Utah State Implementation Plan

Section XX

Regional Haze

Addressing Regional Haze Visibility Protection for the Mandatory Federal Class I Areas Required Under 40 CFR 51.309

Adopted by the Air Quality Board
April 6, 2011

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G. LONG-TERM STRATEGY FOR FIRE PROGRAMS

1. Regulatory History and Requirements

In its 1996 final report, the GCVTC recognized that past land management practices, including decades of fire suppression, have led to an increase of accumulated forest fuels. Thus, wildfires are becoming larger in size, unnaturally destructive, and more dangerous and costly to control. Fire is a component of most natural ecosystems in the West and must be a component of processes to meet land management, human health and visibility objectives. The GCVTC recognized that prescribed fire and wildfire levels are projected to increase significantly for decades to come, and that programs to minimize emissions and visibility impacts and educate the public should be implemented.

The Regional Haze Rule (40 CFR 51.309(d)(6)) requires documentation that all federal, state and private prescribed fire programs in the state evaluate and address the degree of visibility impairment from smoke in their planning and application; that a statewide inventory and emissions tracking system be established for volatile organic compounds, nitrogen oxides, elemental and organic carbon, and fine particle emissions from fire; that any administrative barriers to the use of alternatives to burning be identified and removed where possible; that enhanced smoke management programs considering visibility as well as health and nuisance objectives be included and that they be based on specific criteria; and that annual emission goals for fire be established in cooperation with states, tribes, federal land managers and private entities to minimize emissions increases from fire to the maximum extent feasible.

The WRAP's effort to document and understand the incidence of fire and its effect on visibility in Class I areas has been extensive and productive. WRAP modeling shows that prescribed fire will continue to affect visibility. See the WRAP TSD Chapter 6 for details.

2. Prescribed Fire Program Evaluation

Pursuant to 40 CFR 51.309(d)(6)(i), the State of Utah has evaluated all federal, state, and private prescribed fire programs in the state, based on the potential to contribute to visibility impairment in the 16 Class I areas of the Colorado Plateau, and how visibility protection from smoke is addressed in planning and operation. The State of Utah relied upon the WRAP report *Assessing Status of Incorporating Smoke Effects into Fire Planning and Operation*[35] as a guide for making this evaluation. The State of Utah has also evaluated whether these prescribed fire programs contain the following elements: actions to minimize emissions; evaluation of smoke dispersion; alternatives to fire; public notification; air quality monitoring; surveillance and enforcement; and program

[35] All WRAP documents cited in Part G are available in the Utah TSD Supplement.

evaluation. A description of the evaluation that was made in accordance with 40 CFR 51.309(d)(6)(i) follows.

a. Wildlands Fire

The Utah Smoke Management Plan (SMP), revised March 23, 2000, provides operating procedures for federal and state agencies that use prescribed fire, wildfire, and wildland fire on federal, state and private wildlands in Utah. The SMP includes the program elements listed in 40 CFR 51.309(d)(6)(i), with the exception of alternatives to fire. In a letter dated November 8, 1999, the EPA certified the Utah SMP under EPA's April 1998 *Interim Air Quality Policy on Wildland and Prescribed Fires (Policy)*. EPA's Policy also includes the elements that are listed in 40 CFR 51.309(d)(6)(i).

In 2001, the Utah SMP requirements were codified through rulemaking and comprise R307-204 of the Utah Administrative Code. R307-204 applies to all persons using prescribed fire or wildland fire on land they own or manage, including federal, state, and private wildlands. The Utah TSD Supplement includes copies of the Utah SMP.

Under R307-204, Land Managers are required to submit pre-burn information including the location of any Class I areas within 15 miles of the burn, a map depicting the potential impact of the smoke from the burn on any Class I areas, a description of fuels and acres to be burned, emission reduction techniques to be applied, and monitoring of smoke effects to be conducted. In addition, Land Managers are required to submit a more detailed burn plan that includes, at a minimum, information on the fire prescription or conditions under which a prescribed fire may be ignited.

Under R307-204, prescribed fires requiring a burn plan cannot be ignited and wildland fire used for resource benefits cannot be managed before the executive secretary of the Air Quality Board (AQB) approves or conditionally approves the burn request. The burn approval requirement provides for the scheduling of burns to reduce impacts on visibility in Class I areas.

After the burn is completed, the Land Manager is required to submit post-burn information to evaluate the effectiveness of the burn and provide a record of acres treated by the burn. The procedures listed above serve as an evaluation of the degree of visibility impairment from smoke from prescribed fires that are conducted on federal, state, and private wildlands.

Information on the types of management alternatives to fire considered by Land Managers are included in programmatic or long-term management plans. These programmatic plans are developed in accordance with the National Environmental Policy Act (NEPA) and are reviewed by the Division of Air Quality (UDAQ) on an individual basis. Typically, the Land Manager does not evaluate alternatives to fire once the decision has been made to use fire and the subsequent burn plan developed.

b. Agricultural Fire

The WRAP inventory and a survey[36] conducted by Utah State University (USU) Extension indicate that agricultural burning is a very small portion of total emissions in Utah, and also of agricultural burning in the West. See Table 10 below. The USU survey results are included in the Utah TSD Supplement.

Table 10. Agricultural Burning Emissions Comparison

Agricultural Burning Emissions Comparison						
Numbers were obtained from the Emission Inventories Spreadsheets in the Technical Support Document provided by the WRAP for Section 309 SIPs. These spreadsheets are available at www.wrapair.org.						
		(tons per year)				
	PMC	$PM_{2.5}$	SO_x	NO_x	VOC	CO
Utah Agricultural Burning	12	212	10	101	216	2,327
Total Ag Burning in WRAP region	1,125	20,901	1,352	10,094	20,310	216,732
*Total Utah emissions from all sources	63,718	85,347	66,796	269,557	172,231	1,685,503
Utah Ag burning as a % of WRAP Ag Total	1.03%	1.01%	0.77%	1.00%	1.06%	1.07%
Utah Ag burning as a % of Utah Total Emissions	0.02%	0.25%	0.02%	0.04%	0.13%	0.14%
*Total Utah emissions were obtained from WRAP spreadsheets by summing Utah's county emissions and then adding total emissions due to Wild Fire, Ag Burning and Rx Fire.						

Emissions from agricultural burning are less than 0.25% of total Utah emissions and therefore do not result in significant impacts on visibility in the 16 Class I areas or on regional haze in general. Since agricultural burning emissions are minimal and half of them occur far from the Colorado Plateau, agricultural land managers are currently not subject to the Utah Enhanced Smoke Management Plan.

(1) Decline in Agricultural Burning Since 1996. The USU survey makes clear the decline in agricultural burning--a reduction of 48% statewide--between 1996 and 2002, and documents the reasons for the change. Only 31,999 acres were burned in 2002 out of a total of 8.7 million acres harvested. Of the total acres harvested, only about one million acres is cultivated; the majority of land is rangeland. The survey documents three reasons for the decline in agricultural burning: stubble or residue was sold rather than burned, the stubble or residue was mowed or chopped and worked back into the soil, and livestock were used to graze the stubble or residue. One reason for the change in practices is that the drought that began in 1999 has reduced the available forage for

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[36] Utah State University Extension, in collaboration with the Utah Farm Bureau Federation. *Agricultural Burning in Utah and the Regional Haze Rule. Logan, Utah. July 2003.*

livestock that normally graze native vegetation, thus making straw more valuable as a feed crop. However, the survey concludes that more stubble and residue was being grazed by livestock or tilled into the soil or baled and sold in 2002 than in 1996.

(2) Emission Reduction Techniques. Of Utah's 29 counties, there are seven in which no burning occurred in 1996 or 2002 and two more in which there was no burning in 2002. The USU survey documents county-by-county the specific Emission Reduction Techniques commonly in use. Emission reduction techniques are common practice in seventeen of the counties.

(3) Local Government Control Measures. Finally, more than half (16,600) of the acres burned are in Box Elder County in the northwestern corner of Utah, nearly 100 miles from any Class I area. Box Elder County has an ordinance in place to regulate when, where and how much burning can take place. A copy of the ordinance is in the Utah TSD Supplement.

(4) Program Evaluation. The State of Utah has determined that the appropriate local government controls and voluntary emission reduction techniques are in place and these efforts meet the requirements of 40 CFR 51.309(d)(6)(i).

3. Emission Inventory and Tracking System

a. Wildlands Inventory

Under R307-204, Land Managers are required to submit an emissions inventory for particulate matter. A tracking system has been established to record the required inventory information. Pursuant to 40 CFR 51.309(d)(6)(ii) and R307-204, the emissions inventory and tracking system for fire sources has been revised within the State of Utah to include volatile organic compounds, nitrogen oxides, elemental and organic carbon, and fine particulate.

For consistency, the State of Utah will use the emissions tracking system developed by the WRAP as defined by the WRAP *Fire Tracking System Policy.*[37] This policy identifies a process for gathering the essential post-burn activity information necessary to consistently calculate emissions for both man-made or anthropogenic and natural sources of fire and uniformly assess fire impact on regional haze. This policy is the basis for creating a fire emissions inventory for visibility purposes within the State of Utah, using an emission calculation mechanism developed by the WRAP. In addition, fire emission inventory updates will be provided in future progress reports as part of the reasonable progress demonstration specified in 40 CFR 51.309(d)(10)(i). See the Utah SMP in the Utah TSD Supplement for copies of the tracking forms and further information on the emissions inventory and tracking system in the State of Utah.

[37] All WRAP documents cited in Part G are available in the Utah TSD Supplement.

b. Agricultural Lands Inventory

To meet the requirements of 40 CFR 51.309(d)(6)(ii), the State of Utah will work collaboratively with the Utah Farm Bureau Federation and Utah State University Extension to develop and implement an inventory and emissions tracking system for agricultural burning. The survey conducted in 2003 by the Utah State University Extension, in collaboration with the Utah Farm Bureau Federation, will be used as a baseline for future emissions tracking activities. Since agricultural burning has been documented in Subsection 2.b above to be a very small proportion of total emissions in Utah and a very small proportion of agricultural burning in the West, the emission tracking activities will be conducted on a periodic basis to determine if any significant changes have been made since the 2003 survey. Results from the periodic emission tracking activities will be provided in future progress reports to EPA, as part of the reasonable progress demonstration specified in 40 CFR 51.309(d)(10)(i).

4. Identification and Removal of Administrative Barriers

During the annual meeting for establishing the Annual Emissions Goal, the UDAQ staff and Land Managers for fire will assess whether administrative barriers to the use of non-burning alternatives exist. If a specific administrative barrier is identified during this annual meeting, UDAQ will investigate how this barrier may be removed, if feasible, and will work collaboratively with the Land Managers to remove the barrier as required by 40 CFR 51.309(d)(6)(iii).

An evaluation of the administrative barriers to the use of the non-burning alternatives, if any, will be included in the formal progress report to EPA every five years as required by 40 CFR 51.309(d)(10)(ii).

In addition, the State of Utah will use two documents prepared by the WRAP for this effort: (1) *Nonburning Alternatives for Vegetation and Fuel Management*, and (2) *Burning Management Alternatives on Agricultural Lands in the Western United States.*

5. Enhanced Smoke Management Program

Pursuant to 40 CFR 51.309(d)(6)(iv), all smoke management programs that operate within Utah are consistent with the WRAP *Enhanced Smoke Management Programs for Visibility Policy.* This policy calls for programs to be based on the criteria of efficiency, economics, law, emission reduction opportunities, land management objectives, and reduction of visibility impacts. The Enhanced Smoke Management Plan (ESMP) is found in the Utah TSD Supplement.

The following is a list of the elements of the Utah ESMP and the revisions made to the Utah SMP and R307-204 in order to meet the requirements of 40 CFR 51.309(d)(6)(iv).

a. Actions to Minimize Fire Emissions

Utah's ESMP focuses on three general approaches that are designed to minimize emissions from prescribed fire and wildland fire use for resource benefits: use of

emission reduction techniques, establishing emission goals, and use of existing burn manager qualification programs.

b. Evaluation of Smoke Dispersion

Under the Utah ESMP, the Land Managers will focus on improved weather data for more accurate spot weather forecasts, scheduling of prescribed fires by the executive secretary of the Air Quality Board to minimize cumulative effects of smoke from fires on Class I areas, burner qualification and certification programs, use of the latest modeling programs to assist in the evaluation of dispersion conditions, and use of field level data such as maps showing where smoke is likely to settle.

c. Alternatives to Fire

Under the Utah ESMP, the types of management alternatives used and the acres treated on an annual basis will be tracked using Land Manager databases that are being developed. Land Managers evaluate and will continue to evaluate the use of alternatives to fire in programmatic or long-term management plans, and the ESMP requires Land Managers to provide a summary of the management alternatives that were used in a given year.

d. Public Notification of Burning

Under the Utah ESMP, a one-stop information center will be added to the Utah SMP website to provide a list of upcoming projects as a means to notify the public about prescribed fire or wildland fire projects.

e. Air Quality Monitoring

Under the Utah ESMP, Land Managers will monitor the effects of prescribed fire and wildland fire on visibility in Class I Areas. At a minimum, visual monitoring and documentation of the direction of the smoke plume will be performed. Under R307-204, the executive secretary of the Air Quality Board may direct Land Managers to operate real-time air quality sampling equipment on large fires that are expected to last more than one day, or fires close to Class I areas. Monitoring of smoke impacts on visibility will lead to improved future operations and a better understanding of smoke accumulation problems and solutions. In addition, the Utah ESMP will provide a detailed description of the monitoring equipment that is available and its location within the region.

f. Surveillance and Enforcement

The Utah ESMP builds upon the relationship that was established between the Land Managers and the UDAQ for the development of the Utah SMP. A good working relationship between the Land Managers and UDAQ can significantly reduce the need for surveillance and enforcement. UDAQ staff conduct site inspections on prescribed fires that are close to Class I areas to verify compliance with the burn plan on an as-needed basis. Reports are generated when site inspections are conducted.

g. Program Evaluation

The UDAQ staff and Land Managers will conduct an annual effectiveness review for the Utah ESMP. A formal progress report will be completed every five years as required by 40 CFR 51.309(d)(10)(ii).

h. Burn Authorization

Under R307-204, since March 2000, Land Managers have been required to submit pre-burn information including the location of any Class I areas within 15 miles of the burn, a burn plan if requested, a map depicting the potential impact of the smoke from the burn on any Class I areas, and a description of fuels and acres to be burned. Prescribed fire requiring a burn plan cannot be ignited before the executive secretary of the Air Quality Board approves or conditionally approves the burn request. See the Utah SMP in the Utah TSD Supplement for more details on the burn authorization requirements.

i. Regional Coordination

Coordination of fire projects is imperative to avoid cumulative smoke impacts in Class I areas. The Utah ESMP is designed to provide for information sharing among the Land Managers, UDAQ, and the public within Utah, as well as in neighboring states.

j. ESMP for Agricultural Burning

The State of Utah has determined that appropriate emission reduction techniques and control measures for agricultural burning are in place in the agricultural community and at the local government level. This satisfies the requirements of 40 CFR 51.309(d)(6)(iv).

6. Annual Emission Goals

Pursuant to 40 CFR 51.309(d)(6)(v), efforts will be made within the State of Utah to minimize emission increases in fire, excluding wildfire, to the maximum extent feasible, through the use of annual emission goals, in accordance with the WRAP *Annual Emission Goals for Fire Policy*. The State of Utah intends to use this policy to quantify the emission reduction techniques that are being used within the state on a project-specific basis to reduce the total amount of emissions increases being generated from areas where prescribed fire is being used. The Utah TSD Supplement describes this process in more detail.

H. ASSESSMENT OF EMISSIONS FROM PAVED AND UNPAVED ROAD DUST

1. Regulatory History and Requirements

The Grand Canyon Visibility Transport Commission, in its 1996 report to EPA,[38] believed that dust emissions from paved and unpaved roads are generally near-field transport issues rather than long-range transport issues, especially with respect to larger coarse materials that settle out of the atmosphere before being transported long distances. However, the GCVTC also recommended additional studies would be necessary to verify this assumption since the state of the science the GCVTC relied upon for characterizing the emissions and transport of dusts from roads was limited, and the projected growth of on-road emissions could contribute to regional haze, based on the projected growth of population and vehicle-miles-traveled.

The Regional Haze Rule (40 CFR 51.309(d)(7)) requires states to assess the impact of dust emissions from paved and unpaved roads on regional haze in the 16 Class I areas located on the Colorado Plateau in the first implementation plans due December 2003. The Western Regional Air Partnership analyzed this issue, including efforts to improve methods for estimating road dust emission inventories as applied to regional scale modeling and characterization of the transport and deposition processes. Results of WRAP modeling work have demonstrated road dust is not a significant contributor to visibility impairment in the 16 Class I areas on the basis of regional transport. Due to this finding, no additional road dust control strategies are needed in the current SIP.

2. State of Utah Long-term Strategy for Road Dust Sources

a. Assessment of Paved and Unpaved Road Dust Emissions.

Pursuant to 40 CFR 51.309(d)(7), an assessment was made by the WRAP of the impact of dust emissions from paved and unpaved roads from transport region states on the 16 Class I areas of the Colorado Plateau. A complete description of this assessment is provided in Chapter 7 of the WRAP Technical Support Document. The State of Utah, in consultation with the WRAP, will track emissions and perform further assessments of road dust impacts on visibility in the 16 GCVTC Class I areas in the progress updates and status reports, and will submit implementation plan revisions as needed to make reasonable progress in the SIP amendments due in 2008, 2013, and 2018.

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[38] *Recommendations for Improving Western Vistas,* page 46.