

# **Crop Residue Burning Program Operating Guide**

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**State of Idaho  
Department of Environmental Quality**

**June 2020**



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# **Crop Residue Burning Program Operating Guide**

**June 2020**



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## Acronym List

CRB	crop residue burning
CMAQ	Community Multiscale Air Quality
CRP	Conservation Reserve Program
CREP	Conservation Reserve Enhancement Program
DEQ	Department of Environmental Quality
EDMS	records management database used by DEQ
GPS	Global Positioning System
IDL	Idaho Department of Lands
ISP	institution with sensitive populations
mph	miles per hour
NAAQS	National Ambient Air Quality Standards
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
O <sub>3</sub>	ozone
PM <sub>2.5</sub>	particulate matter less than 2.5 microns in diameter
PM <sub>10</sub>	particulate matter less than 10 microns in diameter
ppb	parts per billion
RH	relative humidity
SBP	Spot and Bale Permit
SIP	State Implementation Plan
SMA	smoke management area
SOP	Standard Operating Procedure
µg/m <sup>3</sup>	micrograms per cubic meter
USDA	US Department of Agriculture

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# 1 Purpose

The purpose of this operating guide is to serve as the main crop residue burning (CRB) smoke management program implementation guide. It describes in detail the overall and day-to-day operation of the program, including grower and Idaho Department of Environmental Quality (DEQ) requirements, roles, and responsibilities of DEQ staff, CRB program policies and procedures, and program evaluation and annual review requirements. The appendices contain useful reference tools such as weather forecasting websites and burn decision procedures. The CRB program is dynamic and continually improving; therefore, this operating guide will be reviewed on an annual basis and revised as necessary.

DEQ's CRB program and this operating guide do not apply to crop residue burning within reservation boundaries in Idaho other than where DEQ implements the Crop Residue Burning Program for The Kootenai Tribe per MOU (EDMS 2008AAD54). Interested parties should contact individual tribes for information on crop residue burning on reservations in Idaho.

For ease of reading, this operating guide refers to all persons who conduct crop residue burning as "growers." However, this does not mean that only growers may conduct crop residue burning. Any person may conduct crop residue burning so long as the burning is conducted in accordance with the requirements of the CRB program, CRB rule (IDAPA 58.01.01.617–624), and State Implementation Plan (SIP).

## 2 Program Requirements

The following is a summary of the commitments made during the crop residue disposal negotiation process and memorialized in the statute 39-114 (House Bill 557), CRB rule, and SIP last updated in 2018. More detailed descriptions of the policies and procedures are in following sections and the appendices.

### 2.1 Burning Subject to DEQ's Crop Residue Burning Program

The following burning is regulated under DEQ's CRB program and must comply with the rules and regulations of the program:

- Residue from traditional crops—Includes, but is not limited to, cereal grain, row crops, alfalfa, hay, Kentucky blue grass, and other grass seed varieties.
- Conservation Reserve Program (CRP) and Conservation Reserve Enhancement Program (CREP) lands—Includes the burning of CRP and CREP land while the land remains in the programs, and when the land is being taken out of the program to return to agricultural production.
- Pasture—Grazing lands comprised of introduced or domesticated native forage species that are used primarily for livestock production. Lands receive periodic renovation and/or cultural treatments such as tillage, fertilization, mowing, and weed control and may be irrigated (US Department of Agriculture, Natural Resources Conservation Service [USDA, NRCS] "National Range and Pasture Handbook," December 2003).

- Wildlife habitat areas or habitat improvement areas that include planted nonnative vegetation or food crops that provide forage.
- Weed patches within a crop field.
- Spot and bale burning.
- Propane flaming.

The following burning is **not regulated** under DEQ’s CRB program but is regulated under other open burning rules:

- Orchard clippings—Regulated under IDAPA 58.01.01.613, “Orchard Fires”.
- Rangeland—Land on which the historic climax plant community is predominantly grasses, grass-like plants, forbs, or shrubs. Includes lands revegetated naturally or artificially when routine management of that vegetation is accomplished mainly through manipulation of grazing (USDA, NRCS “National Range and Pasture Handbook,” December 2003). Rangeland burning is regulated under IDAPA 58.01.01.614, “Prescribed Burning”.
- Wildlife habitat areas or habitat improvement areas that include only natural vegetation and not food crops. Wildlife habitat burning is regulated under IDAPA 58.01.01.614, “Prescribed Burning”.
- Ditch banks, fence lines, and canal banks (includes rock piles in a field but does not include weed patches in a field that are not within rock piles). This burning is regulated under IDAPA 58.01.01.608, “Weed Control Fires”.
- Residential yard waste—Includes tree leaves, yard trimmings, and gardening waste. Burning of residential yard waste is regulated under IDAPA 58.01.01.611, “Residential Solid Waste Disposal Fires”.

## 2.2 Grower Requirements

Growers must complete the following activities for CRB. All section 2.2 requirements are accommodated in the public on-line application system <https://www2.deq.idaho.gov/air/CRB/>. Requirements for propane flaming and spot and bale burning are outlined in Appendix A.

- Register for a permit prior to the proposed burn date. IDAPA 58.01.01.619 requires registration at least 30 days in advance; however, review times are typically less and can often accommodate less than 30 days advance notice when resources are available. The following information shall be included in the registration:
  - Location of the field.
  - Applicant information including: name, address, and telephone number. Identification of the person who will conduct the burning, and the portable form of communication will also need to be provided.
  - Plot plan showing the field location and property lines in relation to the nearest residential, public, and commercial properties and public roads.
  - Type of crop residue, acreage, and fuel characteristics of the proposed burn.
  - Fire prevention measures that will be available.
  - Requested date that the field will be available to burn.
- Obtain all necessary local and/or State fire safety permits. These may include permits from the Idaho Department of Lands (IDL) and/or local fire district offices. As a

convenience to the grower, DEQ's CRB online application synchronizes with IDL's online burn permit system to issue IDL burn permits when the DEQ CRB permit is issued. If you have questions about IDL fire safety permits, please contact IDL at 866-581-6498. IDL does not issue fire safety permits for some counties.

- Growers and Burn Managers must successfully complete the CRB training prior to burning and renew the training every 5 years.
- When a specific field is ready to burn, place it on the ready to burn list by 12:00pm the day prior to the designated burn day. This can be completed through the Grower Online Tool or by contacting the Seasonal Smoke Specialist or Regional Office staff assigned to CRB tasks.
  - Fields must be placed on the Ready to Burn list by noon the day prior to be eligible for burning the next business day. There are very few exceptions to this rule including: application failures, communication/implementation errors between grower and DEQ, and smoke dispersion considerations pending a meteorological evaluation by staff meteorologists.
- Contact appropriate agency, such as state or local highway district, to determine if any requirements for public roadway safety must be considered if you are burning near a roadway. Avoiding impacts on public roadways, IDAPA 58.01.01.621.02.g (proximity to public roadways considerations), will be a critical factor in determining appropriate burn day.
- Obtain approval from DEQ and follow all permit conditions on the day of the burn. Approval must be given prior to ignition.
- Carry a portable form of communication, which was identified on the initial registration, during the burn activity. If the cell number or communication tool has changed since the registration the grower must contact DEQ with updated information.
- Burn crop residue only in the field where it was generated.
- Report post burn results to DEQ within 24 hours, or earlier if you want to be considered for burning the same field the next day, if unable to complete the burn. If the grower fails to submit a postburn report, they risk losing priority for their next burn. The postburn report must be submitted using either the online tool (preferred) or by communication with the DEQ staff (Seasonal Smoke Specialist or Regional Office). Grower name, permit number, field name, and burn date are automatically generated in the online postburn report. The following additional information must be entered for the postburn report if post burn report is being completed by a DEQ staff member:
  - Number of acres burned.
  - Comments about how the burn went (Did the weather forecast verify? Did smoke dissipate well?)
  - Consider providing feedback if you consider the program was effective or ineffective, and any suggestion for improvement.
  - Date of burn.
  - Date postburn report was submitted.
  - Name of Staff submitting postburn report.
- A \$2 fee per acre burned applies to crop residue burning. CRB fees will be invoiced at the end of the year and invoices will be mailed out the first week of January. Invoices are due 30 days after issuance. Growers with unpaid invoices from the previous year will not be eligible to burn until all fees have been paid.

## 2.3 DEQ Requirements per Rules and Statute

The following is a list of requirements that DEQ must follow when approving crop residue burns. Additional program requirements can be found in section 4 – Policy and Procedures.

- Approve or deny requests to burn:
  - To approve a request to burn, DEQ must determine that ambient air quality levels meet both of the following criteria:
    - 1) Do not exceed 90% of the ozone national ambient air quality standard (NAAQS) and 75% of the level of any other NAAQS on any day and are not projected to exceed such level over the next 24 hours (IDAPA 58.01.01.621).
    - 2) Have not reached, and are not forecast to reach and persist at, 80% of the 1-hour action criteria for particulate matter identified in IDAPA 58.01.01.556 Air Pollution Emergency Rule, Criteria for Defining Levels within Stages (IDAPA 58.01.01.621). 80% of the 1-hour action criteria for fine particulate matter (PM<sub>2.5</sub>) is currently equal to 64µg/m<sup>3</sup>.
  - May not approve crop residue burning on weekends, federal or state holidays, after sunset or before sunrise, or during an episode of air stagnation or degraded air quality (IDAPA 58.01.01.622.01).
  - May not approve crop residue burning within 3 miles of institutions with sensitive populations (ISPs) when surface wind speeds exceed 12 miles per hour (mph) at the field (IDAPA 58.01.01.621.01).
- Consider the following parameters when making a burn decision (please see section 4.3.1 for a full discussion of burn parameters and criteria) (IDAPA 58.01.01.621.01):
  - Expected emissions from all burns proposed for the same date.
  - Proximity and emissions from other burns within the area; this includes burning from other sources such as prescribed fire, or burning by other entities such as tribal or neighboring state burn programs.
  - Moisture content of the crop residue.
  - Acreage, crop type, and fuel characteristics.
  - Meteorological conditions.
  - Proximity to ISPs.
  - Proximity to public roadways and airports.
  - Ignition techniques.
  - Any other factors relevant to preventing exceedances of the program concentration thresholds or action levels defined by the statute, CRB rule, or SIP.
- Designate burn or no burn days, post the burn decision daily on the website, and offer an e-mail update service with the following information (IDAPA 58.01.01.623):
  - Burn or no burn determination.
  - Locations of proposed burns and number of acres permitted to be burned in each county.
  - Meteorological conditions and real-time ambient air quality monitoring data.
  - Toll-free number to receive requests for information.
- Implement an enhanced documentation process for instances when air quality monitoring levels reach trigger thresholds prior to the burn approval process or when air quality monitoring levels reach trigger thresholds following an approved crop residue burn.

- Prepare an annual report that includes, at a minimum, an analysis of exceedances of the program concentration thresholds that were reasonably suspected to have been caused or contributed by approved crop residue burning and an assessment of the circumstances around any reported endangerment to human health associated with approved crop residue burning. The report shall also include an SMA summary of acres burned by county, CRB related complaints, and recommended revisions to the CRB rule or this operating guide deemed necessary to prevent future exceedances of the program concentration thresholds (IDAPA 58.01.01.622.02).
- Assemble an advisory committee consisting of representatives from environmental organizations, grower organizations, tribal organizations, health organizations, the Idaho State Department of Agriculture, DEQ, and others to discuss the CRB program (IDAPA 58.01.01.622.03).

### **3 Roles and Responsibilities of DEQ Staff**

The following descriptions of roles and responsibilities explain what occurs during the burn season.

DEQ has no authority or explicit responsibility for fire safety or prevention related to crop residue burns outside of IDAPA 58.01.01.619.05 “Preventative Measures”. The person conducting the burn is responsible for obtaining all required permits, taking all appropriate fire safety measures, having appropriate fire safety equipment, and overseeing the burn until the fire is out. If the fire escapes, the person conducting the burn can be held liable for property damage and fire suppression costs. If a burn escapes, DEQ staff shall move themselves and their vehicles to a safe area. DEQ staff shall not assist in controlling the fire. Failure to control a fire being used to treat crop residue is a violation of General Permit Condition #2. A notice to comply or notice of violation should be issued when there is sufficient evidence to document such a violation. The applicable rule citation for this violation is IDAPA 58.01.01.621.02.

#### **3.1 Smoke Management Supervisor**

DEQ employs one Smoke Management Supervisor who works for the Air Quality Planning Bureau. The Smoke Management Supervisor is responsible for smoke management for all types of allowable forms of open burning statewide on lands outside the five tribal reservations.

The Smoke Management Supervisor roles and responsibilities for the crop residue program are as follows:

- Serve as the main point of contact for DEQ with the CRB Advisory Committee.
- Make certain training for growers and DEQ staff is updated regularly to remain relevant.
- Ensure program implementation complies with the Idaho statute, CRB rules, and the SIP.
- Ensure CRB Program resources are properly distributed and utilized.
- Provide backup coverage for the CRB Smoke Management Analyst as needed.

### 3.2 CRB Smoke Management Analyst

DEQ employs a Smoke Management Analysts to perform the CRB program functions. The CRB Smoke Management Analyst is the primary contact for the CRB program. The CRB Smoke Management Analyst's roles and responsibilities are as follows:

- Serve as primary contact for the state.
  - Internal to DEQ—year-round
  - External to DEQ—during non-burn season
- Review the daily meteorological forecast and air quality monitoring data.
- Host and direct the daily CRB coordination calls during the fall burn season with Seasonal Smoke Specialists, regional office staff, and the staff meteorologist.
- Issue daily burn decisions by county; including the number of acres per county by 10:00am local time. (See section 4.3 for full discussion of burn decision responsibilities).
- Review Seasonal Smoke Specialists' or regional office requests for increases in approvable acres during the burn day and approve or deny.
- Review air quality and coordinate with staff meteorologists throughout a designated burn day and make decision to stop burning as needed.
- Review and process registration forms (see Appendix C).
  - Determine completeness and contact grower if additional information is needed.
  - Identify ISPs, public roadways, airports, and populated areas.
  - Identify initial permit requirements.
  - Approve registration and issue the “Registration Receipt and Initial Permit Requirements”.
- Notify Seasonal Smoke Specialists' and/or regional office when trigger levels for enhanced documentation have been reached. Track completion of enhanced documentation.
- Track complaints to help identify when additional information is needed.
- Support CRB program enforcement activities. Serve as the main point of contact for the CRB program with the air quality enforcement program.
- Maintain program SOP's.
- Compile data and complete the annual report.
- Provide support to regional offices.
- Keep the Smoke Management Supervisor informed of issues as necessary.
- Assist with outreach activities.
- Develop, propose, and promote program improvements to Smoke Management Supervisor.
- Develop annual training for CRB staff.

### 3.3 Seasonal Smoke Specialists

DEQ employs Seasonal Smoke Specialists who work out of the regional offices. Some regional offices also utilize year-round staff to carry out Seasonal Smoke Specialist duties in their region during the burning seasons. The Seasonal Smoke Specialists are responsible for the following activities:

- Attend the pre-season training session.
- Serve as primary point of contact for growers during the burn season.
- Assist with grower registration and contact grower prior to requested burn date.
- Daily review of staff meteorologist's forecast for recommended burning to further understand the potential for burning each day.
- Daily review of regional meteorological forecast products.
- Propose specific burns, in writing, to the CRB Smoke Management Analyst. To ensure efficient coordination, include the Smoke Management Supervisor, Regional Manager, and staff meteorologists in these communications. (See Appendix B for current distribution list).
- Request field specific weather forecast when needed.
- Participate in daily CRB coordination calls during the fall burn season.
  - Comment on current day's events.
  - Be prepared with a list of growers and fields that are ready to burn.
  - Describe the previous day's burns that were completed in assigned area. This includes a description of how the weather forecast performed and the smoke behavior witnessed. This feedback is essential to continual improvement of the burn decisions.
- Approve individual growers and fields in accordance with the burn decision.
- Issue notification of final burn approval (permit posted online) by 11:00 a.m. using the CRB website.
- Notify growers, by phone, of final burn approval—**ask if grower understands all permit requirements** and remind them to notify the appropriate fire department and/or sheriff's department.
- Observe and document burns by using weather checklist, Kestrel weather meters, and taking photos.
- Be out observing burns when burning is approved in the region. The criteria in section 4.5.4 will be considered anytime field staff will not be present for burning.
- Stay in contact with growers throughout the day.
- Stop further burning in assigned area when necessary due to deteriorating conditions, or poor and/or undesirable dispersion.
- Request increases in approved acres from the CRB Smoke Management Analyst if conditions justify and the final burn decision included this option.
- Ensure weather checklists (field notes and weather data) are completed within the application at least once per week.
- Complete enhanced documentation as required. (See section 4.6)
- Assist the Regional Office Analyst with complaint response, enforcement activities, investigation of apparent violations, and development of enforcement referral packages as directed.
- Assist with outreach efforts and grower training as directed.

### 3.4 Regional Office

DEQ will ensure each of DEQ's six regional offices have staff assigned with tasks which support the CRB program. This is usually accomplished through established air quality staff analyst(s) or

regional air quality manager depending on the make-up of the regional office org chart and size. The regional office responsibilities are described below:

- Serve as additional point of contact for growers and public (year-round).
- Train, supervise, and deploy Seasonal Smoke Specialists. *Note: regional office supervisors are responsible for ensuring Seasonal Specialists are properly trained. The CRB Program provides an annual training session for all CRB staff.*
- Assist the Seasonal Smoke Specialists with the ready to burn list, and final burn approvals.
- Assist with grower registrations.
- Observe burns when needed, such as on days when activity is high and Seasonal Specialists are unable to cover all critical areas or when Seasonal Specialists are not available for field duties.
- Assist with enhanced documentation as needed (see section 4.6).
- Primary responsibility to respond to complaints received from regional activity per standard response protocol listed in section 4.7.
- Investigate apparent violations.
- Develop enforcement referral packages for potential violations.
- Conduct outreach and grower training.
- Operate the regional seasonal monitors.

### **3.5 Meteorologist**

DEQ has meteorologists to provide fire weather and smoke dispersion forecasting and support for the burn decision process. The meteorologist responsibilities are described below:

- Provide daily smoke dispersion forecasts each for northern and southern Idaho, with initial burn recommendations for program consideration.
- Participate in daily CRB coordination calls during the fall burn season to discuss anticipated weather conditions for the day and respond to any weather related questions from the call participants.
- Provide support to the CRB program staff for the burn decision process; including providing field specific forecasts, helping staff interpret weather model or forecast information, and impromptu coordination calls for further clarification of specific location weather conditions if needed.
- Monitor weather conditions throughout the day and alert CRB program staff of any unexpected changes likely to affect field burning.
- Provide post burn analysis documentation as requested.
- Provide annual weather summary for use in the annual report.

## **4 Policies and Procedures**

### **4.1 Grower Training**

Growers must successfully complete a CRB training session provided by DEQ or complete the online CRB training prior to being approved to burn crop residue, burn spots and bales, or

conduct propane flaming. Refresher training must be completed at least every 5 years. Training covers the following topics:

- Air quality protection and smoke management.
- Open burning rules and CRB rules.
- Grower responsibilities and requirements.
- DEQ responsibilities and requirements.
- Ignition and burning techniques for good smoke management.
- Weather conditions and how it relates to smoke management considerations.

The training is offered periodically through the regional offices based upon demand and is available online at DEQ's CRB website:

[http://www2.deq.idaho.gov/air/crbtraining/story\\_html5.html](http://www2.deq.idaho.gov/air/crbtraining/story_html5.html).

## **4.2 Registrations and Fees**

### **4.2.1 Grower Submittal of Registrations and Fees**

Growers must register their fields prior to the proposed burn date. According to IDAPA 58.01.01.619 registration is required at least 30 days in advance; however review times are typically 3 days or less. Registrations are accepted online and in paper form. Growers who register online must also submit a signed copy of the registration form as soon as possible. The regional office staff and CRB Smoke Management Analyst are available to assist growers who do not have internet access or are having trouble navigating the online registration process. The following information is required for registration:

- Location of the field(s) in the form of latitude and longitude and county (on-line registration supports mapping capabilities to fulfill the latitude and longitude requirement).
- Applicant information (and person conducting the burn, if not the same)—name, mailing address, e-mail address, and phone number.
- Mobile phone number.
- Plot plan showing the location of the field(s), property lines, and relative locations of residential, public, and commercial properties and public roads (on-line registration supports mapping capabilities to fulfil the plot plan requirement).
- Type of crop residue, acreage, and fuel characteristics.
- Fire prevention measures.
- Proposed date of the burn when grower is expected to be ready to burn residue.

Any additional information that would be helpful to DEQ when making a burn decision should also be included on the registration form. This information may include special topographical features (e.g., canyon rims), special conditions (e.g., specific wind direction needed, prior burn knowledge), and ISPs.

As of February 27, 2019, growers do not pay CRB fees prior to burning. Fees will be invoiced and mailed out the first workweek of January each year. Growers may pay CRB and Spot and Bale Permit (SBP) fees online, by mail, or by hand delivery to the State Office or the nearest DEQ regional office. Registrations and fees mailed to the State Office should be sent to:

Idaho Department of Environmental Quality  
CRB Program  
1410 N. Hilton  
Boise, ID 83706-1255

#### **4.2.2 DEQ Processing of Registrations and Fees, Development of Permit Conditions**

The CRB Smoke Management Analyst will process the registration forms. Registrations are date stamped and entered into the CRB database upon receipt. The CRB Smoke Management Analyst will review the information submitted to determine whether it is accurate and complete. If additional information is needed, the CRB Smoke Management Analyst will contact the grower or request regional office staff to make contact to obtain the necessary information.

The CRB Smoke Management Analyst will review the registrations to develop the initial permit requirements in accordance with DEQ's registration review SOP. The CRB database identifies ISPs located within 3 miles of each field, as well as other special features, such as populated areas, public roads, and airfields. DEQ may also choose to include ISPs or other features that are farther than 3 miles from the field if the CRB Smoke Management Analyst, with consultation from the regional office, deems appropriate. This decision may be made for large fields, types of crop residue that generate heavy smoke, growers that have not demonstrated good burning practices in the past or are new to the program, or areas with specific terrain or microclimates that may require a higher level of protection for ISPs. DEQ will add permit requirements that are based on the field location. These requirements are not expected to change from year to year. These field-specific permit requirements will remain attached to the field and will be applied every time the field is burned. If the permit conditions need to be revised, this can be done by the CRB Smoke Management Analyst.

One-time burn approval conditions may be added to the permit by the CRB Smoke Management Analyst, CRB Smoke Management Analyst, Seasonal Smoke Specialist, or regional office during the burn approval process. The one-time burn approval conditions are not attached to the field and will not automatically be applied to the field every time it is burned. These one-time conditions are in addition to the field-specific permit conditions developed by the CRB Smoke Management Analyst.

Once the CRB Smoke Management Analyst has reviewed the registration, they will send the "Registration Receipt and Initial Permit Requirements" document and cover letter to the grower via e-mail or postal service. The purpose of this document is to verify with the grower that the information submitted is complete, the registration has been accepted by DEQ, and the registration requirements have been met. This document will also include the general permit conditions that are applicable to all crop residue burning, the field-specific requirements added by the CRB Smoke Management Analyst, and a map of the field in relation to nearby ISPs. The regional office and Seasonal Smoke Specialist for the appropriate region will be notified that the

registration has been approved and instructed to make contact with the grower prior to the requested burn date.

**The “Registration Receipt and Initial Permit Requirements” document is NOT a final approval to burn.** It is a document that acknowledges registration criteria are met and includes the general and initial permit requirements DEQ deems necessary to ensure compliance with the air quality and safety requirements of the rules.

Growers must submit fees for SBPs prior to permit approval. Growers can submit fees using three methods: online, mailed, or hand-delivered. All fees mailed or hand-delivered to the state office will be date stamped, entered into the database by the CRB Smoke Management Analyst, and delivered to the fiscal department in the state office. Fees hand-delivered to the regional offices will be processed according to that office’s procedures and sent to DEQ Fiscal office. All fees received will be processed by DEQ Fiscal office and will be automatically inputted into the application.

#### **4.2.3 Grower Notification of “Ready to Burn”**

When a grower is ready to burn a registered field, he or she must notify DEQ either online or by phone so the field can be listed as “ready to burn”. The CRB online application will not allow a field to be placed on the ready to burn list if the grower or burn manager does not have a valid CRB training date. The ready to burn list must be managed by the regional office staff so that only growers who are truly ready to burn are on the list.

### **4.3 Burn Decisions**

The following burn decision policies and procedures explain what occurs during the burn season. DEQ has meteorologists to provide fire weather forecasting and support during the burn decision process.

The CRB Smoke Management Analyst is responsible for making the preliminary and final burn decisions for each county following DEQ’s burn decision SOP. This document is located in EDMS (#2019ACW5). Burn decisions are based on a review of current weather observations and forecast meteorology, air quality conditions, fuel and soil moisture levels, other sources of smoke emissions, and burn recommendations provided by DEQ meteorologists. The burn decision process during the fall burn season includes a daily coordination call for both northern and southern Idaho at 8:30 a.m. local time. During the daily coordination calls, the Seasonal Smoke Specialists and regional office staff should assist the CRB Smoke Management Analyst by providing input based upon local knowledge and experience and their interactions with growers. The DEQ meteorologists and CRB Smoke Management Analyst will, in return, provide valuable insight for the Seasonal Smoke Specialists and Regional Office staff to consider while approving burns if a burn day is ultimately declared. Seasonal Smoke Specialists should remain in touch with growers to understand which growers are truly ready to burn and to relay burn approvals to the growers in a timely manner. Figure 1 shows this burn decision process in a flowchart. Appendix D describes the burn decision procedures for DEQ staff. Appendix E includes the burn decision criteria as they appear in the SIP.

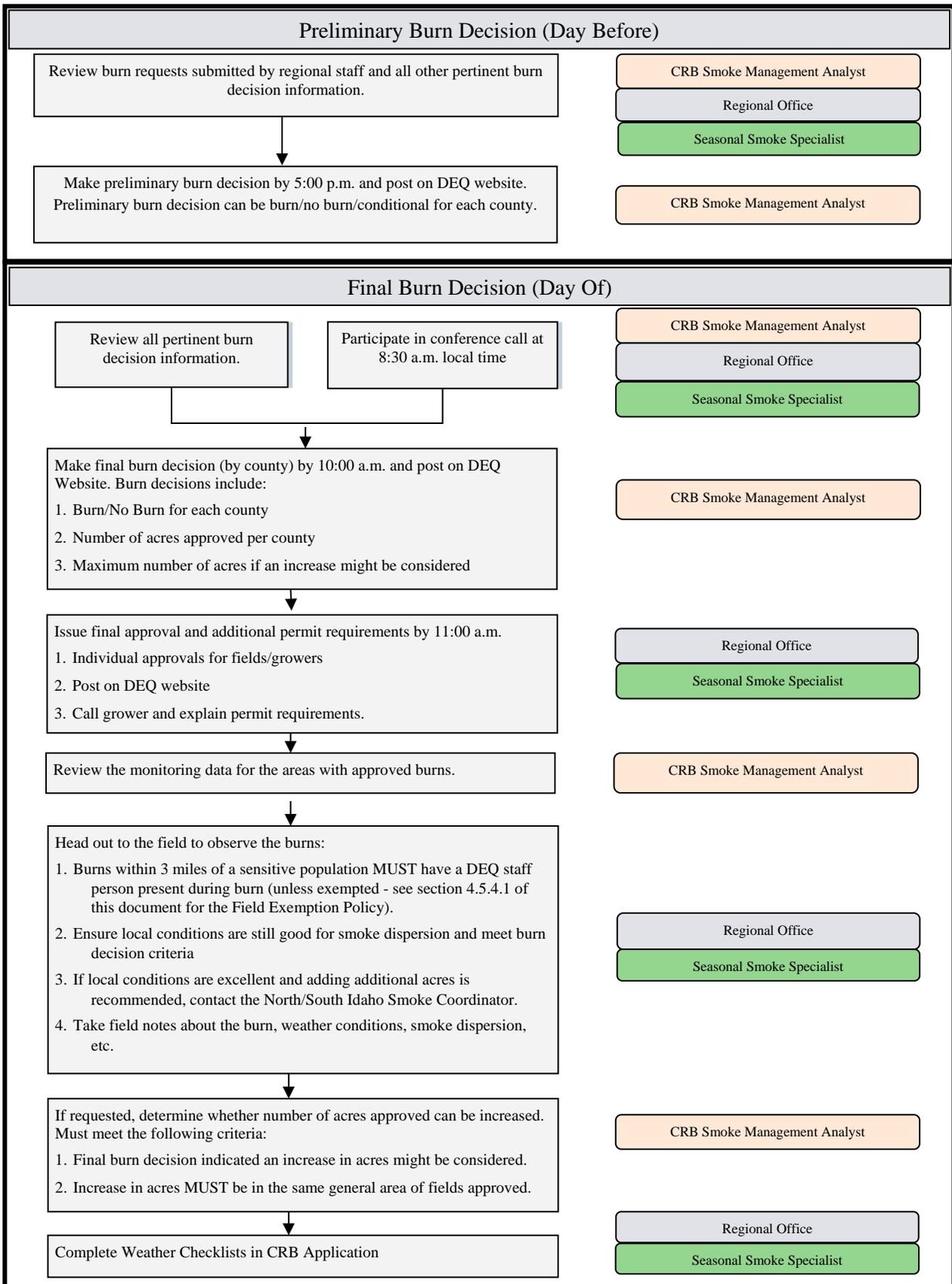


Figure 1: Burn Decision Process

The preliminary burn decision should be issued by 5:00 p.m. the day before the burn. For a Monday burn day, the preliminary burn decision should be made by 5:00 p.m. on the prior Friday. Preliminary burn decisions may consist of a burn, no burn, or conditional burn decision. A conditional burn decision may be issued when the forecast does not clearly indicate either a burn or no burn determination. A preliminary burn decision of no burn may not be reevaluated during the final burn decision—the final burn decision must remain as no burn. **Therefore, a preliminary no burn decision should only be issued when the CRB Smoke Management Analyst is very confident that the following day will be unsuitable for burning.**

The final burn decision should be issued by 10:00 a.m. on the burn day whenever possible. There may be instances when the final burn decision cannot be made by 10:00 a.m... In these rare cases, the decision must be made by 11:00 a.m. at the latest and will need to be coordinated with Seasonal Smoke Specialist field final approval process. Final burn decisions may consist of a determination of burn or no burn and shall include the number of approvable acres for each county. Final burn decisions should also include other pertinent information such as the approved burn window, whether test-burns are to be conducted, and if additional acreage may be approved pending satisfactory results from the initial acreage or test burns.

Test burns can be a useful method of assessing the dispersion conditions, especially near difficult areas such as canyon rims or towns or during periods of limited or uncertain dispersion. **Test burns should not normally be conducted at fields located within 3 miles of ISPs. Use caution with any test burns that are within 3 miles of an ISP.** Test burns should be large enough to obtain a good assessment of the dispersion conditions but not so large that adverse impacts become likely if conditions are worse than expected. Test burns should generally be approximately 40–80 acres. Test burns must be observed by DEQ staff.

#### **4.3.1 Burn Decision Criteria and Parameters**

DEQ considers a number of parameters and associated factors to make a sound decision about whether to allow the burning of each individual field. Generally, no single parameter should be the basis for the burn decision. Rather, some combination of parameters should allow DEQ to ensure the best possible conditions for smoke management. Even when air quality monitoring data remain in the good range, meteorological forecasts or observed weather conditions may be such that burning cannot be allowed due to poor dispersion characteristics. Conversely, air quality may be in the moderate category, and meteorological forecasts or observed weather conditions may be such that limited burning can be allowed.

As a means to address the diverse topography, climate, soils, and crops throughout the state, DEQ has developed smoke management areas (SMAs) that divide the state into more manageable units. Figure 2 shows the SMAs and county boundaries.

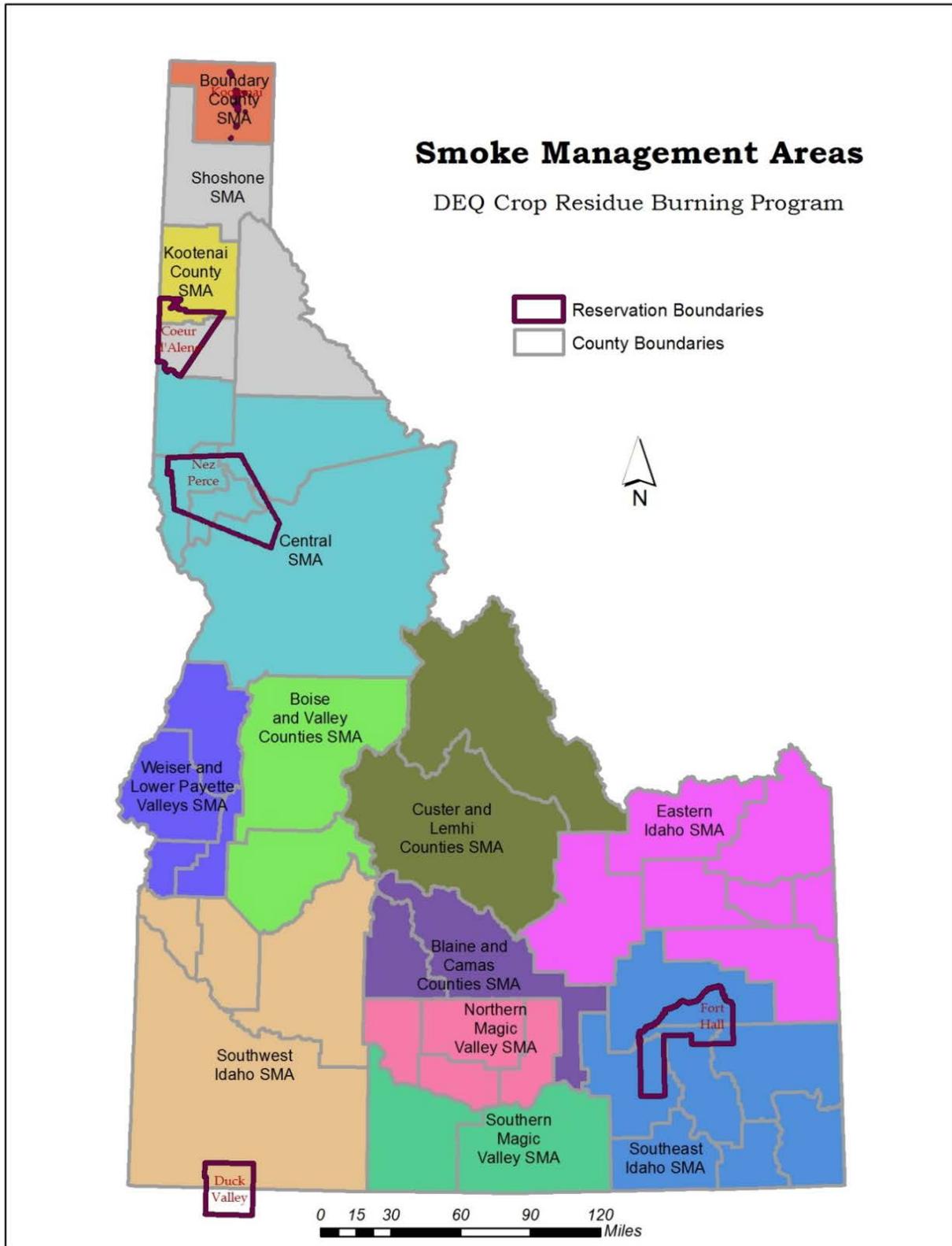


Figure 2. Smoke Management Areas.

In accordance with the CRB rule (IDAPA 58.01.01.621), DEQ will consider the following criteria when making a burn decision:

- Expected emissions from all burns proposed on the same day.
- The proximity of other burns and other potential emission sources in the same area.
- Moisture content of the crop residue to be burned.
- Acreage, crop type, and fuel characteristics.
- Forecast and observed meteorological conditions.
- Proximity to ISPs, public roadways, and airports.
- Any other factors relevant to preventing exceedances of the program concentration thresholds, such as burning/ignition methods and soil moisture.

Burns will not be approved on weekends, federal or state holidays, after sunset or before sunrise, or during an episode or air stagnation or degraded air quality. However, spot and bale burning and propane flaming may occur on weekends and holidays (Appendix A).

#### **4.3.1.1 Air Quality**

To approve a request to burn, DEQ must determine that ambient air quality levels meet the following two criteria:

- Do not exceed 90% of the ozone NAAQS and 75% of the level of any other NAAQS on any day and are not forecast to exceed such level over the next 24 hours.
- Have not reached, and are not forecast to reach and persist at, 80% of the 1-hour action criteria for particulate matter.

The pollutants of concern for crop residue burning are particulate matter less than 2.5 microns in diameter or less than 10 microns in diameter (PM<sub>2.5</sub> and PM<sub>10</sub>, respectively) and ozone. The thresholds for these pollutants, given in micrograms per cubic meter (µg/m<sup>3</sup>) of PM<sub>2.5</sub> and PM<sub>10</sub> or parts per billion (ppb) of ozone, are defined as follows:

- PM<sub>2.5</sub> 1-hour average—64 µg/m<sup>3</sup>
- PM<sub>2.5</sub> 24-hour average—26 µg/m<sup>3</sup>
- PM<sub>10</sub> 24-hour average—112 µg/m<sup>3</sup>
- Ozone 8-hour average—63 ppb

If applicable monitoring data are not available, visibility may be considered as a component of the burn decision process. In order to protect the NAAQS, if visibility is deteriorated and expected to remain so throughout the day, a no burn decision should be made. When considering visibility it is important to note that the combination of water and particulate matter in the atmosphere dramatically reduces visibility which can lead to inaccurate conclusions about particulate matter concentrations. Caution should be used when using visibility criteria for a no burn decision when relative humidity is greater than 65%. Always discuss visibility observations with the CRB Smoke Management Analyst or Meteorologist.

#### **4.3.1.2 Meteorological Conditions**

Table 1 lists the meteorological parameters that DEQ reviews and evaluates when making a burn decision. The goal is to ensure good smoke management (i.e., smoke that rises from the ground and remains aloft, disperses within the mixing layer, and drifts away from populated areas and

ISPs with the transport winds). The information listed in Table 1 is for guidance only and is intended to be helpful in identifying no burn days and conditional burn days (when a limited number of acres may be approved).

The information needed to evaluate these parameters may be obtained from a combination of several sources, including weather forecasts and summaries of current conditions.

**Table 1. Burn decision meteorological parameters.**

<b>Parameter</b>	<b>Burn Day</b>	<b>Conditional Burn Day</b>	<b>No burn Day</b>
<b>Ventilation</b>	“Good” to “Excellent” ventilation is preferred; however, if ventilation is “Good” or “Excellent,” check to make sure surface wind speeds are <12 miles per hour (mph).	<ul style="list-style-type: none"> <li>• “Good” to “Excellent” ventilation may be unacceptable if surface winds are &gt;12 mph.</li> <li>• Burning under “Limited” ventilation may be acceptable only if other criteria are met and burning proceeds with caution.</li> <li>• “Poor” ventilation should be avoided unless there is good vertical convection with enough fuel and/or wind to carry the fire and good transport winds aloft.</li> </ul>	“Poor” ventilation should be avoided.
<b>Cloud cover</b>	Mostly sunny to partly cloudy is typically best.	<ul style="list-style-type: none"> <li>• Clear bright skies may indicate a high-pressure system with stagnant conditions. Make sure other criteria are met if this is the case.</li> <li>• Cloudy conditions may be acceptable if clouds are high and all other criteria are met.</li> </ul>	Mostly cloudy conditions with low clouds should be avoided.
<b>Surface wind speed (sustained)</b>	Moderate winds, 3 to 8 mph are preferred.	<ul style="list-style-type: none"> <li>• Calm or near calm winds should be avoided. Light winds &lt;3 mph generally are insufficient to carry the fire. However, sunshine and abundant/dry fuel, especially on a hill, may result in good rise for lighter winds &lt;3 mph.</li> <li>• Winds 8–12 mph may be ok if there is strong sunshine to maximize vertical convection, but proceed with caution.</li> </ul>	<ul style="list-style-type: none"> <li>• Burning is not allowed at fields located within 3 miles of an ISP when wind speeds exceed 12 mph.</li> <li>• Winds &gt;12 mph should be avoided even in remote areas for fire safety reasons.</li> </ul>
<b>Surface wind direction</b>	<ul style="list-style-type: none"> <li>• Avoid institutions with sensitive populations, populated areas, and nearby public roadways, etc.</li> <li>• If possible, also avoid large bodies of water and large canyons/valleys.</li> <li>• Be aware of typical wind shifting patterns in an area and atypical forecast wind shifts.</li> </ul>	N/A	It is critical to avoid cities and institutions with sensitive populations.

Parameter	Burn Day	Conditional Burn Day	No burn Day
<b>Transport wind speed</b> (at 850 millibar level or about 5,000 feet AGL)	7–20 mph is preferred.	Use caution with transport winds that are <7 mph or >20 mph.	Upwind of cities and institutions with sensitive populations, transport winds >20 mph should be avoided.
<b>Transport wind direction</b>	Avoid institutions with sensitive populations, populated areas, and nearby public roadways, airports, etc.	Avoid transport winds taking smoke towards cities and institutions with sensitive populations unless ventilation is “Good” to “Excellent.”	It is most critical to avoid cities and institutions with sensitive populations at all times.
<b>Mixing height</b>	Greater than 5,000 feet above ground level is desired.	With mixing heights of 1,000–5,000 feet, caution should be used. If transport winds will transport smoke over large bodies of water and large canyons/valleys, avoid burning if mixing height is less than 5,000 feet.	Avoid burning if the mixing height is <1,000 feet above ground level.
<b>Relative humidity</b>	15–45% relative humidity is the ideal range.	<ul style="list-style-type: none"> <li>• Relative humidity &lt;15% is acceptable if fire control/safety concerns with surrounding fuels are low.</li> <li>• Relative humidity between 45% and 60% may inhibit plume rise and smoke dispersion.</li> <li>• For bluegrass, relative humidity &gt;30% may inhibit plume rise and smoke dispersion.</li> </ul>	Relative humidity >60% should be avoided as it may inhibit smoke dispersion and may leave unburned materials.
<b>Inversion conditions</b> There are two types of inversions (radiation and subsidence) and they should both generally be avoided.	Preferably, burns should occur after 10:00.a.m. and be extinguished before 5:00 p.m. to avoid trapping the smoke in mountain valleys by radiation inversions.	<p>Radiation Inversion—This is a surface-based inversion that exists on most mornings and evenings, particularly when daytime heating is strong.</p> <ul style="list-style-type: none"> <li>• Burning should not be permitted before the inversion has mixed out unless transport conditions after breakup would best protect population centers and burning during an inversion does not cause adverse impacts.</li> <li>• A sufficient amount of time should be allowed at the end of the burn day for any residual smoke to disperse before a radiation inversion returns.</li> </ul>	<p>Subsidence Inversion—When a strong high-pressure system is present with clear skies, hot air subsides, causing stable air and poor dispersion. This condition is easy to forecast and a no burn day should be called when a strong high-pressure system is over the region.</p>

Burning when a subsidence inversion is present should only be approved after careful consideration. For radiation inversions, burning should generally not be permitted before an inversion has mixed out. However, there may be occasions when the Seasonal Smoke Specialist, under the close guidance of the CRB Smoke Management Analyst, and DEQ meteorologists, may allow ignition prior to the inversion mixing out to promote optimum transport after mix-out and ensure protection of populated areas.

For example, north of Grangeville, afternoon transport winds typically carry smoke from burns on the Camas Prairie in a southerly direction, which poses a significant risk of adversely impacting Grangeville. However, the transport winds immediately following the morning inversion mix-out typically blow to the east. Because of this tendency, a burn may be approved to start in the morning so that smoke would rise to the inversion layer where it would remain until the inversion mixed out. The initial transport of the smoke would then be to the east, followed some time later by a shift to the south. Having already drifted some distance to the east, smoke movement to the south would not impact Grangeville. Other examples of assigning an early burn window exist throughout the state.

Care must be taken when using this technique to determine that the mixing height prior to the inversion mix-out is adequate to hold the smoke generated from the burn without causing an adverse impact.

This practice should be used only after conducting sufficient evaluation to understand local wind patterns and temperature profiles to ensure that such a practice is expected to be successful. A Seasonal Smoke Specialist wishing to use this practice must first work with the CRB Smoke Management Analyst and meteorologists to conduct the necessary evaluation and documentation.

#### **4.3.1.3 Other Relevant Factors**

The following are additional factors that should be considered when making a burn decision:

- **Burning method**—Burning method includes both the ignition method (e.g., matches or lighters, propane torches, modified harrow rakes, or diesel burners), the number of ignitors on the field, and the pattern of lighting. Generally, hotter fires will result in less smoke production and better smoke lift.
- **Fuel type, size, and arrangement**—These characteristics also affect smoke emissions. Generally, denser fuel results in more smoke production. Fuel density can change by crop type and variety (e.g., wheat stubble is typically less dense than bluegrass residue and certain wheat or bluegrass varieties can be denser than others).
- **Fuel loading**—This is the amount of residue that is available to be burned per acre. Generally, greater fuel loading equates to more smoke.
- **Fuel moisture**—Fuel moisture content is dependent upon fuel type, recent precipitation, and relative humidity. To promote a hot burn and good plume rise, the fuel moisture should be as low as possible throughout the residue layer. Generally, higher fuel moisture levels will result in more smoke and reduced plume rise.
- **Soil moisture**—Moisture from the soil will cool the smoke and result in a reduced plume rise.

- **Red Flag Warnings**—DEQ will not approve burns during a National Weather Service (NWS) issued Red Flag Warning. If burning is approved to take place before a warning takes effect, caution must be used and all burns must be extinguished prior to the warning taking effect.

### 4.3.2 Making a Burn Decision

This section lists the general steps that the CRB Smoke Management Analyst and regional offices follow when making a burn decision.

#### 4.3.2.1 CRB Smoke Management Analyst

The CRB Smoke Management Analyst makes preliminary and final burn decisions (i.e., burn/no burn/conditional burn day) for each county. The number of approved acres must also be included for final burn decisions. The CRB Smoke Management Analyst's burn decision responsibilities include the following steps:

##### Preliminary Burn Decision

1. Review the air quality monitoring data and compare the current pollutant concentrations to the program concentration thresholds and the preburn trigger thresholds described in section 4.3.1.
2. Review the NWS forecast, forecast models, and meteorologist forecast; Table 1 includes guidelines for evaluating meteorological data and forecasts. The meteorological evaluation should be focused on those areas where requests to burn are expected.
3. Make a preliminary burn decision by county based on the weather forecast and forecast air quality pollutant levels. This burn decision is completed by 5:00pm and is applicable to the next day.
  - **No Burn**—Meteorological conditions or elevated air quality concentrations are forecast to not allow burning; or there are no growers on the ready to burn list.
  - **Conditional**—There are growers currently on the ready to burn list; however, meteorological and air quality conditions for the next day are uncertain.
  - **Burn**—Growers are currently on the ready to burn list, and meteorological and air quality conditions are forecast to support burning.

##### Final Burn Decision

1. Review the air quality monitoring data and compare the current pollutant concentrations to the program concentration thresholds and the preburn trigger thresholds described in section 4.3.1. Forecast the ozone concentrations in applicable areas to determine if burning is appropriate.
2. Review the CRB website and consult with regional office staff to identify fields that are ready to burn, field locations, and other factors such as the requested acreage, locations of nearby ISPs, and initial permit conditions.
3. Review available current and forecast meteorological conditions. Table 1 includes guidelines for evaluating meteorological data. The meteorological evaluation should be focused on those areas where requests to burn are expected.

4. Review information about other possible smoke sources, such as wildfires and prescribed fires, in the area of interest.
5. Review the meteorologist's daily burn recommendation for each county. These are qualitative assessments based on the smoke dispersion forecast. Discuss the atmospheric conditions with the meteorologist to fully understand the ability of airsheds to disperse smoke appropriately. The meteorologist's burn recommendation will be provided as follows:
  - **No Burn**—Smoke dispersion is forecast to be poor. Burning is not recommended.
  - **Conditional**—Smoke dispersion is forecast to be marginal. Limited burning with caution may be possible.
  - **Burn**—Smoke dispersion is forecast to be good to excellent. Other parameters such as air quality and fuel moisture level must still be suitable for burning.
6. Review burn request emails. During the fall burn season submit proposed burn decision in the CRB application by 8:15a.m. local time.
7. During fall burning season host and direct daily coordination calls.
8. Make a burn decision for each county based on the steps described above and input from the regional office staff and meteorologists. Include the total amount of acreage approved for each county. Acreage determination should be considered carefully to ensure accuracy for the potential activity expected to occur.
  - **No Burn**—Meteorological conditions or elevated air quality concentrations are forecast to not allow burning or no growers have requested to burn.
  - **Burn**—Meteorological and air quality conditions are forecast to support burning and growers have requested to burn.

Note: During the spring burn season daily coordination calls are not conducted. The CRB Smoke Management Analyst works directly with the Regional Office and meteorologists to review forecast information and final burn decisions

#### **4.3.2.2 Regional Office Responsibilities**

The Seasonal Smoke Specialists and regional office should review the following information for their SMAs in preparation for the CRB program coordination calls:

- **Current and forecast meteorological conditions**—Regional office staff should review the NWS forecast discussion and other weather forecast tools appropriate for the region and the meteorologist's forecast for their SMAs. Regional office staff should consider and be prepared to provide input on the burn decision parameters that may be unique to their region, such as current and forecast weather conditions, microclimates, terrain, and soil moisture levels, in field approvals, test burns, etc.
- **Current and forecast air quality conditions**—Regional office staff should review the current and forecast air quality conditions in their SMAs and be prepared to make specific field approval recommendations during the burn decision process.
- **Ready to burn list**—Regional office staff should review the ready to burn list and have a good idea of which growers are truly ready to burn and which fields are candidates for burning with the forecast conditions and be prepared to make specific recommendations for approvals.

- **Email daily burn requests** – Regional office staff must send an email to the CRB Smoke Management Analyst, CRB Analyst, Smoke Management Supervisor, Regional Manager and meteorologists detailing the burn requests by 8:30am local time. Requests emails should be sent every day there is a field on the ready to burn list for the region, even if the email states there are no requests. The purpose of the burn request email is to help expedite the daily coordination call. During the spring season these emails will be utilized in lieu of daily coordination calls.

#### 4.4 Burn Day Activities—Growers

Since DEQ must operate the CRB Program to protect public health and the environment, growers must remain as flexible as possible to have the greatest opportunity to burn their fields. DEQ will attempt to find appropriate burn days for all fields that growers desire to burn; however, there are bound to be instances when the requests to burn exceed the smoke-carrying capacity of the atmosphere or instances where a specific field may require an uncommon wind direction to be safely burned within the confines of the rules.

DEQ will attempt to provide growers with as much notice of pending burn approval as possible. DEQ will normally make the final burn decision and specific burn approvals between 9:00am and 11:00am on the day of the burn. Growers should expect DEQ Seasonal Smoke Specialists to be in regular contact with them to ensure coordination and availability are optimum.

When DEQ has given final burn approval for a field, the grower will be contacted by the Seasonal Smoke Specialist, usually before 11:00am. If the grower is ready to conduct the burn, the Seasonal Smoke Specialist will issue the permit, which contains the field-specific permit requirements and add additional permit requirements (if any) during the final burn approval. If the grower will not be able to conduct the burn that day, he or she should tell the Seasonal Smoke Specialist as soon as possible so the field can be placed back on the ready to burn list, if desired. Regular contact with the Seasonal Smoke Specialists will help to ensure availability to burn is known well in advance to optimize program efficiencies.

The grower is required to abide by all permit requirements and may be subject to an enforcement action for failure to comply with any applicable statute, rule, or permit requirement. Appendix F provides information on how DEQ determines compliance with permit requirements. The grower may be required, as part of the burn approval, to conduct a test burn prior to having additional acres approved to be burned. **DEQ staff must be present at all test burns to evaluate smoke dispersion.**

During the burn, the grower must be reachable via cellular phone or another pre-determined form of portable communication. The grower is responsible for shutting down burns when required to do so by the Seasonal Smoke Specialist. If DEQ determines that the burn is having, or will have, an adverse impact on ISPs, DEQ may require the grower to stop ignition immediately so the fire burns down. Under no circumstances shall more fuel be added or ignited when a stop ignition requirement has been communicated.

## 4.5 Burn Day Activities—DEQ

### 4.5.1 Field Approval Process

The Seasonal Smoke Specialists, with assistance from the CRB Smoke Management Analyst and the Regional Office Analyst, will determine which fields to approve for burning. The field approval process must be consistent with the burn decision and is highly dependent on grower availability.

The field approval process is based on which fields are appropriate to burn with the forecast conditions. After all other factors have been evaluated, the length of time a field has been registered should be considered. Care should be taken to avoid overloading an airshed with smoke from too many approved burns in the same airshed or additional burning activity from other sources that will contribute to a buildup. Safeguards are in place, such as the coordination call and the in-field observations, to help ensure an airshed is not overloaded. To implement this safeguard smoke specialists or regions should be in the field during burn days.

The following factors should also be considered when determining which fields to approve for a given burn day:

- **Burning near canyon rims**—These burns should only be conducted when both surface and transport winds are blowing away from the canyon. The atmosphere over canyons can be cooler than the surrounding area, which can draw a smoke plume down to the ground. When winds are forecast to carry smoke over a canyon, only those burns that are predicted to have excellent plume rise (i.e., the plume should be predicted to rise sufficiently to remain aloft even over the canyon) should be approved.
- **Burning near large bodies of water**—These burns should only be conducted when both the surface and transport winds are blowing away from the water. The atmosphere is typically cooler and more stable over large bodies of water such as lakes and major rivers. The cooling effect of the water can draw smoke downward. Even in the absence of a true lake-breeze, the interaction between lake-generated winds and prevailing winds is complex and can cause variable conditions that can change quickly. Knowledge of the expected prevailing wind direction and strength is important. It is also important to know the direction of transport winds aloft, which may carry smoke over the lake. Surface and transport winds can be from vastly different directions. A good guide is to burn downwind of large bodies of water so that the plume does not blow over the water.
- **Favorable winds**—Some areas have fairly predictable wind patterns, including predominant wind directions, wind shifts, and diurnal (daily) patterns. In these areas, burns may be timed to take advantage of such patterns and priority for burn approval may be appropriate if these conditions are forecast.
- **Burn location relative to ISPs**—Most burning should be conducted so that surface and transport winds carry smoke away from ISPs. This restriction will usually be included in the initial permit conditions. Consideration should also be given to the hours of operation at the ISP (e.g., a school that may be out of session on a particular day). In these cases, priority for burn approval may be given to those fields that can be burned with no risk to the sensitive population.
- **Elevation and field aspect**—Elevation should be considered in regard to the mixing height. An elevated field may be just below the top of the mixed layer, resulting in little

room for the smoke plume to disperse within. In addition, if a topographical feature such as a ridgeline is above the top of the mixed layer, a smoke plume may be trapped by the topography and may not be able to disperse. Further, an ISP may be located on an elevated plateau above a field located on the valley floor. The elevation difference must be considered when interpreting mixing height for the area. Field aspect (i.e., direction of the slope of the field) may help to identify fields that are warmer and dryer than other fields. This distinction can be particularly useful at the beginning and end of the season or following rain when the driest fields are the most appropriate to burn.

- **Infestation issues**—Fields that need to be burned due to infestations should be considered for approval priority to minimize the threat of the infestation worsening or spreading. Discussions with the grower and local ISDA representatives should occur in these instances.

#### 4.5.2 Public Notification of Burn Approvals

DEQ will notify the public of approved burns by posting the following burn decision information on the website:

- Whether a given day is a burn or no burn day.
- The location and number of acres permitted to be burned.
- The location and amount of additional acres that may be added, if applicable, pending adequate results from test burns.
- Meteorological conditions and any other real-time ambient air quality monitoring data.

DEQ also has a toll-free phone number (800-345-1007) and website (<http://www.deq.idaho.gov/air-quality/burning/crop-residue-burning>) that the public can use to receive burn decision information, provide a comment, or submit a complaint. This toll-free number is shared with the Nez Perce Tribe and the Coeur d'Alene Tribe. DEQ also sends a listserv e-mail to announce that a burn decision has been made. Additional notifications may be required in some regions to address specific local conditions such as: The Coeur d'Alene Region must contact the Kootenai Tribe directly to notify them of burn approvals in the Kootenai River Valley of Boundary County SMA. DEQ implements the CRB Program for growers burning inside reservation and allotment lands of the Kootenai Tribe per MOU (EDMS 2008AAD54).

#### 4.5.3 Permit by Rule

The permit by rule consists of three parts: registration, registration fee, and notification of final burn approval (posted online).

The grower will receive the following documents during the burn season:

- “Registration Receipt and Initial Permit Requirements” document, which acknowledges receipt of registration and provides the initial permit requirements for each field.
- Final burn approval on DEQ website, which includes any additional permit requirements or conditions.

Once the grower has notified DEQ that he or she is ready to burn (preferably 2–3 days prior to the field being ready), the field will be placed on the ready to burn list for burn approvals. The Seasonal Smoke Specialist will notify the grower of the final approval the morning of the burn.

During this notification the Seasonal Smoke Specialist will ask the permittee if they understand all the listed permit conditions. The final notifications of burn approval will be posted on DEQ's website along with any additional permit requirements under which the burn is approved.

All burns must be conducted in compliance with the listed permit conditions. The only time permit conditions might change is when an on-site Seasonal Smoke Specialist or regional office identifies permit conditions that are inaccurate due to an error during the registration process or because they are not representative of conditions in the field. In such instances, the field staff **must** contact the CRB Smoke Management Analyst to change the permit conditions. If they are unavailable, the burn must proceed according to the existing permit conditions or not take place at all.

**The notification of final burn approval posted online is the only document that authorizes the grower to burn the crop residue. Therefore it is imperative that Seasonal Smoke Specialists or anyone completing the task of contacting the permittee ensure that all permit conditions are understood by the permittee.**

#### **4.5.4 Field Observation**

Seasonal Smoke Specialists should be in the field observing burns on all days when burning is approved in their SMAs, and all burns within 3 miles of an ISP shall be observed unless an exemption has been requested and approved. Whenever a field located within 3 miles of an ISP is approved to be burned without DEQ observation, DEQ must contact the ISP(s) prior to ignition with the date, time, and location of the burn and contact information for the appropriate DEQ Regional Office and the CRB Smoke Management Analyst. Seasonal Smoke Specialists are also expected to periodically make field observations on days when burning has not been authorized in their SMA. This is a critical part of our CRB surveillance effort. Opportunities for outreach and education can occur during these observational times as well.

If grower non-compliance with program requirements is an ongoing problem in an SMA, it is recommended that Seasonal Smoke Specialists or regional office staff tasked with smoke management duties be in the field during the fall burn season on days when no burn approvals are issued but conditions may seem conducive to potential unapproved CRB. Establishing a DEQ presence during these occasions will also provide an opportunity for grower outreach and education, or enforcement actions, and should improve program support and overall compliance.

##### **4.5.4.1 Field Observation Exemptions**

Field staff is expected to observe burns when burning is approved in the region. Anytime field staff will not be present for burning, discuss with the CRB Smoke Management Analyst prior to the burn decision. The following categories of burns have specific requirements for DEQ observation:

- **Test burns**—Field staff *must* observe all test burns.
- **Burns located within 1 mile of an ISP**—Field staff shall observe all crop residue burns within 1 mile of an ISP. Exemptions to this requirement must be preapproved by the CRB Smoke Management Analyst or assigned designee. Exemption requests must be completed in the CRB application. The CRB Smoke Management Analyst will review and approve or deny the request.

- **Burns located between 1 and 3 miles from an ISP**—For fields 20 acres or smaller, field staff shall observe these burns unless regional office staff have evaluated the proposed burn and have documented the justification that it is not necessary to observe the burn. Justification shall be based on the parameters described below and must be documented on the exemption request form in the CRB application.  
For fields larger than 20 acres, field staff shall observe these burns. Exemptions to this requirement must be preapproved by the CRB Smoke Management Analyst or assigned designee. Exemption requests must be completed in the CRB application. The CRB Smoke Management Analyst will review and approve or deny the request.
- **Burns located beyond 3 miles of an ISP**—Field staff is expected to be in the field observing burns when burning is approved in their SMA. Exemptions to this requirement must be discussed with the CRB Smoke Management Analyst or assigned designee prior to the final burn decision. Exemption requests must have documentation, such as e-mail communication or phone log notes. The exemption documentation form is not necessary for fields burns located beyond 3 miles of an ISP.

Factors that will be used to justify the Exemptions may include, but are not limited to, the following:

- Fields that are considered to have a low risk of causing adverse impacts to an ISP.
- Fields located in remote areas where weather and terrain conditions are known to provide excellent dispersion conditions.
- Burning will be conducted by a highly proficient and adequately trained person with a history of complying with DEQ rules and implementing effective smoke management techniques.
- Total acreage approved for burning in the area is de-minimis per modeled impact analysis.
- The SMA does not have a history of grower noncompliance with program requirements.

#### **4.5.4.2 Exemption Parameters**

The following parameters should be evaluated to determine the risk of a particular burn and whether it needs to be observed by DEQ staff:

- **Person conducting the burn**—The experience and proficiency of the person conducting the burn should be considered. Growers who have a history of using good burning techniques and have demonstrated good judgment in conducting past burns may be considered for burning without DEQ observation. Growers who are new to the program or who have a history of using unreliable or ineffective burning techniques or have not demonstrated good judgment should not be considered for burning without DEQ observation.
- **Forecast meteorological conditions**—Forecast meteorological conditions that should be considered in determining the relative risk that a particular burn may pose to an ISP include the following:
  - Surface wind speed and direction
  - Transport wind speed and direction
  - Mixing height and ventilation
  - Air temperature

- Relative humidity
- Inversion strength and timing of the mix-out
- Elevation of ISP relative to field location
- Confidence in forecast meteorological conditions
- **Field conditions**—Field conditions that should be considered in determining how well a particular field may be expected to burn include the following:
  - Crop type
  - Fuel load
  - Fuel moisture
  - Soil moisture
  - Past successful or unsuccessful attempts to burn the particular field
- **Terrain, local conditions, and monitoring network**—Knowledge of terrain and other local conditions should be considered, including how terrain, predominant wind patterns, and local diurnal patterns may affect smoke behavior. Air quality monitors located at ISPs may be factored into the decision making process.

## 4.6 Enhanced Documentation

DEQ has established procedures to ensure that the provisions of IDAPA 58.01.01.621 and the SIP are met—specifically that ambient air quality levels of criteria air pollutants do not exceed 90% of the ozone NAAQS and 75% of any other NAAQS; are not projected to exceed 90% of the ozone NAAQS and 75% of the any other NAAQS over the 24 hours following the burn decision; and have not reached, and are not forecast to reach and persist at, 80% of the 1-hour action criteria for particulate matter under Section 556 of the “Rules for the Control of Air Pollution in Idaho” (IDAPA 58.01.01).

The purpose of enhanced documentation is fourfold: (1) provide additional documentation of the burn approval decision making process when air pollution monitoring levels exceed threshold levels prior to the start of a burn (preburn enhanced documentation); (2) document events surrounding elevated air quality concentrations measured after the start of a burn (postburn enhanced documentation) if the approved burn was deemed to have potentially caused or contributed to the measured concentration or possible adverse impacts or public roadway safety hazards; (3) evaluate the success of a burn that may help to enhance program implementation, and (4) establish additional field specific permit conditions when appropriate. The pollutant concentration thresholds that trigger pre-burn and post burn enhanced documentation are shown in Table 2.

**Table 2. Enhanced documentation trigger levels for particulate matter less than 2.5 microns (PM<sub>2.5</sub>) and ozone.**

Averaging Period and Pollutant	Preburn Level	Postburn Level
1-hour PM <sub>2.5</sub>	N/A	64 µg/m <sup>3</sup>
4-hour PM <sub>2.5</sub>	22 µg/m <sup>3</sup>	32 µg/m <sup>3</sup>
24-hour PM <sub>2.5</sub>	16 µg/m <sup>3</sup> (Air Quality Index = 59)	26 µg/m <sup>3</sup> (Air Quality Index = 80)
8-hour ozone	N/A	63 ppb (Air Quality Index = 77)

Note: µg/m<sup>3</sup> = micrograms per cubic meter; ppb = parts per billion

Pre-burn enhanced documentation is **only required when burning will be approved or when burning has been approved but has not yet commenced** and either of the following two conditions occur:

- The rolling 4-hour average PM<sub>2.5</sub> concentration equals or exceeds 22 micrograms per cubic meter (µg/m<sup>3</sup>) any time from 5:00am up to the start of the burn.
- The rolling 24-hour average PM<sub>2.5</sub> concentration equals or exceeds 16 µg/m<sup>3</sup> any time from 5:00am up to the start of the burn.

Post burn enhanced documentation is **only required when burning has been approved and has occurred** and any one of the following occurs:

- The 1-hour average PM<sub>2.5</sub> concentration equals or exceeds 64 µg/m<sup>3</sup> any time after the start of the burn through 10:00pm on the day of the burn.
- The rolling 4-hour average PM<sub>2.5</sub> concentration equals or exceeds 32 µg/m<sup>3</sup> any time after the start of the burn through 10:00pm on the day of the burn.
- The 24-hour average PM<sub>2.5</sub> concentration equals or exceeds 26 µg/m<sup>3</sup> during the burn day (midnight to midnight).
- The 8-hour average ozone concentration equals or exceeds 63 ppb any time after the start of the burn to midnight.

#### 4.6.1 DEQ Staff Responsibilities

The CRB Smoke Management Analyst is responsible for the following tasks regarding enhanced documentation:

- Review the monitoring data prior to the morning burn decision to determine whether any preburn trigger levels have been exceeded.
- Notify the applicable regional office staff of instances when approved burns will require preburn enhanced documentation.
- Continue to track the monitoring data throughout the day and notify the applicable regional office staff of any enhanced documentation criteria that have been triggered during the burn day. This may consist of preburn triggers that have been exceeded prior to the start of the burn or postburn triggers that have been exceeded after the burn was started.

- For any 8-hour ozone concentration exceedance, it will be the responsibility of the CRB Smoke Management Analyst or regional ozone forecaster to complete enhanced documentation if forecast allows burning to occur but concentrations for the burn day exceed the criteria for restricting burning.
- Participate in post burn enhanced documentation development to help identify any changes to decision process or any new field specific requirements needed to improve the overall decision making for the area or specific field.
- Ensure enhanced documentation is completed in the CRB application.

Regional office staff are responsible for the following tasks regarding enhanced documentation:

- Complete enhanced documentation within the CRB application for all applicable burns. If enhanced documentation is necessary for a given field it will be flagged on the regional home page in the CRB application.
  - Preburn enhanced documentation, when required, must be completed prior to the final burn approval. If the pre-burn enhanced documentation requirement is triggered after the final burn approval but prior to the start of the burn, the pre-burn enhanced documentation should be completed while the information remains fresh (typically within a day or two). Pre-burn enhanced documentation is limited and simply explains why burning should be approved such as; ventilation is expected to clear airshed prior to when burning starts. (See section 4.6.2 for additional information)
  - Post burn enhanced documentation must be completed within two days to ensure relevant conditions are captured and archived meteorological forecast data is available if needed. ISP contact may be necessary as well. Immediate feedback from representatives of ISP's will be much more valuable than feedback after several days or weeks. Refer to the intent of the enhanced documentation while completing these forms to ensure the proper level of information is included in this document.

#### **4.6.2 Pre-burn Enhanced Documentation**

Pre-burn enhanced documentation must be completed when DEQ will be providing, or has provided, final burn approval and a measured pollutant concentration in the area exceeds a preburn trigger level shown in Table 2. Pre-burn enhanced documentation requires DEQ to evaluate elevated pollutant concentrations in the area prior to the start of the burn and assess how smoke from the approved burning will affect the concentrations. Pre-burn enhanced documentation, when triggered, must be completed prior to the final burn approval, and the final burn approval must be based on the enhanced documentation assessment. If the trigger occurred after final burn approval but prior to the start of the burn, enhanced documentation should be completed as soon as possible. Therefore, for a final burn approval to be made, the assessment must be that smoke from the approved burn would not cause or contribute to a measured concentration above a program concentration limit and would not result in an adverse impact.

Pre-burn enhanced documentation is required when a trigger limit is met any time from 5:00 a.m. up to the start of the burn.

### 4.6.3 Post Burn Enhanced Documentation

Post burn enhanced documentation must be completed when an approved crop residue burn is reasonably suspected of having caused or contributed to a possible adverse impact, public roadway safety hazard, or when a measured pollutant concentration has exceeded a trigger level (See Table 2). A notification will be posted on the region home page of the CRB application if a field(s) requires post burn enhanced documentation. Post burn enhanced documentation protocol requires DEQ to review the applicable monitoring data, assess other potential sources of air pollutants, analyze the meteorological conditions, consider unique or unanticipated events or circumstances, review the decision making process, and assess whether smoke from approved burning affected pollutant concentrations. When required, post burn enhanced documentation should be completed within two days following the burn so that details are not forgotten and the assessment can be put to use quickly as a learning tool for future burn decisions.

Post burn enhanced documentation is required when a 1-hour or 4-hour PM<sub>2.5</sub> trigger limit is met or exceeded any time from the start of the burn until 10:00 p.m. on the burn day or a 24-hour PM<sub>2.5</sub> trigger or 8-hour ozone trigger is met any time from the start of the burn until midnight.

The purpose of evaluating and determining whether an adverse impact to an ISP occurred is to gauge how well implementation of the program complies with the SIP and to provide information for improving burn decisions. **DEQ currently conducts enhanced evaluation and documentation when smoke dispersion does not go as planned.** All CRB seasonal monitors in the state are within 3 miles of ISPs with the exception of the Porthill monitor. For the purpose of improving the burn decisions, DEQ will consider all monitors when evaluating if the enhanced documentation requirement has been triggered. DEQ will use the following procedure to evaluate whether an adverse impact at an ISP occurred.

- When a monitor is present and the maximum hourly PM<sub>2.5</sub> concentration is below 20µg/m<sup>3</sup> (or visibility is at least 10 miles if no monitor is available):
  - Conclude that no adverse impact occurred.
  - No additional documentation needed unless DEQ received a complaint from an ISP.
  - If a complaint was received from an ISP, full evaluation and enhanced documentation will be completed. If a complaint was received from a non-ISP, it will be addressed through the DEQ complaint tracker.
- When a monitor is present and the maximum hourly PM<sub>2.5</sub> concentration is between 20µg/m<sup>3</sup> and 26.2 µg/m<sup>3</sup>:
  - Conclude adverse impact unlikely.
  - Brief evaluation needed to determine whether an adverse impact occurred. The following items will be reviewed for the evaluation:
    - Monitoring data
    - Weather data
    - Field notes
  - If a complaint was received from an ISP, full enhanced documentation and evaluation will be completed.
- When a monitor is present and the maximum hourly PM<sub>2.5</sub> concentration is greater than 26.2 µg/m<sup>3</sup> (or visibility is less than 10 miles if no monitor is present):

- Adverse impact possible.
- Full evaluation and enhanced documentation will include review of the following:
  - Monitoring data
  - Weather data
  - Field notes
  - Contact with the ISP—questions identified on the enhanced documentation form will be asked to the ISP and responses documented
  - Burn Decisions
  - Smoke Dispersion Forecasts
  - Expected smoke behavior for the day
  - Smoke behavior observed
  - Forward trajectory analysis
  - Recommended changes
  - Adopted changes

#### 4.6.4 Tracking Enhanced Documentation and Impacts to ISPs

Events that trigger enhanced documentation are tracked in the CRB application. The purpose of tracking is to record the trigger events, track that enhanced documentation was completed, and to provide a process to efficiently document those situations where circumstances unrelated to the approved burning resulted in the triggering of the enhanced documentation.

DEQ should take note if an ISP is impacted repeatedly and evaluate the burn decision and burn approval decision making involved with those impacts with the goal being to avoid further impacts to the ISP. This is a critical function of the enhanced documentation process.

The tracking log includes date, monitor locations, burn location, trigger reason, brief description, ISPs affected, type of enhanced documentation, responsible staff, completion date, and summary.

#### 4.6.5 Monitors

Table 3 lists the PM<sub>2.5</sub> and ozone monitors that should be reviewed for evaluating compliance with the standards described above. According to the DEQ Air Quality Monitoring SOP’s and the US Environmental Protection Agency’s guidelines for air quality monitoring, negative values of 10 or greater (i.e., -10–0) are to be kept and included in the averaging of the PM<sub>2.5</sub> 24-hour concentrations. Values less than negative 10 are to be considered invalid for this review.

**Table 3. Crop residue burning program air quality monitors.**

Site Name	Location	Pollutants <sup>(a)</sup>	Smoke Management Area
<b><i>DEQ Boise Regional Office Monitors</i></b>			
Garden Valley	Garden Valley	PM <sub>2.5</sub>	Boise and Valley Counties
McCall USFS	McCall	PM <sub>2.5</sub>	
Idaho City	Idaho City	PM <sub>2.5</sub>	
Fire Station #5	Boise	PM <sub>10</sub>	Southwest Idaho
Nampa	Nampa	PM <sub>2.5</sub> / PM <sub>10</sub>	

Site Name	Location	Pollutants <sup>(a)</sup>	Smoke Management Area
Garden City	Boise	PM <sub>2.5</sub>	
White Pine Elementary	Boise	O <sub>3</sub> (seasonal)	
St. Luke's	Meridian	O <sub>3</sub> / PM <sub>2.5</sub>	
Weiser High School	Weiser	PM <sub>2.5</sub> (seasonal)	Weiser and Lower Payette Valleys
<b>DEQ Twin Falls Regional Office Monitors</b>			
Rock Creek	Twin Falls	PM <sub>2.5</sub>	Southern Magic Valley
Paul Elementary School	Paul	PM <sub>2.5</sub> (seasonal)	Northern Magic Valley
Ketchum	Ketchum	PM <sub>2.5</sub>	Blaine and Camas Counties
<b>DEQ Idaho Falls Regional Office Monitors</b>			
Idaho Falls	Idaho Falls	PM <sub>2.5</sub>	Eastern Idaho
Rexburg	Rexburg	PM <sub>2.5</sub> (seasonal)	
Salmon	Salmon	PM <sub>2.5</sub>	Custer and Lemhi Counties
<b>DEQ Pocatello Regional Office Monitors</b>			
Pocatello	Pocatello	O <sub>3</sub> /PM <sub>2.5</sub> / PM <sub>10</sub>	Southeast Idaho
Soda Springs	Soda Springs	PM <sub>2.5</sub> (seasonal)	
Preston	Preston	PM <sub>2.5</sub>	
<b>DEQ Lewiston Regional Office Monitors</b>			
Grangeville	Grangeville	PM <sub>2.5</sub>	Central
Cottonwood	Cottonwood	PM <sub>2.5</sub> (seasonal)	
Potlatch	Potlatch	PM <sub>2.5</sub> (seasonal)	
Juliaetta	Kendrick	PM <sub>2.5</sub> (seasonal)	
Moscow	Moscow	PM <sub>2.5</sub>	
Lewiston	Lewiston	PM <sub>2.5</sub>	
Kamiah*	Kamiah	O <sub>3</sub>	
<b>DEQ Coeur d'Alene Regional Office Monitors</b>			
Nursery Road	Coeur d'Alene	PM <sub>2.5</sub>	Kootenai County
Sandpoint	Sandpoint	PM <sub>2.5</sub> / PM <sub>10</sub>	Shoshone
Pinehurst	Pinehurst	PM <sub>2.5</sub> / PM <sub>10</sub>	
St. Maries	St. Maries	PM <sub>2.5</sub>	
Mt. Hall	Copeland	PM <sub>2.5</sub> (seasonal)	Boundary County
Bonnars Ferry**	Kootenai Tribe Mission	PM <sub>2.5</sub>	
Porthill	Canadian Border	PM <sub>2.5</sub> (seasonal)	
<b>National Park Service Monitors</b>			
Yellowstone	Yellowstone National Park	O <sub>3</sub>	Multiple smoke management areas
Craters of the Moon	Craters of the Moon	O <sub>3</sub>	

Site Name	Location	Pollutants <sup>(a)</sup>	Smoke Management Area
Minidoka	Minidoka Nat'l Historic Site	PM <sub>2.5</sub>	
<b>Utah Department of Environmental Quality Monitors</b>			
Cache County	Logan, Smithfield	O <sub>3</sub> / PM <sub>2.5</sub>	Southeast Idaho
Box Elder County	Brigham City	O <sub>3</sub>	Southeast Idaho
<b>Washington Department of Ecology Monitors</b>			
Colbert-Greenbluff Road	Spokane	O <sub>3</sub>	Kootenai County

<sup>a)</sup> PM<sub>2.5</sub> = particulate matter less than 2.5 microns in diameter; O<sub>3</sub> = ozone; PM<sub>10</sub> = particulate matter less than 10 microns in diameter

\*Monitor operated by Nez Perce Tribe

\*\*Monitor operated by Kootenai Tribe

## 4.7 Complaint Response, Compliance, and Enforcement

It is the responsibility of the regional offices to respond to all CRB complaints, investigate all apparent CRB violations, and refer apparent violations to the state office for formal enforcement consideration, when appropriate. The CRB Smoke Management Analyst should be consulted about suitable enforcement responses to help maintain consistency throughout the state. The CRB Smoke Management Analyst is available to assist in the documentation process when needed. Appendix F provides information about determining compliance with permit conditions. DEQ can receive complaints via the toll-free phone system, through DEQ's web submittal process, or directly to regional offices by phone or personal contact.

To maintain consistency in all regions and ensure compliance with the applicable state rules, regional office staff shall address all CRB complaints in the following manner:

- Respond to all CRB complaints as soon as practicable; ideally, this should be the same day as the complaint is received. Compliant must be addressed no later than the next business day after receiving the complaint.
- Log all complaints into the DEQ complaint tracking system. This includes all complaints received through the toll-free phone, personal contact, or web system that are CRB related. Documenting all complaints regarding CRB activity, whether these complaints are directly attributed to CRB activity or ultimately proven not a CRB impact, is critical to understanding smoke behavior, public perception, or needed outreach.
- Document, as appropriate, information pertaining to the complaint. This could include law enforcement or fire agency reports, physical evidence, photos, GPS locations, field descriptions, or statements.
  - All specific complaint allegations must be addressed with data that is pertinent to the complaint such as: when complainant states burning occurred after the approved burn window the complaint response must address the allegation directly by providing findings specifically addressing timing of burn activity. This might come directly from in-field observations by Seasonal Smoke Specialists, web cam images, or may come from subsequent interview of the grower if no other evidence is available.

- A determination of compliance, if able, must be provided. For example: if the complainant states smoke crossed the county border and impacted their residence the response has to include the field observations compiled during the day. This could support the complaint or may serve to dismiss the complaint.
- When an apparent CRB violation is observed, the regional office should identify, verify, and secure the information and evidence necessary to support enforcement activities. The regional office staff should consult with the CRB Analyst immediately when violations occur to help determine the appropriate enforcement action for the violation.
- The CRB Smoke Management Analyst will track completeness and direct regional staff if complaint response has not been addressed within two days of receipt of the complaint.
- Complaint response must ultimately conform to agency compliance program requirements.

## 5 Program Evaluation and Annual Review

DEQ is required to review the CRB program and this operating guide annually. However, DEQ staff continually review air quality and burn decision data to determine the efficacy of the program. The following are examples of evaluation and analysis that will take place annually:

- Days with approved CRB that had elevated air pollutant concentrations will be analyzed to determine whether the CRB may have caused or contributed to the measured concentration.
- Days with approved CRB that had low air pollutant concentrations will be analyzed to determine which parameters may have contributed to that day's good smoke dispersion characteristics.

Program feedback and recommendations will be sought from the public, participating growers, the US Environmental Protection Agency, fire districts, tribes, and other smoke management agencies.

Although the program will undergo this thorough annual review, DEQ staff should also be striving to improve program operations. Burns are continuously monitored throughout the day to determine how well they are going and if unexpected weather conditions or smoke management issues occur, why they have occurred. This information will help staff make necessary adjustments in the decision-making process for subsequent burn days.

## Appendix A. Spot Burning, Baled Agricultural Residue Burning, and Propane Flaming

Spot burning, baled agricultural residue burning, and propane flaming rules were developed after the second year of DEQ's CRB Program in 2011 and were implemented in spring 2013. These permits were developed to reduce the administrative requirements for burning very small amounts of residue while still protecting public health.

### Spot and Baled Agricultural Residue Burn Permit

The spot and baled agricultural residue burn permit (spot and bale burn permit) can be used to burn small areas of residue or weeds or equivalent piled or baled residue under the following conditions:

- No more than 1 acre of spots and/or equivalent piled or baled agricultural residue may be burned per day. For the purposes of this permit, 2 tons of piled or baled agricultural residue is equivalent to 1 acre of spots.
  - A spot or pile burn may include weed patches, spots of heavy residue, equipment plugs or dumps, pivot corners, and very small pastures but does **not** include the open burning of wind rows.
  - Baled agricultural residue may be burned to dispose of broken, mildewed, diseased, or otherwise pest-ridden bales still in the field where they were generated. Once a bale has been removed from the field, it cannot be returned to the field and then burned. If the grower has a significant disease or pest problem that cannot be addressed under the spot and bale rule limitations the grower could consider burning under the Infectious Waste Burning rule (IDAPA 58.01.01.616).
- No more than 10 acres of spots and/or equivalent piled or baled agricultural residue may be burned per calendar year, per permit.

### Grower Requirements

- Burning under the spot and bale burn permit shall only be allowed on DEQ-designated burn days for the county where the field is located and within the designated burn window. Spot and bale burns shall not smolder and generate smoke outside of the designated burn window. DEQ burn decisions are available at <https://www2.deq.idaho.gov/air/CRB/BurnDecisionMap/index/>
- Burning under a spot and bale burn permit may be allowed on weekdays, weekends, and holidays.
- All burning must be conducted in accordance with the permit issued by DEQ. The permit includes general requirements that apply to all burning conducted under the spot and bale burn permit and field-specific requirements due to location (e.g., proximity to a school).
- The permittee must record the date, time frame, type of burn, type of crop, and amount burned on the date of the burn. Records shall be retained for 2 years and made available to DEQ upon request. DEQ provides an online record keeping program within the grower's account for convenience.
- A spot and bale burn permit is valid for the calendar year. All permits issued in a given calendar year will expire on December 31 of that calendar year.

- The permittee must attend a crop residue burning training session provided by DEQ which is offered periodically through the Regional Offices or online at <http://www.deq.idaho.gov/air-quality/burning/crop-residue-burning/>

### **Permit Process**

Registration and fee payment is available online at <http://www.deq.idaho.gov/air-quality/burning/crop-residue-burning/>

Submit a registration using DEQ supplied forms to DEQ at least 14 days prior to the first desired burn date of the calendar year. The registration must include the following information:

- The location of each field where the grower wants to conduct a spot or bale burn.
  - The applicant's name, mailing address, telephone number, and cell phone number or other form of portable communication.
- Pay a nonrefundable permit fee of \$20 to DEQ at least 14 days prior to the first desired burn date of the calendar year.

### **Propane Flaming Permit**

The propane flaming permit only applies to very specific activities. Propane flaming is the brief use of flame-generating equipment to apply flame and/or heat to the topsoil of a cultivated field of pre-emerged or plowed-under crop residue with less than 550 pounds of burnable, non-green residue per acre. Propane flaming is allowed for control of diseases, insects, pests, and weed emergence and must be conducted on the field where the residue was generated.

### **Residue Loading Requirement**

The picture below shows a field with 550 pounds of burnable, non-green residue per acre. A field with less than this amount of residue would qualify for propane flaming as long as other requirements are met. This picture is taken from the "Picture your Residue" publication by the United States Department of Agriculture Soil Conservation Service (available at [http://www.deq.idaho.gov/media/977017-picture\\_your\\_residue.pdf](http://www.deq.idaho.gov/media/977017-picture_your_residue.pdf)).



### ***Grower Requirements***

Unlike other types of DEQ-regulated crop residue burning, propane flaming, as defined above, does not require growers to register fields or pay a fee. Instead, growers shall be deemed to have a permit by rule if they comply with the following rule requirements (IDAPA 58.01.01.624.04 and 624.05):

- The permittee must ensure that adequate measures are taken so the burn does not create a hazard for travel on a public roadway.
- Propane flaming shall only be allowed on DEQ-designated burn days for the county where the field is located and within the designated burn window. Burns shall not smolder and generate smoke outside of the designated burn window. DEQ burn decisions are available at <https://www2.deq.idaho.gov/air/CRB/BurnDecisionMap/index>.
- Burning conducted under a propane flaming permit may be allowed on weekdays, weekends, and holidays.
- The permittee must record the date, time frame, type of burn, crop type, and amount burned on the date of the burn. Records shall be retained for 2 years and made available to DEQ upon request.
- The person conducting burning must carry a portable form of communication such as a cellular phone in order to receive information necessary to protect air quality.
- The permittee must attend a crop residue burning training session provided by DEQ online at [www.deq.idaho.gov/air-quality/burning/crop-residue-burning](http://www.deq.idaho.gov/air-quality/burning/crop-residue-burning).
- All persons intending to conduct propane flaming shall obtain any additional permits from federal, state, or local fire control authorities prior to burning. DEQ's spot and bale burning web application will assist the grower in obtaining Idaho Department of Lands burn permits.

***Burning Restrictions***

- Burning is not allowed if the proposed burn location is within 3 miles of an institution with sensitive population and the surface wind speed is greater than 12 mph or if the smoke is adversely impacting or expected to adversely impact an ISP.
- All open burning, including propane flaming, is prohibited when DEQ issues an air quality emergency episode notice as defined by Idaho rules (IDAPA 58.01.01.552).
- Tires and other restricted materials described in Idaho rules (IDAPA 58.01.01.603) are not allowed for ignition in fields.

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## Appendix B. Contact List

<b>2019 Distribution List Contacts</b>			
<b>Name</b>	<b>Operating Guide Role</b>	<b>Burn Request Email</b>	<b>Email</b>
Tami Aslett	CRB Smoke Management Analyst	YES	<a href="mailto:Tami.Aslett@deq.idaho.gov">Tami.Aslett@deq.idaho.gov</a>
Jacob Wolf	Meteorologist	YES	<a href="mailto:Jacob.Wolf@deq.idaho.gov">Jacob.Wolf@deq.idaho.gov</a>
Brian Himes	Meteorologist	YES	<a href="mailto:Brian.Himes@deq.idaho.gov">Brian.Himes@deq.idaho.gov</a>
Kimi Smith	Meteorologist	YES	<a href="mailto:Kimi.Smith@deq.idaho.gov">Kimi.Smith@deq.idaho.gov</a>
Mark Boyle	Smoke Management Supervisor	YES	<a href="mailto:Mark.Boyle@deq.idaho.gov">Mark.Boyle@deq.idaho.gov</a>
Shawn Sweetapple	CRO Manager	YES	<a href="mailto:Shawn.Sweetapple@deq.idaho.gov">Shawn.Sweetapple@deq.idaho.gov</a>
Philip Hagihara	LRO Manager	YES	<a href="mailto:Philip.Hagihara@deq.idaho.gov">Philip.Hagihara@deq.idaho.gov</a>
Dave Luft	BRO Manager	YES	<a href="mailto:David.Luft@deq.idaho.gov">David.Luft@deq.idaho.gov</a>
Bobby Dye	TFRO Manager	YES	<a href="mailto:Bobby.Dye@deq.idaho.gov">Bobby.Dye@deq.idaho.gov</a>
Melissa Gibbs	PRO Manager	YES	<a href="mailto:Melissa.Gibbs@deq.idaho.gov">Melissa.Gibbs@deq.idaho.gov</a>
Rensay Owen	IFRO Manager	YES	<a href="mailto:Rensay.Owen@deq.idaho.gov">Rensay.Owen@deq.idaho.gov</a>
<i>* Please include the local Regional Manager in burn request emails</i>			

## Appendix C. Registration Review Checklist

### Checklist for Processing Grower Registrations:

1. Navigate to <http://apps.deq.idaho.gov/Air/CRBAdmin/>
  - A. This home page will display the current number of registrations that have been submitted and other pertinent information.

Crop Residue Burning Administration Select a Grower

State Office ▼

**Burn Approvals**

80 acres are currently awaiting approval. [Click Here to view eligible fields.](#)

0 acres have been approved for today. [Click Here to view approved fields.](#)

**Daily Burn Decisions** (Last Updated 06/12/2019 10:56 AM Mountain)

North Idaho - Proposed Burn Decision - *Incomplete* - [View Burn Decision](#)  
 South Idaho - Proposed Burn Decision - *Incomplete* - [View Burn Decision](#)

North Idaho - Final Burn Decision - *Complete* - [View Burn Decision](#)  
 South Idaho - Final Burn Decision - *Complete* - [View Burn Decision](#)

Spot and Bale / Propane Flaming - Burn Decision - *Complete* - [View Burn Decision](#)

**Registrations**

13 registrations have been submitted and are awaiting review. [Click here to view registrations](#)

Show 10 entries Search:

Registration Number	Grower Name	Field County	Burn Date	Date Submitted
SBP2019-1	Wes Lester	IDAHO		06/10/2019
SBP2019-2	Bryan Jorgensen	CARIBOU		06/10/2019
CRB2019-3	Gary Palmer	NEZ PERCE	6/12/2019	06/12/2019
SBP2019-3	Cleston Godfrey	CARIBOU		06/10/2019
SBP2019-4	Douglas Ashburn	LATAH NEZ PERCE		06/10/2019

Showing 1 to 10 of 11 entries Previous 1 2 Next

**Exemption Request(s)**

0 exemption requests are awaiting review.

Approval	Edit Request	Permit Number	Grower Name	Field County	SMA
No data available in table					

B. Select “Click here to view registrations”. Once in the Registrations page the “Registrations Awaiting Review” will be in a list format.

C. Click on the registration number to open up the details for that specific registration. (CRB Registration numbers will start with CRB2020-X, Spot and Bale registrations will start with SBP2020-X).

Registrations Select a Grower

**Registrations Awaiting Review**

Show 10 entries Search:

Registration Number	Grower Name	Smoke Management Area	Burn Date	Date Submitted	Manual Override	Modified
CRB2019-3	Gary Palmer	Central	6/12/2019	6/12/2019		
SBP2019-8	John Kellogg	Boundary County		6/10/2019	<input type="checkbox"/>	
SBP2019-9	Brian Busch	Central	In Progress	In Progress	<input type="checkbox"/>	
SBP2019-10	Justus Barton	Central		6/11/2019	<input type="checkbox"/>	
SBP2019-11	Joe Anderson		In Progress	In Progress	<input type="checkbox"/>	
SBP2019-12	Wes Lester		In Progress	In Progress	<input type="checkbox"/>	

Showing 1 to 6 of 6 entries Previous 1 Next

**D.** The Registration Review page contains grower information, registration information, and registration notes. Selecting “Edit” will open the registration and users can review burn details, burn manager, and fire safety measures.

Registration Review CRB2019-94 Select a Grower

---

**Grower Information**

Drex The T-Rex - 56  
 Dino Ave  
 BOISE ID 83706  
 Email Address: [drex@t-rex.com](mailto:drex@t-rex.com)  
 Home/Business Phone: 407-551-3123  
 Cell Phone: 407-551-3123

---

**Registered Fields**

Show 10 entries Add a Field

Edit	Field	Requested Burn Date	Crop Type	Requested Acres	Burn Duration	Burn Manager	Fire Safety Methods	Remove
<a href="#">Edit</a>	Dino 1	7/2/2019	Corn	100	2.00	Drex The T-Rex	Water Availability Hand Tool Availability Fire Breaks or Safety Zones	<a href="#">Remove</a>

Showing 1 to 1 of 1 entries Previous 1 Next

---

**Registration Notes**

**E.** After reviewing the burn detail, burn manager information, and fire safety measures, select “Save Registration” or select “Add Another Field” if another field needs to be added to the registration. After selecting save registration, users will be returned to the registration overview page.

Registration Form Drex The T-Rex - 56 Select a Grower

---

Step 1 Registration Type    Step 2 Select a Field    Step 3 Burn Details    Step 4 Burn Manager    Step 5 Fire Safety    **Step 6 Submit**

---

**Grower Information**

Drex The T-Rex - 56  
 Dino Ave  
 BOISE ID 83706  
 Email Address: [drex@t-rex.com](mailto:drex@t-rex.com)  
 Home/Business Phone: 407-551-3123  
 Cell Phone: 407-551-3123

---

**Field Name** Dino 1  
**Permit Number** 2019-94-1  
**Registration Type** CRB  
**Crop Type** Corn  
**Burn Acreage** 100  
**Requested Burn Date** 07/02/2019  
**Burn Duration (hrs)** 2.00  
**Burn Manager** Drex The T-Rex  
**Fire Safety Methods:** Water Availability  
Hand Tool Availability  
Fire Breaks or Safety Zones

[Edit Details](#)  
[Remove field from Registration](#)  
[Click to see a list of ISPs near this field](#)

---

[Add Another Field](#) -OR- [Save Registration](#)

F. Click on an individual field name (i.e. *Dino 1*) to open up the details for the field.

Registration Review CRB2019-94 Select a Grower

---

**Grower Information**

Drex The T-Rex - 56  
 Dino Ave  
 BOISE ID 83706  
 Email Address: [\\*\\*\\*\\*\\*@\\*\\*\\*\\*\\*](mailto:*****@*****)  
 Home/Business Phone: [\\*\\*\\*\\*\\*](tel:*****)  
 Cell Phone: [\\*\\*\\*\\*\\*](tel:*****)

---

**Registered Fields**

Show 10 entries Add a Field

Edit	Field	Requested Burn Date	Crop Type	Requested Acres	Burn Duration	Burn Manager	Fire Safety Methods	Remove
Edit	Dino 1	7/2/2019	Corn	100	2.00	Drex The T-Rex	Water Availability Hand Tool Availability Fire Breaks or Safety Zones	Remove

Showing 1 to 1 of 1 entries Previous 1 Next

---

**Registration Notes**

G. The Edit field page provides the field details. Users need to verify the field name and field acres. If the field is within the Treasure Valley Airshed, select it from the drop down box. Field county, smoke management area, and last reviewed will automatically populate. Field location information will automatically populate from the selected location on the map. Based on the location of the field, ISP within 3 miles and location within Kootenai Tribal boundaries will also automatically populate.

Edit Field Drex The T-Rex - 56 Select a Grower

---

Show additional information

**Field Details**

Field Name \*

Field Size (Whole Acres Only) \*

County \*

Airshed

Smoke Management Area

Last Review

**Field Location**

Please enter the latitude and longitude of the field. You can also identify the field's location by clicking on the map below.

Latitude \*

Longitude \*

ISP Within 3 Miles \*

Field within Kootenai Tribal Reservation Boundaries \*

---

**Field Map and Special Features**

Instructions:  
Left click on the map to add a field marker icon.

Map Legend

- Field Location
- 3 mile radius around field center
- School
- Hospital
- Other Institutions with Sensitive Populations (nursing homes, assisted living centers, etc)

**H.** Below the map is a list of the ISP’s with their address and phone number. There is a “Notes” box to input and specific notes regarding the field. In the field requirements box users will need to identify the specific field requirements. Step I reviews these requirements.

**List of ISPs**

Name	Address	Phone Number
Communicare Inc #5 Kuna		
CRIMSON POINT ELEMENTARY SCHOOL		
Falcon Ridge Charter School		
Fremont H. Teed Elementary School		
HUBBARD ELEMENTARY SCHOOL		
INDIAN CREEK ELEMENTARY		
Kuna High School	637 E Deer Flat	██████████
Kuna Living Center	184 W White Way	██████████
Kuna Middle School	1365 Boise St	██████████
REED ELEMENTARY SCHOOL		

Showing 1 to 10 of 11 entries

**Field Requirements**

Requirements:

**I.** Growers may need to adhere to special requirements when they are burning a specific field. It is up to the user to select the appropriate requirements when situations call for them. Some requirements are explained below:

**I-1.** If an ISP is located within 3 miles of the field the grower cannot burn if wind speeds exceed 12mph at any time. If an ISP is a school they cannot burn if winds exceed 12mph while school is in session.

**I-2.** Growers cannot burn if sustained surface winds are blowing toward an ISP or school while in session. Here is where users will use a Wind Direction Chart to establish wind requirements for a field near an ISP, (i.e. a grower cannot burn a field if an ISP lies to the West of the field when surface winds are blowing from the East). Burning in these wind conditions could potentially adversely affect the ISP with smoke.

**I-3.** There are situations that require on-site approval. If there is a note in a grower’s account stating on-site approval, you can select “permittee must have verbal approval

from onsite DEQ staff prior to “ignition”. This condition is more commonly used in the final approval process in accordance with the burn decision.

**I-4.** If the field lies adjacent to a public highway, users will want to make sure to select wind requirements that will not allow smoke to drift over the roadway. Some fields adjacent to Highway 95 have specific permit requirements and users will need to select the option “Permittee shall obtain a Right-of-Way Permit from the Idaho Transportation Department”.

**I-5.** If Bales are present in the field and are to be burned, users can select the following requirement, “All material to be burned must be unbaled and spread into windrows...” This will allow a better burn because baled material is likely to smolder for long periods of time.

**J.** After requirements for a field (if there are any) are selected, click “*Save Field*” at the bottom of the page.

**K.** After reviewing all the fields on the registration, select “Approve Registration”. An email will be automatically generated and sent to the grower. If the grower does not have an email address, print the completed registration and send a hard copy via USPS to the grower.

Registration Review CRB2019-94 Select a Grower

---

**Grower Information**

Show The T-Map - 50  
 One Ave  
 PO Box ID 83700  
 Email Address  
 Home/Business Phone  
 Cell Phone

---

**Registered Fields**

Show 10 entries Add a Field

Edit	Field	Requested Burn Date	Crop Type	Requested Acres	Burn Duration	Burn Manager	Fire Safety Methods	Remove
1	One 1	7/2/2019	Corn	100	2:00	One The T-Map	Water Availability Hand Test Availability Fire Breaks or Safety Zones	Remove

Showing 1 of 1 entries Previous 1 Next

---

**Registration Notes**

Approve Registration
Reject Registration

## Appendix D. Burn Decision Procedures for DEQ Staff

### CRB Smoke Management Analyst

#### ***Day Before Burn***

1. Review current monitor readings and trends for particulate matter and ozone within the smoke management area (SMA). Compare to the regulations (i.e., 90% of the ozone the National Ambient Air Quality Standard (NAAQS), 75% of any other NAAQS and 80% of the 1-hour trigger for particulate matter).
  - 64 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) for  $\text{PM}_{2.5}$  (1-hour average)
  - 26  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{2.5}$  (24-hour average)
  - 112  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{10}$  (24-hour average)
  - 63 parts per billion (ppb) for ozone (8-hour average)

A no burn decision may be made at this point and the following steps will not be needed.

2. Briefly review meteorological forecast models, tools, and real-time data.
3. Review wildland fire and prescribed burn information.
4. Make preliminary burn decision (burn/no burn/conditional) for each county based on the information and tools reviewed.

#### ***Day of Burn***

1. Review the preliminary burn decision. If it was no burn, no further action is needed.
2. Review current  $\text{PM}_{2.5}$  and ozone monitor readings and trends within the SMA for the following data.
  - Current 1-hour, 4-hour, and 24-hour average  $\text{PM}_{2.5}$  concentrations
  - Current 1-hour and forecast 8-hour ozone concentration

Compare monitoring data to trigger levels for enhanced documentation.

Compare data to the regulations (i.e., 90% of the ozone the National Ambient Air Quality Standard (NAAQS), 75% of any other NAAQS and 80% of the 1-hour trigger level for particulate matter).

- 64  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{2.5}$  (1-hour average)
- 26  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{2.5}$  (24-hour average)
- 112  $\mu\text{g}/\text{m}^3$  for  $\text{PM}_{10}$  (24-hour average)
- 63 ppb for ozone (8-hour average)

***Note: A no burn decision may be made at this point and the following steps will not be needed.***

3. Review meteorological forecast, and coordinate with DEQ meteorologist for, real-time data included in accordance with DEQ's CRB burn decision SOP.
4. Review wildland fire and prescribed burn information.

5. Review the ready to burn fields, noting field locations and size for each SMA.
6. Review the smoke dispersion forecast from the meteorologists (available by 8:00am) during the fall burn season or the NWS forecast if the meteorologists' forecast is unavailable.
7. Submit proposed burn decision. An email will be sent to recipients on the distribution list upon submission.
8. Host daily coordination calls with the meteorologists, regional office staff, Seasonal Smoke Specialists, and other smoke managers at 8:30 a.m. local time.
9. Make the final burn decision for each county (burn/no burn and number of acres) based on review of information and consultation with regional office staff by 10:00 a.m. local time.
10. Throughout the burn day, monitor the air quality and coordinate with DEQ meteorologists for real-time conditions. If air quality and/or meteorological conditions result in the burn decision being changed during the day, proper documentation should be maintained to support decisions to increase or decrease the acres to be burned. An increase in acres during the burn day is only allowed if it was noted in the final burn decision. If the burn decision changes, coordinate with the regional office staff to document the change as follows:
  - Thoroughly document the reasons and conditions supporting the change.
  - Ensure all applicable staff is updated.
  - Continue to monitor air quality conditions.

## **Seasonal Smoke Specialists**

### ***Day Before Burn***

1. Provide input on the preliminary burn decision if needed.
2. Review and maintain the ready to burn list and plan the following day. Communicate directly with growers to secure reasonable assurance for the next day's planning.

### ***Day of Burn***

1. Review the pollutant and meteorological monitoring data. Review and document visibility conditions and fire safety issues.
2. Review the meteorologists' forecast (available by 8:00 a.m.) during the fall burn season or the NWS forecast discussion if the meteorologists' forecast is unavailable.
3. Participate in daily CRB coordination calls (fall burn season). Be prepared with a current list of growers who **are** ready to burn and their requested acreages.
4. During the morning coordination call discussions about smoke behavior and weather forecast validation from the previous day will occur. Be prepared to share specific smoke descriptions and feedback about the previous day's forecast.
5. Based on the burn decision, determine what fields will be approved to burn. Approval priority will be as follows:
  - Favorable conditions exist for sensitive areas (e.g., fields near towns, roads, and canyons) and ISPs.

- The forecast conditions favor the unique or specific requirements of the area to be burned.
  - The earliest burn requests received from growers. Considerations on when fields are actually ready to burn should be included.
6. Post the notifications of final approval and contact the approved growers to notify them of final approval. Seasonal Specialists must supply the grower with the following information:
    - Approved burn window or ignition time.
    - Approved burn locations or specific field.
    - Specific permit requirements (conditions) for the burn (e.g., expected wind direction or speed, any conditions necessary to protect institutions with sensitive populations, potential for rain, etc.).
    - Other relevant information.
  7. Receive any updated instructions for the day from the regional office. These instructions may include driving to the burn location to monitor burns, responding to complaints, or investigating illegal burns.
  8. When in the field, be aware of current atmospheric conditions that may affect burning (e.g., incoming storms or changes in temperature, humidity, wind speed and direction, cloud type, and visibility conditions) and effects of the surrounding terrain.
  9. Record field conditions and observations. Records must meet minimum requirements. Be sure you are aware of the weather checklist requirements.
  10. If meteorological conditions in the field differ from those forecast, immediately contact a staff meteorologist for direction. If conditions deteriorate, the Seasonal Smoke Specialist has the authority to require withholding of additional fuel so the fire burns down and excluding additional burning for the day. Contact your growers if or when they are affected by this.
  11. Remain in contact with growers throughout the day either by cell phone or in person. Acreage of burn may be increased (an increase must be in accordance with the acreage listed on the final burn decision) or decreased during the burn day, depending on improving or deteriorating conditions. The CRB Smoke Management Analyst or assigned designee has the authority to increase acreage. If acreage is increased, the Seasonal Smoke Specialist will be contacted with the necessary information.
  12. When all approved burns have been completed, update logs and databases as required. Weather checklists and other documentation have specific timeline requirements for filing. Be sure you are aware of those timely reporting requirements.

## **Regional Office Staff Assigned to CRB Tasks**

A Regional Office Analyst may also have to take on some or all of the duties listed above for the Seasonal Smoke Specialist if the specialist is unavailable or if activity levels exceed current Seasonal Specialists staffing. Routine responsibilities include the following.

***Day Before Burn***

1. Provide input to the preliminary burn decision if needed.

***Day of Burn***

1. Review the forecast from the staff meteorologist (available by 8:00 a.m. local time) during the fall burn season or the NWS forecast discussion if the meteorologists' forecast is unavailable.
2. Participate in daily CRB coordination calls with meteorologists, CRB Smoke Management Analyst, other regional office staff, Seasonal Smoke Specialists, and other smoke managers at 8:30 a.m. local time.
3. During the daily CRB coordination call discussions about smoke behavior and weather forecast validation from the previous day will occur. Be prepared to share specific smoke descriptions and feedback about the previous day's forecast.
4. Provide input on the final burn decision if needed.
5. Support field staff during burn day

## Appendix E. State Implementation Plan Requirements for Burn Decision Criteria

This appendix contains the specific information that was included in the *Open Burning of Crop Residue State Implementation Plan (SIP) Revision*.<sup>1</sup> This information will be used in conjunction with the rest of the guidance in this operating guide. Some of the information included in this appendix is also discussed elsewhere in this guide. The purpose of this appendix is to ensure that DEQ captures all the requirements from the SIP.

### Meteorological Data

The goal of smoke management is to assure good to excellent ventilation (smoke rises and disperses above the ground) and good to excellent dispersion (smoke goes into the transport winds and moves out of the area). Aspects of the meteorological data that should be evaluated include:

Ventilation index is a calculation based on the surface wind speed and the mixing height. The ventilation index for the burn area should be ‘marginal’ to ‘excellent’ throughout the duration of the approved burn.

- Burns should be grouped by areas of best ventilation.
- Burning under poor ventilation should not be conducted.
- Burning under limited ventilation may be successfully conducted if the other prescription criteria are met and should only be approved on a case-by-case basis.
- Ventilation characteristics may be established using forecast characteristics or from observed smoke behavior and cloud formation.

Cloud cover should be “mostly sunny” to “partly cloudy.”

- Uplifting, billowy clouds (fair weather cumulus) show the most unstable conditions (best ventilation and dispersion).
- Clear, bright blue skies are often indicative of high-pressure systems that are likely to have poor ventilation. Before burning under clear skies, all other prescription criteria should be met.
- Burning under low-lying, solid cloud cover should be avoided if the mixing height is at or near the same elevation as the cloud layer. If the solid cloud cover is at a higher elevation burning may be successfully accomplished if other prescription parameters are met.

Surface wind speeds should be in the 3-8 mph range or at a speed sufficient to carry the fire.

- Winds speeds of less than 3 mph can often result in fire spreading unpredictably. Wind that is too light and variable can create poor dispersion conditions.

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<sup>1</sup> Idaho Department of Environmental Quality. 2008. *Open Burning of Crop Residue State Implementation Plan (SIP) Revision*. Boise, ID: Idaho Department of Environmental Quality. Available at <http://www.deq.idaho.gov/crop-residue-burning>.

- When burning within 3 miles of an ISP, sustained surface wind speeds shall not exceed 12 mph, and, generally, the wind speed should be within 3-8 mph, which is the optimum range.
- Burning when surface winds are greater than 12 mph should be done with extreme caution. Too strong of surface winds can inhibit plume rise, pushing smoke along the surface. Strong surface winds can also make control of the fire difficult.

Surface wind direction can vary depending upon the location of the burn.

- Burning should be conducted to keep smoke away from ISPs, public roadways, airports, and populated areas. Burning should not be conducted when conditions are such that smoke is likely to reach such receptors.
- Take caution if the surface wind direction is forecast to shift at some point during the burn window. A shift in direction can result in smoke impacts or increased fire risk.

Transport wind speed should be 7 – 20 mph for best dispersion.

- Be cautious of burning when transport wind speeds exceed 20 mph. Transport wind speeds that are above 20 mph may produce turbulence that causes smoke to return to ground level.

Transport wind direction is dependent upon the location of the burn.

- Burning should be conducted to keep smoke away from ISPs, public roadways, airports, and populated areas. Burning should not be conducted when conditions are such that smoke is likely to reach such receptors.
- Take caution if the transport wind direction is forecast to shift at some point during the burn window. A shift in direction can result in smoke impacts.

Mixing heights should be at least 1,000 feet above ground level.

- Mixing heights may vary throughout the airshed based on changes in elevation and other surface features, such as large bodies of water.

Relative humidity (RH) should be considered for smoke management and fire safety reasons.

- Low RH levels (i.e., below 25%) may be preferable for smoke management. However, because lower RH levels can make it difficult to control a fire, caution should be used.
- For bluegrass residue burning, RH levels over 30% may inhibit plume rise and smoke dispersion, so ventilation conditions should be especially considered.
- High RH levels (i.e., above 60%) are likely to inhibit plume rise and smoke dispersion and may result in incomplete burning of residue.
- The response to changes in relative humidity occurs more rapidly with fine dead fuel suspended above the ground because these fuels are not in contact with the damp lower layer and are more exposed to the sun and wind.

Radiation inversions may cause the burn window to be narrow even under optimal conditions.

- Burning should not be permitted before the inversion has mixed out unless transport conditions after breakup would not protect population centers.
- A sufficient amount of time should be allowed at the end of the burn day for any residual smoke to disperse from the area before a radiation inversion becomes established.

## Specific Attributes of the Smoke Management Areas

Idaho has diverse terrain, topography, climate, soils and crops. To address this diversity, DEQ has developed Smoke Management Areas (SMAs) that divide the state into more manageable parts.<sup>2</sup> Within the SMAs, DEQ may develop specific prescriptions designed to maximize smoke dispersion and to minimize air quality impacts.

Some examples of prescriptions that may apply to all, or part, of a SMA are:

- Burns near canyon rims should be conducted only when both transport and surface winds are blowing away from the canyon.
  - Ensure that conditions are such that adequate plume rise will occur. In some cases, a test burn may be necessary. Smoke that drifts over a canyon is likely to descend toward ground level if the temperatures in the canyon are cooler than the temperatures over the surrounding land.
  - For fire safety reasons burns should be conducted before the surface wind speed increases (typically by 12:00PM). Avoid burning if ‘whirlwinds’ are visible.
- Burns near large bodies of water should be conducted only when both transport and surface winds are blowing away from the water. The air will usually be cooler and more stable over large bodies of water. This can cause ‘lake-breezes’ in the afternoon that will pull smoke downward - winds at the surface blow from the lake to shore, which causes air above the lake to sink downward. Even in the absence of a true lake-breeze, the interaction between lake-generated winds and prevailing winds is complex and can cause variable conditions that can change quickly. Knowledge of the expected prevailing wind direction and wind strength is important. It is also important to know the direction of transport winds aloft to avoid smoke drifting over the water. Surface and transport winds can be from vastly different directions. A good guide would be to burn downwind of major lakes so that the smoke is never carried over the lake.
- Favorable Winds. Certain areas have fairly predictable predominant winds and fairly predictable daily wind shifts. In such areas, burning should be timed to match the local wind pattern to achieve the most favorable smoke dispersion characteristics.

## Visibility

Visibility conditions should be considered when deciding whether to approve burning. When deciding to allow burning on a given day, if visibility is less than 10 miles and is expected to remain so throughout that day, a no burn decision will be made.

## Individual Fields/Institutions with Sensitive Populations

DEQ will consider the following factors in developing specific prescriptions and burn approvals.

- Burn location is identified on the permit utilizing Latitude/Longitude coordinates.

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<sup>2</sup> Burn management areas are now referred to as smoke management areas (SMAs). Please see Figure 2 in the main document for SMA names and boundaries.

- Elevation and aspect are also considered. Due to microclimatic variations in wind speed, direction, lift and dispersion, burn location information is very important. Fields that have slopes that face toward the south will receive more solar heating than other fields and tend to have lower soil moisture and fuel moisture levels.
- Proximity to Institutions with Sensitive Populations. The proximity of the burn to institutions with sensitive populations, including public schools while in session; hospitals; residential health care facilities for children, the elderly or infirm; and other institutions with sensitive populations as approved by the Department. The Department shall not authorize a burn if conditions are such that institutions with sensitive populations will be adversely impacted or when the plume is predicted to impact such institutions.
- Proximity to Public Roadways. Identify the location of the field in proximity to public roadways.
- Proximity to Airports. Identify the location of the field in proximity to airports.
- Proximity of Other Burns. The proximity of other burns and other potential emission sources within the area to be affected by the proposed burn.
- Size of the burn includes the area (acres or feet) of the burn as well as the height of the burn if the burn is a pile.
- Burning method refers to the lighting method such as match/lighter, propane torch, or diesel burners, as well as the pattern of lighting. Generally, the hotter the fire, the less smoke it produces and the better the smoke produced is pushed upward for dispersion.
  - If a field is lit slowly section by section and/or is lit from the top of a slope downward, the burn can take longer, not burn as hot, and may produce more smoke than burning a field more effectively.
  - A typical, more effective burn begins with lighting a backfire along the downwind perimeter of a burn. A backfire moves slowly with relatively low flames because it burns into the wind. When a backfired portion of the burn is safe, flank fires are generally lit beginning at the backfire along burn perimeters parallel with the wind. Flank fires have moderate flame heights and speed because they move perpendicular to the wind. When the back and flank portions of the fire are safe, a head fire is typically lit to consume the remaining fuel quickly. A head fire moves relatively fast with longer flames because it burns with the wind. Usually, fires that burn uphill act as head fires and those that burn downhill act as backfires, regardless of wind direction.
- Fuel type affects smoke generation and dispersion. Generally, the more dense the fuel, the more smoke it produces when it burns. For example, fuel density can change with crop type and variety (e.g. wheat stubble is typically less dense than bluegrass stubble, and certain wheat or bluegrass varieties can be denser than others).
- Fuel loading/expected emissions. Fuel loading is a function of fuel type, acreage of the burn, density of material remaining in the field, and burn type. Generally, the greater the fuel loading, the greater the expected emissions and the potential for smoke.
- Fuel moisture is dependent upon fuel type and relative humidity. In general, fuel moisture should be as dry as possible throughout the residue layer to promote plume rise.
  - Fuel moisture influences smoke quantity and plume rise. In general, the greater the fuel moisture, the more smoke and limited plume rise.
  - Fuel moisture should be initially assessed independently of RH.

- Relative humidity and temperature control fuel moisture content up to about 32 percent. Liquid moisture such as rain or dew must contact a fuel for moisture content to rise above 32% and the increase depends upon the duration as well as the amount of precipitation.
- The moisture content for fine or dead fuel, such as pine needles and dried grasses, responds rapidly to changes in relative humidity.
- There is a lag time involved for fuel moisture content to reach equilibrium with the RH of the surrounding atmosphere.
- Previous drying and wetting of the fuel will influence fuel moisture.

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## Appendix F. Determining Compliance with Permit Conditions

This appendix provides a detailed description of how the Idaho Department of Environmental Quality (DEQ) determines compliance with permit conditions. Permit conditions are an important part of proper smoke management. Failure by the grower to comply with permit conditions may result in the issuance of a compliance document (notice to comply or notice of violation), civil or criminal charges, and monetary penalties.

A Seasonal Smoke Specialist or regional office staff that is on site at a burn might identify permit conditions that are inaccurate due to an error during the registration review process or because they are not representative of the conditions in the field. If this occurs, the on-site DEQ staff **must** contact the CRB Smoke Management Analyst prior to ignition to have the permit conditions changed. If they are unable to contact the CRB Smoke Management Analyst (e.g., lack of cell service, analysts not available), he/she must have the grower proceed with the burn as specified on the current permit or not conduct the burn at all.

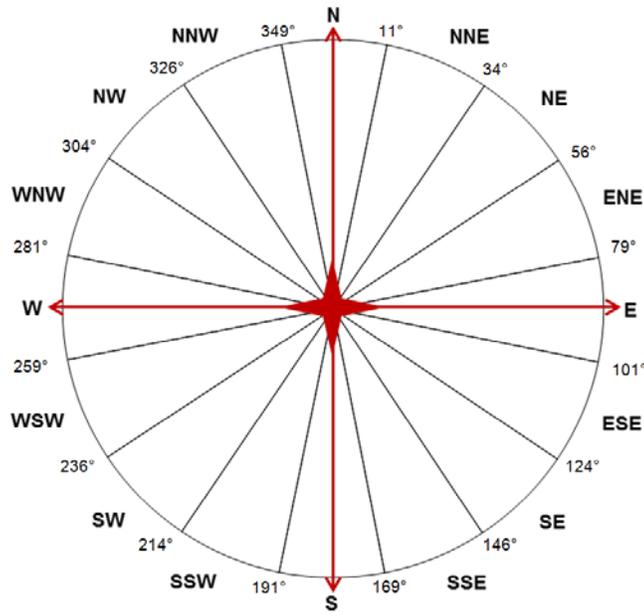
### Permit Conditions

**Wind Speed**—Crop residue burning (CRB) permits often contain a condition that restricts burning if “sustained surface wind speeds” are above 12 miles per hour (mph). The purpose of this condition is to restrict burning during those times when strong surface winds could blow smoke along the ground toward institutions with sensitive populations (ISPs), populated areas, public roadways, or other features that should be protected. DEQ is required to restrict burning at fields that are within 3 miles of an ISP when the sustained surface wind speed exceeds 12 mph. DEQ may also choose to include a wind speed restriction on fields that are near roadways, airfields, or populated areas to better protect these features. DEQ defines sustained wind speed as the average wind speed over a continuous 2-minute period.

**Wind Direction**—CRB permits often contain a condition that restricts burning if the surface wind is from a particular direction or combination of directions. The purpose of this condition is to restrict burning during those times when the wind could carry smoke toward ISPs, populated areas, public roadways, or other features that should be protected.

DEQ uses the 4 cardinal wind directions and 12 intercardinal wind directions (north-northeast, northeast, east-northeast, east-southeast, southeast, south-southeast, south-southwest, southwest, west-southwest, west-northwest, northwest, and north-northwest) to describe the wind direction restrictions. The restriction includes the listed direction plus or minus 11.25 degrees. For example, if a permit condition restricts burning when winds are from the west-southwest (i.e., 247.5 degrees), burning is restricted when the sustained wind direction is anywhere from 236.25 to 258.75 degrees. To simplify these guidelines, DEQ has rounded these numbers to the nearest degree (Figure 1).

Direction	Degree Range	
	From	To
North (N)	349°	<11
North-northeast (NNE)	11°	<34
Northeast (NE)	34°	<56
East-northeast (ENE)	56°	<79
East (E)	79°	<101
East-southeast (ESE)	101°	<124
Southeast (SE)	124°	<146
South-southeast (SSE)	146°	<169
South (S)	169°	<191
South-southwest (SSW)	191°	<214
Southwest (SW)	214°	<236
West-southwest (WSW)	236°	<259
West (W)	259°	<281
West-northwest (WNW)	281°	<304
Northwest (NW)	304°	<326
North-northwest (NNW)	326°	<349



**Figure 1. Compass directions for wind direction permit condition compliance.**

**Burn Window**—When DEQ issues a CRB permit, a start time and end time (burn window) will be specified. The burn window is based on several smoke management factors, including forecast mixing height and ventilation, forecast wind speeds and directions, forecast relative humidity, and other relevant factors. The purpose of the burn window is to limit burning to the portion of the day when smoke from the burn is expected to disperse without causing an impact to the environment or public health. Burns may not be ignited prior to the start time and must be completed (fire out) by the end time.

**Visibility Hazard on a Public Roadway**—The following procedure is used to evaluate whether smoke from an approved burn has created a hazardous condition for travel on a public roadway.

DEQ documents any observations of smoke on a public roadway while field staff observes crop residue burns. DEQ staff will not observe all burns that are near public roadways but will observe burns that have been determined to pose a risk of creating a hazardous condition for travel on a public roadway.

*Note: prior to conducting burning adjacent to a state highway or interstate, the permittee should consult with the appropriate transportation agency (such as the Idaho Transportation Department) about obtaining a Right-of-Way Permit with an approved traffic control plan.*

DEQ uses the stopping sight distance as a function of speed information (Table 1) to determine if smoke is creating a hazardous condition for travel on a public roadway. If visibility is greater than the appropriate stopping sight distance, crop residue burning did not result in a hazardous condition. If visibility is less than the stopping sight distance for the appropriate speed limit, DEQ will determine whether the grower has an approved traffic control plan for burning and has followed that plan. If the grower has an approved traffic control plan in place and followed the plan, the grower will be deemed in compliance with the permit requirement. If the grower did not

have an approved traffic control plan or did not follow the plan, the grower will be deemed to be in violation of the permit requirement.

**Table 1. Stopping sight distance as a function of speed.**

<b>Speed (miles per hour)</b>	<b>Stopping Sight Distance (feet)</b>
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

*Source: Manual on Uniform Traffic Control Devices for Streets and Highways: 2009 Edition, Table 6C-2 (page 555), published by the US Department of Transportation, Federal Highway Administration. Available at <http://mutcd.fhwa.dot.gov>.*

## Appendix G. Seasonal Smoke Specialists Daily Checklist

This guide should be used to help facilitate completion of daily activities for new Specialists. It is also intended for returning Specialists to use as a reference. It is an abbreviated list of daily tasks. It is neither a complete list of duties, nor a list that will describe how to accomplish those duties.

- Check Ready to Burn (RTB) list for current fields. Growers must have fields on RTB list prior to noon local time the day before they would like to burn. Have an idea about who may want to burn that day.
- Create a list of the fields for burning that day and ensure the grower is ready and available to burn. Send your burn request email to the daily burn request distribution list (see appendix B) either the day before or by 8:30 a.m. local time the day of the burn request. This ensures all staff is informed of the potential burning.
- Review smoke dispersion forecast, current and forecast weather conditions, and air quality in your area.
- Review proposed burn decision, participate in the morning conference call, and have a list of growers that would like to burn (Fall Season).
- Outside of the fall burn season, the Smoke Management Analyst will respond to your burn request by 9:30 a.m. local time with the final burn decision. The final burn decision will include a brief air quality and weather discussion, burn window and burn decision acres. Based on burn decision, determine what fields will be approved to burn. Approval priority is as follows:
  - Favorable conditions exist for sensitive areas.
  - Forecast conditions favor the unique/specific requirements for the area.
  - Date of burn requests.
- Contact growers wanting to burn by telephone. Notify them of approval/denial of their field(s) and inform them of final permit requirements if a burn is approved. *Note: scheduling start times with growers may be appropriate to ensure field staff availability.*
- Approve and post final burn permits for the day (Must be completed by 11 a.m. local time).
- Verify regional burn information is correct on the public DEQ webpage.
- Print or download weather checklists (field notes) for fields that you will observe. This can be done the afternoon or evening prior to help expedite morning deployment.
- Attend ISP burns unless you have requested an exemption from the CRB Smoke Management Analyst or CRB Analyst and an exemption has been granted by the CRB Program staff.
- Attend burns that are not sensitive in nature if ISP fields are not being burned that day.
- Collect weather readings prior to, during and after the burn. Ensure weather conditions are within permit requirements and are favorable for good smoke dispersion.
- Take photos of observed burns and smoke dispersion.

- If meteorological conditions are not favorable when on site, contact CRB Program staff to discuss possible options.
- Remain in contact with growers throughout the burn day until burning is complete and information for the post burn report has been received.
- Complete weather checklists (field notes) for all observed burns.
- Complete post burn reports if grower requests your assistance.
- Submit field notes into the application within one week of observations.
  - When adding multiple fields to the field notes and selecting print, there will be a map, and specific burn restrictions for each field. There is only one section for field, weather and smoke observations. Users can edit comments in the remarks section. PDF's, word documents, and excel files can be uploaded.
  - Blank copies of field notes are available in the application. The template can be found on the field notes page in the upper right hand corner (It is the printer icon).
- Track completion of post burn reports. Post burn reports should be completed within 24 hours. Staff should work with growers to complete post burn reports within the 24 hour time frame. If post burn reports are not completed, growers may not be allowed burn the following day.
- Contact Growers who have not submitted a post burn report.
- Follow-up on new registrations (incomplete registrations, grower training).
- Complete enhanced documentation as needed.
- Start preparing for tomorrow. Review forecast and fields on RTB list.
- Move growers to RTB list when requested.
- Document your communications with growers and all of your burn approvals and denials.
- Complete enhanced documentation as required. Pre burn enhanced documentation is required before the start of the burn. Post burn enhanced documentation is required within 2 days. You will receive a notice on your landing page and by email if you need to complete post burn enhanced documentation.
  - Note: From the staff landing page, users can select “click here” to view field(s) requiring post burn enhanced documentation. Fields will be identified in a table at the top of the page (missing post burn enhanced documentation) which will show all fields requiring enhanced documentation. Select “add documentation” for the field(s) being documented and the form will auto-populate the date and SMA. The field(s) will be highlighted in yellow with red text. Multiple fields can be added to one enhanced documentation form.

## Appendix H. Summary of Changes

This appendix provides a brief summary of changes made to the previous version of the Crop Residue Burning Program Operating Guide. Simple changes to wording meant to provide improved clarity and understanding for DEQ staff implementation, or updating outdated information such as hyperlinks, or web page references are not identified in this summary. This summary lists minor process changes that were made to align with forecasting tools, measurement standards, newly available agency tools, and where responsibilities have been shifted due to resources analysis or process improvements identified throughout the year.

Before incorporating any changes, each operating guide change is reviewed to determine if it could be considered a State Implementation Plan (SIP) or rule change. SIP and Rule related changes are never made without extensive planning and rulemaking efforts with the advisory committee and other stakeholder involvement. Changes to any State Implementation Plan (SIP) required conditions, if occurring, are explicitly identified.

- The tasks previously assigned to the CRB Program Lead and the CRB Program Analyst found in Sections 3.2 and 4.3.2, have been combined. These tasks are now assigned as CRB Smoke Management Analyst duties.
- Throughout the guide all references to information and documentation stored in the agency's electronic document management system, or Content Manager, were removed and replaced with references to documentation being stored in the new CRB application system.
- Updated list in Section 4.6.5 of monitors used for CRB burn decision and enhanced documentation. DEQ's Pocatello Regional Office installed an ozone monitor in spring 2020.
- Established a specific deadline of two workdays for field staff to complete post burn enhanced documentation. Section 4.6.3.
- Included information in Appendix A that highlights the availability of online record keeping for spot and bale permit holders to fulfil recordkeeping rule requirements.
- Changed the definition used for sustained wind speed in Appendix F from average wind speed over a continuous 1-minute period to a continuous 2-minute period to be consistent with the national weather service definition.
- Modified Appendix G Seasonal Smoke Specialists Daily Checklist to highlight several process changes including:
  - Reference to Appendix B Distribution for daily burn request communication.
  - Added detail for the CRB smoke management analyst process for approving and responding to burn request for burning that is occurring outside of fall burn decision process.
  - Added the process for submitting field notes to the new CRB application.
  - Added the process for submitting enhanced documentation to the new CRB application.

SIP and Rule related changes:

- None