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Frequently Asked Questions & Answers: Wildland Fire and Air Quality Issues

Fire Questions:

Q: What are wildlands?

A:

- o Generally, “wildland ecosystems” include forests, grasslands and shrub or brush lands. The term “wildland,” as used in EPA’s Interim Air Quality Policy on Wildland and Prescribed Fires, refers to an area of limited development having the following characteristics:
 - Development is generally limited to roads, railroads, power lines, and widely scattered houses or other buildings.
 - The land is not cultivated (e.g., the soil is disturbed less than once in ten years) or fallow. It may be neglected altogether or managed for purposes such as wood or forage production, wildlife management, recreation, wetlands, or protective plant cover.
 - The land is not in the U.S. Department of Agriculture (USDA) Conservation Reserve Program.*
- o In a separate forum, USDA has established the Agriculture Air Quality Task Force. The Task Force, comprised of representatives from USDA, EPA, and State and local agencies, will address more specifically air quality issues related to open burning on agricultural lands.

*[USDA Conservation Reserve Program: The program gives farmers an incentive to stop growing specific crops in certain locations and to allow those fields to remain fallow. The program applies to lands that are highly erodible. Farmers contract with the USDA to take specific fields out of production for a period of time , typically 10 years.]

Q: How much wildland fire naturally occurred in the U. S.?

A:

- o Layers of biomass byproduct (soot) examined in Greenland show that North American wildland fire activity levels were relatively high for much of the last 5,000 years. Analysis suggests that there was about 5-10 times more wildland fire in the United States before European settlement than there is today. Fire suppression practices in the U.S. have resulted in the accumulation of flammable "fuels" (e.g., brush, logs, etc. on forest floors) in many wildland ecosystems. Therefore, if historic fire regimes were restored to the lands today there would be from 3 to 6 times more area burned, consuming between 4 and 8 times more biomass, and producing as much as 6 to 9 times more emissions from smoke. (Urbanization and farming have significantly reduced the amount of natural wildlands in the U.S.)

Q: What are "wildland" and "prescribed" fires?

A:

- o A planned or "prescribed" fire is any fire intentionally ignited to meet specific land management objectives (e.g., to reduce flammable fuels, such as the accumulation of brush, logs, etc. on forest floors; or to help restore ecosystem health). Prescribed fires are pre-planned ignitions, with predetermined boundaries. They are conducted only under certain weather conditions (e.g., during periods of low wind) when flame length and heat can be controlled. Generally, public land managers must obtain approval of prescribed fire or burn plans from applicable state agencies before conducting burns. Wildland fires, like prescribed fires, are managed to benefit resources or the environment. Wildland fires are usually ignited naturally (i.e., by lightning) in areas where the land use plan calls for fire. The wildland fire must meet a prescription and be managed just like a prescribed fire.
- o All applicable requirements under the National Environmental Policy Act (NEPA) must be met on federal lands. Before federal land management activities (e.g., trail building, timber harvesting, use of fire, etc.) are conducted, NEPA requires that the environmental impacts of these activities be analyzed to assess their impacts on cultural resources, wetlands, soil, water quality, air quality, visibility, and other resources.

Q: How has fire exclusion harmed our forests and grasslands?

A:

- o Since the turn of the century, fire has been aggressively suppressed in the nation's forests and grasslands to protect public safety, property, and natural and cultural resources, and to prevent what was thought to be the destruction of our natural and cultural resources.

All fires, whether started by nature (e.g., lightning-caused) or by humans, were considered bad because they were thought to damage soil, impair water quality, threaten wildlife, and decrease timber value.

- o But the damaging effects of excluding fire were more difficult to recognize and mounted gradually and inconspicuously over decades. Fire exclusion practices have resulted in forests, shrub lands, and grasslands plagued with a variety of problems, including overcrowding, resulting from the encroachment of species normally suppressed by fire; vulnerability of trees to insects and disease; and inadequate reproduction of certain species. In addition, heavy accumulation of fuels (such as dead vegetation on forest floors) can cause fires to be catastrophic, which threaten firefighter and public safety, impair forest and ecosystem health, and degrade air quality.

Q: How will an increase in the use of fire benefit ecosystem health?

A:

- o Fire has always been an integral part of many historic ecosystems. Fire is a unique ecological process because it simultaneously heats (directly and indirectly) the surrounding environment, recycles nutrients, and alters the structure of plant communities. The effects of fire can retard or accelerate the natural development of plant communities, alter species diversity, change nutrient flows, and interact with other physical, chemical, and biological systems. Thus for most North American ecosystems, fire sustains functional ecosystems.

Q: How will an increase in the use of fire decrease the number, severity and cost of catastrophic wildfires?

A:

- o Prescribed fires reduce the intensity and magnitude of wildfires (unwanted wildland fires) by reducing the accumulation of flammable fuel (e.g., dead branches, brush, needles, leaves) on the forest floor. Fire, used as a land management tool, “thins” out available fuels, reducing the chance that natural/lightening-caused fires will spread quickly, over long distances and become unmanageable. With the periodic application of prescribed fire in the future, the threat of uncontrollable, catastrophic wildfires will be reduced significantly, helping to protect firefighter and public safety, property, and natural and cultural resources.
- o Reducing the number of catastrophic wildfires through the increased use of prescribed fire will also lower costs to taxpayers. Prescribed fires typically cost \$5 to \$70 per acre, compared to \$650 to \$1,600 an acre to suppress wildfires (unwanted wildland fires). Suppressing catastrophic fires can require significant costs for mobilizing firefighters, fire suppression equipment, including fire engines and airplanes, and fuels and supplies.

Q: How will the most critical areas in need of fire application be identified?

A:

- o Some wildland areas that are in or near an “urban interface” (where houses and structures have been built) may be considered a priority for using prescribed fire because they are considered at high risk for wildfires that could become catastrophic. Other areas will be selected for a variety of land management purposes, including forest and ecosystem health. An overgrown-overcrowded stand of evergreens on a mountain side, for example, would benefit from using prescribed fire to thin out the stand of trees, which would reduce fuel build-up (that can lead to catastrophic wildfires), help create a healthier ecosystem, and over time, improve the aesthetic beauty of the landscape.

Q: Are there viable alternatives to the use of prescribed fire?

A:

- o Mechanical treatments may be appropriate land management tools under certain circumstances. Mechanical treatments can include selective cutting, thinning or pruning of trees, and other methods to remove branches or small trees (called biomass) from the wildlands. In some areas prescribed fire cannot be used safely and effectively without first removing some portion (excess) of the fuel loading (e.g., logs, brush, and branches) with mechanical methods. For example, mechanical treatments may be used to reduce fuel density in wildland/urban interface areas (e.g., residential areas located near natural areas that are at high risk for wildfires) to reduce hazard. Also, logging waste materials (slash) may be removed to prepare a site for replanting or natural regeneration. Exactly when and how mechanical removal is used depends on local conditions.
- o In many cases, however, mechanical treatments cannot replace the use of prescribed fire for restoring ecosystem health. Certain plant communities (such as the California chaparral) are dependent on fire for regeneration. In addition, fire releases important nutrients into the soil that enable trees and plants to grow healthy, with less susceptibility to disease and insect infestation. In addition, mechanical treatments are not an option in wilderness areas and other areas where there are no access to roads to allow equipment onto a site. Some wildland areas are also inaccessible to mechanical treatments because of the severity of their slopes. Certain equipment will not function properly on very steep hills and slopes. Except for commercial timber, mechanical treatments may also have significant economic limitations.
- o In some situations, chemical treatments (e.g., herbicides or pesticides) may provide a viable alternative for managing wildland vegetation. When land management goals call for precluding, reducing, or removing live vegetation and/or specific species from a site,

chemical treatment may be an appropriate tool. However, there is the potential that the use of chemical treatments could degrade water quality, injure wildlife, or hurt species not intended for treatment.

Air Questions:

Q: What is the relationship between fire and air quality?

A:

- o Fires occur naturally in the wildlands and are one of the many natural sources of particulate matter (tiny particles such as dust, soot, etc.) Particulate matter is the main pollutant of concern from smoke because it can cause serious health problems, especially for people with respiratory illness. These health effects include increased respiratory symptoms and disease, decreased lung function, and even premature death. Smoke can also adversely affect the clarity (visual range) of our air. This is of particular concern in national parks, forests, and wilderness areas, where visibility impairment can block or “haze” our views and appreciation of scenic vistas. Wildland fire is also part of the natural ecological process of many ecosystems. Without wildland fires the ecological health of many national parks, forests, and wilderness areas will decline. In recognition of the serious problems caused by past land management practices, Federal Land Managers have recently endorsed the increased use of fire as a resource management tool for ecosystem health.
- o Wildfires (unwanted wildland fires) can pose significant safety threats to firefighters and the general public, and destroy property and natural and cultural resources. The intense or extended periods of smoke associated with wildfires can also cause serious health effects and significantly decrease visibility. Years of aggressive fire suppression practices have resulted in forests and rangelands that have heavy accumulations of fuel that can lead to catastrophic wildfires.
- o Smoke management techniques are used during prescribed fires to minimize the impacts from smoke on public health and the environment. These techniques include scheduling burns during favorable weather conditions that allow for good smoke dispersal and limiting the amount of land burned at one time. Each prescribed burn site will have unique characteristics, but in general, smoke impacts can be greatly minimized by burning during weather conditions that provide optimal humidity levels and wind conditions for the type of materials being burned, in addition to limiting the amount of materials and acreage burned at one time.

Q: What are the sources of particulate matter?

A:

- o Particulate matter is comprised of “fine” particles (those less than 2.5 microns in diameter--or $PM_{2.5}$) and “coarse” particles (those less than 10 microns in diameter--or PM_{10}). Ten micrometers is about one-seventh the diameter of a human hair. The composition and sources of $PM_{2.5}$ and PM_{10} are very different. Fine particles result from fuel combustion (from motor vehicles, power plants, industrial boilers), and wood combustion (from residential fireplaces and woodstoves, wildland fires, and agricultural burning.) Fine particles can also be formed in the atmosphere from gases such as sulfur dioxide, nitrogen oxides, and volatile organic compounds. $PM_{2.5}$ is a major component of smoke from fires. Coarse particles are generally emitted from sources such as windblown dust, vehicles traveling on unpaved roads, materials handling, and crushing and grinding operations.

Q: Why did EPA recently update its national air quality standards for ozone and particulate matter.

A:

- o In July 1997, EPA revised the existing national air quality standards for ozone and particulate matter, and adopted a new standard for fine particles. The scientific review process determined that the “old” standards did not adequately protect public health. For ozone, longer term exposures can cause significant health effects, including asthma attacks, breathing and respiratory problems, loss of lung function, and possible long-term lung damage and lowered disease immunity. For particulate matter, exposures to smaller sized particles ($PM_{2.5}$) can cause premature deaths, increased respiratory symptoms and disease (especially for children and individuals with asthma), decreased lung function, and other serious respiratory problems.

Q: What are the public health benefits associated with the new ozone and particulate matter standards?

A:

- o EPA’s new ozone standard provides significant health benefits, especially for children. The new standard will prevent approximately 1 million incidences per year of significant decreases in children’s lung function that can limit a healthy child’s activity or increase medical treatment for children. The new standards will reduce the risk of hospital admissions and emergency room visits for children and others with asthma and other respiratory problems.
- o EPA’s new particulate matter standards will prevent approximately 15,000 premature

deaths per year. They will prevent hundreds of thousands of cases of aggravated asthma in children and adults. Asthma is now the leading chronic illness among children. The standards will also reduce the risk of thousands of hospital admissions and emergency room visits among the elderly and those with heart and lung disease.

Q: How will Federal and State Agencies ensure public health and environmental protection when using prescribed fires?

A:

- o Prescribed fires are used at certain times of year and under certain circumstances to manage wildland ecosystems. Most other sources (such as cars and industrial sources), in contrast, yield continuous emissions of particulate matter. Unlike wildfires (e.g., unplanned wildland fires), prescribed fires can be ignited when weather and other conditions are most favorable to minimize the impacts of smoke on communities. Many Federal and state land managers use smoke management techniques to mitigate the smoke impacts from prescribed fires.
- o Smoke management techniques include scheduling burns during favorable weather conditions that allow for good smoke dispersal and limiting the amount of land burned at one time. Each prescribed burn site will have unique characteristics, but in general, smoke impacts can be greatly minimized by burning during weather conditions that provide optimal humidity levels and wind conditions for the type of materials being burned, in addition to limiting the amount of materials and acreage burned at one time.

Q: What is EPA's Interim Air Quality Policy on Wildland and Prescribed Fires?

A:

- o The U.S. Environmental Protection Agency (EPA) worked in partnership with land management agencies in the U.S. Departments of Agriculture, Defense, and the Interior, State Foresters, State air regulators, and others to obtain recommendations and develop a national policy. The Policy addresses how best to improve the quality of wildland ecosystems (including forests and grasslands) and reduce threats of catastrophic wildfires through the increased use of managed fire, while achieving national clean air goals.
- o The Wildland Fire/Air Quality Policy Workgroup developed recommended criteria for land managers and State and Tribal air pollution agencies to use in planning for and implementing prescribed fires. The Interim Policy also recommends a variety of smoke management techniques that land managers can use to help reduce smoke impacts from prescribed fires to the maximum extent possible.
- o EPA's Interim Policy provides incentives to States and Tribes to adopt and implement

programs to minimize the public health and environmental impacts of smoke from prescribed fire, while providing the flexibility to tailor these programs to meet unique State and Tribal needs.

Q: How does EPA’s Interim Air Quality Policy on Wildland and Prescribed Fires relate to EPA’s implementation strategy for the new national air quality standards for ozone and particulate matter, and the proposed new Regional Haze Program?

A:

- o In July 1997, EPA issued revised national air quality standards for ozone and particulate matter, including a new standard for fine particles, and proposed a new Regional Haze program for public comment. In developing an implementation strategy for the new ozone and particulate matter air quality standards and the Regional Haze Program, EPA formed a subcommittee under the auspices of the Federal Advisory Committee Act (FACA) to get input from a wide range of stakeholders on how best to develop cost-effective and flexible implementation programs. The Ozone, Particulate Matter, and Regional Haze subcommittee was comprised of representatives from industry, academia, States, environmental groups, other Federal agencies, and other stakeholders.
- o EPA formed a special FACA subcommittee workgroup to address more specifically the potential impacts of wildland fire (i.e., particulate matter emissions from smoke) on air quality and visibility impairment. This workgroup (The Wildland Fire/Air Quality Workgroup) developed a national policy recommendation to EPA that provides guidance to State air agencies and land managers on how best to allow the increased use of fire in wildland ecosystems in the context of implementing new air quality standards for ozone and particulate matter, as well as meeting national visibility goals under the proposed Regional Haze Program.
- o EPA will continue to work with this interagency group to assure compatibility between fire and air quality programs consistent with public health, safety, and environmental protection.

Q: How does the Interim Air Quality Policy on Wildland and Prescribed Fires relate to EPA’s proposed Regional Haze Program?

A:

- o The Clean Air Act requires EPA to protect visibility in national parks and certain wilderness areas (“Class I” Areas.) The goal of the visibility program is to reduce impairment due to human-made air pollution. EPA has long recognized that smoke from fire can have a significant impact on visibility.

- o In conjunction with EPA's new air quality standards for ozone and particulate matter, in July 1997, EPA proposed for public comment a new Regional Haze program to improve visual air quality in more than 150 important natural areas across the United States. Haze obscures the clarity, color, texture, and form of what we see and is caused by pollutants (mostly fine particles less than PM_{2.5}) that are emitted from a wide range of sources, including power plants, motor vehicles, and burning on agricultural lands and wildlands. Pollutants that cause haze can be transported long distances. Thus, haze occurs regionally throughout the nation. EPA believes that the most effective way to address visibility impairment is to establish a regional haze program in combination with the new standards for particulate matter.
- o EPA's Interim Policy recommends a variety of smoke management techniques for land managers to use to help reduce smoke impacts from prescribed fire to the maximum extent possible. Smoke management techniques are used to help avoid impairing visibility in Class I areas.
- o Once the Regional Haze Program is finalized, EPA will revisit the section of the Interim Air Quality Policy on Wildland and Prescribed Fires that pertains to the impact of wildland and prescribed fires on visibility and regional haze.

Q: How does EPA's Interim Air Quality Policy on Wildland and Prescribed Fires address the impacts of the increased use of prescribed fire on other Clean Air Act requirements?

A:

- o In addition to the national air quality standards for ozone and particulate matter and the proposed Regional Haze Program, the increased use of prescribed fire may impact other Clean Air Act requirements. The Workgroup that developed EPA's Interim Policy examined how/if increased emissions from prescribed fires may impact requirements for the Prevention of Significant Deterioration (PSD) program and Conformity requirements for Federal agencies.
- o Conformity -The Clean Air Act has special requirements for actions conducted by Federal agencies that may impact air quality. Federal agencies located in nonattainment areas must "conform" or comply with applicable State requirements to reduce or eliminate the severity and number of violations of national air quality standards. In addition to the existing methods for demonstrating conformity of Federal fire projects, EPA will pursue, in consultation with the other Federal agencies, adding an alternative method to the General Conformity rules through rulemaking. Under the proposed alternative method, Federal prescribed fire projects would be considered to conform with the state implementation plan if they are managed under a certified basic smoke management program. The program must require regional coordination (cooperation of all jurisdictions

in an airshed) when authorizing fires and real-time air quality monitoring at sensitive receptors, when warranted, in addition to the basic program components. The Policy outlines the components of a basic smoke management program.

- o PSD - The Clean Air Act authorizes States with approved PSD programs to exclude particulate matter emissions caused by “temporary” activities from consuming increment. EPA expects the States, on an individual basis, to decide the extent to which prescribed fires (and the resulting emissions increases) should be considered “temporary” sources of air pollution when determining increment consumption in specific areas. The goal of the PSD program is to prevent “clean” air quality (in areas that meet the national air quality standards) from deteriorating beyond certain amounts or increments

Q: Can the use of prescribed fire increase substantially nationwide without causing violations of EPA’s national air quality standards for particulate matter.

A:

- o EPA believes that the amount of prescribed burning, conducted under smoke management programs, can be increased substantially without causing violations of the air quality standards for particulate matter. Smoke management programs include techniques to minimize emissions including, scheduling burning during favorable weather conditions (e.g., during periods of low wind when flame length and heat can be controlled), controlling types of ignitions, and controlling the time period of burning.
- o EPA’s Interim Air Quality Policy on Wildland and Prescribed Fires outlines the criteria for basic smoke management programs to promote consistency in fire management planning among the States and Tribes and to help ensure that Clean Air Act requirements are met. EPA’s Interim Policy allows States and Tribes to build upon or tailor existing or new smoke management programs to meet their unique needs.

Q: How does EPA’s Interim Air Quality Policy on Wildland and Prescribed Fires relate to EPA’s Natural Events Policy?

A:

- o Impacts on the current PM₁₀ (denoting particles less than 10 micrometers in diameter) national air quality standards caused by wildfires (unwanted wildland fires) are addressed in a policy statement issued by EPA in May 1996, regarding Areas Affected by PM-10 Natural Events (subsequently referred to as the PM₁₀ Natural Events Policy).
- o EPA’s Interim Air Quality Policy on Wildland and Prescribed Fires applies to all other types of wildland and prescribed fires, regardless of the source of ignition.

- o The PM₁₀ Natural Events Policy provides that EPA: (1) will not redesignate an area as “nonattainment” (areas out of compliance with the PM₁₀ standard) if the State develops and implements a plan to respond to the health impacts of wildfires that are considered “natural events;” and (2) will discount exceedances of the PM₁₀ standard when redesignating a nonattainment area to “attainment” status if the exceedances resulted from an uncontrollable natural event (i.e., a wildfire.) EPA’s PM₁₀ Natural Events Policy outlines measures States and Tribes must take to respond to the health impacts of natural events, including wildfires.
- o In the near future, EPA will update the Natural Events Policy to address the new fine particulate matter standard (PM_{2.5}) and the revised PM₁₀ standard, and incorporate the new definitions of wildland fire and prescribed fire adopted by the Departments of Agriculture and the Interior.

Q: How does EPA’s Interim Air Quality Policy on Wildland and Prescribed Fires relate to the Grand Canyon Visibility Transport Commission recommendations?

A:

- o EPA’s Interim Air Quality Policy on Wildland and Prescribed Fires is consistent with the fire-related recommendations of the Grand Canyon Visibility Transport Commission (GCVTC).
- o Congress created the GCVTC in 1991, under the authority of the Clean Air Act Amendments of 1990, to advise EPA on strategies for protecting visual air quality at national parks and wilderness areas on the Colorado plateau.
- o The GCVTC issued a report and recommendations to EPA in June 1996. The GCVTC’s report included specific recommendations with regard to the use of prescribed fire as it relates to regional visibility affecting 16 national parks and wilderness areas in the Colorado Plateau. The Commission recognized that fire plays a significant role in visibility on the Plateau. It also recognized that land managers have proposed a significant increase in prescribed fire programs aimed at correcting the buildup of fuel due to the effects of decades of fire suppression. The Commission recommended the implementation of programs to minimize emissions and visibility impacts from the use of prescribed fire. These recommendations included a multi-stakeholder effort to develop and implement enhanced smoke management programs; the development of cooperative funding mechanisms among agencies to pay for increased smoke management programs and integrated assessment efforts; and the promotion of public education programs.

Q: How does EPA’s Interim Air Quality Policy on Wildland and Prescribed Fires relate to agricultural burning?

A:

- o EPA's Interim Policy only addresses fires on wildlands. Wildland ecosystems generally include forests, shrub or brush lands, and grasslands. Specifically, "wildland" is defined as an area where development is generally limited to roads, railroads, power lines and widely scattered structures or buildings. The land is not cultivated or fallow and is not in the USDA Conservation Reserve Program. Wildlands may be neglected altogether or managed for such purposes as wood or forage production, wildlife, recreation, wetlands, or protective plant cover.
- o In a separate forum, the U.S. Department of Agriculture has established the Agriculture Air Quality Task Force. EPA is an active participant in the Task Force. The Task Force has unanimously endorsed a listing of high priority research needs to improve the level of understanding of the impact of agriculture on air quality levels. On February 25, 1998, the U.S. Department of Agriculture and EPA announced a Memorandum of Understanding (MOU) to ensure that the two agencies work together to provide a healthy environment with clean air in harmony with a strong agriculturally productive nation. The MOU establishes a framework for the two agencies to share expertise and a process for involving the agricultural community in a cooperative effort to address agriculture-related air quality issues, including emissions from agricultural burning.
- o EPA will work with the taskforce to refine the distinction between wildland fires, which are covered by the Interim Policy, and agricultural burning.

Q: How much will the use of prescribed fire increase over the next 10-20 years on Federal lands? What areas will likely see the largest increase in the use of managed fire?

A:

- o Federal wildlands are managed by the following agencies: the U.S. Forest Service; the Bureau of Land Management; the National Park Service; the Fish and Wildlife Service; and the Bureau of Indian Affairs. The historic estimate of prescribed fire use on Federal wildlands (from 1984-1994) for the primary purpose(s) of reducing fuel and the associated risk of catastrophic wildfires and/or for ecosystem health is 662,000 acres (for all agencies combined.)
- o Because of the increase in fuel buildup on wildlands, which has contributed to the increase in catastrophic wildfires over the past two decades, Federal land management agencies will increase their use of prescribed fire and other treatment techniques to reduce fuel loadings and restore ecosystem health. By 2000, the Forest Service, for example, plans to burn approximately 2 million acres annually in areas that are most at risk for wildland fires and/or where prescribed fires will yield the most benefit for ecosystem health. All total, the

five Federal land management agencies intend to apply prescribed fire to approximately 5.1 million acres annually by 2005. High priority areas include wildland/urban interface areas where houses and other structures are located near wildlands (in rural areas or in the midst of forests). Prescribed fire will also be used in fire-adapted ecosystems that have suffered from the effects of fire suppression practices and the subsequent fuel buildup. These include the long-needle pine forests in the southeast and the mountain shrub and ponderosa pine forests in the west. Fire helps maintain the health and stability of these ecosystems.

- o As the build-up of fuel is reduced in Federal wildlands through prescribed fires and other techniques, emissions of smoke from future prescribed fires will continue to decrease.

Background: Federal land management agencies have jurisdiction over the following areas:

Forest Service:	191 million acres
Bureau of Land Management:	267 million acres
National Park Service:	80 million acres
Fish and Wildlife Service:	92 million acres
Bureau of Indian Affairs:	62 million acres in trust