

A. EXECUTIVE SUMMARY

The Federal Land Managers' Air Quality Related Values Work Group (FLAG) was formed to develop a more consistent approach for the Federal Land Managers (FLMs) to evaluate air pollution effects on their resources. Of particular importance is the New Source Review (NSR) program, especially in the review of Prevention of Significant Deterioration (PSD) of air quality permit applications. The goals of FLAG have been to provide consistent policies and processes both for identifying air quality related values (AQRVs) and for evaluating the effects of air pollution on AQRVs, primarily those in Federal Class I air quality areas, but in some instances, in Class II areas. Federal Class I areas are defined in the Clean Air Act as national parks over 6,000 acres and wilderness areas and memorial parks over 5,000 acres, established as of 1977. All other FLM areas are designated Class II. Maps of Federal Class I areas are provided in Appendix E. Lists of Class I Area contacts are provided in Appendix F.

FLAG members include representatives from the three FLMs that administer the nation's Federal Class I areas: the U.S. Department of Agriculture Forest Service (USDA/FS), the National Park Service (NPS), and the U.S. Fish and Wildlife Service (FWS). (Subsequently in this report, these three agencies collectively will be referred to as "FLMs." Class I and Class II air quality areas are called "FLM areas" in this report.) Appendix G contains a list of FLAG Participants.

This report describes the work accomplished in Phase I of the FLAG effort. That work includes identifying policies and processes common to the FLMs (herein called "commonalities") and developing new policies and processes using readily available information. This report provides State permitting authorities and potential permit applicants a consistent and predictable process for assessing the impacts of new and existing sources on AQRVs, including a process to identify those AQRVs and potential adverse impacts. The report also discusses non-new source review considerations and managing emissions in Federal areas. In Phase II, FLAG will address unresolved issues including those that will require research and the collection of new data.

This *FLAG Phase I Report* consolidates the results of the FLAG Visibility, Ozone, and Deposition subgroups. The chapters prepared by these subgroups contain issue-specific technical and policy analyses, recommendations for evaluating AQRVs, and guidelines for completing and evaluating NSR permit applications. These recommendations and guidelines are intended for use by the FLMs, permitting authorities, NSR permit applicants, and other interested parties. The report includes background information on the roles and responsibilities of the FLMs under the NSR program.

This document includes guidelines for completing and evaluating NSR applications that may affect FLM areas. It does not provide a universal formula that would, in all situations, allow one to determine whether or not a source of air pollution does, or would, cause or contribute to an adverse impact. That determination remains a project-specific management decision, the responsibility for which remains with the FLM, as delegated by Congress. The FLM's assessment of whether or not an adverse impact would occur is based on the sensitivity of the AQRVs at the particular FLM area under consideration.

To provide information for the FLM's assessment of adverse impacts on AQRVs, the permit applicant should identify the potential impacts of the source on all applicable AQRVs of that area. An FLM may ask that an applicant address any or all of the areas of concern. The primary areas of concern to the FLMs with respect to air pollution emissions are visibility impairment, ozone effects on vegetation, and effects of pollutant deposition on soils and surface waters.

The *FLAG Phase I Report* also describes the FLAG effort—including the FLAG approach, organization, and plans for future FLAG work. Appendix A of the report contains a glossary of technical terms, abbreviations, and acronyms used in the report along with associated definitions. Appendix H provides a list of all references cited in the FLAG report.

The key recommendations developed by the Visibility, Ozone, and Deposition subgroups are summarized below. However, for all three subject matter areas, FLAG recommends that the permit applicant consult with the appropriate regulatory agency and with the FLM for the affected area(s) for confirmation of preferred procedures. This consultation should take place in the early stages of the permit application process.

1. RECOMMENDATIONS FOR EVALUATING VISIBILITY IMPACTS

FLAG has provided guidance in the form of recommendations, specific prescriptions, and interpretation of results for assessing visibility impacts of sources near Class I areas (although this guidance is generally applicable to Class II areas, as well). The guidance addresses assessments for sources proposed for locations near (generally within 50 km) and at large distances (greater than 50 km) from these areas. It also recommends impairment thresholds and identifies the conditions for which cumulative analyses of all increment-consuming sources would be necessary. The key components of the recommendations are highlighted below.

In general, FLAG recommends that an applicant:

- Consult with the appropriate regulatory agency and with the FLM for the affected Class I area(s) or other affected area for confirmation of preferred procedures and for the need for a cumulative analysis.
- Obtain FLM recommendation for the specified reference levels (estimate of natural conditions) and, if applicable, FLM recommended plume/observer geometries and model receptor locations.
- Apply the applicable EPA Guideline, steady-state models for regions within the Class I area that are affected by plumes or layers that are viewed against a background (generally within 50 km of the source).

Calculate hourly estimates of τ and plume contrast, with respect to natural conditions, and compare these estimates with the thresholds given in Section D.2.c.

- For regions of the Class I area where visibility impairment from the source would cause a general alteration of the appearance of the scene (generally 50 km or more away from the

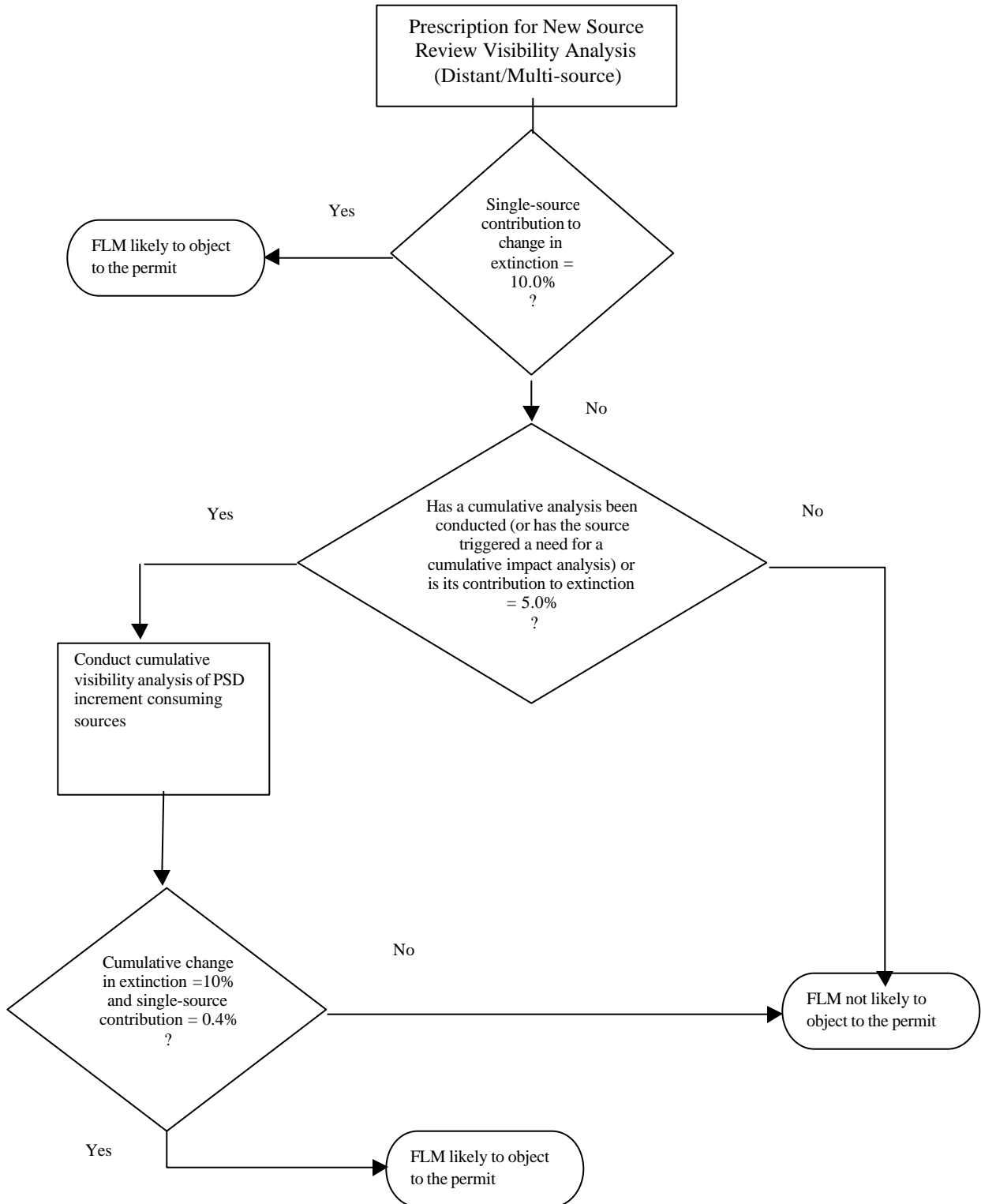
source or from the interaction of the emissions from multiple sources), apply a non-steady-state air quality model with chemical transformation capabilities (refer to IWAQM guidance documents), which yields ambient concentrations of visibility-impairing pollutants. At each Class I receptor:

Calculate the change in extinction due to the source being analyzed, compare these changes with the reference conditions, and compare these results with the thresholds given in Section D.2.c.

If necessary, calculate the cumulative change in extinction due to new source growth.

This prescription is portrayed schematically in Figure V-1.

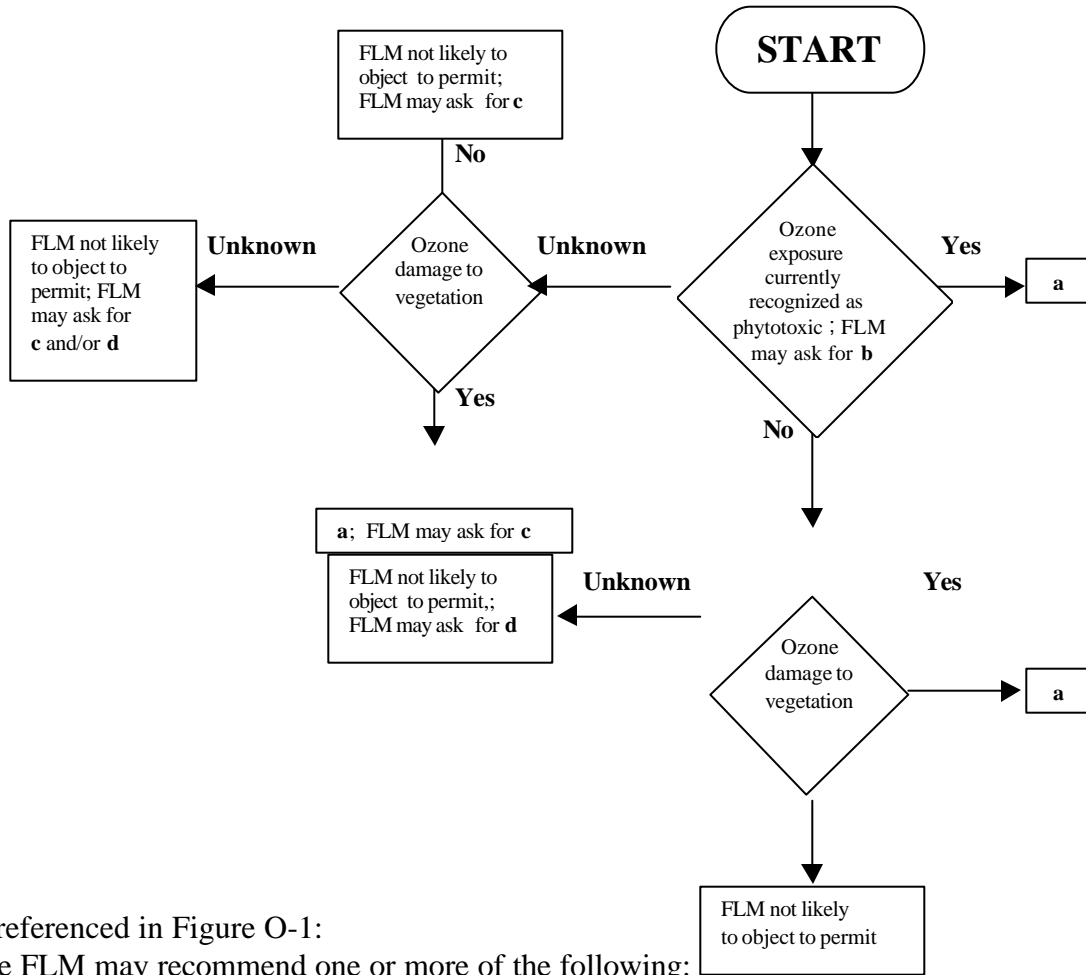
Figure V-1. Prescription for visibility assessment for distant/multi-source applications
(source greater than or equal to 50 km from the Class I area)



2. RECOMMENDATIONS FOR EVALUATING OZONE IMPACTS

- FLAG agrees with the EPA contention that single source-receptor modeling for ozone is not feasible at this time. FLM actions or specific requests on a permit application will be based on the existing air pollution situation at the area they manage. These conditions include (1) whether or not actual ozone damage has occurred in the area, and (2) whether or not ozone exposure levels occurring in the area are high enough to cause damage to vegetation (*i.e.*, phytotoxic O₃ exposures). Figure O-1 shows the various responses an FLM would have to a permit application. (Note: the term “Ozone exposure currently recognized as phytotoxic” is determined based on data from exposure response studies and ambient ozone levels at the site. The FLM may ask the applicant to calculate the ozone exposure values if these data are not already available. “Ozone damage to vegetation” is determined from field observations at the impacted site.)
- Oxidant stipple necrosis on plant foliage and ozone-induced senescence infer adverse physiological or ecological effects, and are considered to be damage if they are determined to have a negative impact on aesthetic value.
- The W126 ozone metric is recommended to describe ozone exposure, based on a 24-hour, seasonal (April through October) period of measurement. The number of hours in this period of time greater than or equal to 100 ppb (N100) will also be determined, in recognition of the importance of peak concentrations in plant response.
- NO_x and VOC are of concern because they are precursors of ozone. Current information indicates most FLM areas are NO_x limited. Until we determine the VOC or NO_x status of each area, we will focus on control of NO_x emission sources.

Figure O-1. FLM response to potential ozone effects from new emissions source.



Items referenced in Figure O-1:

- a. The FLM may recommend one or more of the following:
 - That the proposed source use stricter than BACT controls (*e.g.*, Lowest Achievable Emission Rate [LAER]).
 - That the proposed source obtain NO_x emission offsets that will benefit the potentially affected FLM area (as demonstrated by dispersion modeling).
 - That the permitting authority (*i.e.*, state or EPA) conduct regional modeling to identify sources that are contributing significantly to ozone-associated impacts in the FLM area, and that the permitting authority then undertake actions necessary to reduce emissions from those sources (*e.g.*, SIP revision).
- b. The applicant calculate the ozone exposure for vegetation (using W126 and N100 metrics) for the affected FLM area(s) where such information is not already available.
- c. The permitting authority or applicant fund post-construction ambient ozone monitoring in or near the FLM area.
- d. The applicant conduct or fund post-construction ozone effects surveys in the FLM area and/or exposure/response effects research.

3. RECOMMENDATIONS FOR EVALUATING DEPOSITION IMPACTS

The permit applicant should consult with the appropriate regulatory agency and FLM for the affected area(s) to determine if a deposition impact analysis should be done. If an analysis is advised, the permit applicant should obtain available information on Class I AQRVs, critical loads, and concern thresholds from the FLM. In addition, the applicant should refer to the “Recommendations and Guidance for Evaluating Potential Effects from Proposed Increases in Deposition to an FLM Area” section of the Deposition Chapter (Section D.4.f). The following steps summarize that guidance.

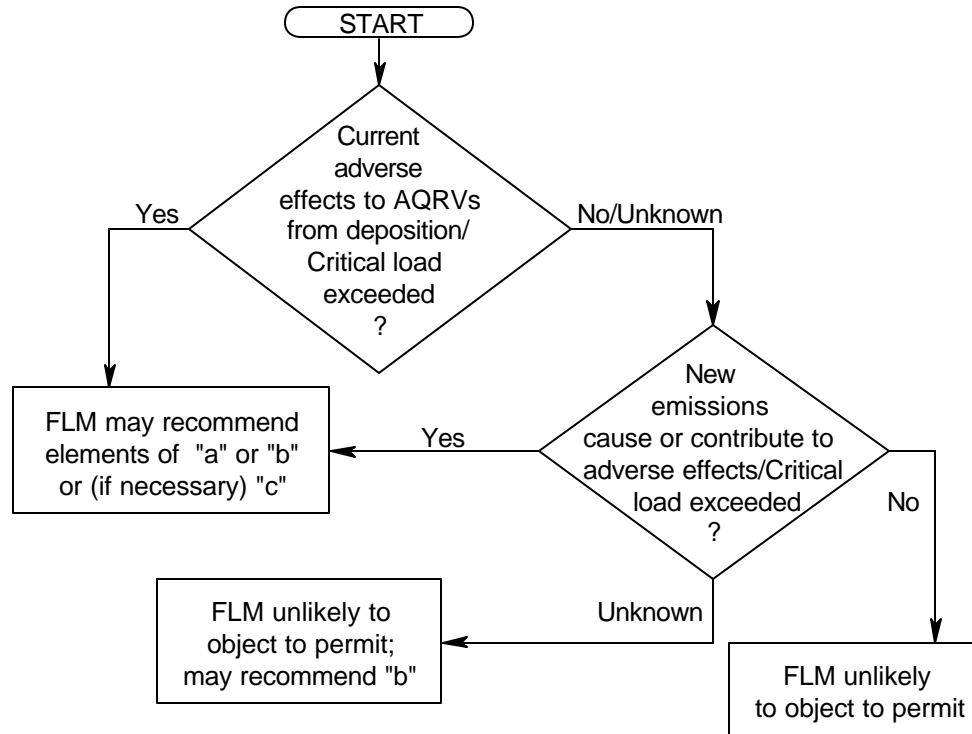
- Estimate the current deposition rate to the FLM area. A list of monitoring sites providing data to characterize deposition in FLM areas is included in the Deposition Chapter (Table D-2).
- Estimate the future deposition rate by adding the existing rate, the new emissions’ contribution to deposition, and the contribution of sources permitted but not yet operating. Modeling of new and permitted but not yet operating emissions’ contribution to deposition should be conducted following IWAQM recommendations.
- Compare the future deposition rate with the recommended screening criteria (e.g., critical load, concern threshold, or screening level value) for the affected FLM area. A list of documents summarizing these screening criteria, where available, can be found in Appendix H. Information for USDA/FS Class I areas is also available at:

<http://www.fs.fed.us/r6/aq/natarm>.

A website with NPS and FWS Class I area information is currently under development.

- In consultation with the FLM, use the following flowchart (Figure D-1) to determine whether mitigation is recommended.

Figure D-1. FLM response to potential deposition effects from new emissions sources.



- a. The applicant should use one or more of the following:
- Stricter (than BACT) controls (e.g., Lowest Achievable Emission Rate [LAER]).
 - Emission offsets located in an area that, considering geographic and meteorological factors, will benefit the impacted wilderness or park, as demonstrated by modeling.
 - Regional modeling to identify sources contributing significantly to deposition adverse effects; SIP revision to reduce emissions contributing to adverse effects. (See text for discussion of mitigation options.)
- b. Deposition and deposition effects monitoring/research in the FLM area.
- c. Denial of permit.