OPERATIONAL GUIDANCE FOR THE OREGON
SMOKE MANAGEMENT PROGRAM

POLICY: This directive provides operational procedures to implement the Oregon Smoke Management Plan. The objectives of the Smoke Management Plan are to:

A. Minimize smoke emissions resulting from prescribed burning as described by ORS 477.552.

B. Provide maximum opportunity for essential forestland burning;

C. Protect public health by avoiding intrusions;

D. Coordinate with other state smoke management programs;

E. Comply with state and federal air quality and visibility requirements; and

F. Promote the further development of techniques to minimize or reduce emissions by encouraging cost-effective utilization of forestland biomass, alternatives to burning, and emission reduction techniques.

AUTHORITY: This directive implements ORS 477.013, 477.515, ORS 477.552 through 562, OAR 629-043-0040, and OAR 629-048-0001 through 629-048-0500.

DEFINITIONS: See OAR 629-048-0005.

STANDARDS:

A. The Smoke Management Rules: The Smoke Management administrative rules (OAR 629-048-0001 through 629-048-0500) provide a specific framework for the administration of the Smoke Management program by the State Forester. The plan requires the State Forester and each field administrator to maintain a satisfactory atmospheric environment in Smoke Sensitive Receptor Areas (SSRAs), federal Class I Areas, and other areas sensitive to smoke (OAR 629-048-0230(8)).

In administering the Smoke Management Plan, the State Forester and the field administrators will monitor weather and air quality conditions in SSRAs and other areas sensitive to smoke.

In order to meet air quality standards and the objectives stated above, restrictions on prescribed forestland burning are applied through issuance of Smoke Management instructions by the State Forester in order to limit the amount of particulate matter that is released into the airshed.

B. Plan Applicability: The Smoke Management Plan applies to all lands classified as forestland under ORS 526.305 to 526.370 and all federally managed forestland, whether or not classified, within a forest protection district. See OAR 629-048-0100 for specifics. In general, all federal forestland and Class 1 forestland in Western Oregon is regulated at a
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higher level but all forestland owners and managers must comply with various aspects of
the program.

C. Smoke Management Forecasts and Instructions: To minimize the amount of smoke
entering SSRAs, as described in OAR 629-048-0140, and other areas sensitive to
smoke (OAR 629-048-0005(22)). The Smoke Management forecast unit issues daily
forecasts and instructions during periods of substantial prescribed burning.

1. Smoke Management forecasts shall be issued as needed for three regions within
the regulated area; Western Oregon, including Fire Weather Zones 601 through
612, Zones 615 through 623, and 639; Central and Northeast Oregon, including
Fire Weather Zones 640 through 646; and South-Central Oregon, including Fire
Weather Zones 624 and 625.

Written Smoke Management forecasts are normally issued during the period
from late March through June and late September through December, when
significant prescribed burning is being conducted. Forecasts are written at other
times as dictated by weather and the level of burning. Special written forecasts
shall be issued when requested for specific burns, as forecaster workload
permits.

Scheduled forecasts shall be issued in mid afternoon and are valid for the next
day. Forecasts shall be disseminated no later than 3:15 p.m. When necessary,
an updated forecast shall be issued if significant changes from the previous
forecast have occurred or are expected. When possible, updated forecasts will
be issued in the early morning, normally before 8:00 a.m. However, updates may
be issued at other times when necessary.

- Dissemination. Forecasts shall be disseminated by e-mail and made
available on the Oregon Department of Forestry web site
(http://www.oregon.gov/ODF/Fire/Pages/Burn.aspx). The Western Oregon
forecast shall also be placed on a telephone message recording.

- Content. Forecasts include four main sections: a general discussion of the
weather expected through the forecast period; specific mixing, transport
wind, and surface wind forecasts; a general outlook for the following three
days; and daily outlooks for mixing height, transport wind, and surface
wind. Updated forecasts may not include outlooks.

2. Instructions and/or advisories shall be issued in conjunction with each Smoke
Management forecast. For forestland included in Level 1 regulation, as defined in
OAR 629-048-0005(19), instructions detail the locations and amounts of material
that may be burned, provide minimum separation from SSRAs, and other
restrictions as may be necessary to minimize smoke impacts. In areas of Level 2
regulation, the information may be considered an advisory but adherence is
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strongly encouraged and burn bosses should use the forecasts and instructions to minimize the possibility of drifting smoke into SSRAs.

- When significant burning is taking place, the Smoke Management forecast unit shall issue written instructions with the forecasts. Outside the period when written forecasts and instructions are issued, burning shall be carried out only after consultation with the forecaster.

- Special Protection Zones (SPZ) have been established around certain communities requiring additional protection from particulates. Any burning in an SPZ, during its protection period, must have the approval of the meteorologist. Specific control strategy restrictions for these areas adopted by the Department of Environmental Quality (DEQ) and Oregon Department of Forestry (ODF) are found in OAR 629-048-0135 and OAR 629-048-0137. SPZ maps are found in Appendix 5.

- Air Stagnation Advisories (ASA) are issued by National Weather Service forecast offices for areas where atmospheric conditions are likely to allow air pollutants to accumulate for an extended period. Forestland burning will be limited to units that are not expected to worsen air quality within the area covered by the ASA. Similar restrictions shall apply for areas for which an air pollution alert has been issued by DEQ.

- The instructions shall be considered a directive from the State Forester for all burning in areas of Level 1 regulation. Any planned variances from the daily burning instructions must be discussed with the Smoke Management duty forecaster. OAR 629-048-0230(6) requires that variances from the instructions must be documented by the burn boss. In addition, variances or revisions to the instructions will be logged by the Smoke Management forecaster as workload permits.

- For forestland included in Level 2 regulation, (OAR 629-048-0005(20)), compliance with the Smoke Management instructions is encouraged. Instructions will identify the amount of material that may be burned, those locations where burns should not be conducted, and other special considerations necessary to minimize the amount of smoke from being carried into SSRAs.

D. Burning Operations: All burning must be conducted in compliance with the Smoke Management Plan. The burn procedures of OAR 629-048-0230 set the minimum requirements that must be met for conducting each prescribed burn.

1. In areas of Level 1 regulation, units must be registered for burning seven days prior to burning (OAR 629-048-0300), planned in the data system the day of the proposed burn (OAR 629-048-0230(4)), and accomplishments reported the first
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business day following the actual burn (OAR 629-048-0320) and each additional
day that burning is conducted in the unit.

2. For forestland subject to Level 2 regulation, burning is not required to be planned
prior to burning. However, all burns must be registered prior to burning and
accomplishment reported by the first business day of the week following ignition.
Specific requirements for reporting are detailed in Appendix 1.

3. In addition to adhering to the restrictions of the Smoke Management forecasts
and instructions, burn bosses must monitor on-site conditions and be prepared to
terminate ignition or take other appropriate action if conditions warrant. Burns
conducted in areas of Level 2 regulation are not required to adhere to the
instructions/advisories but are strongly encouraged to follow the guidance and
burn in such a manner to minimize smoke impacting SSRAs or other smoke
sensitive areas.

4. The Smoke Management forecaster should be consulted before burning under
marginal dispersal conditions and for large or multi-day burns. If notified at least
two days in advance of extended period burns and burns greater than 2000 tons,
the Smoke Management forecaster will, workload permitting, prepare a forecast
specific to the unit being burned.

E. Monitoring: When necessary, the State Forester shall monitor prescribed burning
operations by aircraft and/or other means to ensure compliance with the Smoke
Management Plan and to determine the effectiveness of Smoke Management
procedures. During marginal conditions or when burning is being conducted near SSRAs
or other smoke sensitive areas, monitoring of smoke behavior should be intensified as
needed by using lookouts, aerial observations, and on-site observations of smoke
behavior. A recommended aerial monitoring form is provided in Appendix 4. For some
areas, near real-time data from DEQ air quality monitors and cameras are available via
the internet. This information is used in the preparation and validation of daily Smoke
Management instructions and in the evaluation of smoke impacts.

F. Audits: To evaluate compliance with the Smoke Management Plan, the State Forester
shall conduct a review of approximately one percent of the units burned each year in
areas under Level 1 regulation. Approximately one-half of the audits will be conducted on
the day of the burn and approximately one-half will be pre-burn audits. All units to be
audited shall be randomly selected. Each burn day audit shall include a site visit during
burning, visual tracking and documentation of smoke behavior and movement, and a
determination of compliance with: (a) the conditions of the burning permit, (b) the
provisions of the Smoke Management administrative rules and directives, and (c) the
applicable Smoke Management burning instructions. Each pre-burn audit shall include a
site visit before burning. An independent fuel inventory shall be conducted to validate
accuracy of tonnage estimates.
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Following completion of the audits, a written report of all findings must be prepared and forwarded to the Smoke Management unit. Results of these audits shall be summarized and included in the reports of annual Smoke Management activities.

G. Reporting and Analysis: Data for all prescribed forestland burning throughout the state must be entered into the Smoke Management data system.

The Smoke Management data system is maintained to provide for analysis of the program, manage the collection of burn fees, and provide for calculation of prescribed burning emissions. Data for registered, planned, and accomplished burn units shall be reported in accordance with Appendix 1.

1. Alternative practices to reduce burning are contained in OAR 629-048-0200. Field administrators and federal land managers are encouraged to report application of these practices with an estimate of the reduction of material burned to the Smoke Management unit.

2. Use of best burn practices to reduce emissions (OAR 629-048-0210) is encouraged to minimize emissions. Additional information on emission reduction techniques and alternative practices may be accessed through the ODF web pages on the Internet. Informing the Smoke Management unit of specific actions taken to reduce emissions is encouraged.

H. Smoke Impacts: There are two types of smoke impacts, smoke intrusions of smoke into SSRAs and smoke incidents where significant smoke enters an SSRA at levels below a smoke intrusion (OAR 629-048-0005(27), a Class I Area or other sensitive/populated areas. For two Class I Areas, extra effort (use of test fires or balloon releases to check wind direction or coordinating with the duty forecaster) is needed to minimize smoke from the main plume of a prescribed burn from impacting the Kalmiopsis Wilderness and Crater Lake National Park. If a complaint is received, or district personnel become aware of a smoke intrusion or smoke incident, the District Forester shall assign a qualified individual to conduct an investigation and document the findings.

1. Smoke incidents: The verified entry of smoke at ground level into –
   - “Class I Areas” at levels at or above 70µg/m³ for 1 hour duration or 26 µg/m³ for a 24 hour duration (midnight – midnight).
   - “Populated areas that are not designated as SSRAs” at levels at or above 70µg/m³ for 1 hour duration or 26 µg/m³ for a 24 hour duration (midnight – midnight).
   - Smoke Sensitive Receptor Areas that is below the level of a smoke intrusion.
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All of the incidents above shall be evaluated and logged internally, describing the date, time, duration, location, magnitude (if available), area affected, responsible agency, and any noteworthy comments. A smoke incident log is provided in Appendix 2.

2. Smoke Intrusions (OAR 629-048-0110): An intrusion occurs when verified smoke from prescribed burning enters an SSRA at levels defined in OAR 629-048-0005 (27). For every smoke intrusion, the source of the impact, the duration, and the magnitude of the intrusion will be determined, if possible. Magnitude shall be determined using particulate matter (PM) readings when available, or estimated from the reduction of visibility in the smoke intrusion or smoke incident area.

When PM readings are available, smoke incidents or smoke intrusions will be characterized based on PM values averaged over a one-hour period, or a 24-hour period from midnight to midnight.

- Visibility: If no PM data is available, or if smoke impacting a community is not observed by a PM monitor, the short-term (hourly) impact may be estimated from a reduction of the prevailing visibility. Distinguishing between a smoke intrusion or a smoke incident based on visibility estimates shall be characterized as follows:

SMOKE INTRUSION/INCIDENT CLASSIFICATION BASED ON VISIBILITY REDUCTION (RV)

(For instructions on estimation of visibility see Appendix 2)

<table>
<thead>
<tr>
<th>Baseline Visibility (Miles)*</th>
<th>INTRUSION VS INCIDENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>INCIDENT</td>
</tr>
<tr>
<td>&gt;50</td>
<td>RV ≥ 4.6</td>
</tr>
<tr>
<td>25 - 50</td>
<td>RV ≥ 4.4</td>
</tr>
<tr>
<td>20 - 24</td>
<td>RV ≥ 4.1</td>
</tr>
<tr>
<td>15 - 19</td>
<td>RV ≥ 3.8</td>
</tr>
<tr>
<td>10 - 14</td>
<td>RV ≥ 3.5</td>
</tr>
<tr>
<td>5 - 9</td>
<td>RV ≥ 2.5</td>
</tr>
<tr>
<td>3 - 4</td>
<td>RV ≥ 1.8</td>
</tr>
<tr>
<td>1 - 2</td>
<td>RV ≥ 0.5</td>
</tr>
<tr>
<td>&lt; 1</td>
<td>-</td>
</tr>
</tbody>
</table>

*Baseline visibility is based on optimal visibility with little, if any, discernable visibility restriction. Visibility changes due to naturally occurring phenomena must be factored into the classification as needed (e.g., the change from daylight to dark, blowing dust or sand, rain, fog, etc.)
3. Smoke Intrusion Reporting:

- Smoke Management forecaster(s) will notify DEQ when they become aware of smoke entering an SSRA at levels reaching intrusion criteria (OAR 629-048-0005(27)) and initiate an investigation of the cause. Investigation will include notifying responsible parties. Field administrators must inform the forecaster as soon as they become aware of impacts.

- Smoke intrusion reports shall be prepared for all smoke intrusions. The report consists of two sections. The first section is completed by the Smoke Management forecaster within two business days and submitted to the burn boss or district forester for completion. The report is then returned to Smoke Management within two business days. Upon finalization the report is distributed to interested agencies. A report format is provided in Appendix 2.

- Smoke intrusions that meet or exceed the 24-hour average PM2.5 value of 35 micrograms per cubic meter (National Ambient Air Quality Standard) exceedance will be reported to Smoke Management and DEQ as soon as possible, but no later than one business day after the burn is completed. Reporting will be similar to smoke intrusions but will include management actions (see Appendix 2) to prevent this type of intrusion from occurring in the future. ODF and DEQ will coordinate, along with the agency responsible for the intrusion, and agree to what preventative actions will be taken.

I. Complaints: Complaints shall be investigated, appropriately treated, recorded, and the complainant informed of the investigation results in a timely (consistent with other workload), courteous, and professional manner. Data gathered through complaint investigation shall be reported periodically in accordance with OAR 629-048-0450.

A complaint is any report of smoke alleged to be from forestry activity that may adversely impact public health or protected visibility. Any grievance, tip, information, or inquiry which (1) calls into question forest prescribed burning practices such that an on-site investigation is deemed necessary, or (2) appears likely to be a recurring problem such that documentation seems necessary should be treated as a complaint.

1. Receiving Complaints: Districts and Salem Smoke Management staff shall:

- Respond to the complainant in a timely manner.

- Follow up with appropriate action to the satisfaction of the District Forester.

- Maintain a written record containing at least: the nature of the complaint, names of those involved in the investigation, findings, and action taken. This record shall be kept on file for two years. Copies shall be sent to the
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area office and the Salem Smoke Management unit.

- Inform the complainant of the opportunity to receive follow up of investigation findings.

2. Initial Contact: When a complaint is received, the person receiving the complaint should use the Smoke Complaint Report form found in Appendix 2 of this directive to record the name(s) of the complainant, the description of the complaint, and where the problem is located. If the complaint is received in Salem or by a district other than the one with geographic responsibility, it shall be referred immediately by the person taking the complaint to the proper district.

- If the complainant begins to provide information about health effects resulting from a smoke incident, interrupt the complainant to explain that medical information received by the ODF will become part of the public record and confidentiality cannot be assured.

- If a smoke incident or smoke intrusion is ongoing when the complaint is received, reasonable effort should be made to dispatch the nearest qualified department personnel to the location in question to observe and document the date, time, duration, magnitude, location, scope, and origin of the smoke.

3. Investigation: Other agencies that may have a role in investigating a complaint shall be promptly informed after the initial contact. ODF personnel will cooperate with other agencies involved in joint complaint investigations.

- If the complaint involves an ongoing occurrence, an individual qualified to and capable of investigating the complaint shall be dispatched to the scene immediately. Exceptions must be approved by the District Forester.

If the problem does not require immediate attention, an onsite investigation may be made at the earliest convenience if such site inspection will contribute to the resolution. In all cases, the complainant should be informed of the planned inspection time, if appropriate.

- Observations, notes, and evidence (if appropriate) shall be made/collected in order to make the following determinations:
  
  i. Does the problem involve the Smoke Management Plan (prescribed burning of forest fuels on forestland)?

  ii. Are there any violations? (If so, follow proper enforcement procedures.)

  iii. What may be done to correct the problem?
iv. What actions may be taken to prevent recurrence of the impact?

4. Follow-up: After the investigation is completed, and with the approval of the District Forester on the findings and any necessary follow-up action, complainants who requested investigation information should be contacted and informed of the findings and follow-up action.

5. Reports: A written complaint investigation report or intrusion report as appropriate must be made for all complaints received. For most complaints, use the complaint form in Appendix 2. This form will be sufficient if it contains the minimum information listed above.

For complaints involving violations, or for which evidence has been collected, an expanded investigation report containing pictures, correspondence, and/or other data may be appropriate.

A file of these reports shall be maintained at the district. Copies must be sent to the area office, Salem Smoke Management unit, and other agencies involved in the complaint. A summary of complaints will be made available to the Smoke Management Advisory Committee when requested.

J. SSRA Listing Evaluation Procedures: OAR 629-048-0150 establishes criteria for evaluating proposed listing of areas as SSRAs. Using these criteria, an evaluation of a recommendation must be made for consideration by the Board of Forestry. Analysis shall be conducted with the assistance of DEQ air quality staff. This evaluation will consider:

1. Review of prior smoke incidents. Reports of incident investigations will be used to quantify the duration, magnitude, and frequency of impact from forestland prescribed burning.
   - The cause(s) of the impacts to determine the likelihood of similar events in the future. Consider the potential of repeated or long-lasting impacts.
   - The results of objective measurements, monitoring, or study efforts.
   - Burning programs/plans for areas that could drift smoke into the area.
   - Geographic factors that would tend to funnel smoke into the area.
   - Population and trends for population growth within the community under consideration.
   - Impact on prescribed burning programs in the surrounding area.
   - Probability of the area exceeding National Ambient Air Quality Standards due to potential prescribed burning smoke impacts.
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• Consideration for other air quality improvement projects ongoing or planned for the area.

• Analysis of complaints received, community or governing agency concerns, and recommendations for addition of the area.

Once the evaluation is complete, a report of the results of the analysis must be prepared and a joint recommendation of ODF and DEQ must be submitted to the Board of Forestry. In the event an agreement cannot be achieved between the two departments, ODF will include an explanation of the lack of agreement in the recommendation.

K. Communication, Community Response Plans and Exemption Requests: With increased potential for smoke impacts into SSRAs and other smoke sensitive areas, OAR 629-048-0180 outlines a communication framework to inform vulnerable SSRAs about the impact of prescribed burning smoke and how a community can know when they may be impacted by it. These communities will be encouraged to develop a response plan and program to notify their citizens of potential smoke impacts and how they can reduce their exposure.

1. ODF Salem headquarters will develop and distribute a communication framework that will include at least:

• The purpose and importance of prescribed burning,

• The health risks of wildfire and prescribed fire smoke,

• Recommendations for the public and vulnerable populations to reduce their exposure to smoke,

• How local officials and the public can find out about current and upcoming prescribed burns planned in their area, and

• How residents of an SSRA and other interested persons can get up-to-date information about anticipated smoke impacts in specific SSRAs.

2. ODF and DEQ will recommend that SSRAs which have experienced repeated smoke incidents and/or intrusions collaboratively develop a community response plan and program. This should be led by the local public health authority, in coordination with members or representatives of vulnerable populations, community officials, representatives from entities that have responsibility for prescribed fire, forest restoration collaborative groups, local businesses, and other interested members of the public. Information in the plan and program should include, but is not limited to the following:

• A description of populations in an SSRA community that are vulnerable to the health effects of short-term smoke;
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• Adequate means by which the public, especially vulnerable populations in the SSRA community, will be notified in a clear and reliable way of anticipated smoke impacts in a timely manner;

• Adequate options for protecting the health of vulnerable populations (or helping such populations to protect themselves) from short-term exposure to smoke; and

• A plan and program for communications between the entities that conduct prescribed fire, the local public health authority, and the community’s public and vulnerable populations who may be impacted by smoke.

3. SSRA communities that develop a community response plan and program may request an exemption to the one-hour average intrusion threshold through their local governing body and County Commission. The request for exemption will be considered for approval by ODF and DEQ under the advisement of Oregon Health Authority (see OAR 629-048-0180 for the complete exemption process).

4. SSRA communities with an approved 1-hr exemption are required to submit an annual report in conjunction with the local health authority that includes:

• A summary of methods used to communicate to the public and vulnerable populations;

• A log of dates and times the community initiated their response plan;

• A record of local meetings to discuss or update the community response plan.

“Initiated response plans” means notifications and/or alerts to the public about prescribed fire smoke that impacted, or was expected to impact, the SSRA at 1 hour PM2.5 levels of 70µg/m$^3$ or higher.

L. Quantification of Forest Residues: Consistent evaluation of the fuel available and consumed in each prescribed burn is important for estimating the emissions produced during the burn. Accurate pre-burn quantification of material is essential in minimizing errors in the emissions estimates.

1. The fuel consumed by a prescribed burn is calculated by:

• Determining total pre-burn fuel tonnage load.

• Determining average pre-burn duff depth, litter depth and type.

• Computing woody fuel consumption using available tools developed to predict woody fuel consumption.
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- Calculating and adding duff and litter consumption.

2. Estimation of the total pre-burn fuel tonnage should be through the application of the "planar transect methods" of inventorying forest residue, such as the Brown's inventory method, by use of "Photo Series for Quantifying Forest Residue," or through supplemental photographs developed for specific areas and fuel types. Only if the preceding methods cannot be used should other estimation procedures be employed.


- Digital Photo Series and other estimation aids may be accessed through ODF Smoke Management web pages.

- Instructions for fuels inventory and consumption procedures are available via the Internet or from the ODF Smoke Management unit.

3. For units that have already been piled, one of the three following methods should be used:

- Statistical sample of pile volume is the preferred method. In the statistical sampling method, a randomly selected group of piles is measured and the corresponding pile type is assigned to each sampled pile (Appendix 2). Species of the debris in the piles is determined and calculation of the total material is made through the Piled Fuels Biomass Emissions web application (https://depts.washington.edu/nwfire/piles/), BlueSky Playground, Consume, or through manual calculations.

- Aerial photo interpretation may be used when large-scale aerial photographs of slash piles in harvested units can be evaluated to determine dimensions and volumes. References for application of this technique may be obtained via the Internet or the Pacific Northwest Research Station, USFS.

- Ocular estimate of pile volumes in which the size and number of piles to be burned is estimated through visual techniques where irregular and differing pile types are “smoothed” to an overall size and shape of pile. Estimate of the total amount of material to be burned is then calculated through one of the approved procedures or computer applications.
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4. Consumption of material during the burn is estimated using the same tools as for pre-burn fuel loading or through the use of consumption calculation software applications. Post-burn fuel loading may be estimated using measurement samples or reapplication of the photo series. Additionally, the ODF fuel-loading calculator (http://smkmgt.com/weather/tools/fuel_loading/fuel_loading_tool_home.html), the BlueSky Playground (https://playground.airfire.org), or USFS Consume application to estimate fuels consumed during the prescribed burn may be used. These may be obtained on the Internet and are also available from the Smoke Management unit.

RESPONSIBILITIES:

A. Fire Protection Division Chief: The Fire Protection Division Chief is responsible for the coordination of the Smoke Management Plan with cooperating agencies and state and regional air quality authorities.

B. Fire Protection Division: The Smoke Management unit is responsible for the day to day operation of the Smoke Management program, including:

1. Issuing Smoke Management forecasts and instructions. Forecasts and instructions shall be issued daily during periods of substantial burning (normally March through June and late September through December). These forecasts are monitored and updated as necessary. When routine written instructions are not being prepared, meteorologists shall coordinate and approve prescribed burns on a case by case basis.

2. Maintaining the Smoke Management data system. All forestland burning shall be entered into the data system in accordance with the instructions in Appendix 1.

3. Coordinating with field administrators and identifying and conducting necessary training.

4. Monitoring the Smoke Management program and providing required summary reports and information to interested parties. Smoke Management unit personnel will prepare reports summarizing annual forestland prescribed burning activities, pertinent emissions information, and summaries of audits and smoke incidents.

C. Area Directors, District Foresters, and Unit Foresters are responsible for ensuring that the provisions of this directive are met and that prescribed burning activities are conducted within the requirements of the Smoke Management rules.

D. Field Administrators: ODF and federal land management agency field administrators oversee prescribed burning in accordance with the Smoke Management rules, this directive, and daily Smoke Management instructions.
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Federal land managers are required by the federal Clean Air Act to follow the directions of the forester for the protection of air quality in their prescribed burning operations.

E. **Burn Bosses:** Forest landowners/operators are responsible to conduct forestland prescribed burning according to the Oregon Smoke Management Plan, requirements of field administrators and the instructions issued by the forester.

**REVIEW:** The Smoke Management directive shall be reviewed according to OAR 629-048-0450(5). The review will be conducted jointly by the State Forester and the Director of Environmental Quality and will include representatives of affected agencies and parties.

**AGREEMENT:**

In witness whereof, the parties have agreed to the standards and procedures set forth in this directive.

State of Oregon
Department of Forestry

By: ________________________ By: ________________________
Title: ________________________ Title: ________________________
Date: ________________________ Date: ________________________

State of Oregon
Department of Environmental Quality
REPORTING SYSTEM
SMOKE MANAGEMENT PLAN

General: ODF maintains a computer database to record and administer Smoke Management data. State and private Smoke Management data is entered by field offices into the database via the ODF network. Federal data is collected and consolidated at the USFS regional office and transferred electronically to ODF.

The reporting system is designed to provide a record of:

A. Forestland scheduled for prescribed burning.
B. Locations and amounts of daily planned burning.
C. Burning that has been accomplished.
D. Fee collection and administration information.
E. Historical data for calculation of emission estimates and other summaries.

Area Included: Reporting is required throughout the state. The procedures and requirements for frequency of reporting in different areas of the state are identified below. Data are grouped by administrative units, i.e., national forests, Bureau of Land Management districts, other federal lands, private ownership, and state or local jurisdictions.

Types of Burning to be Reported: All burning related to forest management activities should be included in the reporting system, except as noted below. Examples of reported data include slash and brush disposal after logging, road building, scarification, or burning of brush fields for reforestation.

Types of Burning That Should Not be Included: The following types of burning are not under the authority of the Smoke Management Plan and should not be entered into the Smoke Management data system:

- Burning of household or yard maintenance debris such as paper, leaves, lumber, etc.
- Burning related to agricultural practices, including Christmas tree growing, orchard pruning, and grass or grain stubble burning.
- Burning related to demolition, home or other construction, and building site preparation.
- Any burning done in conjunction with a land use change.
Frequency of Reporting: All burns must be entered into the data system prior to ignition. Detailed procedures are highlighted later in this Appendix. In areas subject to Level 1 regulation, all planned and accomplished burning is entered into the computer data system on a daily basis. Planned burns shall be entered by the day of the burn and accomplishments are reported on the next business day after the unit is burned. In areas of Level 2 regulation, planning burns in the data system is not required and, although daily reporting is encouraged, accomplishments are required to be reported no later than the first business day of the week following the burn.

Procedures:

A. For private, local and state government burning:

1. A unit registration is entered into the data system for each burn unit. Information to be entered is contained in Reporting System Coding Sheet (Part 1). These data are entered into the data system at the local ODF field office. The ODF E-notification number, obtained through the local ODF office, will be used for tracking burn units for all landowners. For Level 1 regulated lands, registration is to be completed at least seven days prior to a planned ignition. Districts may waive the seven-day requirement in accordance with OAR 629-048-0300(2) but all units must be registered prior to burning.

2. Prior to 10 a.m. the day of the ignition, unit numbers of planned burns in Level 1 regulated areas are entered into the data system by field offices. Part 2 is used to assemble the information needed to plan a burn. A listing of planned burns is then compiled and made available to all interested parties. Right-of-way burns need not be planned on a daily basis.

3. An accomplishment report for each burn is submitted by field offices the day after burning, using Part 3. Burning on Level 2 regulated lands must be entered into the data system no later than the first business day of the week following the burn.

4. Right-of-way burns shall be registered as per step one, above. Right-of-way burns do not have to be planned prior to burning. Accomplishments are reported in accordance with paragraph 3 above.
B. For federal agency forestland burning:

1. Information required for registration is the same as for non-federal burning but units are entered into the FASTRAX data system developed for use by the federal agencies. The primary unit identifier shall be the E-notification number obtained through the local ODF office, or a non-activity “406” number obtained through the Salem headquarters office. In order to ensure unit information is transferred without error to the Smoke Management database, registration must be completed at least 7 days prior to the planned ignition. This may be waived by the State Forester in specific instances to meet agency needs but all units must be registered prior to burning.

2. Units to be burned shall be planned through FASTRAX by the day of the burning.

3. Burning results for all federal burning shall be reported through FASTRAX the first business day following the burn.

4. Smoke Management data for federal agencies is consolidated by USFS, Region 6 and is then transmitted electronically to ODF. After this data has been input into the Smoke Management data system, reports of errors and other information is sent back to the USFS to verify receipt of the information and facilitate error correction.

5. To facilitate collection of rangeland burning emissions, data for this burning may be entered into the data system as outlined above, using code “s” as the burn type.

Forms: The following forms below shall be used to gather Smoke Management information for entry into the data system. These forms are available in electronic format on the Smoke Management Internet pages. Locally generated forms are discouraged unless approved by the Smoke Management unit manager.
## OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

### OREGON SMOKE REGISTRATION PART 1:

<table>
<thead>
<tr>
<th>UNIT IDENTIFICATION:</th>
<th>Unit 1</th>
<th>Unit 2</th>
<th>Unit 3</th>
<th>Unit 4</th>
<th>Unit 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATE REGISTERED:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>REGISTRATION #:</td>
<td></td>
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<tr>
<td>DISTRICT ID:</td>
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</tr>
<tr>
<td>OWNERSHIP CODE:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SALE NAME:</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### UNIT INFORMATION:

- **TOWNSHIP:**
- **RANGE:**
- **SECTOR:**
- **LATITUDE:**
- **LONGITUDE:**
- **COUNTY:**
- **DISTANCE TO SSRA:**
- **UNIT ACRES:**
- **CUTTING DATE:**
- **ELEVATION:**
- **SLOPE:**
- **BURNT TYPE:**
- **BURNT REASON:**

### TREATMENT SUMMARY:

- **OPERATOR NAME:**
- **FUEL SPECIES:**
- **LANDING R/A ACRES:**
- **LANDING R/A TONS:**
- **PILE ACRES:**
- **PILE TONS:**
- **BROADCAST ACRES:**
- **DUFF DEPTH:**

#### FUEL TONS PER ACRE (SOUND):

- **0 - 1/4”**
- **1/4 - 1”**
- **1 - 3”**
- **3 - 9”**
- **9 - 20”**
- **20+”**

- **LITTER TYPE:**
- **LITTER DEPTH:**
- **LITTER % COVERAGE:**

### FUEL TONS PER ACRE (ROTTEN):

- **0 - 9”**
- **9 - 20”**
- **20+”**

### ROTTEN STUMPS:

- **DIAMETER:**
- **HEIGHT:**
- **DENSITY:**

### LIVE FUELS:

- **SHRUB TYPE:**
- **SHRUB % COVERED:**
- **SHRUB HEIGHT:**
- **TONS PER ACRE:**

### COMMENTS:

### BILLING INFORMATION:

- **Vendor ID:**
- **First Name:**
- **Last Name:**
- **Business Name:**
- **Address 1:**
- **Address 2:**
- **City:**
- **State:**
- **Zip:**
- **Phone:**
- **Suspended:**
### Operational Guidance for the Oregon Smoke Management Program

#### Oregon Smoke Registration - Plans (Part 2)

<table>
<thead>
<tr>
<th></th>
<th>Unit 1</th>
<th>Unit 2</th>
<th>Unit 3</th>
<th>Unit 4</th>
<th>Unit 5</th>
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<tbody>
<tr>
<td>Planned Date</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planned Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres Planned</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Landing L/W Tons Planned</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pile Tons Planned</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Broadcast Tons/Acres Planned</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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#### Oregon Smoke Registration - Accomplishments (Part 3)

<p>| | | | | |</p>
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<thead>
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<tbody>
<tr>
<td>Actual Burn Date</td>
<td></td>
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<td></td>
</tr>
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<td>Actual Burn Ignition Time</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Acres Burned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landing L/W Tons Burned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pile Tons Burned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broadcast Tons/Acres Burned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieved Rapid Ignition:</td>
<td></td>
</tr>
<tr>
<td>Shrub Consumption:</td>
<td></td>
</tr>
<tr>
<td>Duff Fuel Moisture:</td>
<td></td>
</tr>
<tr>
<td>Fuel Moisture 10 HR %:</td>
<td></td>
</tr>
<tr>
<td>Fuel Moisture 100 HR %:</td>
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<tr>
<td>Fuel Moisture 1000 HR Code:</td>
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<tr>
<td>Days Since Significant Rain:</td>
<td></td>
</tr>
<tr>
<td>Wind Speed:</td>
<td></td>
</tr>
</tbody>
</table>
OPERATIONAL GUIDANCE FOR THE OREGON SMOKE MANAGEMENT PROGRAM

Smoke Management Registration (Part 1 of 3)

<table>
<thead>
<tr>
<th>Fee payer Name:</th>
<th>□ Operator</th>
<th>□ Landowner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billing Street:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address City:</td>
<td>State:</td>
<td>Zip Code:</td>
</tr>
<tr>
<td>Phone Number:</td>
<td>Signature:</td>
<td></td>
</tr>
<tr>
<td>Operator Name (if different than fee payer):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date Register:</td>
<td>District ID:</td>
<td></td>
</tr>
<tr>
<td>Registration #:</td>
<td>(12 digit, including unit, YY-DDU-NNNNNN-UU)</td>
<td></td>
</tr>
<tr>
<td>Ownership Type:</td>
<td>□ Private (P)</td>
<td>□ R6 Fed (F)</td>
</tr>
<tr>
<td>Sale/Unit Name:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal Location: TWIN</td>
<td>N S</td>
<td>E W</td>
</tr>
<tr>
<td>Latitude (DD.DDD) Decimal Degrees only:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Longitude (DD.DDD) Decimal Degrees Only, must include the &quot;-&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Unit Acres:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total acres the material you're burning came from:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date 70% Felled (m/y):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevation: Avg. Slope %:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of burn: (Check Only 1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ (B) Broadcast Activity</td>
<td>□ (G) Grapple Pile</td>
<td></td>
</tr>
<tr>
<td>□ (F) Broadcast Natural</td>
<td>□ (H) Hand Pile</td>
<td></td>
</tr>
<tr>
<td>□ (J) Underburn Activity</td>
<td>□ (N) Underburn Natural</td>
<td></td>
</tr>
<tr>
<td>□ (L) Landing Piles Only</td>
<td>□ (R) E/W</td>
<td></td>
</tr>
<tr>
<td>□ (M) Range</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If unit has landing piles in addition to another type of burn, DO NOT check Landing Piles Only, check the box that pertains to the majority of your unit, and enter the Landing pile tons in the space below.

| Burn Reason: (Check Only 1) |            |
| □ (H) Hazard Reduction | □ (W) Wildlife Habitat |
| □ (E) Hazard & Silviculture | □ (S) Silviculture |
| □ (F) Forest Health | □ (R) Other |
| □ (L) Lvl 2 Reg., Fee Exempt | |

| Species: Only 1 |            |
| □ (D) Douglas Fir/Hemlock/Cedar | □ (H) Hardwood |
| □ (S) Sage/Bitterbrush | □ (G) Grass |
| □ (P) Mixed Conifer | □ (I) Ponderosa |
| □ (L) Lodgepole | |

<table>
<thead>
<tr>
<th>Landing R/W Ac:</th>
<th>Landing R/W Tons:</th>
<th>Filed Ac:</th>
<th>Filed Tons:</th>
<th>Broad/Under Burn Ac:</th>
<th>Duff Depth:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Fuel Tonnage:</th>
<th>Tons/Acre (0.25&quot;)</th>
<th>Tons/Acre (0.26-1&quot;)</th>
<th>Tons/Acre (1.1-3&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres:</td>
<td>Tons/Acre (3.1-9&quot;)</td>
<td>Tons/Acre (9.1-20&quot;)</td>
<td>Tons/Ac. (20.1&quot;)</td>
</tr>
</tbody>
</table>

| Forest Floor Litter Type: |            |
| □ Short Needle Pine | □ Long Needle Pine |
| □ Other Conifer | □ Deciduous Hardwood |
| □ Evergreen Hardwood | □ Grass |

Litter Depth (i.e. 1.5") Litter coverage on ground (%)

| Rotten Stumps: (Average Diameter, Height, and amount per acre.) |            |
| Rotten Logs: (Tons) | 3-9" | 9-20" | 20+" |
| Live Shrub Type & Cover %: |            |            |            |
| Live Shrub Height: |            |            |
| Live Shrub Tons per Ac: |            |            |

Comments: THIS IS NOT A BURNING PERMIT. (All units must be registered a minimum of 7 days before burning, earlier preferred.)
Smoke Management Registration
Burn Plan (Registration Part 2)

Operator: ________________ Phone: ________________

Planned Date of Burn: ________________ Planned Ignition Time: ________________

Acres Planned: ________________ Landing – R/W Tons Planned: ________________ Pile Tons Planned: ________________
Broadcast Tons/AC Planned: ________________

Special Problems and Mitigation Instructions:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Personnel:

________________________________________________________________________

Equipment:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Other:

________________________________________________________________________

Mop-up and patrol is required to prevent the spread of fire from the planned unit. Mop-up and patrol will be provided by the landowner or operator until the danger of fire spreading is over. Sufficient contingency force must be provided by the landowner or operator to ensure control of this burn during periods of adverse weather conditions.

Pursuant to ORS 477.066, 067, 068, and 120 the Landowner and Operator identified on this plan shall immediately proceed to control and extinguish any uncontrolled fire escaping the planned burn area and be liable for up to $300,000 of the Forester’s fire suppression costs. In case the Landowner or Operator fails to perform the duty required, or is willful, malicious, or negligent in the fire origin, or subsequent spread, or fails to make every reasonable effort, the actual costs incurred by the Forester, or a Forest Protection Association in controlling and extinguishing the fire shall be paid by the Landowner or Operator.

Signature of Operator: ______________________________ Date: ________________

Signature of ODF Forester: ______________________________ Date: ________________

Attach a map of the unit which shows: 1) access routes, 2) unit boundaries, 3) water sources, 4) problem areas, 5) control lines, 6) adjacent fuels, 7) adjacent landowners.

FOR OFFICE USE ONLY
Stewardship Forester: ______________________________ Notes: ______________________________

District ID: ______________________________
## Smoke Management Registration

### Accomplishment Section, (Registration Part 3)

<table>
<thead>
<tr>
<th>Operator Name:</th>
<th>Phone:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit Name:</td>
<td>Registration #:</td>
</tr>
<tr>
<td>Actual Burn Date:</td>
<td>Actual Ignition Time:</td>
</tr>
<tr>
<td>Actual Acres Burned:</td>
<td>Landing-R/W Tons Burned:</td>
</tr>
<tr>
<td>Pile Tons Burned:</td>
<td>Broadcast Tons/Ac. Burned:</td>
</tr>
<tr>
<td>Total Broadcast Tons Burned:</td>
<td>Total Tons Burned:</td>
</tr>
<tr>
<td>Ignition Duration:</td>
<td>Achieved Rapid Consumption:</td>
</tr>
<tr>
<td>Duff Fuel Moisture:</td>
<td>Fuel Moisture 10Hr%</td>
</tr>
</tbody>
</table>

**Fuel Moisture Code:**
- ☐ NFDR-th (1000hr moisture from NFDS model)
- ☐ Adj-th (user adjusted moistures)
- ☐ Weighted (oven weighted samples)

<table>
<thead>
<tr>
<th>Days Since Significant Rain:</th>
<th>Wind Speed:</th>
</tr>
</thead>
</table>

**Additional Comments:**

---

---
INSTRUCTIONS FOR REPORTING SYTEM CODING SHEET

Unless otherwise specified, data shown in quotation marks (" ") should be entered without the quotation marks. All entries are mandatory unless indicated otherwise. Entries consist of only numbers or letters. No special characters such as dashes, commas, etc. may be used.

PART ONE: REGISTRATION INFORMATION

1. Date registered: Enter the day of registration in MM/DD/YY format.

2. Registration number: Twelve digits, the ten (10) digit E-notification number obtained through the Forest Practices program plus a two digit unit extension that can come from either the E-notification system or can be generated locally. Enter data as one, twelve-digit number with no spaces, dashes, or other characters. For natural, “non-activity” units without E-notification numbers, contact the Salem Smoke Management unit. Blocks of 100 “406” numbers will be issued to local offices for conducting these burns. Units should not be re-registered using a different number during the three-year burning window available under the original registration.

3. District or Forest Identifier: A three-digit code as shown in the table, “Smoke Management District ID Numbers” later in this Appendix.

4. Ownership type:
   - USFS - U
   - Federal (BLM) - F
   - Other Federal – O
   - State, County, Municipal – S
   - Private - P

5. Sale name: Up to 20 characters, letters, and numbers only with no punctuation.

6-8. Legal: Enter location by township, range, and section, but do not include the letters "T", "R", and "S". Partial townships may be entered. "1/4, 1/2, and 3/4" partials should be entered in decimal format as "2, 5, or 7", respectively after the full township or range. If the unit covers more than one section, enter the predominant section number.

6. Township

7. Range

8. Section
INSTRUCTIONS FOR REPORTING SYSTEM CODING SHEET

PART 1:  BASIC UNIT INFORMATION (Cont.)

Examples:

<table>
<thead>
<tr>
<th>Field Number</th>
<th>10</th>
<th>11</th>
<th>12</th>
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</thead>
<tbody>
<tr>
<td>T10S-R10W-S33</td>
<td>10S</td>
<td>10W</td>
<td>33</td>
</tr>
<tr>
<td>T10 1/2S-R11E-S25</td>
<td>10.5S</td>
<td>11E</td>
<td>25</td>
</tr>
<tr>
<td>T9 3/4S-R7 1/2E-S6</td>
<td>9.7S</td>
<td>7.5E</td>
<td>6</td>
</tr>
</tbody>
</table>

9. **Latitude**: Use decimal degrees only. Enter two digits to left of decimal and four digits to the right of the decimal.

10. **Longitude**: Use decimal degrees only. Enter a “-” sign and three digits to the left of the decimal and four digits to the right of the decimal.

11. **County Number**:

<table>
<thead>
<tr>
<th>County Number</th>
<th>Baker</th>
<th>Douglas</th>
<th>Lake</th>
<th>Sherman</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>10</td>
<td>19</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Benton</td>
<td>11</td>
<td>20</td>
<td>Lane</td>
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<td>22</td>
<td>Linn</td>
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<tr>
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<td>Polk</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>36</td>
</tr>
</tbody>
</table>

12. **Distance from nearest Smoke Sensitive Receptor Area (SSRA) boundary**: Round to nearest mile. If within SSRA, use 0. If more than 60 miles, enter "60".
INSTRUCTIONS FOR
RECORDING SYSTEM CODING SHEET

PART 1: BASIC UNIT INFORMATION (Cont.)

13. **Acres in unit:** Enter the total number of acres in the unit. Acreage for individual treatment types will be broken out in data fields 21 through 26, below.

14. **Date when 70% of the cutting was completed:** Enter the six-digit code “yyyy-mm”, e.g. “2009-12” means that December 2009 was the cutting date. Leave blank for natural fuels or no cutting.

15. **Elevation of burn:** Elevation of burn above sea level in feet. Enter average elevation to the nearest 100 feet.

16. **Slope:** Enter actual average slope. Maximum of three digits, do not enter % symbol.

   Example: 30% slope is entered as “30”.

17. **Type of burn:** Enter the predominate type of burning. Do not enter “L” for units that are a combination of landings and other burn types.

   - Broadcast Activity - B
   - Underburn Activity - U
   - Broadcast Natural - F
   - Underburn Natural - N
   - Handpile - H
   - Grapple Pile - G
   - Tractor Pile - T
   - Landing Only - L
   - Right-of-way – R
   - Rangeland – S

18. **Primary reason for burn:**

   - Hazard Reduction - H
   - Silviculture - S
   - Forest Health - F
   - Wildlife Habitat - W
   - Hazard and Silviculture - B
   - Other - R
   - Forest Health, Maintenance – M
   - Level 2 regulation, Fee Exempt – E

19. **Operator Name:** Individual or business conducting the burn (optional entry).

20. **Predominant species of fuel:**

   - Douglas Fir, Hemlock, Cedar - D
   - Ponderosa Pine - P
   - Lodgepole Pine - L
   - Mixed Conifer - M
   - Hardwood - H
   - Brush - B
   - Juniper - J
   - Grass - G
   - Sagebrush or Bitterbrush – S
INSTRUCTIONS FOR 
REPORTING SYSTEM CODING SHEET

PART 1: BASIC UNIT INFORMATION (Cont.)

21. **Landing or right-of-way pile acres:** Enter the total number of acres from which the material was collected. If less than 1, report as 1. Include all landing acreage for the unit.

22. **Landing and right-of-way pile acres:** Enter the total acres of material contained within all landing (and right-of-way) piles that will be burned. Do not include broadcast woody loading or in-unit piles in this entry (See item 28-33). Leave blank if there are none.

23. **Landing and right-of-way pile tons:** Enter the total tons of material contained within all landing (and right-of-way) piles that will be burned. Do not include broadcast woody loading or in-unit piles in this entry. Leave blank if there are none.

24. **Piled acres:** Enter the number of acres expected to be burned as in unit piles. Leave blank if there are none.

25. **Piled tons:** For piled burns, and piles (other than landing or right-of-way piles) on broadcast and underburn units, enter the pile tonnage expected to be burned in the unit. Leave blank if there are none.

26. **Broadcast acres:** Enter acres of broadcast or underburning expected to be burned. Leave blank if there are none.

27. **Average duff depth:** Report to the nearest tenth of an inch. Do not include the decimal when reporting. Example: 1.6 inches of duff should be reported as "16".

28-33. **Woody loading in broadcast and underburns:** Reported as tons per acre by size class. For natural fuels burns, include all fuel types in the appropriate size classes. Round all data to the nearest ton/acre.

28. 0 - 0.25" loading
29. 0.26 - 1.00" loading
30. 1.1 - 3.00" loading
31. 3.1 - 9.00" loading
32. 9.1 - 20.00" loading
33. >20" loading
INSTRUCTIONS FOR REPORTING SYSTEM CODING SHEET

34-36. **Forest floor fuel (optional entry):**

34. Litter type: Choose one of the following:
   - Short needle pine
   - Long needle pine
   - Other conifer
   - Deciduous hardwood
   - Evergreen hardwood
   - Grass

35. Litter depth: Record in 10ths of inch.

36. Litter coverage percent: Percentage coverage for entire unit.

37-39. **Rotten fuel tons per acre (optional entry):** Reported as tons per acres by size class.

37. 3 – 9” loading
38. 9 – 20” loading
39. >20” loading

40-42. **Rotten stumps (optional entry):** Report diameter in inches, height in feet (use decimal value for a partial foot), and density number of stumps per acre.

40. Diameter
41. Height
42. Density

43-46. **Live fuels (optional entry):**

43. Shrub type: Choose one of the following.
   - Broadleaf
   - Evergreen
   - Sage

44. Shrub percent coverage: Coverage over entire unit
45. Shrub height: In tenths of feet
46. Tons per acre: Shrubs consumed by burning

47. **Comments (optional entry):**
INSTRUCTIONS FOR
REPORTING SYSTEM CODING SHEET

PART 2: PLANNED BURN

The following information shall be entered into the computer by the day the unit is planned for burning for all districts and forests in Level 1 regulation, except for right-of-way piles. Planning of right-of-way piles and areas in Level 2 regulation is encouraged but not required.

1. **Unit number:** The twelve (12) digit number that was entered in Part 1 is entered.

2. **District or forest identifier:** As used in Part 1.

3. **Planned date:** Enter the date the unit is planned to be burned using the format mm/dd/yy.

4. **Estimated ignition time:** Use the 24-hour clock and local time. For example, a planned ignition time of 2:00 p.m. is entered as 1400.

5. **Acres planned:** Enter the number of acres that are planned to be burned. For piled units this is the acres from which the material was gathered.

6-7. **Expected fuel consumption:**

- 6. **Landing pile tons:** For right-of-way and landing pile units, enter the total tons expected to be burned. Leave blank if there are none.

- 7. **Unit pile tons:** For piled burns and piles (other than landing or right-of-way piles) that are planned to be burned on broadcast and underburn units, enter the pile tonnage in total tons of woody material expected to be burned. Leave blank if there are none.

8. **Expected fuel consumption in broadcast or underburns:** Enter the number of tons of woody fuel, excluding piles and ground fuel expected to be burned in tons per acre.
INSTRUCTIONS FOR REPORTING SYSTEM CODING SHEET

PART 3: ACCOMPLISHED BURN

The following information shall be entered into the computer the next business day after the burning occurred for all districts and forests in Level 1 regulation.

For right-of-way piles and all burning in areas of Level 2 regulation, accomplished burning shall be entered into the data system by close of the first business day of the week following ignition. Daily reporting of accomplishments in Level 2 areas is encouraged.

For landing and piled units only items 1 through 8 need to be reported.

1. **Unit number**: Use the twelve (12) digit number that was entered in Part 1 and Part 2.

2. **District or forest identifier**: As used in Part 1 and Part 2.

3. **Actual date of burn**: Enter the date the unit was burned using the format mm/dd/yy.

4. **Actual ignition time**: Use the 24-hour clock and local time.

5. **Number of landing/right-of-way acres burned**: This can be more or less than the number planned. Include slop-over acres in the total. Report only those acres treated by fire, not the total unit size if different. In the event more acres were burned than initially registered and this area was not treated as a wildfire, the additional acreage must be registered and accomplished as a separate unit. Fees shall be applied as appropriate.

6. **Landing or right-of-way tons burned**: (may be more or less than that entered in Part 1 and 2): Enter the total tons of material actually burned in the piles.

7. **Pile acres burned**: Report only those acres treated by fire, not the total unit size if different. This can be more or less than the number planned. Include slop-over acres in the total. In the event more acres were burned than initially registered and this additional area was not treated as a wildfire, the extra acreage must be registered and accomplished as a separate unit. Fees shall be applied as appropriate.

8. **Pile tons burned**: Enter the pile tonnage in total tons of material burned. Do not include landing or right-of-way tonnage in this field.
PART 3: ACCOMPLISHED BURN (Cont.)

9. **Fuel consumed in broadcast and underburn portion of units:** Enter the amount of woody fuel and ground fuel burned as tons per acre. This number can be more or less than the entries made in Part 1 and Part 2.

10. **Was rapid ignition achieved?**
    
Enter "Y" or "N", use subjective judgment to answer.

11. **Shrub consumption (optional entry):** Percentage of shrubs consumed in unit.

12. **Duff fuel moisture:** Enter either dry (30%), normal (70%), or moist (120%).

13. **10-hour fuel moisture:** Enter the percentage rounded to whole numbers. Example: 15.4% fuel moisture should be entered as "15".

14. **1000-hour fuel moisture:** Enter the percentage without the “%”. Example: 24% fuel moisture should be entered as "24".

15. **1000-hr fuel moisture code:** Method used to determine. Enter one of the selections below for the method used to determine 1000-hr moisture.
    
    Method
    NFDR-th
    Adj-th
    Weighed

16. **Number of days since significant rain:** West of the Cascades: Enter the number of days since 0.5 inches of rain have fallen within a 48-hour period.

    East of the Cascades: Enter the number of days since 0.25 inches of rain have fallen within a 48-hour period.

17. **Wind speed:** In miles per hour
## SMOKE MANAGEMENT DISTRICT ID NUMBERS

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<thead>
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<th>ID</th>
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OREGON SMOKE MANAGEMENT REPORTING SYSTEM CODING SHEET
RIGHT-OF-WAY UNITS

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<th>Agency</th>
<th>Month</th>
<th>Forest/District</th>
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<table>
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<tr>
<th>Unit #</th>
<th>DATE BURNED</th>
<th>ACTUAL IGNITION TIME</th>
<th>ACTUAL TONS BURNED</th>
<th>INSTRUCTIONS</th>
</tr>
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</table>
| 1      | mm/dd/yy    | xxxx                 | xxxxxx             | Data is entered for each day a unit is burned. Example, if a unit was partially burned on 5 different days, there will be 5 entries in the form.  
1. Enter 12 digit unit number.  
2. Data may be entered for the calendar month but is reported to the data system as required for the level of regulation.  
3. Right-of-way burning need not be planned on a daily basis.  
4. Ignition time is based on a 24-hour clock, local time.  
5. Report total tons burned during each burning period. |
REPORTING SMOKE INTRUSIONS AND SMOKE INCIDENTS

A. Smoke intrusion reports and the smoke incident log provide a descriptive record of smoke impacts into SSRAs or other sensitive areas. Smoke intrusion reports shall be made for prescribed burning smoke that enters SSRAs at levels defined as an intrusion. Smoke entering SSRAs at levels below the intrusion threshold or other areas sensitive to smoke shall be identified and reported as smoke incidents. The reports are used to evaluate the causes of impacts and to identify potential areas of improvement in forecasts, instructions, and operational procedures that will minimize future smoke impacts. The incident log may be useful in an evaluation if the area is recommended for inclusion on the list of SSRAs. Reports shall be summarized in annual analyses of Smoke Management data compiled by the Smoke Management section.

B. Field units (i.e., state districts and associations, resource areas, and national forests) are responsible for monitoring smoke from burning activity and reporting smoke impacts to the Smoke Management Meteorologist. The Meteorologist will determine whether the smoke impact is a smoke incident or a smoke intrusion. If the smoke impact is a smoke incident it will be logged on a smoke incident log detailing the date, time, duration, magnitude, area affected, responsible agency, and any pertinent comments. If the smoke impact is validated as a smoke intrusion the Meteorologist will use Form 1-4-1-301 to detail the impact.

C. The Salem Smoke Management unit completes sections A through E of the report. The report will be forwarded to the field to complete section F. The field unit will return the completed report back to the Smoke Management unit for dissemination to affected field offices, ODF leadership, DEQ, and the Smoke Management Advisory Committee. In the event that a smoke intrusion involves burns conducted in more than one field unit, the Smoke Management unit will combine the individual field reports into a single summary report. Additionally, the Smoke Management unit shall:

1. Transmit to applicable field offices and DEQ initial notification of smoke intrusions as soon as they become aware of smoke entering at PM levels at or above the one-hour or 24-hour thresholds.

2. Coordinate with other offices and agencies to develop descriptive reports of smoke intrusions.

3. Prepare an annual summary of smoke intrusions and smoke incidents. This summary is included in reports of annual Smoke Management activities required by OAR 629-048-0450 and presented to the Smoke Management Advisory Committee as needed.
REPORTING SMOKE INTRUSIONS AND SMOKE INCIDENTS

D. If a smoke intrusion is determined to exceed the National Ambient Air Quality Standards (NAAQS), the Smoke Management Meteorologist will immediately notify DEQ of the impact, if DEQ has not already contacted ODF about the intrusion. All other aspects of the intrusion will continue to be processed similar to a smoke intrusion described in C. When the intrusion report is complete and disseminated, ODF, DEQ and members of the agency responsible for the burn(s) will meet either by phone or in person to discuss why the exceedance occurred and how it can be prevented in the future. Details of any outcomes to prevent future NAAQS exceedances will be highlighted in the Smoke Management Annual Report.

Procedures:

1. Burn bosses, field administrators, or other forestry personnel shall report suspected smoke impacts into SSRAs, Class I Areas, or areas sensitive to smoke by telephone to the Smoke Management forecaster as soon as possible. If Smoke Management office is not open leave a message with a return number.

   Personnel observing smoke entering an SSRA from burn units outside their administrative area should also submit telephone and written reports as outlined above. In addition, they should notify the field office that has administrative responsibility for the problem unit(s) that smoke is entering or about to enter an SSRA.

2. An evaluation of the impact shall be made by field personnel, time and workload permitting, to determine the extent, magnitude, and duration of the smoke impact.
SMOKE INTRUSION REPORT
Form 1-4-1-301

Intrusion #: _____ Intrusion Date(s): _____ Location(s): _____

SECTIONS A-E TO BE COMPLETED BY SALEM FORECASTER:

A. SMOKE ORIGIN:

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<th>Location (TRS)</th>
<th>Owner Class</th>
<th>Elev (ft)</th>
<th>Acres</th>
<th>Tons</th>
<th>Burn Date</th>
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B. INTRUSION SUMMARY:

1. Area Affected

2. Intrusion Date __________ Start Time __________ End Time __________ Duration ______ hour(s)

3. Highest hourly PM2.5 (μg/m³) __________ or lowest prevailing visibility during intrusion (mi) __________

4. 24-hr average PM2.5 (μg/m³) (midnight to midnight) __________

C. ODF SMOKE FORECAST:

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<th>Mixing Height</th>
<th>Surface Wind</th>
<th>Transport Wind</th>
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<td>Next 12 hours</td>
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D. ODF SMOKE INSTRUCTIONS:

1. Written instructions (if applicable): _____

2. Verbal instructions (if applicable): _____

E. SMOKE MANAGEMENT WEATHER OFFICE REPORT:

1. Describe general weather conditions (including observed mixing heights and transport winds): _____

2. Comments: _____

SECTION F TO BE COMPLETED BY FIELD PERSONNEL:

F. FIELD REPORT:

1. Describe general weather conditions observed during the burn period and for the next 6 hours (sky conditions, wind speed and direction, height of smoke plume, direction of smoke travel, etc.): _____

2. Comments (Note other sources of smoke that may have contributed to the intrusion): _____

3. Public complaints: _____

______________________________ / _______________________________
District/Forest Representative/Date        Smoke Management Forecaster/Date

Final Intrusion Report Fill-in.docx/Aux F (Plot)   Page 1   Revised 05/13/2019
Smoke incidents: The verified entry of smoke at ground level into –
  - “Class I Areas” at levels at or above 70µg/m³ for 1 hour duration or 26 µg/m³ for a 24 hour duration (midnight – midnight).
  - “Populated areas that are not designated as SSRAs” at levels at or above 70µg/m³ for 1 hour duration or 26 µg/m³ for a 24 hour duration (midnight – midnight).
  - Smoke Sensitive Receptor Areas that is below the level of a smoke intrusion.

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<th>Responsible Agency</th>
<th>Burn size (tons); Location (TRS)</th>
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</table>
SMOKE MAGNITUDE DETERMINATION FROM VISIBILITY OBSERVATIONS

INTRODUCTION: When no PM monitor data is available to determine the magnitude of a smoke impact, visibility data may be used to estimate the level of impact when such data is available from a reliable source. The observation procedure outlined below, using standard National Weather Service visibility criteria from Federal Meteorological Handbook No. 1, may be utilized by field units to gauge impacts in areas where no monitoring data is available. Prevailing visibility is used as a surrogate for PM monitor data. Use the procedure outlined below to determine prevailing visibility and the visibility table in Appendix 2, page 6 to make an estimate of the magnitude of a smoke impact.

OBSERVATION PROCEDURE:

1. Determination of sector visibility: When the visibility is not uniform in all directions, divide the horizon circle into sectors which have approximately the same visibility. Using available landmarks, aided by a detailed local area map, determine the greatest distances that can be seen in each segment of the horizon circle. Base this estimate on the appearance of the landmark. If the markers are visible with sharp outlines and little blurring of color, the visibility is much greater than the distance to the markers. If a marker can barely be seen and identified, the visibility is about the same as the distance to that marker. When the visibility is greater than the distance of the farthest markers, estimate the greatest distance you can see in that direction. Note the portions of the circle with similar visibility characteristics.

2. Determination of prevailing visibility: After sector visibilities have been determined, resolve them into a single value for reporting purposes. To do this, use either the greatest distance that can be seen throughout at least half the horizon circle, or if the visibility is varying rapidly during the time of the observation, use the average of all observed values. Prevailing visibility should be reported in miles.
## EXAMPLES – Determining Prevailing Visibility
(Prevailing Visibility indicated by asterisks)

<table>
<thead>
<tr>
<th>Visibility (Miles)</th>
<th>Approximate Degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>90</td>
</tr>
<tr>
<td>2½ *</td>
<td>90</td>
</tr>
<tr>
<td>2¼</td>
<td>90</td>
</tr>
<tr>
<td>2</td>
<td>90</td>
</tr>
</tbody>
</table>

Visibility | Approximate Degrees |
-----------|---------------------|
10         | 40                  |
8*         | 150                 |
6          | 70                  |
5          | 100                 |

Visibility | Approximate Degrees |
-----------|---------------------|
8          | 100                 |
6          | 50                  |
5*         | 130                 |
4          | 80                  |
## OREGON SMOKE MANAGEMENT
### SMOKE COMPLAINT REPORT

<table>
<thead>
<tr>
<th>Complaint From:</th>
<th>Name:</th>
<th>Organization:</th>
</tr>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>Received by:</th>
<th>Name:</th>
<th>Office:</th>
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<tbody>
<tr>
<td></td>
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<table>
<thead>
<tr>
<th>Date:</th>
<th>Time:</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Complaint Source:</th>
<th>Phone:</th>
<th>Mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Person</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Investigated By:</th>
<th>Name:</th>
<th>Office:</th>
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<tbody>
<tr>
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<table>
<thead>
<tr>
<th>Date:</th>
<th>Time:</th>
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<tbody>
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<table>
<thead>
<tr>
<th>Location of Smoke Impact:</th>
<th>Location of Smoke Source:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>T</th>
<th>R</th>
<th>sec</th>
<th>Unit Number(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

### Description of Complaint:

- Inform the complainant that they have ability to receive follow-up.

### Investigation Results:

- Burn Permit Issued
- Landowner
- Reported Tons/Acres
- Actual Tons/Acres
- In data system
- Citation issued
- Instruction Compliance
- Referred to other Agency
- Other

### Remarks:

- |
- |
- |

### Distribution:

- Smoke Management
- USFS: R6
- District
- District
- District
- District
- District
- District
- Tribe/Other Agency

### Complaint No.:

<table>
<thead>
<tr>
<th>Signature</th>
<th>Date</th>
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</table>
SHAPE CODE CHARTS

1. Half-section of Sphere

Half of a ball, where the width is approximately twice the height, and the sides are evenly rounded.

2. Paraboloids

Pile height is same as radius (half diameter), but surface tapers in a parabola towards the top. Sides taper in a parabola towards the top, where the height is greater than the radius (half the width). Pile height is less than half the radius, and the sides drop down to the base in a parabola.

3. Half Cylinder

Logs and debris are generally aligned in parallel. Pile shape is rounded side-to-side, with both ends of the pile approximately the same height.

4. Half Frustum of Cone

Logs and debris are generally aligned in parallel. Pile shape is rounded side-to-side, but heights of opposing ends are not equal (pile tapers).

5. Half Frustum of Cone with round ends

Pile shape is generally the same as #4, but the ends are rounded, and appearance is similar to half a pear.

6. Half Ellipsoid

Long, tapering pile, rounded side-to-side, with well-rounded ends. Widths of opposing ends are not equal.

7. Irregular Solid

Irregularly-shaped pile with straight but uneven sides. Dimensions for opposing sides are not necessarily equal.
AERIAL MONITORING

The form below (available on the department Smoke Management website) may be used to record observations during aerial monitoring flights. Completed forms should be forwarded to the forecaster after the flight has been completed.

Aerial monitoring should be conducted during periods of considerable burning and when burning in less than excellent atmospheric dispersion conditions. Monitoring should be scheduled far enough into the burns to determine the extent and direction of smoke drift.

Instructions for entries are found on the second page of the form. Flying parallel to the smoke plume is recommended to ensure accurate determination of the direction of movement of the smoke. The plume type diagrams provide a quick reference for generalized descriptions. If they do not adequately describe the character of the observed smoke, specific descriptions of observed plumes should be made.

The chart on the second page of the form may be used during takeoff and/or landing to record a temperature profile using the aircraft outside air temperature sensor. These profiles are an aid to help determine atmospheric stability and mixing height.
# Aerial Smoke Monitoring Form

<table>
<thead>
<tr>
<th>Date:</th>
<th>Observer</th>
<th>Takeoff Time</th>
<th>Landing Time</th>
</tr>
</thead>
</table>

**Flight Route:**

**Weather Elements:** (Cloud type and amount, Visibility, Haze Layers, etc.)

**Air Quality/Other Burning:**

**Prescribed Burning Smoke Behavior**

<table>
<thead>
<tr>
<th>Time</th>
<th>Location</th>
<th>Unit Number</th>
<th>Smoke Layers</th>
<th>Smoke Movement</th>
<th>Remarks: (Plume type, surface smoke, dispersion, wind/shear, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Base</td>
<td>Low-level</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Top</td>
<td>Aloff</td>
<td></td>
</tr>
</tbody>
</table>

**Plume Types:**

SSRA/Class I Area impact: Occurring _____________ Likely ______________________

Which Area:

Smoke Source:

Level of Impact:
Flight Route: General description of area observed.


Air Quality/Other Burning: Haze or smoke layers as a result of industrial, agricultural, or other burning. Estimate height, thickness, density. If possible determine if surface based or aloft. Identify sources if observable.

Time: Time of each observation made.

Location: Township, range, section or latitude and longitude. Location relative to SSRAs if close.

Unit #: Identify number if was planned.

Smoke Layers: If smoke is layering determine top and bottom and estimate visibility or visibility change from clear air.

Smoke Movement: Determine or estimate movement of various levels or heights in a column. Look for shear layers.

Remarks: Other factors that would aid in data analysis. Length of layered smoke plume, smoke mixing down toward surface. Downwind dissipation.

Plume Type descriptions:
1. Good vertical lift. Plume holds together. Little or no low-level smoke escape. Light wind, little shear.
2. Good vertical lift. Plume generally holds together. Column tilted by wind or top shearing off at relatively high elevation.
3. Limited plume rise. Plume generally well defined with definite low-level downwind spread of layered smoke.
4. Poor lift. Smoke rises little. Tends to hold to a defined area but some escape or low-level smoke.
5. No column development. Smoke diffuses with little or no lift. Most smoke near surface with little tendency to hold together. Smoke spreads.
6. Plume mostly intact. Indications of one or more shear layers apparent. Identify directions if possible.
7. Plume initially rises but bends over or mixes significantly back to the surface.

SSRA/Class I Area Impact: Identify area impacted or likely to be impacted, intensity of impact. Main plume, drift, residual.

TEMPERATURE PROFILE
Indicate temperatures during climb-out or descent. Note inversion layers (temperature increasing with height). Plot profile at right.
SPECIAL PROTECTION ZONE MAPS

Special Protection Zone (SPZ) boundaries are shown in maps in this appendix. SPZ rules are found in OAR 629-048-0135 and 0137.