

# Air Pollution Control District - County of San Luis Obispo SMOKE MANAGEMENT PLAN

## APPLICATION FOR BURN PERMIT

In accordance with the San Luis Obispo Air Pollution Control District (APCD) Smoke Management Program, this Smoke Management Plan (SMP) serves as a permit application that is to be completed by the applicant and submitted to the APCD. This SMP application consists of a Project Description page and two sections – A and B. **ALL APPLICANTS MUST COMPLETE THE PROJECT DESCRIPTION PAGE (page 1).** Both sections A and B of the SMP are one page forms (**pages 4 and 5**) that may need to be completed depending on the burn's potential to impact smoke sensitive areas and the size of the burn. Once approved by the APCD, this SMP serves as a conditional permit to burn, when combined with the APCD's permit to burn. **The APCD will require submittal of smoke management plans 14 days in advance. The APCD requires approval of the smoke management plan at least 72 hours prior to the burn.**

The **Project Description Page (page 1)** requests general information and identifies conditions for all prescribed burn projects. It identifies the permittee and relevant contact information, who the land owner is, the project name, project location, burn size, purpose of the burn, type of fuel to be burned, and estimated emissions from the burn. It provides a checklist of additional sections of the SMP that may be filled out and attached. Finally, it requests the preparer's signature, the name of the permittee or authorized representative, and the permittee or authorized representative's signature.

**Section A (page 4)** is a one-page form that must be completed and attached to the Project Description page if the burn has the potential to result in impacts to smoke sensitive areas. Smoke sensitive areas are defined as "populated areas and other areas where the APCD determines that smoke and air pollutants can adversely affect public health or welfare." Such areas can include, but are not limited to, towns and villages, campgrounds, populated recreational areas, hospitals, nursing homes, schools, roads, airports, public events, shopping centers, and Class I Areas (areas that are mandatory visibility protection areas designated pursuant to section 169A of the federal Clean Air Act). The APCD can tell you if you are in a Class I Area.

**Section B (page 5)**, is a one page form that must be completed and attached to the Project Description if the burn will be greater than 100 acres or will produce more than ten tons of particulate matter. Section B identifies meteorological conditions necessary for ignition, contingency actions that will be taken if smoke impacts begin to occur from the burn, and information on consideration and use of alternatives to burning.

**General Information and Requirements** regarding this SMP are provided on **page 3**. Terms used in this form have the same meaning as those defined in the APCD's Rules and Regulations definitions or the California Code of Regulations, Title 17, Section 80101. Where differences occur, the APCD's definitions apply. **Emission Factors** to assist with calculating burn particulate matter emissions are provided on **pages 7 and 8**. Contact the APCD if you have questions or need assistance with making these calculations.

Information may need to be extracted from the project burn plan (if available) to supplement the SMP. APCD review of the burn plan is for informational purposes only. When the burn plan is reviewed, the APCD assumes no approval authority or liability for approving the burn plan. The permittee is responsible for assuring firefighter and public safety, which is not the intent of the information included on this form.

**Project Description**  
**(Complete This Page for San Luis Obispo County APCD PRESCRIBED BURNS)\***

<b>1.1 Project Name:</b> _____	<b>Project Location: (Report at least one of the following location descriptions. Provide attachment as needed.)</b>
<b>1.2 Permittee Name:</b> _____	<b>1.8a Legal:</b> T _____ R _____ S _____ M&B _____
<b>1.3 Permittee Address:</b> Street: _____ City: _____ State: _____ Zip: _____	<b>1.8b Lat/Long:</b> Lat _____ (deg.) _____ (min) _____ (sec) Long _____ (deg.) _____ (min) _____ (sec)
<b>1.4 Permittee/Field Contact:</b> _____	<b>1.8c UTM: Zone:</b> _____ N _____ m, E _____ m
<b>1.5 24-hour Phone/Pager:</b> _____	<b>1.9 Project Elevation (msl feet):</b> Top: _____ Bottom: _____
<b>1.6 Project Location (Counties):</b> _____	<b>1.10 Land Owner Name:</b> _____
<b>1.7 Nearest Town:</b> _____	Street: _____ City: _____ State: _____ Zip: _____

- 1.11 Proposed Time of Year for Burn (Month/Year): \_\_\_\_\_ Proposed Date of Burn: \_\_\_\_\_ start \_\_\_\_\_ end
- 1.12a Is the Primary Purpose of the Burn for Fire Hazard Reduction? \_\_\_\_\_
- 1.12b Burn Type (Check one): \_\_\_\_\_ Forest Management: \_\_\_\_\_ Range Improvement \_\_\_\_\_ Wildland Vegetation Management  
\_\_\_\_\_ Natural Ignition (see General Information on page 3 for description of these burn types)
- 1.13 For Range Improvement Burns, Check Vegetation Management Objective: \_\_\_\_\_ Wildlife or Game Habitat Improvement  
\_\_\_\_\_ Livestock Habitat Improvement \_\_\_\_\_ Initial Establishment of an Agricultural Practice on Previously Uncultivated Land
- 1.14 Vegetation Type (Percentage): \_\_\_\_\_ Brush \_\_\_\_\_ Grass \_\_\_\_\_ Timber Litter \_\_\_\_\_ Timber Slash \_\_\_\_\_ Other (Describe): \_\_\_\_\_
- 1.15 Vegetation Condition: \_\_\_\_\_ Machine Pile Burn \_\_\_\_\_ Hand Pile Burn \_\_\_\_\_ Understory \_\_\_\_\_ Landing Pile Burn \_\_\_\_\_ Broadcast
- 1.16 Project Area: \_\_\_\_\_ (acres) 1.17 Number of Piles: \_\_\_\_\_ 1.18 Average Pile Size: \_\_\_\_\_
- 1.19 Total Project Fuel Loading: \_\_\_\_\_ (tons vegetation) 1.20 Particulate Matter Emissions: \_\_\_\_\_ (tons PM10)  
(Use Emissions Factors Tables on pages 7-8 for assistance with emissions calculation)
- 1.21 Emission Factor Table Used or EPA-Approved Calculation Method: \_\_\_\_\_
- 1.22 Preferred Ignition Hours for the Fire: \_\_\_\_\_
- 1.23 Expected Burn Duration (ignition to complete extinction): Total Time: \_\_\_\_\_ (hours or days)
- 1.24 Fuel Drying Time and Conditions prior to ignition: \_\_\_\_\_
- 1.25 Ignition Conditions to Minimize Smoke (complete as appropriate):  
No More Than \_\_\_\_\_ Piles At One Time, and No More Than \_\_\_\_\_ Piles Per Hour, or \_\_\_\_\_ Piles Per Day (pile burning)  
No More Than \_\_\_\_\_ Acres Per \_\_\_\_\_ Hour, and No More Than \_\_\_\_\_ Acres Per Day (non-pile burning)  
No Less Than \_\_\_\_\_ Hours Between Ignitions. Other: \_\_\_\_\_
- 1.26 Ignition Technique: \_\_\_\_\_
- 1.27 Expected Fire Intensity: \_\_\_\_\_ High \_\_\_\_\_ Low
- 1.28 It is the responsibility of the permittee to ensure that conditions of the SMP are met on the day of the burn. The permittee will obtain authorization to burn from the APCD contact listed below no more than 24 hours prior to ignition.\*\***

<b>1.29 APCD Name:</b> _____	<b>1.31 Contact:</b> _____
<b>1.30 Address:</b> _____	<b>1.32 24-hour Telephone:</b> _____
_____	<b>1.33 Fax:</b> _____
_____	<b>1.34 Email:</b> _____

The permittee will report public smoke complaints to the APCD per the procedures described in the General Information section of this SMP on page 3.

**Check as Applicable:**

- This burn could have an impact on smoke sensitive areas – I have filled out and attached all of Section A.
- This burn could have an impact on smoke sensitive areas and APCD policies require that information on meteorological conditions for ignition and contingency planning be provided – I have filled out and attached line items B.1 and B.2 of Section B.
- This burn is greater than 100 acres (or is estimated to produce greater than 10 tons of particulate matter) – I have filled out and attached all of Section B.

**Preparer's Statement: To the best of my knowledge the information submitted in this application is complete and accurate.**

SMP Preparation Date: \_\_\_\_\_  
Preparer's Name (print): \_\_\_\_\_ Title: \_\_\_\_\_  
Preparer's Phone: (\_\_\_\_) \_\_\_\_\_ - \_\_\_\_\_

Preparer's Signature: \_\_\_\_\_

Name of Authorized Representative in Control of the Property (if applicable): \_\_\_\_\_

Permittee or Authorized Representative Signature: \_\_\_\_\_  
Signature Date: \_\_\_\_\_

\* If your burn is less than 10 acres with less than one ton particulate matter emissions, and your burn will not impact any smoke sensitive areas, you may complete only this page. Attach appropriate SMP sections for all other burns.  
\*\* Burner/APCD burn authorization coordination to be determined by the APCD.

**FOR SAN LUIS OBISPO APCD USE ONLY**

\_\_\_ I have reviewed and approved this SMP as a conditional burn permit to be combined with agricultural burn/air pollution permit number \_\_\_\_\_, which expires on \_\_\_\_\_.

\_\_\_ This burn project is greater than 250 acres and/or is a multi-day burn which requires ARB consultation prior to final approval pursuant CCR 80160(g)).

Date ARB Notified: \_\_\_\_\_ Date ARB approval received: \_\_\_\_\_

Smoke from this fire is expected to travel into the following non-attainment or maintenance areas:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Phone/Fax: \_\_\_\_\_

Date: \_\_\_\_\_

## General Information and Requirements

### Description of Burn Types

Forest Management Burning is the use of open fires, as part of a forest management practice, to remove forest debris or for forest management practices which include timber operations, silvicultural practices, or forest protection practices.

Range Improvement Burning is the use of outdoor fires to:

- ◆ remove vegetation for wildlife or game habitat
- ◆ remove vegetation for livestock habitat
- ◆ remove vegetation for the initial establishment of an agricultural practice on previously uncultivated land

Wildland Vegetation Management Burning is the use of prescribed burning conducted by a public agency, or through a cooperative agreement with a private manager or contract involving a public agency, to burn land predominantly covered with chaparral (as defined in Title 14, California Code of Regulations, section 1561.1), trees, grass, or standing brush.

### Conditions of Vegetative Material to be Burned (CCR section 80160 (m – p))

Material should be:

- ◆ in a condition that will minimize the smoke emitted during combustion when feasible, considering fire safety and other factors
- ◆ piled where possible, unless good silvicultural practices or ecological goals dictate otherwise
- ◆ prepared so that it will burn with a minimum of smoke

### Determination of Smoke Sensitive Areas

Smoke sensitive areas are defined as "populated areas and other areas where an APCD determines that smoke and air pollutants can adversely affect public health or welfare." Such areas can include, but are not limited to, towns and villages, campgrounds, trails, populated recreational areas, hospitals, nursing homes, schools, roads, airports, public events, shopping centers, and Class I Areas (areas that are mandatory visibility protection areas designated pursuant to section 169A of the federal Clean Air Act. Your APCD can tell you if your burn is in a Class I Area. If a burn is near a populated area, has potential for substantial emissions, has a long duration, or has the potential for poor smoke dispersion, a smoke sensitive area could be impacted and Section A of the SMP should be completed. Burners may obtain APCD assistance in determining if Section A should be completed.

### Procedures for Permittees to Report Public Smoke Complaints to APCDs (CCR section 80160(l))

1. The permittee shall immediately report any air quality smoke complaints received about this burn project to the APCD with jurisdiction over the burn. A phone call to the APCD during normal seasonal business hours will suffice. During non-business hours a fax or voicemail message will suffice.
2. The complaint report shall include the following: the location of the smoke impact, a short description of the smoke behavior including wind direction and speed, visibility, and public safety impacts if available from the complainant.
3. The permittee shall inform the complainant that he or she may also contact the APCD directly and shall provide the APCD name, telephone number and address.
4. The permittee shall, in coordination with the APCD, seek resolution for all complaints, as necessary.

### Natural Ignition on a No-burn Day (CCR section 80160(h))

When a natural ignition occurs on a no-burn day, the initial "go/no-go" decision to manage the fire for resource benefit will be a "no-go" unless:

1. After consultation with your APCD, the APCD decides, for smoke management purposes, that the burn can be managed for resource benefit; or
2. For periods of less than 24 hours, a reasonable effort has been made to contact the APCD, or if the APCD is not available, the Air Resources Board (ARB); or
3. After 24 hours, the APCD has been contacted, or if the APCD is not available, the ARB has been contacted and concurs that the burn can be managed for resource benefit. A "no-go" decision does not necessarily mean that the fire must be extinguished, but that the fire cannot be considered as a prescribed fire.

### SMP Conditions Must Be Met on Day of Burn (CCR section 80160(j))

Ignition of this burn project will not occur unless all conditions and requirements stated in this SMP are met prior to ignition on the day of the burn event, the ARB and the APCD have both declared the day to be a burn day, and the APCD has authorized the burn on the day of the burn.\*

### Department of Fish and Game Certification (CCR 80160 (p))

Permit applicants are required to file with the APCD a statement from the Department of Fish and Game certifying that the burn is desirable and proper if the burn is to be done primarily for improvement of land for wildlife and game habitat. The Department of Fish and Game may specify the amount of brush treatment required, along with any other conditions it deems appropriate. APCD staff can provide further clarification on this requirement.

\* CCR 80120(e) provides that an APCD may, by special permit, authorize agricultural burning, including prescribed burning, on days designated by the ARB as no-burn days if the denial of such permit would threaten imminent and substantial economic loss.

**SECTION A: AS REQUIRED BY TITLE 17 AND APCD POLICIES, THIS SECTION APPLIES TO ALL BURNS WITH THE POTENTIAL TO IMPACT SMOKE SENSITIVE AREAS (SSAs) \***

- A.1. Describe locations of SSAs and distances from burn site (miles) – (Also the attached Map# \_\_\_\_\_ shows SSAs)  
\_\_\_\_\_
- A.2 The attached map# \_\_\_\_\_ provides smoke travel projections for: \_\_\_\_\_ Day \_\_\_\_\_ Night \_\_\_\_\_ Topographical
- A.3 Has prescribed burning historically occurred in this area? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know
- A.4 If yes, were there impacts to smoke sensitive areas? \_\_\_\_\_ Yes \_\_\_\_\_ No \_\_\_\_\_ Don't Know
- A.5 If yes, please describe impacts: \_\_\_\_\_
- A.6 For burns that will occur past daylight hours and/or for more than one day, please provide APCD contact information and a description of contact procedures that will be used to affirm that the burn project remains within the conditions specified in this SMP, and/or whether contingency actions are necessary. The permittee will follow any instructions by the APCD to communicate directly with ARB when necessary.  
APCD contact ( or designee ) \_\_\_\_\_
- A.7a Telephone: ( \_\_\_\_\_ ) \_\_\_\_\_ - \_\_\_\_\_ A.7b 24-hour Pager ( \_\_\_\_\_ ) \_\_\_\_\_ - \_\_\_\_\_
- A.7c Fax: ( \_\_\_\_\_ ) \_\_\_\_\_ - \_\_\_\_\_ A.7d E-mail: \_\_\_\_\_
- A.8 The permittee will use the frequency and method of contact described below:  
\_\_\_\_\_

The permittee will monitor the burn project for meteorological conditions and smoke behavior before, during, and after the burn using the following techniques and timing:

**A.9 Weather Observation (Wind Direction, Wind Speed, and Temperature):**

Method	Location	Beginning	Interval	Ending
_____ Belt Weather Kit	_____	_____	_____	_____
_____ RAWS	_____	_____	_____	_____
_____ Aircraft	_____	_____	_____	_____
_____ Other _____	_____	_____	_____	_____

(Additional Description of Monitoring Requirements): \_\_\_\_\_

**A.10 Smoke Behavior Observation:**

Method	Location	Beginning	Interval	Ending
_____ Visual**	_____	_____	_____	_____
_____ Test Fire	_____	_____	_____	_____
_____ Balloon	_____	_____	_____	_____
_____ Aircraft	_____	_____	_____	_____
_____ PM Monitoring Inst.	_____	_____	_____	_____
_____ Other _____	_____	_____	_____	_____

(Additional Description of Monitoring Requirements): \_\_\_\_\_

A.11a The permittee shall begin public notification before the day of burning. The notification shall be on going until end of burning. Check which of the following procedures will be used to notify and educate the public about this burn project.  
 Television  Radio  Newspaper  Posters/flyers  Telephone calls  Other (Explained below)

A.11b The specifics of the notification procedure(s) checked above are as follows:  
\_\_\_\_\_

A.12 The permittee will place appropriate signage at or near burn sites to identify the burn project to the public as noted on the attached map# \_\_\_\_\_.

Adjacent APCDs and neighboring state APCDs which may be potentially impacted by smoke travel or which have previously been impacted by smoke from similar burn projects are listed below.

- A.13 APCD Name: \_\_\_\_\_ A.14 Contact: \_\_\_\_\_
- A.15 Address: \_\_\_\_\_ A.16 24-hour Telephone: \_\_\_\_\_
- \_\_\_\_\_ A.17 Fax: \_\_\_\_\_
- A.18 APCD Name: \_\_\_\_\_ A.19 Contact: \_\_\_\_\_
- A.20 Address: \_\_\_\_\_ A.21 24-hour Telephone: \_\_\_\_\_
- \_\_\_\_\_ A.22 Fax: \_\_\_\_\_
- A.23 Neighboring State APCD Name: \_\_\_\_\_
- A.24 Contact: \_\_\_\_\_
- A.25 Address: \_\_\_\_\_ A.26 24-hour Telephone: \_\_\_\_\_
- \_\_\_\_\_ A.27 Fax: \_\_\_\_\_

\* See General Information on page 3 for determining if your burn has the potential to impact a smoke sensitive area.  
 \*\* Visual smoke observation refers to observations made through the eyes of designated individuals.

**SECTION B: AS REQUIRED BY TITLE 17 AND APCD POLICIES, THIS SECTION APPLIES TO ALL BURN PROJECTS GREATER THAN 100 ACRES OR PRODUCING MORE THAN 10 TONS OF PARTICULATE MATTER**

B.1. Meteorological Conditions for Ignition

Surface Wind Direction: Ideal: \_\_\_\_\_ Acceptable Range: \_\_\_\_\_ (degrees)  
Surface Wind Speed: Ideal: \_\_\_\_\_ Maximum: \_\_\_\_\_ Minimum: \_\_\_\_\_ (%)  
Transport Wind Direction: Ideal: \_\_\_\_\_ Acceptable Range: \_\_\_\_\_ (degrees)  
Relative Humidity: Ideal: \_\_\_\_\_ Maximum: \_\_\_\_\_ Minimum: \_\_\_\_\_ (%)  
Target Mixing Height Parameters: \_\_\_\_\_ Acceptable Temperature Range: \_\_\_\_\_ (degrees)  
Other Considerations to Assure Acceptable Smoke Dispersion: \_\_\_\_\_  
\_\_\_\_\_

B.2a Describe contingency actions/methods/procedures permittee will take in the event that serious smoke impacts begin to occur or meteorological conditions deviate from those specified in this SMP (for example: stop ignitions, initiate mop-up, conduct fire suppression – describe in detail):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B.2b Describe any applicable interior unit contingency cutoff lines (refer to map# \_\_\_ as appropriate): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B.3 An evaluation of alternatives to burning is described below:

\_\_\_\_\_ It is a part of the environmental documentation required for the burn project pursuant to the National Environmental Policy Act or the California Environmental Quality Act and is either attached to this SMP, is on file with the APCD, or is provided for as agreed to by the APCD. Document location: \_\_\_\_\_

\_\_\_\_\_ Neither a National Environmental Policy Act or the California Environmental Quality Act assessment of alternatives has been performed. Alternatives to reduce fuel load are described in section B.4 – B.9 below.

B.4 Alternatives Used:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B.5 Tons of Vegetative Material Treated Using Each Alternative:

\_\_\_\_\_  
\_\_\_\_\_

B.6 Particulate Reduction for Each Alternative (tons):

\_\_\_\_\_  
\_\_\_\_\_

B.7 Total Particulate Reductions from Alternatives: \_\_\_\_\_

B.8 The following alternatives to burning were considered, but not carried out:

\_\_\_\_\_  
\_\_\_\_\_

B.9 Reasons for Rejection:

\_\_\_\_\_  
\_\_\_\_\_

B.10 If this project is greater than 250 acres or smoke impacts occur, the permittee will provide a completed Post Burn Evaluation Form (see page 6) to the APCD within 30 days of project completion.

B.11 For burns greater than 250 acres, Sections A.9 and A.10 describe the site monitoring requirements.

**Post-Burn Evaluation  
For Burns Greater Than 250 Acres  
or Burns For Which Smoke Impacts Occurred\***

**Section A. General Information:**

Date of Burn: \_\_\_\_\_ Burn Location: \_\_\_\_\_  
Number of Acres Burned: \_\_\_\_\_ Estimated Actual PM Emissions: \_\_\_\_\_ (tons)  
Burner Name: \_\_\_\_\_  
Burner Address: \_\_\_\_\_  
Burner Phone Number: \_\_\_\_\_  
Burner Email: \_\_\_\_\_

1. Did the burn remain within the conditions specified in the Smoke Management Plan? \_\_\_\_\_
2. Are there any adverse smoke impacts? \_\_\_\_\_ If so, proceed to Section B below.
3. Lessons learned (Optional) (Provide attachment if desired):

\_\_\_\_\_  
\_\_\_\_\_

**Section B. For Burns That Had Smoke Impacts, Complete The Following:**

1. What APCDs were Notified (who, when, and at what phone number(s))?  
\_\_\_\_\_  
\_\_\_\_\_
2. Describe adverse smoke impacts below (add attachment if needed):  
\_\_\_\_\_  
\_\_\_\_\_
3. Were there any complaints from the public? \_\_\_\_\_ If so, how many and from whom:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
4. Lessons learned (add attachment if needed):  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. Attach all smoke observation and weather data collected before, during, and after the burn. See collection methods checked in sections A.9 and A.10 of the burn plan for relevant data.

\* As required by title 17 and APCD policies.

**Table 1  
PM-10 EMISSIONS CALCULATIONS FOR PILES**

1. Choose the pile size most representative of the piles on your burn site.
2. Multiply the number of piles in your project with the corresponding "Tons of PM10/Pile" value to get the total PM-10 tonnage.

PM10 EMISSIONS FOR SPECIFIED PILE SIZES	
PILE SIZE (in feet)	TONS OF PM10/PILE
4' diameter x 3' height	0.0005
5' diameter x 4' height	0.001
6' diameter x 5' height	0.002
8' diameter x 6' height	0.004
10' diameter x 6' height	0.007
12' diameter x 8' height	0.01
15' diameter x 8' height	0.02
20' diameter x 10' height	0.04
25' diameter x 10' height	0.07

Pile Tonnage calculated using paraboloid volume formula multiplied by 30 lbs/cu.ft. multiplied by 0.2 packing ratio  
U.S. Forest Service's Conformity Handbook, Table 6 -- PM10 Emissions Factor of 19.0 pounds/ton of fuel burned - average pile and burn slash  
**Revised 2/13/2001**

- a. Formula used for Paraboloid Volume (cu.ft.) =  $3.1416 \times [\text{height} \times (\text{diameter})^2] / 8$  (see Reference b. below).
- b. USDA (2/1996). Forest Service General Technical Report. Report Number: PNW-GTR-364.

**Table 2  
PM 10 EMISSION CALCULATION FOR PRESCRIBED BURNING OF VARIOUS FUEL TYPES<sup>1,2</sup>**

Section 80160 (b) of Subchapter 2 Smoke Management Guidelines for Agricultural and Prescribe Burning, Title 17, California Administrative Code states, "requires the submittal of smoke management plans for all burn projects greater than 10 acres in size or estimated to produce more than 1 ton of particulate matter". To determine what the particulate matter (PM 10) amount is of your burn project please use the equation below and review the following examples. **Information needed for PM 10 Calculations:**

- a. VT = Vegetation type
- b. ACRES VT = Estimated number of acres for VT
- c. FL est. = Estimated fuel loading in VT TONS per ACRE
- d. EV = PM10 emission/ton of fuel

Calculating PM10 Emissions from Prescribed Burning of multiple vegetation types:

$$\begin{aligned} \text{PM10 ton(s) emissions per VT} &= (\text{number of acres VT}) (\text{FL tons per acre}) (\text{Emission Value (EV)}) = \underline{\hspace{2cm}} \text{ ton(s)/VT} \\ \text{PM10 ton(s) emissions per VT} &= (\text{number of acres VT}) (\text{FL tons per acre}) (\text{Emission Value (EV)}) = \underline{\hspace{2cm}} \text{ ton(s)/VT} \\ \text{Sum Total is the Estimated PM 10 for the project} &= \underline{\hspace{2cm}} \text{ ton(s)/project} \end{aligned}$$

VEGETATION TYPE(S)	ACRES (VT) x	FL est.	x EV <sup>1</sup>	PM10 EMISSIONS (ton(s))
Basing Sage/Low Sage	( ) x	( ) x	(0.010) =	_____
Ceanothus	( ) x	( ) x	(0.010) =	_____
Chamise	( ) x	( ) x	(0.009) =	_____
Giant Sequoia	( ) x	( ) x	(0.007) =	_____
Grass/Forb	( ) x	( ) x	(0.007) =	_____
Hackberry Oak	( ) x	( ) x	(0.005) =	_____
Hardwood (Stocked)	( ) x	( ) x	(0.003) =	_____
Hardwood (Non-stocked)	( ) x	( ) x	(0.003) =	_____
Jeffrey Pine/Knobcone	( ) x	( ) x	(0.007) =	_____
Live Oak (Canyon)	( ) x	( ) x	(0.007) =	_____
Live Oak (Interior)	( ) x	( ) x	(0.007) =	_____
Lodgepole Pine	( ) x	( ) x	(0.007) =	_____
Manzanita (Productive Brush)	( ) x	( ) x	(0.009) =	_____
Mixed Chaparral/Montane	( ) x	( ) x	(0.008) =	_____
Mixed Conifer	( ) x	( ) x	(0.006) =	_____
Oak (Black)	( ) x	( ) x	(0.005) =	_____
Oak (Blue)	( ) x	( ) x	(0.003) =	_____
Oak (White)	( ) x	( ) x	(0.003) =	_____
Pinyon Pine	( ) x	( ) x	(0.007) =	_____
Ponderosa Pine, Gray Pine	( ) x	( ) x	(0.007) =	_____
Red Fir	( ) x	( ) x	(0.007) =	_____
Wet Meadow	( ) x	( ) x	(0.004) =	_____
Willow	( ) x	( ) x	(0.007) =	_____
<b>Sum Total of the Estimated PM10 for the project in <u>tons/project</u></b>				<b>= _____</b>

1. See Table 3 on next page for values used to calculate Emission Values.
2. For vegetation types not listed, contact APCD for assistance with determining appropriate emission factors.



**Table 3**  
**EMISSION VALUES (EV) FOR PRESCRIBED BURNS OF VARIOUS VEGETATION TYPES\***

Estimated PM10 emission values for various vegetation types = (% combustion) x (PM10 emission lbs/ton) x (1 ton/2000 lbs)\*

VEGETATION	%Combustion	PM Emissions (lbs/ton fuel)	Conversion Factor	PM10 EMISSION VALUE (PM10 lbs emissions/ton fuel)
Basing Sage/Low Sage	= (1.0) x	(20.17 lbs/ton)	x (1 ton/2000 lbs)	= 0.010
Ceanothus	= (1.0) x	(20.17 lbs/ton)	x (1 ton/2000 lbs)	= 0.010
Chamise	= (0.9) x	(20.17 lbs/ton)	x (1 ton/2000 lbs)	= 0.009
Giant Sequoia	= (0.6) x	(25 lbs/ton)	x (1 ton/2000 lbs)	= 0.007
Grass/Forb	= (1.0) x	(15 lbs/ton)	x (1 ton/2000 lbs)	= 0.007
Hackberry Oak	= (0.4) x	(25 lbs/ton)	x (1 ton/2000 lbs)	= 0.005
Hardwood (Stocked)	= (0.4) x	(15 lbs/ton)	x (1 ton/2000 lbs)	= 0.003
Hardwood (Non-stocked)	= (0.4) x	(15 lbs/ton)	x (1 ton/2000 lbs)	= 0.003
Jeffrey Pine/Knobcone	= (0.6) x	(25 lbs/ton)	x (1 ton/2000 lbs)	= 0.007
Live Oak (Canyon)	= (0.6) x	(25 lbs/ton)	x (1 ton/2000 lbs)	= 0.007
Live Oak (Interior)	= (0.6) x	(25 lbs/ton)	x (1 ton/2000 lbs)	= 0.007
Lodgepole Pine	= (0.6) x	(25 lbs/ton)	x (1 ton/2000 lbs)	= 0.007
Manzanita (Productive Brush) =	= (0.9) x	(20.17 lbs/ton)	x (1 ton/2000 lbs)	= 0.009
Mixed Chaparral/Montane	= (0.8) x	(20.17 lbs/ton)	x (1 ton/2000 lbs)	= 0.008
Mixed Conifer	= (0.6) x	(20.5 lbs/ton)	x (1 ton/2000 lbs)	= 0.006
Oak (Black)	= (0.4) x	(25 lbs/ton)	x (1 ton/2000 lbs)	= 0.005
Oak (Blue)	= (0.4) x	(15 lbs/ton)	x (1 ton/2000 lbs)	= 0.003
Oak (White)	= (0.4) x	(15 lbs/ton)	x (1 ton/2000 lbs)	= 0.003
Pinyon Pine	= (0.6) x	(22 lbs/ton)	x (1 ton/2000 lbs)	= 0.007
Ponderosa Pine, Gray Pine	= (0.6) x	(25 lbs/ton)	x (1 ton/2000 lbs)	= 0.007
Red Fir	= (0.6) x	(23.1 lbs/ton)	x (1 ton/2000 lbs)	= 0.007
Wet Meadow	= (0.6) x	(15 lbs/ton)	x (1 ton/2000 lbs)	= 0.004
Willow	= (0.6) x	(25 lbs/ton)	x (1 ton/2000 lbs)	= 0.007

\* Percent combustion and PM10 emission factors for various fuel types derived from Table 8, Section 6, "Air Quality Conformity Handbook" from the USDA-Forest Service Air Resources / Fire Management Pacific Southwest Region dated November 1995.

\*\* These are the vegetation's estimated emissions values(EV) from the vegetation type as determined above to be use when the burn operator provides the vegetation's fuel loading estimate per acre.

\*\*\* For additional information on emissions factors, see EPA document AP-42: "Compilation of Air Pollutant Emission Factors. Volume 1: Stationary Point and Area Sources," Fifth Edition, AP-42, January 1995, U.S. EPA. Table 2.5-5.

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