Alaska
Enhanced Smoke Management Plan for Planned Fire

Procedures Manual

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Prepared by:

Department of Environmental Conservation
Division of Air Quality
with the Air Quality & Smoke Management Committee
for the Alaska Wildland Fire Coordinating Group

ALASKA ENHANCED SMOKE MANAGEMENT PLAN

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1. EXECUTIVE SUMMARY

The Alaska Department of Environmental Conservation (DEC) in coordination with the Alaska Wildland Fire Coordinating Group (AWFCG) has led the development of Alaska's Enhanced Smoke Management Plan (ESMP). The ESMP and accompanying volume of appendices has been adopted by DEC and participating Wildland owners and managers through a Memorandum of Understanding (MOU).

This document is an updated version of the previous plan, which was approved in June 2009, and fulfills the U.S. Environmental Protection Agency (EPA) requirement, as outlined in the Interim Policy on Wildland and Prescribed fires, to review the ESMP every five years. The 2009 version of the ESMP was included as a component of the Alaska Regional Haze State Implementation Plan (SIP).

The ESMP helps fulfill Alaska's responsibilities for protection of air quality and human health under federal and state law and reflects the Clean Air Act requirement to improve regional haze in Alaska's Class I areas. The Regional Haze Rule requires that visibility at Class I areas be returned to natural background conditions by 2064. Alaska adopted its first State Implementation Plan (SIP) for regional haze on February 11, 2011. EPA published its final approval of the plan in the Federal Register on January 7, 2013. The next Regional Haze SIP is currently due July 31, 2018, although EPA has announced intentions to postpone this due date to 2021.

Future updates to this smoke management plan may be necessary to address additional fire tracking and emission management needs based upon policies and guidelines developed by the Western Regional Air Partnership. This update will be incorporated into the next Regional Haze SIP update, as will any future updates to the ESMP.

Under state regulation, all agencies, corporations, and individuals that burn areas larger than forty acres of land a year, whether slash or in situ, require a controlled burn approval application and written approval from DEC. The ESMP outlines the process and identifies issues that need to be addressed by DEC and land management agencies or private landowners / corporations to help ensure that prescribed fire (e.g., controlled burn) activities minimize smoke and air quality problems.

Adoption of this document enables the State to certify to the U.S. Environmental Protection Agency that we are implementing a smoke management plan that addresses elements of the EPA's Interim Air Quality Policy on Wildland and Prescribed Fire, April 23, 1998 (EPA's Interim Policy). If states do not certify that a basic smoke management plan is being implemented, EPA will not provide special consideration to particulate matter health standard violations attributed to fires managed for resource benefits. According to EPA's policy, a state adopted ESMP enables EPA to use its discretion in deciding to reclassify an area as non-attainment when fires cause or contribute to particulate matter air quality violations. If EPA does indeed reclassify an area, then states need to review the adequacy of their ESMP to make appropriate improvements in cooperation with wildland owners and managers.

The ESMP provides accurate and reliable guidance and direction to and from not only the fire

authorities who use prescribed fire as a resource management tool, but also to the private landowners and corporations who conduct land clearing burns. This ESMP describes and clarifies the relationship between fire authorities and DEC. These agencies must work together effectively to combine planned burning, resource management, and development with smoke, and public health with Class I area visibility goals.

The ESMP Appendices provide additional assistance for interagency sharing of information, the applicability and availability of current smoke management techniques, monitoring protocol, public education strategies, and emission reduction techniques. The ESMP Appendices include up-to-date techniques and tools (e.g. monitoring equipment, modeling, emission factors) available through the Western Regional Air Partnership (WRAP) and member organizations tasked with assisting states, tribes and land managers with smoke management.

Alaska's ESMP will be evaluated annually by the AWFCG and interested parties and revised at least every 5 years in accordance with EPA's Interim Policy on Wildland and Prescribed fires. The ESMP appendices will be updated as new information becomes available, but not more often than once a year.

DEC welcomes the participation of AWFCG agencies and the public in the process to improve the document.

2. GUIDELINES, MEMBERSHIP CRITERIA, AND RESPONSIBILITIES

A list of current AWFCG agency representatives is provided in Appendix A.

2.1 Alaska Wildland Fire Coordinating Group (AWFCG)

The AWFCG, formed in 1994 through the consolidation of the Alaska Multi-Agency Coordinating Group and the Alaska Interagency Fire Management Council, provides a forum that fosters cooperation, coordination, and communication for wildland fire and for planning and implementing interagency fire management statewide. The AWFCG membership includes state, federal, and native land management agencies and owners that have fire management responsibilities.

One of the objectives of the AWFCG is to provide a forum for anticipating smoke intrusions, resolving on-going smoke management issues, and improving smoke management techniques. Another objective is to ensure that prescribed fire, as a tool to reduce risk and future smoke emissions, is considered by DEC when promulgating policy, procedures, and regulations.

The AWFCG establishes committees and workgroups to address specific issues. Since smoke management is a critical and continuous issue in statewide fire management, the AWFCG established the Smoke Management and Air Quality Committee (AQ Committee). The purpose of the committee is to address the AWFCG smoke management objectives, assist DEC with the development and revision of the Alaska Enhanced Smoke Management Plan (ESMP) for

Prescribed Fire, and to disseminate policies, procedures, and regulations related to smoke management. AWFCG members may provide representatives to serve on the AQ Committee. Participation is not mandatory.

The DEC representative serves as Committee Chair. Each agency or organization representative is the point of contact for communicating information between the AQ Committee and their agency or organization. The agency or organization representatives are responsible for assisting agency or organization personnel with pre-season permit applications and post-season reporting. Committee members will:

- Represent an AWFCG member
- Have the authority to speak for their agency or organization on fire and smoke management issues
- Promote good smoke management practices, alternative methods to burning and emission reduction techniques
- Disseminate smoke management information to agency or organization personnel, thereby keeping employees informed of the requirements and procedures of the ESMP
- Attend AQ Committee meetings as scheduled and assist with accomplishing committee objectives and assignments

The responsibilities of the AQ Committee include assisting in development of the ESMP and annually reviewing the effectiveness of the plan. An annual report has been prepared by DEC with the AQ Committee for submittal and approval to the AWFCG since 2009.

The following elements of the ESMP will be reviewed during annual evaluations:

- Implementation
- Burn activity summaries
- Smoke complaint summaries
- Compliance and enforcement
- Scientific and technological advancements
- Sections needing clarification and improvement
- Recommendation for revisions

Changes to DEC's open burning regulations (DEC 18 AAC 50) may occur if DEC deems it necessary. All changes to state regulations must follow standard procedure, including a public comment period. Regulatory changes that affect prescribed burning in the state will be done in coordination with the AWFCG members and any other affected parties. It will be up to DEC to ensure that stakeholders are informed of any anticipated changes. The current DEC Open Burning Policy and Guidelines is contained in Appendix B. Changes to the ESMP MOU document can only be made after contacting each signatory in writing.

2.2 Responsible Authority for the Burn

The Responsible Authority is the individual who is primarily responsible for a Controlled Burn for Resource Management (prescribed burn) or Controlled Burn for Land Clearing and ensures the conditions of the permit are met. Prescribed and land clearing burns require written DEC

approval before starting the burn if the intent is to burn, or clear and burn, 40 acres or more during a year in the same locale. The Responsible Authority submits the finalized Prescribed Burn or Land Clearing application to DEC. This person may also collect, review, and distribute any required pre- and post-burn information to DEC. The Responsible Authority should be identified in the prescribed burn or land clearing burn approval application. The Responsible Authority is often the one who conducts public meetings and has the greatest ability to interact with the public and local authorities on prescribed burning activities in their area.

To obtain valid approval for a Controlled Burning for Resource Management or Controlled Burning for Land Clearing from DEC prior to each permitted ignition, the Responsible Authority must submit a controlled burn approval application to DEC containing the 15 elements listed in Section 3 of this document. Controlled burning for Resource Management and Controlled Burning for Land Clearing approval applications must include a section on smoke management contingencies that discuss actions to be taken in the event of smoke intrusions. The controlled burn approval for resource management (prescribed burns) or land clearing burns received from DEC will contain conditions to be met by the Responsible Authority. Applications for controlled burns may be submitted using the forms on DEC's open burn website[1] or electronically through DEC's Air Permittee Portal.[2]

The Responsible Authority must call and notify the DEC by noon the business day prior to any planned burn (call the number listed in the Open Burn Approval Letter) or email: dec.AQ.airreports@alaska.gov.

The person calling must provide the following information:

1. Controlled Burn Approval number
2. Authorized Agency Name
3. Burn Location
4. Burn Date(s)
5. Contact Name During Burn
6. Contact Telephone Number
7. Description of how and when the Test Burn will be completed
8. Estimated Duration of Active Firing (ignition) Phase (prescribed burning only)
9. Estimated Duration of the Smoldering Phase (prescribed burning only)
10. Description of Pre-Burn Public Notices
11. Consideration of weather forecast and air quality advisories in area of burn

DEC staff will verify the burn approval is current and send an email message with the eleven elements to the appropriate DEC controlled burn application personnel and air monitoring personnel.

The final responsibility for ensuring the conditions of the burn approval permit are met rests with the Responsible Authority. On the burn day, the Responsible Authority must check whether DEC has issued burn restrictions; this information is available on the DEC Air Quality Air Advisory

[1] http://dec.alaska.gov/air/ap/OpenBurn.htm
[2] http://dec.alaska.gov/Applications/Air/airtoolsweb/Home/Index

web site: http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories.

The Responsible Authority should curtail burning if, in their opinion, they are not getting adequate smoke dispersion or if local weather factors are such that smoke problems could result. The Responsible Authority communicates any potential or existing smoke problems to the DEC Meteorologist at 907-269-7676 (primary), or call 907- 269-6249 (secondary), and handles local coordination, local problem-solving, and local communication within the area affected by smoke intrusions. The Responsible Authority may request monitoring assistance from DEC, if necessary. DEC will work with the Responsible Authority (see "Emergency Monitoring Policy," Section 5-3).

2.3 DEC Smoke Management Program

The purpose of the Enhanced Smoke Management Plan (ESMP) is to provide a clear and equitable regulatory basis for smoke management in Alaska. DEC is responsible for protecting the health and welfare of Alaskans from the impacts of smoke from fire as well as protecting visibility according to federal Regional Haze Rules. The ESMP assists DEC in meeting these requirements. In order to ensure the ESMP is successful, DEC is responsible for the following:

- Development and implementation of the ESMP
- Reviewing controlled burn for resource management and controlled burn for land clearing approval applications and issuing controlled burn approvals
- Ensuring controlled burn approval applications comply with state air quality regulations (18 AAC 50.065) and ESMP guidelines
- Collecting, reviewing, tracking, and summarizing statewide pre- and post-burn data for annual ESMP emission inventory reports to be distributed to AWFCG, EPA, and the Western Regional Air Partnership (WRAP). This activity will require annual assistance from the Alaska Interagency Coordination Center (AICC) at the end of the fire season. General information will be compiled from the AICC website at http://fire.ak.blm.gov/. DEC will obtain the specific information required for compiling the annual emission inventory report from AICC.
- Ensuring that field oversight and enforcement is conducted and is uniformly applied
- Coordinating with the AQ Committee members to establish and facilitate support for smoke management techniques and mitigation strategies within the state
- Ensuring that the ESMP is understood and communicated to all land management agencies and the AWFCG
- Facilitating AQ Committee meetings to evaluate the program effectiveness, review policies, discuss new smoke management methods, approve air quality reports to be submitted to the AWFCG for approval, and help solve agency smoke management issues

DEC staff will notify health authorities, news media, the public-at-large, land management agencies, and all other appropriate agencies when unacceptable limits of smoke accumulation are approached or exceeded. DEC staff will restrict implementation of controlled burn approvals for resource management and controlled burn for land clearing permits in specific areas, request burn suppression actions, or request air quality burn bans or restrictions when meteorological or existing air quality conditions so warrant (i.e., if weather forecasters predict undesirable wind

conditions and smoke is drifting into sensitive areas).

3. OPERATIONS AND AUTHORIZATION TO BURN

3.1 Smoke Management

This section is designed to give guidance on preparing smoke management information for the controlled burn for resource management and controlled burn for land clearing approval applications. Consideration of smoke management is a critical component of every controlled burn approval application. This is important for meeting public health, welfare, and Class I area visibility goals as well as coordinating smoke management that may affect other burning in the area. These goals are discussed further in Section 5-1.

Evaluating potential dispersion of smoke emissions from a project is the single most important component of an effective ESMP. Land managers and owners may use a variety of evaluation methods for small projects that will not impact any sensitive features or where potential impacts are easily monitored and mitigated. For large projects, state-of-the-art tools exist to evaluate potential impacts.

DEC evaluates the controlled burn for resource management and controlled burn for land clearing approval applications for the potential of the project to contribute to unacceptable smoke impacts or particulate levels on smoke sensitive features. DEC is responsible for evaluating the cumulative impacts of multiple projects and authorizing only as many projects as the airshed can handle. If during the controlled burn approval process several individual projects request ignition at close time intervals, attempts will be made to ensure the agencies and landowners involved coordinate ignition times to minimize smoke impact.

When scheduling a burn and ignition time, the Responsible Authority must consider existing air quality, meteorological, and environmental conditions to evaluate smoke dispersion. The potential effects of multiple burn days, multiple ignitions, and residual smoke must be evaluated prior to ignition.

Controlled burns (prescribed burns and land clearing burns) will only be conducted when favorable dispersion conditions exist. The Responsible Authority should obtain wind forecasts from the National Weather Service (NWS) forecasters for wind speed and direction, an estimate of mixing heights, and expected residual smoke behavior for the night following the burn. The NWS forecast for smoke dispersion will generally integrate all pertinent weather information such as the timing of expected weather changes that may affect smoke dispersion. Prescribed burn approval conditions may require a pre-burn meteorological conference (METCON) between your fire weather team and DEC's meteorologist prior to ignition.

After ignition, if meteorological conditions change and smoke impacts sensitive features, technologically feasible and economically and environmentally reasonable actions must be taken to mitigate impacts.

Smoke Management Techniques

Below are some examples of smoke management techniques the Responsible Authority should consider to minimize emissions and smoke impacts:

- Use of ventilation factors, up-to-date weather data, and weather forecasts
- Appropriate modeling with accurate weather data and emission factors
- Scheduling burns to use weather fronts bringing precipitation to assist with minimizing air quality impacts when appropriate
- Burning when fuel moistures are low enough to prevent excessive smoldering
- Reference historic (e.g., over the last 10 years) emissions from burns in the area
- Emission projections based on sound data and science
- Identification of smoke sensitive features and receptors, burn when wind direction and dispersion will mitigate impacts to sensitive features
- Visual observations
- Monitoring
- Test burns (small piles or representative areas)

3.2 Elements of Controlled Burn for Resource Management and Controlled Burn for Land Clearing Approval Application

Prior to each planned burn that requires DEC's approval (land management agency or landowner intends to burn, or clear and burn 40 acres or more during a calendar year), the Responsible Authority will submit their controlled burn approval application for controlled burning for resource management or controlled burning for land clearing (Appendix C) to DEC. Each controlled burn approval (Appendix C) will expire on December 31st of the year it was issued. Each agency or landowner may use the DEC application format or the online Permittee Portal[3] to submit their burn approval application. The following information is required to process an approval application:

1. **Indicate the location, duration, and inclusive dates considered for the burn**

   Provide a legal description or latitude and longitude of the location to be burned and the expected duration of both single events and the entire burning project. Minor changes or additional information for the burn plan can be discussed at the time DEC is notified by phone. At a minimum, the applicant is required to call DEC by noon at least one working day prior to ignition. Call the number listed in the Open Burn Approval Letter.

2. **Identify the location of all sensitive features that might be impacted by smoke**

   The Responsible Authority should identify on a map all sensitive features, which include population centers such as communities, cities, towns, hospitals, health clinics, nursing homes, schools (in session), campgrounds, numbered Alaska highways and roads, airports, Prevention of Significant Deterioration Class I Areas, and any other areas where smoke and air pollutants can adversely affect public health, safety, and welfare.

[3] http://dec.alaska.gov/Applications/Air/airtoolsweb/Home/Index

3. **Indicate how the public will be informed prior to, during, and after the burning**

   The best way to avoid complaints is to make sure everyone around the burn area knows when the burn will occur so they can take steps to avoid the smoke. The Responsible Authority's local contact phone number should be publicized so the public can contact you. The public must be notified at least three days prior to the anticipated burn through the local news media or the local Post Office.

4. **Indicate how coordination with other concerned agencies, including the Responsible Authorities of sensitive features, will be carried out**

   Indicate how all concerned agencies will be notified prior to ignition, , including authorities in control of sensitive features identified in item 2 (such as the FAA, State Troopers, military, fire department, adjacent land managers, etc.) who are potentially affected by impaired visibility or adverse smoke impacts. Include a list of telephone numbers or email addresses of agencies that must be contacted prior to ignition.

   The Department of Natural Resources, Division of Forestry (DOF) also issues burn permits; contact DOF to determine what requirements apply. The DOF burn permits are in addition to DEC burn approvals and address fire safety and other issues.

5. **Indicate the source of the weather forecast and how it will be used to prevent smoke impacts**

   Identify how the local and spot weather forecast will be obtained (e.g., through the NWS) prior to ignition of the controlled burn. Parameters that should be obtained are the predicted visibility, dispersion conditions, wind direction, and wind speed.

6. **Indicate how weather changes will be monitored and what will be done to reduce or mitigate smoke impacts if unfavorable weather should occur after ignition**

   Indicate how the weather will be monitored throughout the controlled burn. Identify what actions will be taken if a wind shift or other weather change begins to create an adverse smoke impact on sensitive features identified in Item 2. For example, if an inversion is expected to occur during the night, active ignitions could be ceased.

   If any safety hazard is present as a result of smoke, or if requested by the authority of a sensitive feature, all technologically feasible and economically and environmentally reasonable steps to mitigate smoke impacts must be taken.

7. **Indicate what will be done to validate predicted smoke dispersion**

   Indicate how smoke dispersion will be predicted. If a recommended method (test fire, small piles or areas, etc.) fails to indicate that acceptable smoke dispersion will occur, no fires will be ignited.

8. **Indicate proposed techniques to be used to enhance the active fire phase and reduce the smoldering phase**

   Consider employing emission reduction techniques (Appendix D) to enhance the active fire phase and reduce smoldering, and indicate what is feasible to accomplish the burn objectives.

9. **Indicate how authorities in control of sensitive features will be contacted if visibility decreases**

   Provide a contingency plan (Appendix E) for smoke intrusion into populated areas, Class I areas, or other smoke sensitive features as notified in item 2. Authorities having control over sensitive features identified in item 2 must be notified if visibility is expected to decrease to less than three miles for over an hour. Indicate how authorities of sensitive features will be notified if this occurs. If any safety hazard is present, or if requested by the authority of a sensitive feature, impacts must be mitigated through steps that are technologically feasible and economically and environmentally reasonable. Contingency or emergency monitoring may be needed to measure and detect smoke intrusions on sensitive features.

10. **Identify alternative disposal options for material being controlled burned**

    An evaluation of alternatives to controlled burning (Appendix F) must demonstrate that controlled burning is the only technologically feasible and economically and environmentally reasonable alternative. Identify other alternative disposal options for material burned (e.g., marketing timber with a lumber company) or why burning is the selected alternative and why the alternatives were not used; or list any alternatives to burning that have been done to the burn units prior to ignition.

11. **Indicate how coordination with air quality authorities having jurisdiction will take place**

    At a minimum, notify DEC by telephone by noon one business day prior to ignition. Call the number listed in the Open Burn Approval Letter. Include the 11 items in Section 2.2. If a multiple day burn is planned, the responsible authority need only call before the first ignition day. A call to DEC after a multiple day burn is completed is requested. If the burn is not conducted, please notify DEC within 24 hours to schedule a new burn date.

12. **Indicate the type of vegetation to be burned, pre-burn and post-burn fuel loading estimates, and ignition technique to be used**

    Pre-burn fuel loading represents the amount of fuel present at the burn location (to be consumed) and should be expressed as the weight of fuel per unit area in tons per acre. The post-burn loading estimate represents the fuel remaining after the burn. The ignition technique should describe the method (e.g., hand ignition, drip torch, helitorch) and

technique (e.g., strip head fire, backing fire, etc.)**.**

13. **For prescribed fires, indicate whether the fire is considered "anthropogenic" or "natural." Note: Land clearing burns will be considered "anthropogenic."**

    The WRAP document, "Policy for Categorizing Fire Emissions" explains what is considered a natural source of fire and what is considered a human-caused source.

14. **Provide the approximate emissions expected for each burn and method used to estimate.** Note: Emission estimates for Land Clearing Burns will be calculated by DEC.[4]

    Emissions can be estimated by multiplying the amount of fuel consumed (usually expressed in tons), by an emission factor expressed in pounds per ton of fuel. Emission factors can be found on EPA's website at http://www.epa.gov/ttn/chief/ap42/ch13/. Other emission factors or methods may also be used, including, but not limited to: CONSUME, FEPS, FOFEM, PFEP, and SASEM (Appendix D).

15. **Air monitoring to be conducted**

    Identify how the burn may affect or potentially impact air quality at smoke sensitive features, and how the visibility in Class I areas will be monitored (Appendix G). If the burn will not adversely affect visibility in a Class I area, state that there is low potential of the burn impacting visibility in a Class I area and that monitoring will not be conducted.

Items one through eleven are required in an open burning application under existing DEC regulation (Appendix B); items twelve through fifteen are elements that are necessary for managing smoke and developing and tracking emission inventories for regional haze.

3.3 Post-burn Reporting

After each burn, the Responsible Authority will submit a post burn report to DEC within 90 days. The Responsible Authority must maintain a copy of the application and post burn report. A post-burn report must include the following information:

- **Authorized agency**, controlled fire or range name, and approval number.
- **Date of burn(s)** – Actual dates of the burn (ignition, active burning, and smoldering phases).
- **Burn location** – Latitude and longitude of center of burn area, along with map showing burned area.
- **Total Area of burn** – The entire burn unit less any unburned inclusions (Estimate in acres).

[4] http://www.wrapair.org/forums/fejf/docs.html

- **Fuel type(s)** – The fuel type optimally represents the predominant fuel or cover type consumed in the fire (e.g., Sitka spruce). Specify source of fuel information (e.g,. CFDR, NFFL) and descriptive model.

- **Pre-burn fuel loading information** – Land managers who are unfamiliar with estimating pre-burn fuel loading should ask ~~A~~DEC to supply them with information, guidance documents, and models that are currently used to compile this information. Estimates of fuel loading are all that are necessary.

- **Fuel consumption** – The amount of fuel actually consumed expressed in tons/acre (pre-burn fuel loading data is acceptable if actual numbers cannot be determined).

- **Predominant configuration of the fuel burned,** e.g., pile, windrow, broadcast, or underburn.

- **Emission reduction techniques used** –Describe any techniques applied that reduced the actual amount of emissions, for example, changing ignition timing to allow for more efficient combustion.

- **Type of Burn** – "Anthropogenic" or "natural" classification (see glossary and Appendix). All controlled burns for land clearing are considered human-caused or anthropogenic.

- **Verification of weather forecasts and air quality advisory status** for the event date(s).

- **Description of public notifications made**

- **List of complaints received** concerning excess odors or smoke (if any), including name, phone number of complainant and any corrective action taken.

4. BURN RESTRICTIONS DUE TO AIR QUALITY CONCERNS

When DEC issues burning restrictions based on air quality concerns in any part of the state, all AWFCG members will be notified as soon as possible. If there is residual smoke in the area, it is the responsibility of the Responsible Authorities to contact DEC and check the DEC Air Advisory web site (http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories) prior to a scheduled burn to determine if a restriction is pending or in effect. Local government agencies and the Division of Forestry also need to be contacted to verify there are no open burning restrictions.

DEC Burn Restrictions can be issued as follows:

- Statewide
- By airshed(s)

- By proximity to smoke sensitive feature
- By DEC authority (18 AAC 50.245)
- Any combination of the above

Any restrictions will be based on local observations and available monitoring and meteorological data. Generally, restrictions due to poor air quality are in effect for 24 hours, although multiple day and weekend forecasts will be made. DEC encourages Responsible Authorities to restrict conducting prescribed burn projects on holiday weekends near sensitive areas or areas with high recreation use. The Responsible Authority should contact DEC if they wish to burn during holidays so that adequate contingencies are in place to manage any smoke intrusions.

The final responsibility for smoke management in the locality of the prescribed burn rests with the Responsible Authority who is conducting the burning. The Responsible Authorities are expected to mitigate smoke by choosing optimal times and weather conditions that meet the needs of the prescribed burn and also minimizes smoke intrusions if, in their opinion, they are not getting adequate smoke dispersion, or if local weather factors or topographical features are such that smoke problems could result. Conversely, if local weather conditions appear to be more favorable for burning than what was forecast, Responsible Authorities should contact DEC to discuss options.

Prescribed burn ignitions should not occur if:

- A DEC Air Quality Advisory is in place for areas that could be impacted by the burn
- Air quality is deteriorating and is expected to continue to deteriorate
- There is a high probability that a significant amount of smoke will intrude into "sensitive features”
- The burn will not comply with the Alaska State Implementation Plan (SIP) or the federal Clean Air Act regarding visibility protection of Class I federal areas (Appendix H)
- Any state or federal air quality standards, regulations, laws, or rules would be violated
- Air quality is deteriorating and is expected to continue to deteriorate which may result in an Air Quality Episode (Appendix I) being declared in the next 24-hour period. Additional ignitions will be denied until conditions improve in the area.

5. AIR QUALITY MONITORING

5.1 Visibility and Regional Haze Goals

All states must develop programs to make “reasonable progress” toward meeting the visibility goals in designated Class I areas as part of their air quality State Implementation Plans (SIPs). Alaska has four Class I areas: Denali National Park & Preserve, Tuxedni Wilderness Area,

Simeonof Wilderness Area, and Bering Sea Wilderness Area (Appendix H). DEC has the primary responsibility for SIP development. The state's first Regional Haze SIP was adopted February 11, 2011, and received final EPA approval on March 18, 2013. The state is currently preparing the first five-year progress report. The next Regional Haze SIP is currently due July 2018.

5.2 Ambient Air Monitoring

"Ambient air monitoring" within the context of the ESMP refers to air quality monitoring conducted as a consequence of wildfire activity or in support of prescribed fire activities. All monitoring should be performed with DEC approved air monitoring samplers using standard operating procedures for monitor operation, data collection, and QA/QC. Samplers should be placed outside of the fire zone in a location that is representative of a smoke sensitive area, such as a hospital or health clinic.

Monitor site placement depends on the meteorology (primarily wind direction), area topography, and the relationship of the smoke and airshed to the populated area. Monitoring may require the deployment of several samplers. Example: a land management agency is planning a large prescribed burn and the closest community is fifteen miles away. Weather forecasts indicate that the winds could blow toward the town; therefore, a monitor should be placed in or near the community.

Public health protection is the focus of all monitoring site placement. Responsible Authorities may request assistance from the DEC Monitoring and Quality Assurance Program to identify appropriate monitoring sites. Time and materials fee or a reimbursement agreement with DEC will be necessary.

5.3 Smoke Monitoring Policy

DEC is willing to work with land managers or land owners to assess smoke impacts and protect public health through ambient air monitoring assistance. While DEC does not have funding to support prescribed fire activity, the air monitoring section does have trained staff who could be mobilized to support a fire event by evaluating smoke impacts or monitoring air quality for prescribed burns. Funding agreements will be necessary for DEC to support monitoring.

Emergency response air monitoring support from DEC has been utilized once before on the Carla Lake Fire in 1998. With newer and more portable real-time monitors, the ability to monitor smoke impacts has become easier and more accurate.

6. AIR QUALITY COMPLAINT PROCEDURES

6.1 General Procedures

There may be occasional intrusions of smoke into smoke sensitive areas. The Responsible Authority and DEC are responsible for complaint processing and smoke-intrusion reporting. Documentation of such occurrences will improve future prevention measures and properly inform

Responsible Officials and the public.

The nature of the complaint will determine what procedure is to be followed to address the complainant. Every attempt should be made to resolve the complaint at the lowest possible level. Any agency or landowner receiving complaints should handle the initial situation if they are knowledgeable of the ESMP or the specific burn and should learn as much information about the burn as possible in order for proper follow-up to take place.

Complaints can come in several forms. Historically, complaints have been received from the public at large where the basis for the complaint is an objection to seeing smoke, smelling smoke, and health concerns because of smoke. Local explanation of the program and resolution of the complainant's concerns will often solve the problem. If an AWFCG member receives the complaint they should explain the purpose and basis for the ESMP in order to inform the caller that a control program is in place in Alaska.

The following information needs to be collected in order for the organization or landowner to take proper and necessary follow up actions. Information to be collected includes:

- Name and contact information of the complainant
- Description of the complaint
- Location of the burn (include best estimate of burn location and direction of smoke)
- Time of day
- Any other comments that will aid in the follow up process (e.g., people see or smell smoke, etc.)

The Responsible Authority should forward any complaints received to DEC with their post-burn report or when requested by DEC. If another AWFCG member receives a smoke complaint, it will be forwarded to the appropriate agency representative (usually the Responsible Authority or DEC) as soon as possible. If a smoke complaint on a land clearing burn is received by an AWFCG member, the complaint will be forwarded to DEC as soon as possible. DEC will immediately forward complaints it receives to the Responsible Authority for resolution if the complaint information suggests a prescribed burn is conducted during a restricted period or if smoke dispersion is less than adequate for the burn.

DEC will log all complaints received into the DEC Complaint Automated Tracking System (CATS) via AirTools, the DEC Air Quality database. For each complaint received by the Responsible Authority and DEC, pertinent data will be recorded along with the final resolution or actions taken to address the complaint. This information may be valuable for contacting community residents prior to future planned burns.

6.2 Public Notification and Exposure Reduction

The cooperating agencies and land owners will agree on trigger levels, communication strategies, and contingency measures before the burn project is ignited.

If smoke impacts develop from a prescribed burn and it becomes necessary to issue air quality

notices (e.g., advisories, alerts, warnings, or emergencies), DEC and the Responsible Authority will cooperatively determine a course of action. The Responsible Authority should consult with DEC regarding appropriate short-term fire management response to abate verified impacts to smoke sensitive areas. Management responses should be implemented that will mitigate adverse impacts to public health using technologically feasible and environmentally and economically reasonable actions.

According to 18 AAC 50.245, DEC may, at its discretion, declare an air episode or advisory (Appendix I) and prescribe and publicize curtailment actions when the concentration of $PM_{2.5}$ in the ambient air has reached the levels described in the table below. Advisories are based on current and expected smoke impacts, meteorological conditions, and qualitative assessment by trained staff. Advisories may be issued without monitoring data. Episodes are called at specific levels of air pollution and have associated regulatory requirements. Currently, the $PM_{2.5}$ episode requirements limit the opacity of emissions from woodstoves.

DEC uses the levels in the chart below to announce air quality advisories and episodes. The National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$ are 35μg/m^3 for the 24-hour average and 12 μg/m^3 for the annual average. DEC will follow the AQI levels and will call air quality advisories when levels reach the AQI category of 'Unhealthy for Sensitive Groups,' i.e., when levels exceed or are expected to exceed the NAAQS for $PM_{2.5}$.

Episode Levels for $PM_{2.5}$

AQI Level	AQI Value	24-Hr $PM_{2.5}$ (μg/m^3)	Episode Levels	Cautionary Statements	Descriptive Statements
Good	0-50	0-12.0		None	None
Moderate	51-100	12.1-35.4		None	None
Unhealthy for Sensitive Groups	101-150	35.5-55.4	Alert	People with respiratory or heart disease, the elderly and children should limit prolonged exertion.	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	55.5-150.4		People with respiratory or heart disease, the elderly and children should avoid prolonged exertion; everyone else should limit prolonged exertion.	Everyone may begin to experience some adverse health effects, and members of the sensitive groups may experience more serious effects.
Very Unhealthy	201-300	150.5-250.4		People with respiratory or heart disease, the elderly and children should avoid any outdoor activity; everyone else should avoid prolonged exertion.	Health Alert: Everyone may experience more serious health effects.
Hazardous 1	301-400	250.5-350.4	Warning	Everyone should avoid any outdoor exertion;	Health warnings of emergency conditions.

AQI Level	AQI Value	24-Hr $PM_{2.5}$ ($\mu g/m^3$)	Episode Levels	Cautionary Statements	Descriptive Statements
Hazardous 2	401-500	350.5-500	Emergency	people with respiratory or heart disease, the elderly and children should remain indoors.	The entire population is more likely to be affected.

When DEC declares an advisory, DEC will publicize actions individuals can take to protect public health and may request voluntary emission restrictions from any permitted activity that might impact the area subject to the advisory (18 AAC 50.245). Air quality advisories (Appendix I) include broad educational statements that advise people about the potential for smoke impacts in the area, recommend actions for persons with respiratory illnesses or heart disease, and suggest ways to limit exposure. Advisories may also include restrictions on open burning (18 AAC 50.065(e)). Advisories are posted on DEC's advisory website.[5]

$PM_{2.5}$, alert, warning, and emergency episode levels each have 24-hour average particulate concentration levels and have action statements that suggest ways that the general public and sensitive individuals can limit their exposure. These notices re based on real-time ambient monitoring, in combination with weather forecasts. Alerts will not be issued based solely on visual estimations of smoke impacts, nor on suspected smoke impacts.

A children's Activity Guideline for use during wildfire smoke events, prepared by the Idaho Department of Health and Welfare, lists activities, such as recess and athletic practices, with recommendations for children during smoke events. This document can be found at: http://healthandwelfare.idaho.gov/Portals/0/Health/EnvironmentalHealth/Wildfire-table-for-schools%20mkedits.pdf

If smoke intrusions cause unacceptable area-wide impacts, including nuisance smoke, DEC will deny the ignition of new controlled burns that could impact the area and announce air quality advisories. Air quality advisories are typically appropriate for situations where the potential for multiple-day smoke impacts exists.

[5] http://dec.alaska.gov/Applications/Air/airtoolsweb/Advisories

7. PUBLIC EDUCATION

Public education and outreach prior to burn ignition greatly decreases public complaints and often significantly decreases potential public health impacts attributed to smoke intrusion. Every effort should be made by the Responsible Authority to involve the potentially affected community in an early and on-going discourse on the use of prescribed fires in their area.

Public outreach often helps avoid conflicts which might not otherwise be identified, such as igniting burns during scheduled athletic events, or during annual hunting/fishing opening dates, holidays, or other special events.

Public education guidance should be cooperatively developed and/or distributed by the AWFCG for use by Responsible Authorities. Such guidance would discuss options available for adequate public education, including public meetings, public service announcements, news articles, and public comment periods. The FireWise campaign[6] and the FireWise Alaska handbook[7] have been successful public education processes, and could easily be used as a pattern or as a vehicle to promote public education on prescribed burning objectives at a local or airshed level where appropriate. In addition, the National Wildland Fire Coordinating Group (NWFCG)[8] has developed useful educational materials.

Other Public Education Suggestions:

- Seek out appropriate forums to provide written information about rules and regulations, and answer questions
- Initiate contacts with local news media to generate feature stories about the prescribed fire program and burn regulations
- Include appropriate information about prescribed and land clearing burns in displays used at public gatherings, such as fairs
- Provide press releases and public service announcements when needed
- Coordinate with other agencies' public affairs offices to combine information about burning when appropriate
- Develop brochures and other printed materials for distribution to appropriate sources and recipients

8. FEES AND PROGRAM FUNDING

Fees for a Controlled Burn for Resource Management and Controlled Burn for Land Clearing

[6] http://www.firewise.org/
[7] http://forestry.alaska.gov/pdfs/firewise09.pdf
[8] http://www.nwcg.gov/pms/prev_ed_wui.htm

Approvals are posted in Alaska Administrative Code 18 AAC 50.400(l). Open burning regulations are located at 18 AAC 50.065.

9. ENFORCEMENT

Regulations currently exist that prohibit burning in a manner that adversely impacts public health or the environment (18 AAC 50.065, 50.110, and 50.245). Adherence to State of Alaska regulations is mandatory. It is the responsibility of DEC to enforce the regulations. Additional regulations may be promulgated if the State determines that present regulations are inadequate for protecting public health.

Unacceptable smoke impacts that occur because the Responsible Authority was negligent or failed to follow the open burning regulations may result in enforcement action. Should an agency or land owner fail to follow procedures, requirements, or restrictions issued under the open burning regulation, it may be considered grounds for revocation of the burn permit.

A mechanism similar to the program used to enforce air quality regulations for industrial sources is used to enforce Wildland burning regulations or agreements. Such a program will provide:

- A process for notifying land managers of the unacceptable impacts.
- An opportunity for the land managers to respond to allegations of unacceptable impacts.
- The ability for DEC to take regulatory action, including cooperative agreements, which may require ESMP revisions.
- An appeal process.

In addition, the ESMP program will be reevaluated if a Responsible Authority follows ESMP guidelines, but resultant smoke still violates the NAAQS or produces significant complaints.

10. LIST OF ACRONYMS, ABBREVIATIONS and DEFINITIONS

(µg/m^3)	micrograms per cubic meter
AAC	Alaska Administrative Code
AQ	Air quality
AICC	Alaska Interagency Coordination Center
AWFCG	Alaska Wildland Fire Coordinating Group
CAA	Clean Air Act
CFR	Code of Federal Regulations
DEC	Alaska Department of Environmental Conservation
ESMP	Enhanced Smoke Management Plan (includes Regional Haze requirements)
NAAQS	National Ambient Air Quality Standards

(µg/m^3)	micrograms per cubic meter
PM	Particulate matter
SIP	State Implementation Plan
WESTAR	Western States Air Resources Council
WRAP	Western Regional Air Partnership

Agricultural Burn – also known as Controlled Burning for Land Clearing – open burning of woody debris material by farmers and developers. Approval is required from DEC if the intent is to clear and burn 40 acres or more per year.

Airshed is a geographical area where atmospheric characteristics are similar (e.g. mixing height and transport winds). (i)

Air Quality Advisory refers to a period where an air episode may warrant public notification. Air quality advisories are general, educational-type statements which advise the general public about the potential for smoke impacts and suggest ways to limit exposure. "Advisory" status does not involve any required action on the part of the public or the burn agency and often does not have monitoring data associated with it, though it may refer to weather forecasts.

Air Quality Alert, Warning or Emergency status refers to a period where an air episode is declared, as stated in 18 AAC 50.245. Valid air quality monitoring data and weather forecasts should be used to document air quality status and duration. Regardless of the source of the emissions, air episodes involve required actions on the part of the public (such as avoiding outdoor exercise) or land managers (such as avoiding additional emissions for the area).

Alternatives (or "burning alternatives") refer to mechanical, biological or chemical treatment methods of fuel reduction that do not include burning, such as chipping, grinding, logging, mechanical/hand thinning with removal, etc.

Ambient air is that portion of the atmosphere, external to buildings, to which the general public has access.

Ambient air monitoring in this document refers to air quality monitoring done in support of prescribed fire activities or in response to Wildland fire activities.

Anthropogenic emissions are produced by human activities. (ii)

Approval or controlled burn approval (or "permit") refers to the DEC written approval that is required if material from land clearing operations for prescribed fire for agricultural, development, hazard fuel reduction, and forest or habitat management if the area burned, or the material collected to be burned, is 40 acres or greater per year. (18 AAC 50.065(g))

AP-42 Handbook is the EPA's Compilation of Air Pollutant Emission Factors for stationary point, area, and mobile sources. An emission factor is a representative value that attempts to

relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Emission factors are then used to estimate the magnitude of a source's pollutant emissions.(iii)

Burn plan is a strategic plan for managing a specific fire project to meet specific resource management objects. The plan includes the project objective, fire prescription (including smoke management components), personnel, organization, equipment, etc. It is used to apply for a DEC Controlled Burn Approval. (iv)

Burn restriction (see "Restriction").

Class I Area refers to an area set aside under the Clean Air Act (CAA) Section 162 to receive the most stringent protection from air quality degradation. This classification protects air quality in international parks, national parks greater than 6,000 acres in size, and national wildernesses greater than 5,000 acres in size, that were in existence on August 7, 1977 and any additions to those areas.

Clean Air Act (CAA) means 42 U.S.C. 7401 – 7671q, as amended through November 15, 1990. (18 AAC 50.990(17)).

Controlled Burn Approval application is the permit application required by DEC as part of the controlled burn approval process.

Controlled Burning for Land Clearing – see "Agricultural Burn"

Controlled Burning for Resource Management – see "Prescribed Burn"

Emission factors are typically based on the EPA's AP-42 Handbook. Emission units are stated as "pounds of emission produced per ton of fuel consumed." An emission factor is a representative value that attempts to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. Emission factors are not yet available for accurately predicting emissions from burns in fuels such as Sitka spruce forests, tundra or deep duff layers commonly found in Alaska. Efforts are being made by the USDA Forest Service, Pacific Northwest Experiment Station to conduct research that will lead to more accurate estimations of emissions factors for Alaska. (iii)

Enhanced Smoke Management Plan (ESMP) is the agreement and program plan developed and agreed upon by the AWFCG. The purposes of ESMPs are to mitigate the nuisance and public health/safety hazards (e.g., on roadways and at airports, and at smoke sensitive features) posed by smoke intrusions into populated areas, to prevent deterioration of air quality and NAAQS violations; and to address visibility impacts in mandatory Class I Federal areas in accordance with the regional haze rules. (iii)

Fuel includes combustible vegetative matter such as grass, tundra, trees, shrubs, limbs, duff, and stumps.(iii)

Fuel loading is the amount of fuel present expressed quantitatively in terms of weight of fuel per unit area. This may be available fuel (consumable fuel) or total fuel and is usually dry weight. (ii)

Fuel type is an identifiable association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause a predictable rate of spread or resistance to control under specified weather conditions. (ii)

Inversion refers to a layer of air in which the temperature increases with height. The effect of various types of inversions is to greatly retard the dispersal of smoke. (vii)

Land manager/owner is the responsible Line Officer for the Federal agencies or designated individual in Federal, State, and private organizations who is authorized to make decisions concerning the management of specified land areas. (vi)

Member representative (or **Representative member** or **AQ Member**) means the individual who represents his or her organizational entity (agency or company) and is responsible for collecting and submitting pertinent agency burn information to the DEC Coordinator and AWFCG from their representative agency or company. They attend the annual meetings of the AWFCG.

Mixing height is measured from the surface upward, the height to which relatively vigorous mixing occurs in the atmosphere due to turbulence and diffusion. (viii)

National Ambient Air Quality Standards (NAAQS) are the standards established by the EPA for maximum acceptable concentrations of pollutants in the ambient air to protect public health with an adequate margin of safety, and to protect public welfare from any known or anticipated adverse effects of such pollutants (e.g. visibility impairment, materials damage, etc.) in the ambient air. (iii)

Natural background condition is an estimate of the visibility conditions at each Federal Class I area that would exist in the absence of human-caused impairment. (ix)

Non-attainment areas are areas that exceed the National Ambient Air Quality Standards (NAAQS) for certain "criteria pollutants" established by EPA or the States. Criteria pollutants have specific standards and exist for ozone, carbon monoxide, oxides of sulfur, oxides of nitrogen, lead, and particulate matter. (i)

Nuisance smoke is the amount of smoke in the ambient air at concentrations below the NAAQS which interfere with a right or privilege common to members of the public, including the use or enjoyment of public or private resources. Nuisance smoke is regulated by Alaska regulation 18 AAC 50.110, "Air Pollution Prohibited: A person may not cause or permit any emission that is injurious to human health or welfare, animal or plant life, or property, or that would unreasonably interfere with the enjoyment of life or property." (iv)

Open burning means the burning of a material that results in the products of combustion being emitted directly into the ambient air without passing through a contaminant outlet. (18 AAC

50.990(59)) Open burning includes prescribed fire (Controlled Burning for Resource Management) and Controlled Burning for Land Clearing (agricultural burning). The terms are used interchangeably in this document.

Particulate matter (PM) refers to any airborne material, except uncombined water, which exists as a solid or liquid at standard conditions (e.g., dust, smoke, mist, fumes or smog). (iii)

PM_{10} refers to particles with an aerodynamic diameter less than or equal to 10 micrometers. Emissions of PM10 are significant from fugitive dust, power plants, commercial boilers, metallurgical industries, mineral industries, forest and residential fires, and motor vehicles. (iii)

$PM_{2.5}$ refers to particles with an 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. (iii)

Prescribed fire is any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist. In a federal action National Environmental Policy Act requirements must be met prior to ignition. (vi) Prescribed fire is a type of open burning. The terms are used interchangeably in this document.

Prescription is a written statement defining the objectives to be attained and may include, but is not limited to, temperature, humidity, wind direction, wind speed, fuel moisture, soil moisture, and fire behavior characteristics under which a fire will be allowed to burn. A prescription is generally expressed as acceptable ranges of the prescription elements. The extent of the geographic area to be burned may also be a prescriptive element.

Regional haze is defined in 40 CFR 51.301 and generally refers to concentrations of fine particles in the atmosphere extending up to hundreds of miles across a region and promoting noticeably hazy conditions, wide-spread visibility impairment, especially in mandatory Class I Federal areas where visibility is an important value. (iii)

Responsible Authority (Burn Boss, Fire Management Officer, land manager, etc.) is the individual who collects, reviews, and disseminates pre- and post- burn information to the DEC staff in the form of the Burn Application and Post-burn Report. This person is tasked with the responsibility of ensuring compliance with the approved burn permit, daily operations, coordinating burn information, providing smoke forecasting and air quality restrictions for their burns. This person(s) may also facilitate local area meetings to evaluate program effectiveness, and solve local issues related to their agency's burn plans. The Responsible Authority often has line authority and is the primary person with whom DEC will interact prior to, during, and after a burn. The Responsible Authority should be identified in the Burn Application that is submitted to DEC. (i)

Restriction to burning occurs when an air quality episode is declared which covers the area of concern. Restrictions to burning are generally issued for a twenty-four hour period but may be for a longer period. The alert may be based on an assessment that inadequate air ventilation is available which would inhibit the dispersal of pollutants, such as inversions and low wind speeds.

Regardless of the source of the emissions, public notifications will be issued when smoke is impacting the area. Persons with controlled burn approvals must curtail their fire if their portion of the airshed is becoming overloaded or local weather factors would create smoke problems, even though no other restrictions have been imposed, i.e. wind moving directly into sensitive areas, inversions, etc.

Smoke dispersion refers to the processes within the atmosphere which mix and transport smoke away from the source. This depends on three atmospheric characteristics: atmospheric stability, mixing height, and transport winds. (vii)

Smoke intrusion refers to smoke from a prescribed fire entering a designated area at unacceptable levels. (vii)

Smoke sensitive features are population centers, such as towns and villages, camp grounds and trails, hospitals, health clinics, nursing homes, schools (in session), numbered Alaska highways and roads, airports, Federal Class I Areas, etc., where smoke and air pollutants can adversely affect public health, safety and welfare. (iv)

Smolder means to burn and smoke without flame. (18 AAC 50.990(81))

State Implementation Plan (SIP) is a CAA Section 110 required document in which States adopt emission reduction measures necessary to attain and maintain NAAQS and meet other requirements of the Act (such as regional haze). (iii)

Transport winds is a term that refers to the wind speed and direction at the final height of smoke plume rise. (vii)

Violation of the PM NAAQS refers to 40 CFR Part 50, last revised in 2006. The daily PM10 standard is violated when the 24-hour concentrations exceeds 150 μg/m3 at any monitor within an area more than one time per year. The annual PM10 standard has been revoked.

The NAAQS levels for $PM_{2.5}$ are set at a daily concentration less than or equal to 35 μg/m3 and an annual mean concentration of less than or equal to 15 μg/m3. The daily standard is violated when the 98th percentile of the distribution of the 24-hour concentrations for a period of one year (averaged over three calendar years) exceeds 35 μg/m3 at any monitor within an area. The annual standard is violated when the annual arithmetic mean of the 24-hour concentrations from a network of one or more population-oriented monitors (averaged over three calendar years) exceeds 12 μg/m3. Compliance with the annual $PM_{2.5}$ NAAQS is based on population-oriented monitors because the health information, upon which the standard is based, relates area-wide health statistics to area-wide air quality as measured by one or more monitors. (iii)

Visibility Protection refers to Section 169A of the federal (CAA) which establishes a national visibility goal to ". . . prevent any future, and remedy any existing, impairment of visibility in mandatory Class I areas." Alaska has four federal Class I areas that are national parks or wilderness areas (Appendix H). (iii)

Western Regional Air Partnership (WRAP) is a voluntary organization comprised of western governors, tribal leaders and federal agencies, 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. (x)

Western States Air Resources Council (WESTAR) is an organization which consists of fifteen states including Alaska. WESTAR was formed to promote the exchange of information between the States, serve as a forum for western regional air quality issues of common concern and share resources for the common benefit of the member states.

Wildland is an area where development is generally limited to roads, railroads, power lines, and widely scattered structures. The land may be neglected altogether or managed for such purposes as wood or forage production, wildlife, recreation, wetlands or protective plant cover. (iv)

Wildland fire is any non-structure fire, other than prescribed fire, that occurs in the Wildland.(xi)

11. REFERENCES

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ii. Smoke Management Guide for Prescribed and Wildland Fire, 2001 Edition. National Wildfire Coordinating Group, Fire Use Working Team. 226pp.

iii. Idaho/Montana smoke mgmt operating guide/SMP

iv. NWFCG Wildland Fire Policy 1998.

v. Regional Haze Rules, 40 CFR Part 51, 1999.

vi. Alaska Wildland Fire Management Plan 1998.

vii. Washington state SMP

viii. National Wildfire Coordinating Group. 1996. Glossary of Wildland fire terminology. PMS 205. Boise, ID: National Wildfire Coordinating Group, National Interagency Fire Center. 162 p.

ix. Policy for Categorizing Fire Emissions. November, 2001. Natural Background Task Team, Fire Emissions Joint Forum, Western Regional Air Partnership. Available: http://www.wrapair.org/forums/fejf/documents/nbtt/FirePolicy.pdf

x. WRAP Charter, Purpose, p.1.

xi. USDI and USDA Forest Service. 1998. Wildland and prescribed fire management policy-implementation procedures reference guide. National Interagency Fire Center, Boise, ID. 81pp.

12. SIGNATURE PAGE

Alaska Enhanced Smoke Management Plan Approval

The Alaska Wildland Fire Coordinating Group approved this version of the Alaska Enhanced Smoke Management Plan on June 3, 2015,

Sue Rodman, Chair, AWFCG
Project Coordinator
Alaska Department of Fish and Game

Cindy Heil, Chair, AWFCG Air Quality and Smoke Management Committee
Non-Point Mobile Sources Program Manager
Division of Air Quality
Alaska Department of Environmental Conservation