CA-219: Wildland Firefighting – Firing Operations

Burn Plan
May 2019

California Department of Forestry and Fire Protection
Office of the State Fire Marshal
State Fire Training

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Section 1: Burn Plan Approval

Notify the Duty Officer the Day of the Burn

Agency with Wildland Jurisdiction:

_____
Name

I, the undersigned, have reviewed and approved the following burn plan for this course.

Agency Authorizing Official:

Name	Signature	Date

CA-219 Instructor:

Name	Signature	Date

Section 2: Burn Information

Burn Location(s): _____

Address – Lat/Long – Section/Range/Township

_____

Address – Lat/Long – Section/Range/Township

Burn Date(s): _____

Alternate Date(s): _____

Wildland Donated by: _____

	Name	***Phone***	***Email Address***
Local Air Resource Board Contact:			
Participating Agency(s):			
AHJ Training Coordinator:			
AHJ Facility Coordinator:			
AHJ Live Burn Site Coordinator			
Live Fire IC:			
Live Fire Safety Officer:			
Live Fire Plans:			
Live Fire Logistics:			
CA-219 Instructor:			

	Name	***Phone***	***Email Address***
CA – 219 Assistant Instructors*			
CA – 219 Instructor Trainees (Optional)			

**- (Squad Instructors) 1 per squad (minimum)*

Section 3: Documentation of Action Items

3.1: Notifications

I	Notifications	Date Completed	Initials
1.	Political Jurisdiction		
2.	Air Quality Management District		
3.	Press		
4.	Police Department		
5.	California Highway Patrol		
6.	County Sheriff		
7.	Water District/Company		
8.	Adjacent Property Owners		
9.	E.C.C. (obtain Incident #)		
10.			
11.			

3.2: Documents

II	Documents	Date Completed	Initials
1.	Map of burn site Location		
2.	Press release		
3.	FSTEP course request		
4.	Instructions to property owner		
5.	Landowners agreement		
6.	Title search		
7.	Burn permit		
8.	CEQA exemption (if required)		
9.	Prescribed fire burn plan (if required)		
10.			
11.			

3.3: Preplan and Maps

III	Preplan and Maps	Date Completed	Initials
1.	Meet with IC to develop Holding Force Plan and IAP		
2.	IAP (202, 203, 204, 205, 206, NWS spot forecast)		
3.	Site topo map with ICP, burn units, exposures, water supply, fuel breaks, and staging areas		
4.	IAP topo taps (8.5x11 or 11x17)		
5.	Contingency plan map (if applicable)		
6.	Transportation map to site Send to students and resources if needed		
7.	Heat stress rehab plan		
8.	Go/No-Go completed with BEHAVE PLUS – Fire behavior and flame length prediction tables based on site fuel model and slope		
9.	Logistics plan		
10.	Live fire firing training sequence and firing plan		
11.	Meet with IC, SO and Holding DIVS and/or TFL prior to burn to review burn day objectives and procedures		
12.			
13.			

3.4: Live Fire Logistics Ordered / On Hand

IV	Live Fire Logistics Ordered / On Hand	Date Completed	Initials
1.	Two sources of water supply		
2.	Apparatus request (minimum): 1 engine per squad, 1 reserve engine		
3.	EMS request: Designated staffed aid station, EMS engine or ambulance		
4.	Radios request		
5.	Frequencies request		
6.	Drip torches: 3 per squad (minimum)		
7.	Back fire fusee 10 minute: 2 per student (minimum)		

IV	Live Fire Logistics Ordered / On Hand	Date Completed	Initials
8.	Flare launcher: 1 (minimum)		
9.	Flare launcher flares: 1 per squad (minimum)		
10.	Back pumps: 2 per squad (minimum)		
11.	McLeod tool: 2 per squad (minimum)		
12.	Shovel (forest fire, not round point): 1 per squad (minimum)		
13.	Combi-tool: 1 per squad (minimum)		
14.	Pulaski: 1 per squad (minimum)		
15.	Rehab station and ICP shade canopies (also consider seating)		
16.	Rehab station and ICP ice chests with ice and water		
17.	Rehab station and ICP drinking water: 1 gallon per student each day (minimum)		
18.	Rehab station electrolyte supplement: 1 per student (minimum)		
19.	Spot forecast request ordered for each burn day		
20.	ICS positions listed on IAP ordered as required		
21.			
22.			
23.			

3.5: Live Fire Training Area

V	Live Fire Training Area	Date Completed	Initials
1.	Secure utilities from fire exposure and student contact		
2.	Remove or secure all debris from fire exposure		
3.	Contingency breaks, as needed, to protect exposures		
4.	Contingency breaks to contain fire to approved area		
5.	Construct interior squad burn unit breaks		
6.	Set up Rehab Stations		
7.	Mark and note on maps hazards that are not removed		
8.	Ensure all designated roads are open and safe for participants; post as needed		

V	Live Fire Training Area	Date Completed	Initials
9.	Post signs notifying public of burn		
10.	Public access restricted		
11.	Security/locks (combo or key) or patrols		
12.			
13.			

3.6: Burn Day Organization

VI	Burn Day Organization	Date Completed	Initial
1.	Assign a CA-219 Assistant Instructor to each squad (referred to as Squad Instructor)		
2.	Meet with Squad Instructors prior before the burn to review burn day procedures		
3.	Confirm squad assignments		
4.	Assign FOBS/FEMO as needed to monitor weather, fire behavior, to serve as Lookout and map burned acres		
5.			
6.			

Section 4: Burn Day Instructor Checklist

4.1: General Activities to be Completed

I	General Activities to be Completed	Assigned To	Date Completed
1.	Have AQMD burn authorization number		
2.	Notify Duty Chief		
3.	Review spot forecast		
4.	Complete fire behavior forecast		
5.	Confirm instructor to student ratio (maximum 1:6)		
6.			
7.			

4.2: Preparation

II	Preparation	Assigned To	Date Completed
1.	Establish ICP and briefing area		
2.	Establish ICS check-in		
3.	EMS treatment area established		
4.	Rehab area established		
5.	Two water sources at scene		
6.	Preburn onsite belt weather kit observation		
7.	Look Out/Weather Monitor assigned to take weather and to transmit, DB, RH, W, FDFM, and PI hourly		
8.	Inspect full breaks		
9.	All personnel meet PPE requirements		
10.	All students have authorized task book		
11.			
12.			

4.3: Brief Instructor/Firing Coach

III	Brief Instructor/Firing Coach	Assigned To	Date Completed
1.	Squad assignments		
2.	Evolution schedule and locations		
3.	Evacuation signal		
4.	Live fire firing training sequence and firing plan		
5.	Assign squads to burn areas		
6.	Schedule		
7.	Site specific instructions and safety concerns		
8.	Contingency plan for spots and/or slopovers		
9.			
10.			

4.4: Incident Command

IV	Incident Command	Assigned To	Date Completed
1.	Post IAP map		
2.	Post objectives		
3.	Conduct ICS standard IAP briefing with all on scene		
4.	Review course objectives and procedure with all on scene		
5.	Ensure holding forces are familiar with the area before beginning burns		
6.			
7.			

4.5: Burn Initiation

V	Burn Initiation	Assigned To	Date Completed
1.	Ensure all resources are correctly positioned		
2.	Complete Go/No-Go checklist		
3.	Conduct test burn		
4.	Test communications between all resources and squads		
5.	Initiate training exercise		
6.			
7.			

Post Incident

VI	Post Incident	Assigned To	Date Completed
1.	Ensure mop up standards are met		
2.	Contact Agency Dispatcher and advise that burning complete		
3.	All students have been evaluated course task books completed as appropriate		
4.	Debrief with all		
5.	Critique training evolutions with instructors		
6.	Contact owner and advise of post burn information		
7.	Arrange patrol as needed		
8.			
9.			

Section 5: Go/No-Go

Go/No-Go Checklist Example

Location: _____

Date: _____

Time: _____

CA-219 Registered Instructor: _____

Incident Commander: _____

No fires to be ignited until the following items are satisfactory:

1. IAP approved by wildland jurisdiction ____
2. Spot forecast reviewed ____
3. Fire behavior prediction/observations within parameters ____
   a. Fire behavior parameters checked hourly
4. All required holding forces on scene ____
5. All students and holding forces briefed on objectives and IAP ____
6. All students and holding forces briefed on contingency procedures ____
7. Lookouts posted and assigned to monitor weather and burns ____
8. Assign squad firing instructors' areas and holding forces ____
9. Confirm all site safety issues identified ____
10. Communications tested between all units and squads ____
11. Water supply confirmed ____
12. Site security confirmed ____
13. Dispatcher notified ____
14. All squads and holding resources confirm they are in position ____

Fire Behavior Go/No-Go Parameters

The Go/No-Go fire behavior parameters shall be made from the spot forecast for planning purpose. The final decision for Go/No-Go shall be based on site observations and the agreed to maximum flame length with the IC and/or Agency Administrator that would create a safety or escape concern.

Lookouts and/or the CA-219 Registered Instructor will perform belt weather kit observations before burning, then hourly or sooner if a noticeable adverse change in the weather occurs. If flame lengths or any other fire behavior parameters are exceeded, no further ignitions will take place without IC approval or until the weather becomes favorable and no longer exceeds parameters. IC should consider wind direction, PIG, and escape potential.

For example, flame lengths may be exceeding parameters but the IC might allow the firing to continue because the firing squads can stay up wind of the flames, fire brands are not an issue, and good black has been established around the block making escape unlikely.

Weather observers will monitor, calculate, record, and transmit hourly: dry bulb, RH, eye-level wind and wind direction, FDFM%, and PIG%. The eye-level wind will be used for midflame wind speeds along with FDFM% on the Go/No-Go **Behave Plus** graph for predicting flame length.

Fire Behavior Parameter Go/No-Go Graph

Go/No-Go is based on predicted flame lengths that would be considered unsafe and/or unlikely for the holding crews to maintain control of the burn or would be unsafe for the firing squads. In fuel model 1 and 2, with no over-story, engines can generally attack flame lengths up to 10 feet. Areas that would require direct attack by hand tools alone would require a No-Go at flame lengths of 4 feet.

The NWCG fire suppression interpretations from flame length limit direct attack by hand tools alone to 4-foot flame lengths; engines and dozers limited to no greater than 11 feet.

Behave Plus runs can produce fire behavior charts for variables in wind and fuel moisture based on representative fuel model and slope. Wind and fuel moisture are the variable that change fire behavior on a given site.

The attached example is from the Vacaville CA-219 Test Course. This is the Go/No-Go fire behavior example chart for the Vacaville live fire exercise. The chart is based on FM 1 and an average of 15% slope.

Vacaville S-219 Firing Operations Go/No-Go Fire Behavior Parameters

For the CA-219 live fire exercise site at Cullen Hill on Allison Drive in Vacaville, California (Lat. N38 d 22.1886 min X Long 121 d 58.3213 min).

- FM 1
- Average slope 15%
- Belt weather kit observations to be made, recorded, and transmitted before burning, hourly and if a noticeable change in weather occurs. The CA-219 Registered Instructor will acknowledge the transmission.
- Weather observations will be DB, RH, eye-level wind, FDFM%, and PIG%. The eye-level wind will be used for midflame wind with the FDFM% to estimate expected flame length from the Behave Plus graph output chart below.

Note: Replace this chart based on your actual burn site slope and fuel model if different

Vacaville
Flame Length (ft)
Midflame Wind Speed (upslope) mi/h

1-h Moisture %	mi/h					
1%	2	4	6	8	10	12
2%	3.1	5.2	7.4	9.6	11.8	12.7
3%	2.8	4.6	6.5	8.5	10.0	10.0
4%	2.5	4.2	6.0	7.8	8.6	8.6
5%	2.4	4.0	5.7	7.4	7.9	7.9
6%	2.3	3.9	5.5	7.1	7.5	7.5
7%	2.2	3.7	5.3	6.9	7.0	7.0
8%	2.1	3.5	5.0	6.3	6.3	6.3
9%	1.9	3.1	4.4	5.0	5.0	5.0
10%	1.5	2.5	3.2	3.2	3.2	3.2
11%	0.9	1.2	1.2	1.2	1.2	1.2
12%	0.0	0.0	0.0	0.0	0.0	0.0

- Black line burning of the northern perimeter will be done first.
- A Go for the northern perimeter black line burn is a FL of 6-10 feet.
- No-Go for northern drill perimeter black line burn will be a S, SE, or E wind with an expected FL over 4 feet.
- No-Go for all other burns is FL greater than 10 feet, unless approved by the IC.Section 6: Example Documents

CA-219 Press Release Example

Firefighter Training Burn Press Release and Public Notice

(Date of release)

(Name and organization of releasing official)

The *(fire organization with jurisdiction)* in cooperation with *(list cooperating organizations)* will be conducting a prescribed burn on *(date)* at *(location)*. Smoke will be visible from *(date and time)* to *(date and time).*

This burn is being conducted to provide training essential for public and firefighter safety and to *(insert ecological benefits of the burn, i.e. hazardous fuels reduction, defensible space, invasive species control, range improvement etc.)*.

The public is urged to avoid the areas of *(locations)* for public and firefighter safety*. (List date and times of any roads or areas that may be restricted.)*

For questions please contact *(name, organization, email, telephone).*

CA-219 Burn Site Property Owner's Agreement Example

Live Fire Burn Site Agreement with
(Fire Organization) (address) and Property Owner(s).

I *(We)*, (*names of property owner(s))*, being the owner of the real property whose APN Number is *(number)* located at *(address)*, do hereby grant permission to the *(fire organization)* to set fire and burn *(number)* acres of vegetation and *(list any improvements that may be authorized to burn)* with the exception of *(list any vegetation that should not be burned i.e. oak trees)* located at the address above and described herein for the purposes of live fire training and *(list prescribed burn goals)* during the period of *(date-date)*. I *(We)* certify that there is no insurance coverage on the described vegetation and *(list any improvements that may be authorized to burn)* and do hereby release all claims connected with or may occur out of the setting fire to the described property. I *(We)* certify that no hazardous materials are within the burn site described. The fire organization, however, should be aware that the following items, on or near the property, may be hazards to the firefighters:

(List any hazards, i.e. powerlines, open wells, ditches, etc.)

The *(Fire Organization)* agrees the above listed property will be released to the above owner(s) at the completion of the live fire training and extinguishment of all fires. The *(Fire Organization)* will notify the land owner when the burn is completed and all firefighters have been cleared from the scene. After the burn, the property owner(s) should *(list all property owner instructions and contact information for any additional mop up needs)*.

Property Description: _____

_____

_____

Agreed to on this date: _____

Property Owner (signature): _____

Fire Representative (signature): _____