA-420-B-21-037.

U.S. EPA. (2023). *Draft Guidance on Developing Background Concentrations for Use in Modeling Demonstrations.* EPA-454/P-23-001.

U.S. EPA. (2024a). *Technical Support Document (TSD) for Adoption of the Generic Reaction Set Method (GRSM) as a Regulatory Non-Default Tier-3 NO_2 Screening Option.* EPA-454/R-24-005.

U.S. EPA. (2024b). *Guidance on Developing Background Concentrations for Use in Modeling Demonstrations.* EPA-454/R-24-003.

U.S. EPA. (2024c). *User's Guide for the AMS/EPA Regulatory Model (AERMOD).* EPA-454/B-24-007.