

**Western Regional Air Partnership Policy  
on  
Enhanced Smoke Management Programs  
for Visibility**

**Approved by the Western Regional Air Partnership  
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the Enhanced Smoke Management Program Task Team  
of the Fire Emissions Joint Forum**

# **WRAP Policy on Enhanced Smoke Management Programs for Visibility**

## **Executive Summary**

The Western Regional Air Partnership (WRAP) is charged with developing technical and policy tools to assist states (or the delegated regulatory authority) and tribes with implementing the Regional Haze Rule (Rule).

The WRAP Policy on Enhanced Smoke Management Programs for Visibility (WRAP ESMP Policy) has been developed over an eleven-month period through a stakeholder-based consensus process to assist the WRAP region states and tribes in addressing emissions from fire sources. In this Policy, the WRAP seeks to provide a consistent framework that states and tribes can use to efficiently develop their individual implementation plans. The WRAP recognizes states' and tribes' authority and responsibility to develop, adopt and implement their regional haze implementation plans, and recognizes the Rule as the principal document on which states and tribes should rely.

The Rule requires states to develop implementation plans (SIPs) for addressing regional haze in the Nation's 156 mandatory Class I areas.<sup>1</sup> Additionally, the Rule requires effective management of fire sources. The Rule provides two pathways for western states to follow as they implement the requirements of the Rule: 1) develop their regional haze implementation plans per the nationally applicable provisions of Section 308, or 2) Transport Region states may choose to incorporate the Grand Canyon Visibility Transport Commission (GCVTC) recommendations into their regional haze implementation plans under Section 309 of the Rule.

Enhanced smoke management programs are specifically required in Section 309 of the Rule. However, if a state, under Section 308, has determined that fire emissions are contributing to visibility impairment and that smoke needs to be addressed in its SIP, then an enhanced smoke management program is a viable tool to accomplish this goal. Therefore, the WRAP is advancing the WRAP ESMP Policy for states under both Section 308 and 309 to meet the requirements of the Rule.

Tribes are not subject to the same requirements of the Rule as states, but tribes wishing to assume the regional haze requirements outlined in the Rule may, according to the CAA, seek approval to be treated in the same manner as states, under the Tribal Authority Rule (TAR), 40 CFR 49. The intent of this Policy is to assist both states and tribes with the

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<sup>1</sup> The Rule is only applicable to mandatory Class I areas (see Appendix A & Appendix B for additional information on mandatory Class I areas). States/tribes in the WRAP region may utilize the WRAP ESMP Policy to protect visibility in non-mandatory Class I areas.

development of their regional haze implementation plans (SIPs/TIPs), and therefore, tribes are included in all references to states, except where specific requirements and/or deadlines of the Rule are cited.

The WRAP ESMP Policy defines the enhanced smoke management program as smoke management efforts that specifically address visibility. It is the position of the WRAP ESMP Policy that there are nine elements of an enhanced smoke management program that are necessary to meet the requirements of the Rule. According to the Rule, enhanced smoke management programs are to be included in implementation plans based on the criteria of efficiency, economics, law, emissions reduction opportunities, land management objectives, and reduction of visibility impacts.

Smoke management efforts/programs currently in place (sometimes referred to as “basic smoke management programs”) may not specifically address visibility effects in mandatory Class I areas. The WRAP ESMP Policy explicitly addresses visibility effects from fire that contribute to visibility impairment in mandatory Class I areas. Fortunately, smoke management efforts/programs, regardless of the purpose (e.g., visibility protection, avoidance of National Ambient Air Quality Standards [NAAQS] violations, or prevention of nuisance smoke impacts), have many common elements. It is anticipated that the enhanced smoke management program elements outlined here will integrate well with current and future smoke management efforts/programs.

The WRAP ESMP Policy document is comprised of four major sections. Section 1 is the eight WRAP ESMP Policy statements. Section 2 provides overall background for the WRAP ESMP Policy, including a discussion of the regulatory environment, the current context of smoke management in the WRAP region, and details of the Rule that are germane to the WRAP ESMP Policy. Section 3 is an annotation of each of the eight policy statements, further explaining and defining them, and including a description of the nine enhanced smoke management program elements. Finally, Section 4, the Appendices, include (A) a glossary of terms, (B) a related documents listing, and (C) specific examples for states/tribes on the implementation of the nine enhanced smoke management program elements.

# WRAP Policy

## Enhanced Smoke Management Programs for Visibility

### TABLE OF CONTENTS

|   |          |
|---|----------|
| <b>Executive Summary</b>  | <b>i</b> |
| <b>1. The WRAP Policy on Enhanced Smoke Management Programs for Visibility: Policy Statements</b> | <b>1</b> |
| <b>2. Background</b>  | <b>2</b> |
| 2.1 Clean Air Act and Grand Canyon Visibility Transport Commission                                | 2        |
| 2.2 Western Regional Air Partnership  | 3        |
| 2.3 Regional Haze Rule  | 3        |
| 2.4 Existing Guidance on Smoke Management   | 4        |
| <b>3. Annotated Policy</b>  | <b>5</b> |
| 3.1 Introduction  | 5        |
| 3.2 Visibility Effects  | 6        |
| 3.3 All Fire Sources  | 7        |
| 3.4 Section 309   | 7        |
| 3.5 Section 308   | 8        |
| 3.6 Elements of an Enhanced Smoke Management Program  | 9        |
| 3.6.1 Element 1 Actions to Minimize Emissions from Fire   | 10       |
| 3.6.2 Element 2 Evaluation of Smoke Dispersion  | 10       |
| 3.6.3 Element 3 Alternatives to Fire  | 10       |
| 3.6.4 Element 4 Public Notification of Burning  | 11       |
| 3.6.5 Element 5 Air Quality Monitoring  | 11       |
| 3.6.6 Element 6 Surveillance and Enforcement  | 11       |
| 3.6.7 Element 7 Program Evaluation  | 11       |
| 3.6.8 Element 8 Burn Authorization  | 11       |
| 3.6.9 Element 9 Regional Coordination   | 11       |
| 3.7 Criteria  | 12       |
| 3.8 Application   | 13       |
| 3.8.1 Source Sector Option  | 13       |
| 3.8.2 Situational Option  | 14       |
| 3.8.3 Impact Based Option   | 15       |
| 3.9 Collaborative Development   | 15       |

# TABLE OF CONTENTS

|   |           |
|---|-----------|
| <b>4. Appendices</b>  | <b>17</b> |
| Appendix A. Glossary  | 18        |
| Appendix B. Related Documents Listing                                     | 25        |
| Appendix C. Enhanced Smoke Management Program:<br>Implementation Guidance | 26        |
| C.1 Regional Haze Rule Implementation Plan Process                        | 26        |
| C.2 Elements of an Enhanced Smoke Management Program                      | 27        |
| C.2.1 Element 1. Actions to Minimize Emissions from Fire                  | 27        |
| C.2.1.1 Emissions Reductions Techniques                                   | 27        |
| C.2.1.2 Burn Manager Qualification  | 28        |
| C.2.1.3 Incentives  | 29        |
| C.2.1.4 Emissions Goal/Target   | 30        |
| C.2.2 Element 2. Evaluation of Smoke Dispersion                           | 30        |
| C.2.3 Element 3. Alternatives to Fire                                     | 31        |
| C.2.4 Element 4. Public Notification of Burning                           | 32        |
| C.2.5 Element 5. Air Quality Monitoring                                   | 33        |
| C.2.6 Element 6. Surveillance and Enforcement                             | 33        |
| C.2.7 Element 7. Program Evaluation                                       | 35        |
| C.2.8 Element 8. Burn Authorization                                       | 36        |
| C.2.8.1 Permit by Rule  | 36        |
| C.2.8.2 Burn Permitting System  | 37        |
| C.2.8.3 Centralized Burn Authority  | 37        |
| C.2.8.4 Regional Burn Authority   | 37        |
| C.2.9 Element 9. Regional Coordination                                    | 37        |
| C.2.9.1 Source Sector Authority Coordination                              | 38        |
| C.2.9.2 Centralized Authority Coordination                                | 38        |
| C.2.9.3 Regional (Multi-State/Tribe) Coordination                         | 39        |
| C.3 Responsibilities Under an Enhanced Smoke Management Program           | 39        |
| C.4 Funding Mechanisms for Enhanced Smoke Management Programs             | 40        |

# **1. The WRAP Policy on Enhanced Smoke Management Programs for Visibility: Policy Statements**

Policy Statement A. Enhanced smoke management programs under this Policy are defined as those smoke management efforts that specifically address visibility effects, and therefore, may need to be augmented to address public health and welfare issues.

Policy Statement B. Enhanced smoke management programs apply to all fire sources.

Policy Statement C. Enhanced smoke management programs are required for states under Section 309 of the Regional Haze Rule.<sup>2</sup>

Policy Statement D. Enhanced smoke management programs are a viable tool for all other states and tribes in the WRAP region to use in the development of their implementation plans.

Policy Statement E. Enhanced smoke management programs include nine elements that are necessary to meet the requirements of the Regional Haze Rule, as follow:

Element 1. Actions to Minimize Emissions from Fire

Any burning techniques that reduce the actual amount of emissions produced.

Element 2. Evaluation of Smoke Dispersion

Using meteorological conditions to assess the ability to minimize smoke impacts.

Element 3. Alternatives to Fire

Any method of removing or reducing fuels by mechanical, biological or chemical treatments.

Element 4. Public Notification of Burning

Any method that communicates burn information to the burn community, to air regulators and to the general public. Also includes public education and media relations.

Element 5. Air Quality Monitoring

Observations and/or equipment that enable an assessment of air quality impacts of smoke from fires.

Element 6. Surveillance and Enforcement

An oversight mechanism that assures adherence to smoke management efforts as defined by the regional haze implementation plan.

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<sup>2</sup> Published in the Federal Register on July 1, 1999, 64 FR 35714.

Element 7. Program Evaluation

A mechanism to assess the adequacy of the enhanced smoke management program in meeting the requirements of the Rule.

Element 8. Burn Authorization

The management approach used to facilitate burn decision-making.

Element 9. Regional Coordination

Communication and information sharing across state/tribe jurisdictional lines.

Policy Statement F. Enhanced smoke management programs will be based on the criteria of efficiency, economics, law, emission reduction opportunities, land management objectives, and reduction of visibility impact,<sup>3</sup> which will determine the rigor applied to the nine elements.

Policy Statement G. Enhanced smoke management programs may be applied uniformly to source sectors throughout a state's or tribe's jurisdiction or they may be tailored to source sectors and/or geographic areas to address presumed or confirmed visibility impairment.

Policy Statement H. The development and application of enhanced smoke management programs, including the consideration of the criteria (F), will be done collaboratively with state, tribal, local and federal agencies, and private parties.

## **2. Background**

### **2.1 Clean Air Act and Grand Canyon Visibility Transport Commission**

In 1990, Congress amended the Clean Air Act (CAA), and as part of these amendments created the Grand Canyon Visibility Transport Commission (GCVTC).<sup>4</sup> The GCVTC was charged with assessing the current scientific information on visibility impacts and making recommendations for addressing regional haze in the western United States. The GCVTC signed and submitted more than 70 recommendations to the Environmental Protection Agency (EPA) in a report dated June 1996 that indicated that visibility impairment was caused by a wide variety of sources and pollutants, and that a comprehensive strategy was needed to remedy regional haze.

Fire sources were among those specifically acknowledged in the GCVTC Report as contributors to visibility impairment on an episodic basis:

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<sup>3</sup> 64 FR 35771, §51.309 (d) (6) (iv).

<sup>4</sup> The Grand Canyon Visibility Transport Commission (GCVTC) was composed of the governors of eight western states (AZ, CA, CO, NM, NV, OR, UT, WY), four tribes (Acoma Pueblo, Hopi, Hualapai, and Navajo), four Federal land management agencies (Bureau of Land Management, U.S. Fish and Wildlife Service, U.S. Forest Service, National Park Service), the Columbia River Inter-Tribal Fish Commission, and the Environmental Protection Agency.

All types of fire (prescribed fire and agricultural burning) must be addressed equitably as part of a visibility protection strategy.<sup>5</sup>

The GCVTC Report acknowledged federal and state land managers' projection of significant increases in prescribed fire in order to reduce the effects of wildfire resulting from past decades of fire exclusion.<sup>6</sup> The GCVTC Report cited the need for minimizing the increase in emissions from all fire programs to the maximum extent feasible.<sup>7</sup> One of the Report's recommendations called for:

...the development and implementation of criteria and requirements for the use of enhanced smoke management programs (including alternative management practices) and emission reduction strategies.<sup>8</sup>

## **2.2 Western Regional Air Partnership**

The Western Regional Air Partnership (WRAP) was established in 1997 as the successor organization to the GCVTC. The WRAP is a voluntary organization comprised of western governors, tribal leaders and federal agencies,<sup>9</sup> and is charged "to identify regional or common air management issues, develop and implement strategies to address these issues, and formulate and advance western regional policy positions on air quality."<sup>10</sup> These policies and technical tools are developed through inclusive, stakeholder-based processes and approved by consensus of the WRAP.

WRAP participants include state air quality agencies, tribes, federal/state/private land managers, the EPA, environmental groups, industry, academia and other interested parties. There are over 400 tribes within the WRAP region. The large number of tribes limits the participation of all of them in WRAP activities, and accordingly, in the development of this Policy. Therefore, the tribal representatives involved in the development of this Policy may not represent all tribal concerns.

## **2.3 Regional Haze Rule**

Following the issuance of the GCVTC Report, the EPA issued the Regional Haze Rule (Rule) in July 1999 to improve visibility in 156 national parks and wilderness areas across the country. The Rule outlines the requirements for states and tribes to address

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<sup>5</sup> GCVTC Report, p. 47.

<sup>6</sup> GCVTC Report, p. 23.

<sup>7</sup> GCVTC Report, Recommendation 7, p. 50.

<sup>8</sup> GCVTC Report, Recommendation 4, p. 49.

<sup>9</sup> The WRAP members include the governors of thirteen western states (AK, AZ, CA, CO, ID, MT, ND, NM, OR, SD, UT, WA, and WY). Tribal nations selected as WRAP members include Pueblo of Acoma, Campo Band of Kumeyaay Indians, Cortina Indian Rancheria, Hopi Tribe, Hualapai Nation of the Grand Canyon, Nez Perce Tribe, Northern Cheyenne Tribe, Salish and Kootenai Confederated Tribes, Pueblo of San Felipe, and Shoshone-Bannock Tribes of Fort Hall. Federal WRAP members are the Department of the Interior, the Department of Agriculture, and the Environmental Protection Agency.

<sup>10</sup> WRAP Charter, Purpose, p. 1.



regional haze in these mandatory Class I areas. EPA incorporated all of the GCVTC recommendations into Section 309 of the Rule, which may be used by some of the WRAP states/tribes. The remaining WRAP states must, and tribes may, utilize the nationally applicable Section 308 provisions of the Rule.

Tribes are not subject to the same requirements of the Rule as states, but tribes wishing to assume the regional haze requirements outlined in the Rule may, according to the CAA, seek approval to be treated in the same manner as states, under the Tribal Authority Rule (TAR), 40 CFR 49. In these cases, EPA still recognizes that “unlike States, tribes are not required by the TAR to adopt and implement CAA plans or programs, thus tribes are not subject to mandatory deadlines for submittal of implementation plans.”<sup>11</sup> Although provision for flexibility in the submission of programs and implementation plans for tribes is made under TAR, EPA does “encourage tribes choosing to develop implementation plans to make every effort to submit by the deadlines to ensure that the plans [TIPs] are integrated with and coordinated with regional planning efforts.”<sup>12</sup>

EPA recognizes the WRAP as the Regional Planning Organization that is developing the necessary policy and technical tools to implement the Rule in the WRAP region. A WRAP policy, once approved, represents the WRAP's consensus position on the best means for states and tribes to implement the portion of the Rule at issue. The WRAP recognizes states' and tribes' authority and responsibility to develop, adopt and implement their regional haze state and tribal implementation plans, and the seminal guidance to do this is the Rule.<sup>13</sup>

## **2.4 Existing Guidance on Smoke Management**

The elements of an enhanced smoke management program as outlined in this Policy are based upon careful review and consideration of the Rule and the existing guidance on smoke management: the EPA's Interim Air Quality Policy on Wildland and Prescribed Fires (EPA Interim Policy)<sup>14</sup> and the Agricultural Air Quality Task Force's (AAQTF) Recommendation on Air Quality Policy on Agricultural Burning (AAQTF Recommendation on Air Quality Policy).<sup>15</sup> However, these documents do not specifically provide guidance for smoke management programs that address visibility effects. The WRAP ESMP Policy goes beyond the EPA Interim Policy and the AAQTF Recommendation on Air Quality Policy to address visibility effects and regional haze, as required by the Rule.

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<sup>11</sup> 64 FR 35758.

<sup>12</sup> 64 FR 35759.

<sup>13</sup> WRAP Charter, p.1.

<sup>14</sup> U.S. EPA, Office of Air Quality Planning and Standards, Interim Air Quality Policy on Wildland and Prescribed Fires, April 23, 1998 (hereafter referred to as “EPA Interim Policy”).

<sup>15</sup> Agricultural Air Quality Task Force, Air Quality Policy on Agricultural Burning, Recommendation to the U.S. Department of Agriculture, November 10, 1999 (hereafter referred to as “AAQTF Recommendation on Air Quality Policy”).

## 3. Annotated Policy

### 3.1 Introduction

The WRAP ESMP Policy is the result of the WRAP region-wide multi-state/tribe stakeholder planning and coordination effort focused on addressing the development of enhanced smoke management programs that address visibility effects. The intent of the WRAP ESMP Policy is to assist states (or the delegated authority) and tribes to address visibility effects associated with fire in a way that is adequate for SIP/TIP implementation.

The WRAP ESMP Policy identifies for states/tribes in the WRAP region the elements of an enhanced smoke management program to address visibility effects from all types of fire that contribute to visibility impairment in mandatory Class I areas. Although the Rule is only applicable to mandatory Class I areas, state/tribes in the WRAP region may utilize the WRAP ESMP Policy to protect visibility in non-mandatory Class I areas.<sup>16</sup>

Most states/tribes in the WRAP region address fire source sectors differently, as does EPA in its guidance documents. Consequently, fire sources in the WRAP region are currently regulated at various and inconsistent levels, from rigorous regulation to regulation with exemption applied, to no regulation. This variability emphasizes the need for the development and application of an enhanced smoke management program framework that is predictable and flexible while meeting the requirements of the Rule.

The WRAP ESMP Policy has been developed to embody appropriate regulatory and policy requirements and to provide a predictable framework for enhanced smoke management programs that can be reasonably implemented by states and tribes. The WRAP believes that states, tribes, or EPA on behalf of the tribes maintain the ultimate responsibility for the implementation of the enhanced smoke management program.

The WRAP recognizes states/tribes authority and responsibility to develop, adopt and implement their regional haze state and tribal implementation plans. The WRAP further recognizes that the implementation plans will be revisited and revised, per the schedule specified in the Rule, giving opportunities to refine individual enhanced smoke management programs to reflect technical advances and policy updates.

### 3.2 Visibility Effects

*Policy Statement A. Enhanced smoke management programs under this Policy are defined as those smoke management efforts that specifically address visibility effects, and therefore, may need to be augmented to address public health and welfare issues.*

Most current smoke management efforts and programs to date in the WRAP region have been developed to address public health and/or nuisance concerns, and do not have

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<sup>16</sup> See Appendix B for the reference to a map of Class I areas.

procedures to address visibility effects that contribute to regional haze. The *enhanced* smoke management program adds visibility impairment/regional haze considerations to existing smoke management efforts.

States/tribes are currently addressing NAAQS and/or nuisance to the extent they deem appropriate through existing smoke management efforts. Some states/tribes have certified their smoke management programs under EPA's Interim Policy, both inside and outside the SIP/TIP process.<sup>17</sup> The EPA certified programs include those mandated by rule, state statute, and programs based on voluntary measures.<sup>18</sup> However, few, if any, states/tribes have smoke management programs that address all fire sources, (e.g., prescribed fire on wildlands, wildland fire use, wildfire and agricultural burning), in one unified program.

The WRAP ESMP Policy assumes that states/tribes will *maintain* their current smoke management efforts and/or smoke management programs for NAAQS and/or nuisance. The WRAP ESMP Policy can be used to establish new programs to address visibility concerns even if there are no other smoke management efforts currently in place. While the WRAP ESMP Policy provides a framework for visibility/regional haze, states/tribes may choose to do more in their smoke management programs to protect NAAQS, prevent nuisance and/or address visibility.

The WRAP ESMP Policy facilitates the integration of visibility protection with NAAQS and nuisance protection, in accordance with the Rule:

The regional haze program is being promulgated in a manner that facilitates *integration* of emission management strategies for regional haze with the implementation of programs for new NAAQS for Ozone and PM.<sup>19</sup>

The elements included in the enhanced smoke management program as outlined by this Policy have been selected in an attempt to address direct visibility effects and regional haze in mandatory Class I areas. It is possible that states/tribes may encounter conflicts between managing smoke for visibility considerations and smoke management efforts for NAAQS and/or nuisance. It is therefore recommended that states/tribes coordinate their efforts to protect visibility with existing or future efforts to address NAAQS and/or nuisance smoke.

### **3.3 All Fire Sources**

*Policy Statement B: Enhanced smoke management programs will apply to all fire sources.*

The WRAP ESMP Policy applies to all fire, and maintains the previously established definitions:

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<sup>17</sup> A state/tribe certifies "to EPA that they have adopted and are implementing a smoke management program that includes the basic components identified in this policy." EPA Interim Policy, p. 7.

<sup>18</sup> WRAP states implementing smoke management programs using voluntary measures include NM and ID.

<sup>19</sup> 64 FR 35719, emphasis added.

This Policy applies to both wildland and agricultural lands regardless of ownership (i.e., Federal, state, tribal, public, private), cause of ignition (e.g., lightning, arson, accidental human, land management practices) or purpose of the fire (e.g., vegetative residue disposal, hazard reduction, maintain ecosystem health). It is the intent that this Policy be applied equitably across all land types and sources.<sup>20</sup>

All fire source sectors are included in the WRAP ESMP Policy because it is recognized by EPA that “fire of all kinds (wildfire, prescribed fire, etc.) contributes to regional haze.”<sup>21</sup> This Policy needs to be applied to all sources addressed by the WRAP Fire Categorization Policy. In accordance with Section 118(a) of the CAA requires that all entities, federal and non-federal, be subject to the same requirements, authorities and processes,<sup>22</sup> the WRAP ESMP Policy will be applied equitably to all fire sources.

The WRAP ESMP Policy specifically does not apply to Native American cultural non-vegetative burning for traditional, religious, or ceremonial purposes (e.g., cremation, sweat lodge fires).<sup>23</sup> Nor does it apply to open burning activities on residential, commercial, or industrial property (e.g., backyard burning, garbage incineration, residential wood combustion, construction debris).<sup>24</sup> However, states/tribes may choose to consider the impacts of these fire sources when developing their regional haze implementation plans.

The WRAP ESMP Policy applies to smoke impacts in mandatory Class I areas from fire anywhere in the WRAP region. Each state has an obligation to account for those emissions it produces that have impacts in its own mandatory Class I areas. Accountability also extends to states and tribes that have smoke impacts outside their jurisdictions.

### **3.4 Section 309**

*Policy Statement C: Enhanced smoke management programs are required for states under Section 309 of the Regional Haze Rule.*

The EPA incorporated all of the GCVTC recommendations into Section 309 of the Rule, which specifically calls for “[e]nhanced smoke management programs for fire that consider visibility effects, not only health [NAAQS] and nuisance objectives....”<sup>25</sup> Under Section 309, states must incorporate an enhanced smoke management program into their SIPs, which will give them the demonstration of reasonable further progress through 2018.<sup>26</sup> The ability of a state/tribe to implement the enhanced smoke management

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<sup>20</sup> WRAP Policy for Categorizing Fire Emissions, November 15, 2001 (hereafter referred to as “WRAP Fire Categorization Policy”), p 7.

<sup>21</sup> 64 FR 35735.

<sup>22</sup> Clean Air Act §118(a).

<sup>23</sup> WRAP Fire Categorization Policy, p. 24.

<sup>24</sup> Ibid, however “industrial property” would not include land such as industrial forestland.

<sup>25</sup> 64 FR 35771, §51.309 (d) (6) (iv).

<sup>26</sup> 64 FR 35769, §51.309 (a).

program may require legislative changes to existing rules or removal of exemptions from regulation for specific fire sources.

The tracking of emissions from all fire (i.e., wildland and agricultural land) is a requirement of the Rule for states under Section 309, including the development of an emissions inventory for VOCs, NO<sub>x</sub>, elemental and organic carbon, and fine particulate matter.<sup>27</sup> States/tribes under Section 309 will need to address projected fire emissions in order to facilitate regional haze planning and operational smoke management.<sup>28</sup> The tracking of emissions could allow for these projections to be developed. Emissions tracking will also provide information critical to implementing several of the necessary elements of an enhanced smoke management program. The Rule under Section 309 further calls for the establishment of annual emission goals for fire that will minimize emissions increases from fire to the maximum extent feasible.<sup>29</sup> The WRAP is currently developing policy on both emissions tracking and on the establishment of annual emissions goals that will work in concert with the WRAP ESMP Policy.

### **3.5 Section 308**

*Policy Statement D. Enhanced smoke management programs are a viable tool for all other states and tribes in the WRAP region to use in the development of their implementation plans.*

The Rule requires states/tribes to address visibility impairment in mandatory Class I areas due to emissions from all sources including fire activities. The Preamble to the Rule emphasizes smoke management programs as effective tools to accomplish this:

Where smoke impacts from fire are identified as an important contributor to regional haze, smoke management programs should be a key component of regional and State regional haze planning efforts and long-term strategies.<sup>30</sup>

Under Section 308, a state must consider smoke management techniques for agricultural and forestry lands in its long-term strategy for regional haze. Section 308 of the Rule states:

The State must identify all anthropogenic sources of visibility impairment considered by the State in developing its long-term strategy [for regional haze]. The State should consider major and minor stationary sources, mobile sources, and area sources.<sup>31</sup>

and:

(v) The State must consider, at a minimum, the following factors in developing its long-term strategy [for regional haze]:

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<sup>27</sup> 64 FR 35771, §51.309 (d) (6) (ii)

<sup>28</sup> 64 FR 35771, §51.309 (d) (6) (i).

<sup>29</sup> 64 FR 35771, §51.309 (d) (6) (v).

<sup>30</sup> 64 FR 35736.

<sup>31</sup> 64 FR 35767, §51.308 (d) (3) (iv).

(E) Smoke management techniques for agricultural and forestry management purposes including plans as currently exist within the States for these purposes.<sup>32</sup>

If a state's visibility impairment analysis<sup>33</sup> shows that fire sources contribute to visibility impairment in a mandatory Class I area and the state determines that fire sources need to be addressed in its SIP, then the enhanced smoke management program will be a viable tool to do so. A statewide inventory of emissions of pollutants that contribute to visibility impairment in mandatory Class I areas is a requirement of the Rule for states choosing to implement the Rule under Section 308. Further, these states will also be required to account for future projected emissions.<sup>34</sup>

### **3.6 Elements of an Enhanced Smoke Management Program**

*Policy Statement E: Enhanced smoke management programs include nine elements that are necessary to meet the requirements of the Regional Haze Rule.*

The elements included in the enhanced smoke management program as outlined by this Policy have been selected in an attempt to address direct visibility effects and regional haze in mandatory Class I areas to improve visibility on the worst days and maintain visibility on best days.<sup>35</sup> The first seven enhanced smoke management program elements come directly from Section 309 of the Rule that states that SIPs “*must include smoke management programs that include all necessary components including, but not limited to, actions to minimize emissions, evaluation of smoke dispersion, alternatives to fire, public notification, air quality monitoring, surveillance and enforcement, and program evaluation.*”<sup>36</sup> These same smoke management components are also found in the EPA Interim Policy and the AAQTF Recommendation on Air Quality Policy.<sup>37</sup>

The EPA Interim Policy and the AAQTF Recommendation on Air Quality Policy also advocate a burn authorization component (i.e., Element #8).<sup>38</sup> Without a central burn authority considering the cumulative smoke impacts, it will be difficult on a daily basis for individual land managers/owners to assess their relative contribution to regional haze.

Regional coordination (i.e., Element #9) is central to burn authorization, and will facilitate coordinated decision-making. It is a necessary mechanism to address transport issues and cumulative effects, especially when considering impacts of a source that may be large, or many sources that cumulatively are large, but a long distance from a Class I

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<sup>32</sup> 64 FR 35767, §51.308 (d) (3) (v) (E).

<sup>33</sup> As outlined in the Rule under Section 308, this process includes calculating the baseline of all sources; comparing the baseline visibility conditions with natural conditions; assessing the contribution to this of the different sources (of which smoke is one); then considering in the development of long term strategies: smoke management techniques, including current smoke management programs that exist; and if not adequate, considering enforceable emissions limitations and compliance schedules and other measures as necessary. 64 FR 35765 §51.308.

<sup>34</sup> 64 FR 35767, §51.308 (d) (4) (v) and 35769, §51.308 (g) (4).

<sup>35</sup> 64 FR 35764, §51.301.

<sup>36</sup> 64 FR 35771, §51.309 (d) (6) (i), emphasis added.

<sup>37</sup> EPA Interim Policy, p. 17-23, and AAQTF Recommendation on Air Quality Policy, p. 2.

<sup>38</sup> EPA Interim Policy, p. 18, and AAQTF Recommendation on Air Quality Policy, p.12.

area (i.e., greater than 100 km). Regional coordination is emphasized in the Rule as key to reaching the national visibility goal. In the preamble, the Rule states:

Therefore, States will need to develop strategies in coordination with one another, taking into account the effect of emissions from one jurisdiction to air quality in another.<sup>39</sup>

And in the preamble to Section 308, the Rule states:

In developing each reasonable progress goal, the State must consult with those States which may reasonably be anticipated to cause or contribute to visibility impairment in the mandatory Class I Federal area.<sup>40</sup>

The WRAP ESMP Policy elements include measures to control and/or reduce emissions from fire (Elements 1, 3, and 8); tools to assess and manage the potential impacts from fire (Elements 2 and 5); and operational components of a successful smoke management program (Elements 4, 6, 7, and 9). In addition to the elements descriptions that follow, suggestions for implementation of the nine enhanced smoke management program elements are included in Appendix C of this document.

#### 3.6.1. Element 1. Actions to Minimize Emissions from Fire

A wide range of opportunities to minimize emissions exists depending upon the fire source and management objectives. Four potential actions that may be used are: emission reduction techniques, establishing burn manager qualification programs,<sup>41</sup> developing incentive programs, and establishing emissions goals.

#### 3.6.2. Element 2. Evaluation of Smoke Dispersion

A variety of tools and methods exist by which a land manager/owner could reduce smoke impacts over periods ranging from several hours to several days. States/tribes may focus on the use of specific weather information, fuels information, modeling or a burner qualification and certification program to assist in the evaluation of dispersion conditions.

#### 3.6.3. Element 3. Alternatives to Fire

Alternatives to fire (as distinguished from alternative methods of burning) include any method of removing or reducing fuels by mechanical, biological or chemical treatments. States/tribes may assist land managers/owners to develop and implement alternatives to fire. Land managers/owners may be required to assess the feasibility of using alternatives to fire where there are many competing sources or large amounts of burning occurring that could lead to visibility impairment in mandatory Class I areas. Regulatory authorities may want to consider incentives to encourage the use of alternatives to burning where appropriate. The WRAP through its FEJF has commissioned two reports on alternatives to burning that will aid states and tribes in addressing this element of the ESMP.

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<sup>39</sup> 64 FR 35728.

<sup>40</sup> 64 FR 35766, §51.308 (d) (1) (B) (iv).

<sup>41</sup> States/tribes could consider adopting existing burn qualification programs sanctioned by land management agencies.

#### 3.6.4. Element 4. Public Notification of Burning

Public notification is a significant part of the CAA, and is inherent in the Rule. Public notification under an enhanced smoke management program should be at least what is required by EPA for a certifiable smoke management program,<sup>42</sup> and may include extra activities, depending on location. Generally, regardless of what kind of smoke management program is in place, significant effort should be made to educate and notify the public about burning, its impacts, as well as its benefits.

#### 3.6.5. Element 5. Air Quality Monitoring

Monitoring of smoke impacts may be a very sophisticated effort using EPA reference method sampling equipment or it may be as simple as creating a hand-written log of smoke behavior as assessed visually. Minimal procedures would be most likely in areas of little burn activity or when farther away from Class I areas.

#### 3.6.6. Element 6. Surveillance and Enforcement

Good communication between regulators and land managers/owners can significantly reduce the need for surveillance and enforcement. An atmosphere of trust and cooperation between regulators and land managers/owners can help facilitate emissions reductions and compliance with air quality regulations. Performance and compliance standards may be established under various methods of operations.

#### 3.6.7. Element 7. Program Evaluation

Enhanced smoke management programs need to be reviewed on a periodic basis for their effectiveness by the regulatory authority and affected stakeholders. Formal periodic progress reports could coincide with time intervals used to evaluate reasonable progress. The Rule requires progress reports every five years.<sup>43</sup> However, shorter review and evaluation time periods would better determine if enhanced smoke management programs are effective.

#### 3.6.8. Element 8. Burn Authorization

Burn authorization requirements are expected to vary depending upon the amount of burning that is occurring, the fire source types that are conducting the burning, and the degree of impairment that exists or may be expected to occur as a result of the burning. The proximity of mandatory Class I and non-attainment areas may also have a bearing on the complexity of the burn authorization procedure that should be implemented.

#### 3.6.9. Element 9. Regional Coordination

Coordination of burning activity is critical to avoiding cumulative smoke impacts within and across source types in mandatory Class I areas. Coordination may range from a passive mode of information sharing between land managers/owners and/or the public to a more complex, active coordination in which burn decisions are altered based on jurisdictional authority and other activities that are occurring or have recently occurred. Methods for this inter-jurisdictional and regional coordination will need to be developed.

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<sup>42</sup> EPA Interim Policy, p.17-23.

<sup>43</sup> 64 FR 35768, § 1.308 (g) and 35772, §1.309 (d) (10).



The development process should be a collaborative one involving state, tribal, local and federal agencies, and private parties.

### 3.7 Criteria

*Policy Statement F: Enhanced smoke management programs will be based on the criteria of efficiency, economics, law, emission reduction opportunities, land management objectives, and reduction of visibility impact,<sup>44</sup> which will determine the rigor applied to the nine elements.*

According to the Rule, enhanced smoke management programs are to be included in implementation plans based on the criteria of efficiency, economics, law, emissions reduction opportunities, land management objectives, and reduction of visibility impacts. These criteria will influence the extent to which individual elements of the enhanced smoke management program are applied or the level of effort that is possible. For example, legal barriers may need to be removed and/or infrastructure may need to be developed to implement the enhanced smoke management program. The level of effort each state/tribe will apply to the nine elements of the enhanced smoke management program needs to be based on a *pre-determined* process or metric established by the regulatory authority that considers the public as well as stakeholders.

Additional examples of how states/tribes might consider the enhanced smoke management program criteria are listed below.

Efficiency: What are the resources, infrastructure, networking, workforce and information necessary to reduce visibility impairment in mandatory Class I areas? Is it feasible to share these items with another group in order to reduce redundancy or build on existing expertise?

Economics: What are the costs and incentives of the items listed under Efficiency? Are there ways to economically quantify improvements to regional haze in a local area? What is the economic trade-off of moving fuels off-site to be converted to another use or burned elsewhere? What are the economic costs to a landowner to look for emission reduction alternatives? What are the economic gains from improved habitats, functioning watersheds, species diversity and healthy ecosystems? What are the economic losses to a community associated with impairment, (e.g., property values, tourism, etc.)?

Law: Are there federal, state, tribal ordinances, local rules or statutes that prohibit mechanical treatments or prohibit the regulation of burning? Are there conflicts with management or law pertaining to the Threatened and Endangered Species Act and/or the Wilderness Act?

Emission Reduction Opportunities: Where are the opportunities to consider reducing emissions through mechanical, biological, or chemical means? Where are the places where reducing emissions will be best done through smoke management techniques

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<sup>44</sup> 64 FR 35771, §51.309 (d) (6) (iv).

rather than moving fuels off-site or manipulating fuels through chemicals or biological decomposition or a combination of mechanical treatments and maintenance burning?

Land Management Objectives: Are there places where manipulating fuels is not an option because of land management objectives, e.g., tribal cultural values, wildlife habitat, crop requirements, residue removal constraints, or inaccessible terrain? Are there places where manipulating fuels is more conducive to the land management objective, e.g., areas targeted for commodity production, watershed protections or tribal cultural activities sites? Are there places that restoration of ecosystem function may have a high priority?

Reduction of Visibility Impacts: Using the current information and science available to a state/tribe, how will an enhanced smoke management program decrease impacts to visibility?

### **3.8 Application**

*Policy Statement G: Enhanced smoke management programs may be applied uniformly to source sectors throughout a state's jurisdiction or they may be tailored to source sectors and/or geographic areas to address presumed or confirmed visibility impairment.*

Since emissions from fire sources contribute differently to visibility impairment in Class I areas and/or may be from different geographical areas, tailoring of an enhanced smoke management program to a fire source sector and/or a geographic area may be appropriate. This section presents options for states/tribes to consider in tailoring such a program. The first two options are built upon a presumption that certain sources or situations contribute to visibility impairment. The third option relies upon confirmation of impairment attributed to a source sector. The options described below may be implemented independently or in any combination, as deemed appropriate by the state/tribe.

The options explored here are not exhaustive or definitive in structure or design. However, any selected option must still consider the nine elements as well as the criteria as specified in the Rule. Application of these or any other options can be considered at the source sector level, but should also be sensitive to the potential for cumulative impacts of all fire source sectors. Additionally, state/tribal authorities will want to be mindful of equitable treatment of sources in the implementation of their enhanced smoke management programs.

#### 3.8.1 Source Sector Option

Under this option, there is a presumption that certain source sectors are reasonably expected to contribute to visibility impairment based on historical data and/or projected future burning. Where this presumption exists, states/tribes could choose to apply the nine enhanced smoke management program elements to those source sectors with a greater level of effort.

### 3.8.2 Situational Option

This option describes certain situations that, if true, would indicate to the state/tribe the need for a greater level of effort of implementation of the enhanced smoke management program elements. The scenarios below can be used by states/tribes in the development of area and/or source sector-specific enhanced smoke management programs. Each scenario describes a combination of emission levels, NAAQS status (e.g., non-attainment area status) and proximity to Class I areas that may indicate the level of enhanced smoke management program needed.

The following is an example of how this situational option could be applied, and is modeled after the Prevention of Significant Deterioration (PSD) permitting requirements<sup>45</sup> for major stationary sources (see table in footnote below).<sup>46</sup> In this example, the emissions are the annual totals that would be produced by a fire source sector. The attainment status accounts for existing non-attainment area (NAA) issues that a state/tribe may need to address.<sup>47</sup> The proximity parameter addresses how close a fire source sector is to a Class I area. This example is predicated on all three factors applying simultaneously.

- a) Emissions levels: Greater than 50 tons/yr of PM<sub>10</sub> (total/year) within state/tribe for all anthropogenic fire sources  
 Attainment status: No PM<sub>10</sub> or Ozone NAAs  
 Proximity: Within and near (i.e., <50 km) a Class I area
- b) Emissions levels: Greater than 250 tons/yr of PM<sub>10</sub> (total/year) within state/tribe for all anthropogenic fire sources  
 Attainment status: No PM<sub>10</sub> or Ozone NAAs  
 Proximity: Within 100 km of Class I area
- c) Emissions levels: Greater than 100 tons/yr PM<sub>10</sub> (total/year) within state/tribe for all anthropogenic fire sources

<sup>45</sup> 40 CFR § 52.21.

<sup>46</sup> This table provides estimates of acres burned to give an idea of approximate fire size using the available emission factors for the source type indicated. These numbers are not an exact representation of acreages, emission factor, and fuel loading of all fires for each type. Note: Agriculture and Rangeland numbers are the same.

| Tons (PM <sub>10</sub> ) | Acres Burned (Annual Total)                 |                                       |                                     |
|--------------------------|---|---------------------------------------|-------------------------------------|
|                          | Wildland<br>(Forest: 20 tons/acre consumed) | Agriculture<br>(4 tons/acre consumed) | Rangeland<br>(2 tons/acre consumed) |
| 250                      | 833   | 12,500                                | 12,500                              |
| 100                      | 333   | 5,000                                 | 5,000                               |
| 70                       | 233   | 3,500                                 | 3,500                               |
| 50                       | 167   | 2,500                                 | 2,500                               |

<sup>47</sup> When PM<sub>2.5</sub> NAAs are identified, then PM<sub>2.5</sub> could also be used in assessing the level of enhanced smoke management program needed.

Attainment status: Moderate PM<sub>10</sub> or Ozone NAA or Maintenance Area  
Proximity: Within 100 km of Class I area

d) Emissions levels: Greater than 70 tons/yr PM<sub>10</sub> (total/year) within state/tribe for all anthropogenic fire sources

Attainment status: Serious PM<sub>10</sub> or Ozone NAA  
Proximity: Within 100 km of Class I area

e) Emissions levels: Greater than 250 tons/yr of PM<sub>10</sub> (total/year) within state/tribe for all anthropogenic fire sources

Attainment status: Any level of Attainment/NAA  
Proximity: Distances farther than 100 km

### 3.8.3 Impact Based Option

A state/tribe can determine the level of effort of an enhanced smoke management program based on the relative contribution (i.e., impact) of each of its fire source sectors and cumulatively all fire source sectors' impacts to visibility impairment in Class I areas.

One possible approach that could be used is related to deciview, the metric commonly associated with visibility analyses and also used within the PSD permitting process. Under this scenario, states/tribes would determine the frequency, magnitude (in deciview), and duration of a source sector's contribution to visibility impairment (on the 20 percent "worst" visibility days in a calendar year). To prevent degradation of the 20 percent "best" visibility days in a calendar year, the state/tribe may want to increase the rigor of its enhanced smoke management program if emissions from fire sources correspond with declining visibility.

In order to determine these components, a visibility impairment assessment could be conducted using Interagency Monitoring of Protected Visual Environments (IMPROVE) data, emissions data derived from fire activity data, contemporary visibility modeling techniques, or other available information. Note that currently, final analysis of IMPROVE data sometimes lags as much as a year from when data were collected. This situation may also be true of visibility impairment assessments. Therefore, there may be lag time between when impacts were measured and how soon enhanced smoke management programs could be implemented or revised.

Based on the results of the visibility assessment, the states/tribes could determine what level of effort of enhanced smoke management program corresponds to the degree of impact.

### **3.9 Collaborative Development**

*Policy Statement H: The development and application of enhanced smoke management programs, including the consideration of the criteria (F), will be done collaboratively with state, tribal, local and federal agencies and private parties.*

The GCVTC Report cites the importance of a collaborative process in a number of places with regard to fire.<sup>48</sup> EPA's Interim Policy also supports collaborative efforts and specifies roles for the stakeholders in the process. The underlying tenet of the WRAP process further conveys the importance of approaching visibility and the Rule with stakeholder input and use of collaborative processes.

Utilizing land managers and affected publics as well as the responsible air regulatory entity can result in an enhanced smoke management program that will meet the expectations of EPA for SIP submittal under Section 309, and may reduce localized controversy. There are certain steps in the enhanced smoke management program development process that will need cooperative efforts, such as the establishment of the criteria to be used by the regulatory entity to determine the level of effort needed for the enhanced smoke management program. The criteria for determining the level of effort is a significant issue as there is a paucity of data on emissions and visibility impairment from fire sources. This level of effort assessment is also tied to developing funding mechanisms for the enhanced smoke management program, which the GCVTC urged be developed cooperatively.

The SIP/TIP development process will be initiated by the respective regulatory entity, which is the responsible party for initiating the collaborative efforts. The earlier in the SIP development process that a collaborative effort could be initiated would likely result in a more valuable result. It is envisioned that, through a collaborative effort, a schedule and process for implementing the enhanced smoke management program will be created that is acceptable to both EPA and affected stakeholders. Using a collaborative process will facilitate the needed equity among fire source sectors as well.

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<sup>48</sup> GCVTC Report, p. 49-50.

# **APPENDICES**

## **Appendix A**

### **Glossary**

This glossary is intended to facilitate readers' consistent review of this Policy. This glossary is not intended to be a complete list of all terms and acronyms. An asterisk (\*) indicates a definition from Section 1.1 of the WRAP Fire Emissions Joint Forum (FEJF) Workplan, February 25, 1999. A number sign (#) indicates a definition from the WRAP Policy for Categorizing Fire Emissions, November 15, 2001.

Agricultural Fire/Burning\* - Any fire ignited by management actions to meet specific objectives (i.e., managed to achieve resource benefits) on agricultural land.

Agricultural Land\* - Agricultural land includes croplands, pasture, and other lands on which crops or livestock are produced (PL 104-127, Section 1240A). Rangeland will be included with wildland for the purposes of the FEJF work.

Alternatives to Burning - Land management practices that treat fuel without using fire.

Anthropogenic - Produced by human activities.

Anthropogenic Emissions Source Classification (“anthropogenic”)<sup>#</sup> - A categorization that designates which fire emissions contribute to visibility impairment in a Federal Class I area. “Anthropogenic” emissions must be controlled to achieve progress toward the 2064 natural conditions goal [i.e., natural visibility goal] for each Federal Class I area in the WRAP region. This classification includes natural and human-caused ignitions.

Area Source - A source category of air pollution that generally extends over a large area. Prescribed burning, field burning, home heating, and open burning are examples of area sources.

Attainment Area - An area considered to have air quality as good as or better than the national, state/tribe or local ambient air quality standards. Note that an area may be in attainment for one or more pollutants but be a non-attainment area for one or more other pollutants.

Best Available Control Measures (BACM) - A term used to refer to the most effective measures (according to EPA guidance) for controlling small or dispersed particulates and other emissions from sources such as roadway dust, soot and ash from woodstoves and open burning of rush, timber, grasslands, or trash.

Best Management Practices (BMPs) - A term applied collectively to any administrative or on-the-ground procedure that reduces the negative impacts of some action. An example of a Best Management Practice with respect to air quality would be conducting a prescribed burn when atmospheric ventilation is good, which in turn promotes smoke dispersal.

Class I Area - See Mandatory Class I Area and Non-Mandatory Class I Area.

Control of Fire Emissions<sup>#</sup> - Actions may be taken to control fire emissions by utilizing best management practices such as the use of alternatives, biomass utilization, and other emission reduction techniques.

Criteria Pollutants - The 1970 amendments to the CAA required EPA to set National Ambient Air Quality Standards (NAAQS) for certain pollutants known to be hazardous to human health. EPA has identified and set standards to protect human health and welfare for pollutants: ozone, carbon monoxide, particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), sulfur dioxide, lead, and nitrogen oxide. The term, "criteria pollutants" derives from the requirement that EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.

Cumulative Effects - The effect on the environment that results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency, entity or person undertakes such action. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Deciview - A unit of visibility proportional to the logarithm of the atmospheric extinction. Under many circumstances a change in one deciview will be perceived to be the same on clear and hazy days.

Ecosystem Maintenance Burning<sup>#</sup> - A prescribed fire or wildfire managed for resource benefits, in an ecosystem that is currently in an ecologically functional and fire resilient condition, that is utilized to mimic the natural role of fire.

Ecosystem Restoration Burning<sup>#</sup> - The re-establishment of natural vegetation that may be accomplished through the reduction of unwanted and/or unnatural levels of biomass, which may have accumulated due to management action. Prescribed fires, wildfires managed for resource benefits and mechanical treatments may be utilized to restore an ecosystem to an ecologically functional and fire resilient condition.

Emission - Pollution discharged into the atmosphere. Examples of emissions sources are smokestacks, other vents, and surface areas of commercial or industrial facilities; from residential chimneys; and from motor vehicle, locomotive, aircraft, or other non-road engines.

Emission Inventory - A listing, by source, of the amount of air pollutants discharged into the atmosphere.

Emission Cap - An enforceable limit on the amount of specific air pollutants that can be released or on the amount of a specific pollutant that is allowed to be in the air in a



defined geographic area, and that has regulatory consequences. See also Emission Goal and Emission Target.

Emission Goal - A desired future outcome that may be represented by a numeric indicator, but without regulatory consequences, and as distinguished from a limit (i.e., target or cap). See also Emission Cap and Emission Target.

Emission Reduction - A strategy for controlling smoke from prescribed fires that minimize the amount of smoke output per unit of area treated or other objective unit of accomplishment.

Emission Target - A firm limit on the amount of specific air pollutants that can be released or on the amount of a specific pollutant that is allowed to be in the air in a defined geographic area, but without regulatory consequences (as distinguished from a cap). See also Emission Cap and Emission Goal.

Enhanced Smoke Management Program (ESMP) - A program for fire emissions that considers visibility effects, in addition to health and nuisance objectives, and is based on the criteria of efficiency, economics, law, emission reduction opportunities, management objectives, and reduction of visibility impact.

Federal Class I area - see Class I Area.

Fire\* - When this term appears, it refers inclusively to wildfire, prescribed natural fire/wildland fire managed for resource benefits, prescribed fire, rangeland fire, and agricultural fire.

Fire Source Sector - A segment of fire attributed to a particular management or ownership, e.g., wildland prescribed fire, agricultural prescribed fire, wildfire, and wildland fire use. Also known as a fire source.

Fire Use - A term utilized in federal land management that includes both prescribed fire and wildland fire use.

Fuel Moisture Content - The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees F.

Fuel Reduction - The manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Fuel Treatment - Manipulation or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control (e.g., lopping, chipping, crushing, piling and burning).

Implementation Plan - Plans devised by states and/or tribes to carry out their responsibilities under the CAA. SIPs/TIPs must be approved by the U.S. Environmental Protection Agency and include public review.

Interagency Monitoring of Protected Visual Environments (IMPROVE) - A cooperative visibility monitoring effort, using a common set of standards across the United States, between the EPA, federal land management agencies, and state air agencies.

Jurisdiction - A geographic area of authority.

Land Managers\* - When this term appears, it refers inclusively to federal, state, tribal, and private land managers.

Manage Fire Emissions<sup>#</sup> - Actions may be taken to manage fire emissions to minimize impacts on visibility, public health, and nuisance concerns. Some management actions include concepts such as the timing of ignitions for better dispersion and consideration of downwind air quality and visibility. It may also include consideration of factors related to the area to be burned such as the fuel moisture condition and other physical parameters. Manage fire emissions is analogous to smoke management.

Mandatory Class I Area - An area set aside under the CAA to receive the most stringent protection from air quality degradation. Mandatory Class I Federal Areas are (1) international parks, (2) national wilderness areas and memorial parks larger than 5,000 acres in size, (3) national parks that exceed 6,000 acres in size and which were in existence when the 1977 CAA amendments were enacted. The extent of a mandatory Class I Federal area includes subsequent changes in boundaries, such as park expansions.

Modeling - The artificial simulation of some event or action that has quantifiable results. Mathematical expressions and computers are frequently used in modeling.

National Ambient Air Quality Standards (NAAQS) - See Criteria Pollutants.

National Environmental Policy Act (NEPA) - Establishes procedures that federal agencies must follow in making decisions on federal actions that may impact the environment.

National Visibility Goal - Section 169A of the CAA sets forth a national goal for visibility which is the “prevention of any future, and the remedying of any existing, impairment of visibility in Class I areas which impairment results from manmade air pollution.”

Natural Background Condition<sup>#</sup> - An estimate of the visibility conditions at each Federal Class I area that would exist in the absence of human-caused impairment.

Natural Emissions Source Classification (“natural”)<sup>#</sup> - A categorization that designates which fire emissions can result in a natural reduction of visibility for each Federal Class I

area in the WRAP region. This classification includes natural and human-caused ignitions.

Natural Ignition<sup>#</sup> - Fire/burn ignited due to a natural (i.e., non-human-caused) event, e.g., fire ignited by lightning or volcanic eruption.

Natural Visibility Goal - The ultimate goal of the regional haze program is the absence of visibility impairment due to human-caused emissions.

Non-Attainment Area (NAA) - An area identified by an air quality regulatory agency through ambient air monitoring (and designated by the EPA) that presently exceeds federal, state/tribe or local ambient air quality standards. See Attainment Area above.

Non-Mandatory Class I Areas - Class I areas designated by states or tribes, but are not deemed mandatory by the CAA. As of January 2002, Class I areas designated by tribes include: Fort Peck Reservation in MT, Northern Cheyenne Reservation in MT, Flathead Reservation in MT, Yavapai-Apache Reservation in AZ (Class I status under litigation), and Spokane Reservation in WA.

Nuisance Smoke - Unwanted smoke that does not exceed NAAQS primarily for particulate matter.

Particulate Matter - Any liquid or solid particles. "Total suspended particulates" as used in air quality are those particles suspended in or falling through the atmosphere. They generally range in size from 0.1 to 100 microns.

Plume Blight - Visual impairment of air quality that manifests itself as a coherent plume.

PM<sub>10</sub> - Particulate matter of aerodynamic diameter less than or equal to 10 micrometers. Emissions of PM<sub>10</sub> are significant from fugitive dust, power plants, commercial boilers, metallurgical industries, mineral industries, forest and residential fires, and motor vehicles.

PM<sub>2.5</sub> - Particulate matter of aerodynamic diameter less than or equal to 2.5 micrometers. A measure of fine particles of particulate matter that comes from fuel combustion, agricultural burning, woodstoves, etc.

Point Source - A fixed source of pollution. An example is the smoke stack of a coal-fired power plant or smelter.

Prescribed Fire<sup>\*</sup> - Any fire ignited by management actions to meet specific objectives, i.e., managed to achieve resource benefits.

Rangeland<sup>#</sup> - Land on which the historic climax plant community is predominantly grasses, grass-like plants, forbs, or shrubs. Includes lands re-vegetated naturally or artificially when routine management of that vegetation is accomplished mainly through

manipulation of ecological principles. Rangeland includes natural grasslands, savannas, shrub lands, most deserts, tundra, alpine communities, coastal marshes and wet meadows (Natural Resources Conservation Service National Range and Pasture Handbook, 1997).

Regional Haze - Visibility impairment caused by the cumulative air pollutant emissions from numerous sources over a wide geographic area.

Smoke Effects\* - The effects on visibility (both plume blight and regional haze), public nuisance, and the health-based NAAQS due to emissions from fire.

Smoke Intrusion - Smoke from prescribed fire entering a designated area at unacceptable levels.

Smoke Management Efforts - Programs, practices and techniques to minimize and/or reduce smoke emissions or impacts from fire.

State Implementation Plan (SIP)<sup>#</sup> - See Implementation Plan.

Suppression - A management action intended to protect identified values from a fire, extinguish a fire, or alter a fire's direction of spread.

Transport Region State - One of nine states that make up the Grand Canyon Visibility Transport Region: Arizona, California, Colorado, Idaho, Nevada, New Mexico, Oregon, Utah, and Wyoming.

Tribal Implementation Plan (TIP)<sup>#</sup> - See Implementation Plan.

Visibility Impairment - Any humanly perceptible change in visibility (light extinction, visual range, contrast, coloration) from that which would have existed under natural conditions.

Wildfire\* - Any unwanted, non-structural fire.

Wildfire Managed for Resource Objectives<sup>#</sup> - The management of naturally ignited fires, regardless of land type or ownership, to accomplish specific, pre-stated resource management objectives in predefined geographic areas with or without a plan in place. This term is considered to be analogous with the terms Wildland Fire Managed for Resource Benefits and Prescribed Natural Fire that are used in regulations and policies regarding federal wildlands.

Wildland\* - An area where development is generally limited to roads, railroads, power lines, and widely scattered structures. The land is not cultivated (i.e., the soil is disturbed less frequently than once in 10 years), is not fallow, and is not in the USDA Conservation Reserve Program (CRP). The land may be neglected altogether or managed for such purposes as wood or forage production, wildlife, recreation, wetlands, or protective plant cover (EPA Interim Air Quality Policy). The land is not "agricultural land" as

operationally defined above. Silvicultural land and rangelands (per the FEJF charge), woodlots, and private timberlands will be included with wildlands for the purposes of the FEJF work.

Wildland Fire<sup>#</sup> - All types of fire (see definition of fire above), except fire on agricultural land.

Wildland Fire Managed for Resource Benefits/Prescribed Natural Fire\* - These terms both have current use in regulations and policies. They are considered to be synonymous and are used interchangeably in this work plan. These terms refer to the management of naturally ignited fires to accomplish specific, pre-stated resource management objectives in predefined geographic areas outlined in the fire management plan. Also referred to as Wildland Fire Use.

## **Appendix B Related Documents Listing**

### **Regional Haze Rule**

Published in the Federal Register on July 1, 1999, 64 FR 35714.

[http://www.epa.gov/ttn/oarpg/t1/fr\\_notices/rhfedreg.pdf](http://www.epa.gov/ttn/oarpg/t1/fr_notices/rhfedreg.pdf)

### **Grand Canyon Visibility Transport Commission Report**

Grand Canyon Visibility Transport Commission, Recommendations for Improving Western Vistas, Report to the U.S. EPA, June 10, 1996.

<http://www.wrapair.org> Go to the GCVTC link.

### **EPA Interim Air Quality Policy on Wildland and Prescribed Fire**

U.S. EPA, Office of Air Quality Planning and Standards, Interim Air Quality Policy on Wildland and Prescribed Fires, April 23, 1998.

<http://www.epa.gov/ttn/oarpg/t1/memoranda/firefnl.pdf>

### **AAQTF Recommendation on Air Quality Policy**

Agricultural Air Quality Task Force, Air Quality Policy on Agricultural Burning, Recommendation to the U.S. Department of Agriculture, November 10, 1999.

<http://fargo.nserl.purdue.edu/faca/Archives/2000/Policy/Burning%20Policy.htm>

### **Tribal Authority Rule**

Published in the Federal Register on February 12, 1998, 63 FR 7253.

<http://www.epa.gov/fedrgstr/EPA-AIR/1998/February/Day-12/a3451.htm>

### **WRAP Policy for Categorizing Fire Emissions**

Approved by the Western Regional Air Partnership, November 15, 2001.

<http://www.wrapair.org/commindex.htm> Go to the FEJF Task Teams, then Natural Background.

### **Wildland Fire: Elements of a Basic Smoke Management Program Draft Report**

Completed for the FEJF on July 10, 2001.

<http://www.wrapair.org/commindex.htm> Go to the FEJF Task Teams, then Basic Smoke Management.

### **Smoke Management Program Surveys**

<http://www.wrapair.org/commindex.htm> Go to the FEJF, then Basic Smoke Management.

- 1) Wildland Smoke Management Program Survey, January 26, 2001
- 2) Boulder Wildland Smoke Management Program Survey, February 2, 2001
- 3) Agricultural Burning Smoke Management Program Survey, March 30, 2001
- 4) An Assessment of Tribal Air Quality Data and Programs in the Western United States, The Institute for Tribal Environmental Professionals (ITEP), September 2001

### **Class I Area Map**

<http://www.wrapair.org> Go to About WRAP, then WRAP Boundaries and Regional Visibility Planning in the West.

## **Appendix C**

### **Enhanced Smoke Management Program: Implementation Guidance**

#### **C. 1 Regional Haze Rule Implementation Plan Process**

The Rule requires states to develop State Implementation Plans (SIPs) for addressing regional haze in the Nation's 156 mandatory Class I areas.<sup>49</sup> Additionally, the Rule requires effective management of fire sources.

In general, the SIP/TIP process includes the following steps: state/tribal agency technical analyses; identification of necessary emission reductions; identification of control strategies to achieve emission reductions; demonstration of reasonable further progress; submittal of SIP/TIP to EPA for consideration/approval; public review/comment; EPA approval of SIP/TIP; five-year state/tribe review for reasonable progress and SIP/TIP re-submittal.

Under Section 309, states are required to, and tribes may, have a regional haze implementation plan that addresses the Class I areas of the Colorado Plateau (the 16 Class I areas specified by the GCVTC)<sup>50</sup> submitted by December 31, 2003. The Rule stipulates that states must commit to implement all SIP measures from December 31, 2003 through December 31, 2018.<sup>51</sup> Further, all mandatory Class I areas in the GCVTC Transport Region, other than the Colorado Plateau 16, may be addressed in SIPs/TIPs by the 2008 Section 309 deadline.<sup>52</sup>

Under Section 308 states must, and tribes may, incorporate the requirements of the Rule into their implementation plans within 12 months of designation as PM<sub>2.5</sub> attainment, or within three years after designation as PM<sub>2.5</sub> non-attainment, but no later than December 31, 2008. Under Section 308, all mandatory Class I areas, except those addressed under Section 309, will be addressed in the SIP/TIP submittal tied to the PM<sub>2.5</sub> designation.<sup>53</sup>

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<sup>49</sup> The Rule is only applicable to mandatory Class I areas (see Appendix A & Appendix B for additional information on mandatory Class I areas). States/tribes in the WRAP region may utilize the WRAP ESMP Policy to protect visibility in non-mandatory Class I areas.

<sup>50</sup> The GCVTC Report specified 16 mandatory federal Class I areas on the Colorado Plateau that were adopted into Section 309 of the Regional Haze Rule. These 16 Class I areas are: Grand Canyon National Park, Sycamore Canyon Wilderness, Petrified Forest National Park, Mount Baldy Wilderness, San Pedro Parks Wilderness, Mesa Verde National Park, Weminuche Wilderness, Black Canyon of the Gunnison Wilderness, West Elk Wilderness, Maroon Bells Wilderness, Flat Tops Wilderness, Arches National Park, Canyonlands National Park, Capital Reef National Park, Bryce Canyon National Park, and Zion National Park. 64 FR 35770, §51.309 (b) (1).

<sup>51</sup> 64 FR 35770, §51.309. EPA Region 9 has determined that implementation schedules may be negotiated as part of the SIP/TIP process and has previously accepted up to one year for implementation of SIP/TIP programs.

<sup>52</sup> 64 FR 35773, §51.309.

<sup>53</sup> 64 FR 35765, §51.308 (b) (1), (2).

It is anticipated that the establishment of enhanced smoke management programs will be incorporated into the SIPs/TIPs submitted to EPA in order to meet the requirements of the Rule. Within the context of smoke management, it is recommended that states/tribes integrate their NAAQS and visibility SIP/TIP requirements.

Under the WRAP ESMP Policy there are nine elements of an enhanced smoke management program that meet the requirements of the Rule. For each of the enhanced smoke management program elements, there are implementation examples listed to assist states/tribes in developing their enhanced smoke management programs. This is not meant to be an exhaustive list, and states/tribes may also want to review the Fire Emissions Joint Forum (FEJF) draft report on Wildland Basic Smoke Management Program Elements as well as the EPA Interim Policy and the AAQTF Recommendation on Air Quality Policy for additional suggestions.<sup>54</sup> The level of effort each state/tribe would apply to the nine elements of the enhanced smoke management program needs to be based on a pre-determined process or metric developed collaboratively.

## **C. 2 Elements of an Enhanced Smoke Management Program**

### C.2.1. Element 1. Actions to Minimize Emissions from Fire

A wide range of opportunities to minimize emissions exists depending upon the fire source. Emission reduction techniques may be as simple as changing ignition timing to allow for more efficient combustion. Other techniques may include the use of mechanical means. Options to provide incentives and emission goals may also serve this purpose.

#### C.2.1.1 Emission Reductions Techniques

Under an enhanced smoke management program, provisions are made to account for emission reduction techniques that are utilized when burning. Documentation of emission reduction practices that were considered in the planning or implementation of burns also support annual emission goals and associated emissions tracking requirements. This documentation may be part of a burn plan or other data collection or reporting system that is used to meet annual emission goals and associated emissions tracking requirements as developed by the FEJF.

- Reducing the fuel load to be burned can reduce emissions. This can be accomplished on forestland by not treating (no burning) portions of the unit, yarding, consolidating, or isolating non-merchantable material; providing public firewood access before the burn; finding off-site use for more of the wood before the burn; using chemicals; burning when non-target fuels have a high fuel moisture; using alternative mechanical treatments, and rapid mop-up.
- In agriculture, emissions can be reduced by baling and removing some of the residue, spot burning only needed areas of the field, strip burning and backing fires. Emissions can also be reduced by moving the burning season into a different

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<sup>54</sup> See Appendix B, Related Documents Listing.



time of the year if changes in fuel consumption or emissions factors can be achieved.

- Land managers/owners should strive for the most efficient combustion possible. Vegetation should be dry and in a condition that will minimize the smoke emitted during combustion. When pile burning, material should be burned in dirt-free, not overly compressed, cured, and dry piles. Piled material should be covered if possible. Fires should be ignited so as to burn as rapidly as possible, in ways that shift the proportion of the burn from the smoldering phase to the flaming phase. Minimizing duff consumption and smoldering through fuel moisture considerations will reduce emissions as well. Land managers/owners should only burn those fuels essential to meet resource management objectives and burn piles when other burns are not feasible, such as in snow or rain.

Regulatory authorities and other interest groups may also use WRAP guidance information, such as its Alternatives to Burning document that is currently under development by the FEJF, as a reference for specific alternatives. Another resource is the Smoke Management Guide for Prescribed and Wildland Fire, 2001 Edition (in press).<sup>55</sup>

#### C.2.1.2 Burn Manager Qualification

Another manner in which to reduce emissions is a burn manager qualification program that certifies the land manager/owner is knowledgeable of alternative burning practices and emission reduction techniques, and is capable of implementing them. Burn manager qualification programs already exist in most federal, state and tribal land management agencies.

A certification and qualification process could be established by prescribing what training meets requirements, such as training provided by the National Wildfire Coordination Group (NWCG), and by implementing training seminars and other institutional opportunities for land managers/owners to gain the necessary skills and knowledge to implement proper smoke management techniques. Land manager/owner certification/qualification programs may be similar to those required by federal land management agencies like those offered by the NWCG. For non-federal land managers/owners that cannot participate in federal sponsored training, states/tribes could develop their own certification processes and host training courses such as a “State Forestry Prescribed Fire Correspondence Course” or an “Interagency Basic Prescribed Fire Course”.

In an enhanced smoke management program, burner qualifications might be required on permit applications and tracked by the regulatory agency. Burn size or emission output might be limited depending on the level of burner qualification. For example, a Level I qualified burner can burn up to *abc* acres/tons while a Level II qualified burner can burn up to *cde* acres/tons, and so on.

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<sup>55</sup> Smoke Management Guide for Prescribed and Wildland Fire, 2001 Edition (in press), produced by the National Wildfire Coordinating Group (NWCG) Fire Use Working Team.

As examples, a few types of burner qualifications are listed below:

- Satisfactory completion of the “State Forestry Prescribed Fire Correspondence Course” and direct experience in three prescribed burns prior to taking the course, or satisfactory completion of the “Interagency Basic Prescribed Fire Course” and direct experience in three prescribed burns before or after the course.
- Completion of a NWCG or federal/state/tribe land manager equivalent course dedicated to smoke management or attendance at a state approved smoke management workshop.
- Successful completion of a training program (which includes home study, 8-hour classroom session, and a written exam), documented practical experience in prescribed burning, and a signed agreement to conduct all burns in compliance with all applicable laws and ordinances,
- Land management agencies and the state/tribe develop and present interagency training to promote understanding of the regulatory context and affects of air pollution, fire ecology, and smoke management.

### C.2.1.3 Incentives

Providing incentives to landowners and land managers for practicing emission reduction techniques and utilizing alternatives to burning is yet another option for states/tribes to include in enhanced smoke management programs. This approach could be seen as addressing equity issues in that those who make efforts to reduce emissions are rewarded for their efforts. The reward to the landowner/land manager could be seen in terms of environmental gains as well as financial gain. The reward to communities could be seen in retaining property values, and maintaining economic development and tourist-related industries.

Environmental win-win options may be that by decreasing emissions, a burner is given a higher priority when allocating burn days. Or, by utilizing alternatives, a higher priority is given to a burner when attempting to burn. Similarly, financial win-win options may be to decrease any assessed fees or burn costs when alternatives are used before burning. The system rewards those that take the extra time, effort and money to utilize emission reductions and alternatives. Those who either choose not to, or for land management constraints, cannot utilize emission reductions/alternatives, would pay more.

Landowners/land managers could be afforded the opportunity to deal with other sources to negotiate emissions management strategies for financial gain that would result in a net emissions decrease. In January 2001, the EPA issued a policy document that provides information on discretionary economic incentive programs.<sup>56</sup> In May 2002, the EPA provided additional guidance on voluntary and backstop approaches to emissions reduction in its Section 309 Annex to the Regional Haze Rule for stationary sources of sulfur dioxide.<sup>57</sup> In an enhanced smoke management program, an incentive may be

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<sup>56</sup> EPA Improving Air Quality with Economic Incentive Programs (EIP Guidance), January 2001.

<sup>57</sup> 67 FR 30418.

available if a landowner/land manager can reduce his/her emissions and gain financially from not only supplying a marketplace with raw materials, but also receiving payment for emissions not generated.

#### C.2.1.4 Emissions Goal/Limit

Another action that could be taken by regulatory authorities to minimize emissions is to establish an emissions goal or limit within portions of a state/tribe, the entire state/tribe or over a multi-state/tribe region. How to meet the goal or limit would be left to the discretion of the land managers/owners. Establishing such a goal or limit would encourage land managers/owners to seek alternative methods of burning and alternatives to burning so as to retain the ability to burn where no alternatives are available.

#### C. 2.2 Element 2. Evaluation of Smoke Dispersion

A variety of tools and methods exist by which a land manager/owner could reduce smoke impacts over periods ranging from several hours to several days. Enhanced smoke management programs could contain the following criteria to support the dispersion estimation process.

- States/tribes may provide or find ways to provide websites of current weather and fuels information (i.e., fuel moisture) specific to meet the needs of land managers/owners. Land managers/owners would utilize this information to time ignitions during periods of expected good smoke dispersion.
- Acceptable weather and climatic conditions can be prescribed for burning in specific areas so as to avoid impacting Class I areas. A predefined set of weather elements would provide a degree of certainty as to when burning opportunities would be most likely to occur. Burning should be banned during periods when air stagnation advisories or air pollution alerts are in effect.
- As described previously, a burner qualification and certification program could be established that includes advanced training on understanding the relationships between weather and smoke dispersion. Individuals who have greater knowledge and understanding of the factors affecting smoke behavior may make better decisions on when and when not to burn.
- A more sophisticated and more comprehensive effort to evaluate smoke behavior would be to conduct smoke dispersion modeling in the planning and implementation process for burning. Dispersion modeling may be conducted by a state/tribal agency or other delegated regulatory authority. Such modeling results could be used as a screening approach to determine if there should be extra reason for concern about the proposed burn(s). This approach may assist in determining cumulative effects of multiple burns.

- Centralized decision-making of burn decisions with coordination among land managers/owners (either by source type or between sources) would require a more intensive effort of involvement by groups involved in burning. Land managers/owners would check-in with a centralized burn authority to receive information about other source activity prior to conducting a burn.
- A rigorous, timely, centralized decision-making system established with the intent of providing "go/no-go" decisions affords a greater level of coordination that would rely on greater infrastructure and resources for support. Meteorologists and other specialists with knowledge of air quality, fire, weather and fuels interaction would provide services that direct where and when burning could occur.

### C. 2. 3 Element 3. Alternatives to Fire

The WRAP through its FEJF has commissioned two reports on alternatives to burning that will aid states and tribes in addressing this element of the enhanced smoke management program. These reports show potential methodologies for regulatory entities and their affected stakeholders to assess the potential for alternative use on both wildlands and agricultural lands in their respective jurisdiction. These reports also provide information on barriers to the use of alternatives, which is a requirement of section 309 of the Rule. States/tribes could establish websites with information describing the alternatives.

Land managers/owners may be required to assess the feasibility of using alternatives to fire where there are many competing sources or large amounts of burning occurring. This assessment could be based on established criteria, such as sustainability or potential fuel reduction. Burn plans and data systems could contain information that helps track the practice of using alternatives to fire. Emissions tracking systems<sup>58</sup> and reasonable further progress assessments could use this information to validate landowner/land manager's implementation of alternative practices as an emissions reduction technique.

Sources of smoke from geographic areas that continue to adversely affect a mandatory Class I area's 20 percent "worst" and "best" days, according to the Rule, may be required to implement measures that utilize alternatives to burning to the maximum extent feasible as a condition of further burning. Incentives could be identified wherein land owners/land managers have the opportunity to substitute emissions not produced in one area for emissions produced in another geographic area not affecting a Class I area's visibility as long as there is a net emissions decrease as a result of using the alternatives.

Geographic areas with sustained sources of adverse smoke impacts in mandatory Class I areas may consider burn curtailments if programs to minimize emissions, impacts and alternatives to fire use do not provide the necessary tools to meet reasonable progress toward the natural visibility goal. Such actions could be considered on a fire source basis so as to not impair one source's ability to use fire because of the failure of another source type to take needed actions to meet the natural visibility goal.

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<sup>58</sup> The WRAP's FEJF is currently preparing a policy on emissions tracking systems to assist states/tribes.

#### C. 2. 4 Element 4. Public Notification of Burning

Public notification is a significant part of the CAA, and is inherent in the Rule. Public notification under an enhanced smoke management program should be at least what is required by EPA for a certifiable smoke management program,<sup>59</sup> and may include extra activities, depending on location. Generally, regardless of what kind of smoke management program is in place, significant effort should be made to educate and notify the public about burning, its impacts on visibility as well as its benefits.

Public notification includes public education and media relations, and consists of activities such as issuing notices through the local news media including name and phone number of person/agency, fuel type, expected time and date of burn, location of burn, and the expected plume direction, extent, and duration. Public notification of non-burning alternatives that have been considered for a project could also be included.

Other means of notification may include the use of a website, public open houses or meetings, signs at burn sites, distribution of fact sheets that include information on smoke impacts, brochures, posters, notices, personal contact by phone or visit, or legal advertisements. It is a good practice to maintain a contact list of interested and affected publics, and make sure that notification of planned burns gets to everyone on that list. A plan for notifying the public could be part of the burn plan.

Effective public involvement, notification, and education can decrease complaints and resistance to burning projects, as well as prepare the public to manage their activities around scheduled burns. Public notification and education activities can also increase the public's faith in the different agencies and landowners, knowing that their health and welfare is being carefully considered in both planning and implementation. A well-developed public education and awareness program would not only serve the public but also fulfills a recommendation from the GCVTC.

Public awareness and education activities may be conducted by states/tribes, land managers/owners, or in cooperation by all. Training and guidance in public notification techniques could be provided to land managers/owners not accustomed to conducting such work, i.e., non-federal land managers/owners. Program administrators might consider developing an in-state/tribe public notification process to assist the non-federal land managers/owners. Programs could strive to enhance non-federal land managers'/owners' ability to involve public in planning by providing training and guidance, or open forums for disseminating information on planned burning activities that may affect visibility. If the public is involved in the planning of such activities regarding potential affects to them, there is less chance of resistance to the burn while it is in progress.

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<sup>59</sup> See Appendix B Related Documents Listing, EPA Interim Policy.

Finally, developing involvement by the community and participation by land managers/owners in the SIP/TIP and National Environmental Policy Act (NEPA) planning processes may be beneficial in developing common expectations.

#### C. 2. 5 Element 5. Air Quality Monitoring

Monitoring of smoke impacts may be a very sophisticated effort using sampling equipment and extensive modeling or it may be as simple as creating a log of smoke behavior.

Minimal procedures would be most likely in areas of little burn activity or when farther away from Class I areas. On-site record keeping with subsequent submittal to the state/tribe regulatory authority should be substantive enough for use in analysis of reasonable further progress tracking or emission reduction programs.

As burning activity increases, states/tribes and land owners/managers could consider conducting a more widespread and comprehensive monitoring program. The use of cameras, satellite imagery and aerial monitoring to track and document smoke movement could be considered. The use of IMPROVE monitored data may have to be supplemented by air quality monitoring outside of Class I areas to track smoke movement.

Also, using visitor surveys in Class I areas regarding visibility impairment perceived during their stay may be a way of generating subjective assessments of smoke impacts. Such information would only be used to provide further validation of impacts, as relying on surveys alone would be too subjective for states/tribes to administer reasonable smoke management programs.

#### C. 2. 6 Element 6. Surveillance and Enforcement

Good communication between regulators, land managers/owners and the public can significantly reduce the need for surveillance and enforcement. An atmosphere of trust and cooperation between regulators and land managers/owners can go a long way toward facilitating emissions reductions and compliance with air quality regulations.

Four primary methods under which surveillance and enforcement activities may occur are:

- Voluntary (Land manager/owner self-enforcement)
- Source sector regulator (e.g., Agricultural Burn Manager, Smoke Management Meteorologist)
- State/tribe oversight
- Centralized regulatory authority (state or tribe)

Criteria and activities described below may be applicable for use in any of the four methods. Some of the criteria can, obviously, only be enforced by a body that has legal standing to do so. Whichever of the four methods a state/tribe may choose to implement would be dependent upon the severity of the visibility impacts that are being addressed.

If states/tribes have regulations in place that govern smoke impacts, public complaints can serve to monitor compliance. Such regulations should define criteria for establishing these smoke impacts. The number and location of public complaints may be used to monitor air quality impacts of fires. The number of complaints may not necessarily be a trigger, rather the nature of the complaints and external verification of circumstances leading to the complaints. In some cases, smoke regulations may apply only to non-certified burning. In such cases certified burners cannot be shut down for complaints related to visibility, but can be shut down for a threat to health or safety.

Some criteria for taking action on smoke impacting visibility include:

- Is the visibility impact occasional or constant?
- Is the use of property affected?
- What are the economic impacts of both burning and not burning?
- Is the location of the impact within or outside of a Class I area?
- What is the duration of the impairment?
- What is the number of people affected?
- How many complaints have been received?
- Was the burn conducted in compliance with applicable regulations?
- Has the visibility impact been mitigated to the extent practicable?
- Is the public health threatened?
- Is the impact a result of poor planning or of something that could not be anticipated?

Criteria of performance standards in an enhanced smoke management program must be stated clearly. Methods for detecting non-compliance could also be defined. Some criteria or standards might include:

- Numerical standards for optical data at specific Class I areas (e.g., deciviews)
- NAAQS
- Comparison with photos taken of certain pre-determined visibility conditions (most impaired, least impaired days)

Accordingly, some methods for detecting compliance might include:

- IMPROVE sites
- Photo points
- NAAQS ambient air monitors

If performance standards are established in code, random audits and inspections can provide assistance with compliance. Unannounced burn inspections and burn report audits, including smoke dispersion information, are means of ensuring compliance with air quality regulations. Aerial observations are another surveillance method.

If no visibility impact-related regulations are in place, violation of NAAQS or violation of other codified permit conditions or authorizations might trigger enforcement actions. Enforcement actions must be based on established statute and regulation, and must be applied equitably to all land managers/owners. Depending on state/tribe needs and

compliance history, a written report or warning may be issued on the first instance of violation, while subsequent observed violations result in appropriate legal action.

Example enforcement actions may include:

- 5-day moratorium on ignitions
- Civil/criminal penalties, depending on how regulations are written
- Burn shutdown/mop-up
- Notice of violation/compliance order
- Liability for cost of suppression or damages
- Revocation of permit
- Felony punishment for willful or intentional violation
- Misdemeanor for careless violation

### C. 2. 7 Element 7. Program Evaluation

Enhanced smoke management programs need to be reviewed on a periodic basis for their effectiveness by the regulatory authority and affected stakeholders. It is incumbent upon the state/tribe to submit progress reports to EPA describing how well the enhanced smoke management program is being implemented as part of meeting reasonable further progress requirements. Formal periodic progress report intervals could coincide with time intervals used to evaluate reasonable progress. The Rule requires progress reports every five years.<sup>60</sup> However, shorter review and evaluation time periods would better determine if enhanced smoke management programs are effective.

Generally, daily interaction between land managers/owners and program administrators can provide a continuous means of program evaluation, but a formal method could be in place to document periodic evaluations. Annual evaluations of the overall smoke management program will provide the information needed for periodic reports. Each element of the enhanced smoke management program should consider evaluating:

- Implementation
- Compliance and enforcement
- Sections needing clarification or improvement
- Progress towards goals
- Recommendation for revisions
- Scientific advancements (modeling or other technological needs)

These annual evaluations could include, but not be limited to:

- An accounting of progress toward defined visibility improvement/impact reduction goals
- An accounting of progress toward emission reduction goals
- Review of project burning for the next year, as well as additional out-year planning
- Regional information, considering visibility impacts to and from adjoining states/tribes

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<sup>60</sup> 64 FR 35768, §51.308 (g) and 35772, §51.309 (d) (10).



- Burn activity summaries
- Burning restrictions or air quality alerts
- Significant smoke intrusions or visibility impacts
- Summaries of IMPROVE and other monitored air quality data
- Emission inventory summaries
- Information tracking summaries
- Smoke complaint summaries
- Discussion of alternatives to burning

In an enhanced smoke management program, federal land managers responsible for protecting air quality related values in Class I areas should be given the opportunity to provide input to annual program evaluations.

Where MOUs or other agreements govern smoke management programs, an annual meeting should be held where members share successes and failures, data is summarized and the program is evaluated. In cases where review criteria are established in state code, performance can be compared against standards. Permit files may be kept for a period of time, including complaint files, and statistics generated to evaluate trends in the program.

#### C. 2. 8 Element 8. Burn Authorization

Burn authorization requirements are expected to vary depending upon the amount of burning that is occurring, the fire source types that are conducting the burning, and the degree of impairment that exists or may be expected to occur as a result of the burning. The proximity of non-attainment areas may also have a bearing on the complexity of the burn authorization procedure that should be implemented. Four broad levels of stringency may be considered in the development and adoption of an enhanced smoke management program.

- Establish a permit-by-rule system
- Establish a burn permitting system by source sector or a coalition of source sectors
- Establish a centralized burn authority
- Establish a regional burn authority

Establishment of any of these authorization situations would also entail the development of coordination procedures described in (9) below.

##### C.2.8.1 Permit by Rule

The AAQTF Recommendation on Air Quality Policy describes a process in which a set of requirements are established under which burning may take place. These requirements may include acreage, time of year, time of day and meteorological factors.<sup>61</sup> A written permit may or may not be required. As long as the conditions are met, then burning may occur. There is no daily decision-making by a coordinating authority in this scenario.

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<sup>61</sup> AAQTF Recommendation on Air Quality Policy, p.9.

Such a system may be applicable for any fire source type in geographic areas of low fire use. This system should, however, still allow for the collection of enough information by an appropriate regulatory authority so that source activity and emissions may be tracked.

#### C.2.8.2 Burn Permitting System

A burn permitting system that is established by fire source type would include a local burn manager and/or state, tribe, local agency, whose responsibility is to develop the conditions under which burning may occur and then ensure that burning occurs within the requirements that are established. The elements described in this WRAP ESMP Policy would be implemented by the burn manager to ensure that visibility in Class I areas is protected.

#### C.2.8.3 Centralized Burn Authority

A more intensive level of smoke management would involve the creation of a centralized authority at the state, tribal or local level that provides daily coordination and approval of burns if significant state/tribe-wide burning is occurring. The centralized authority may be responsible for activities of one particular source type or a combination of sources. This type of program could include the detailed use of meteorological information, burn information and a permitting system to avoid cumulative impacts of smoke from a variety of burns.

#### C.2.8.4 Regional Burn Authority

Establishment of a regional burn authority may be required if there are continued and extensive inter-state impacts from burning. States/tribes would agree to have oversight of burning by an authority that equitably considers burning opportunities for all source types while addressing the Class I area impacts over broad areas. A regional burn authority would likely, in most cases, be working with the most severe and persistent problems.

### C. 2. 9 Element 9. Regional Coordination

Coordination of burning activity is critical to avoiding cumulative visibility impacts within and across source types. Coordination may range from a passive mode of information sharing between land managers/owners and/or the public to a more complex, active coordination in which burn decisions are altered based on other activities that are occurring or have recently occurred.

Coordination can occur at locations that reflect the affected level of concern. When burns are located near Class I areas or non-attainment areas, coordination will be carried out at a level that is appropriate. If burns are located adjacent to state/tribe boundaries, coordination will occur appropriate to the smoke transport/emission path and quantity.

A common mode of coordination regardless of the complexity and magnitude of burning would be information sharing via use of the web. Operationally, certain information needs to be established and updated as needed. This would include:

- Burn information (size, location, ignition date, etc.)
- Names and locations of sensitive receptors and/or special protection zones; sensitive receptors should include sensitive populations
- Locations of monitors (state, tribe, EPA or local)
- Database of known significant users of fire (name, phone number)
- Identification of airsheds or air administered units
- Possible identification of Clean Air Corridors
- Updateable database of non-attainment and maintenance areas for criteria pollutants of concern
- Identification of the centralized burn authority that maintains oversight

A minimal level of coordination would include the use of websites to post burn activity. This passive mode of coordination would be used regardless of the burn authorization method that is in place in a particular geographic area. Land managers/owners and regulators could use this information to encourage and promote voluntary coordination among land managers/owners. Burn locations and weather conditions may be posted or linked at a common webpage or series of webpages.

#### C.2.9.1 Source Sector Authority Coordination

A more advanced coordination concept is that of using burn managers or smoke coordination centers to actively time burning to avoid cumulative smoke impacts from burns within a source sector. In addition to creating awareness of other sectors' burning via tracking information on the web, radio or phone communications would be used to distribute that burning information to land managers/owners.

A step further in this process is active management of burning with coordination occurring between burn managers of different source types. Considerations that would be taken into account by the burn managers are parameters such as special weather conditions needed for a particular burn, fire safety considerations, etc. These considerations can be identified in the early periods of burn planning so that all parties are aware of the rationale behind burn decisions.

#### C.2.9.2 Centralized Authority Coordination

A centralized coordination authority within a state/tribe provides for a greater level of control of smoke production and reduction of impacts. In this scenario, potential state/tribe-wide impacts may be better managed and problems avoided than is the case with more fragmented coordination points. Central authorities for each source type would coordinate activities or one central authority would coordinate activities across all source types. In most cases this coordination would occur through a statewide coordination center that has access to information from all burning sources. Such a coordination center would also be more likely to have sophisticated meteorological, air

quality, modeling and fire behavior and effects expertise upon which decisions would be made.

### C.2.9.3 Regional (Multi-State/Tribe) Coordination

Burning that creates inter-jurisdictional impacts may require the establishment and use of multi-state/tribal coordination information procedures. If states'/tribes' Class I areas are consistently and measurably being impacted by smoke from outside of their own boundaries, then more information sharing may be needed on day-to-day burning activities. State/tribe centralized coordination centers would share information and resources to limit cumulative impacts from external sources as well as from those within its own boundaries.

Each state's/tribe's central coordination center would prioritize burns in areas that would be most likely to create cross-jurisdictional impacts. On a regional basis, acres or emissions may be limited by each state's/tribe's burn authority to minimize air quality impacts in neighboring areas. Regional meteorological and air quality information would be shared by coordination centers, with the result being regional approval and real-time tracking of burns and their smoke impacts.

A segment of fires that are considered to be natural under the WRAP Fire Categorization Policy may best be suited for regional coordination opportunities. Such fires are more likely to be of longer duration and have the greater potential for generating regional haze. Coordination in this case may range from monitoring smoke from such fires and reporting impacts to nearby states/tribes, to limiting other burning until the smoke from the natural fires has abated.

Methods for this inter-jurisdiction and regional coordination will need to be developed. The development process should be a collaborative one, involving state, tribal, local and federal agencies, and private parties. Entities to be involved in this process could include WRAP, the Western States Air Resources Council (WESTAR), the National Tribal Environmental Council (NTEC), the Wildfire Leadership Council, the Western States Fire Managers, and national/regional agricultural organizations.

## **C. 3 Responsibilities Under an Enhanced Smoke Management Program**

Throughout all the enhanced smoke management program elements outlined in this Policy, it is assumed that the regulatory authority (i.e., state, tribe, or EPA on behalf of the tribe) has the oversight for the enhanced smoke management program through its implementation plan, although it may choose to delegate implementation to another entity, e.g., county, municipality, fire source sector representative or other non-governmental organization.

It is the regulatory authority's responsibility to ensure that the mechanisms and infrastructure are in place to implement the enhanced smoke management program. The state/tribe is responsible to track emissions and determine the amount of the contribution

to visibility impairment in Class I areas. It is also incumbent upon the regulatory authority to develop a SIP/TIP that is consistent with Section 118 of the CAA pertaining to equitable treatment of federal activities.<sup>62</sup> Finally, failure of the regulatory authority to develop appropriate and necessary oversight and responsibilities may result in EPA's disapproval of the regional haze SIP/TIP.

It is the land manager's/owner's responsibility to meet the enhanced smoke management program requirements. The land manager/owner needs to ensure that data and information submitted to the regulatory authority are accurate, timely, and complete. In some instances this may be no more onerous than a form faxed by the land manager/owner to the regulatory authority at the end of the year; in others, extensive information on a daily basis regarding planned and accomplished burning will be required.

#### **C.4 Funding Mechanisms for Enhanced Smoke Management Programs**

Funding for enhanced smoke management programs can come from many possible sources. Further, funding mechanisms will depend on the magnitude or complexity of the enhanced smoke management program needed. The following is a list of possible methods for funding enhanced smoke management programs:

- A. Funds obtained from users of prescribed fire.
  - a. Memorandum of Understanding (MOU)/Memorandum of Agreement (MOA)/Consortium Funds
    - Each member/signatory pays an annual membership fee and there is an additional per acre fee for accomplished burns.
  - b. Fees
    - Permit Fees
    - Emissions-based Fees
    - Acreage-based Fees
- B. Funds Obtained from Users of Class I Areas
- C. Grants and/or Appropriated Funding
  - A combination of many sources including EPA grants, state/tribe, city and county governments, fire protection assessments, property taxes.
  - General revenue program/appropriated funds received from a legislative body.
- D. Provision of Resources
  - Fire source sector provides personnel or other resources to aid or manage the enhanced smoke management program in lieu of direct permit payments to defray overall costs of the enhanced smoke management program.

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<sup>62</sup> Clean Air Act §118 (a).