PRESCRIBED BURN PROFICIENCY WORKBOOK

(Circle One Position)

1) CERTIFIED PILE BURN MANAGER

2) CERTIFIED BROADCAST BURN MANAGER

Workbook Opened For:

Name: _____

Phone/Email: _____

Home Address: _____

List Any Previous Prescribed Burn Experience:

_____

_____

_____

Workbook Opened By:

Name: _____

Phone Number/Email: _____

Date Opened: _____

The material contained in this workbook defines the proficiency expectation of the prescribed burn manager positions for pile or broadcast burn certification. This workbook is approved for use as a position proficiency document in accordance with the instructions contained herein.

Verification/Certification of Completed Work

for (Select one for verification)**:**

1) CERTIFIED PILE BURN MANAGER

2) CERTIFIED BROADCAST BURN MANAGER

Final Evaluator's Verification

*To be completed **ONLY** when recommending the applicant for certification.*

I verify that (applicant name)____has successfully demonstrated all tasks for the position selected above and should be considered for certification in this position. All tasks are documented with appropriate initials.

Final Evaluator's Signature: _____

Final Evaluator's Printed Name: _____

Phone Number: _____

Date: _____

PROFICIENCY WORKBOOKS

This proficiency workbook has been developed by the State of New Mexico, Energy, Minerals and Natural Resources Department, Forestry Division (Forestry Division) in accordance with 19.20.5 New Mexico Administrative Code (NMAC), Prescribed Burn Manager Certification Program. The prescribed burn manger certification program was adopted for private lands within New Mexico. Further, 19.20.5 NMAC describes two levels of certification for prescribed burn managers - Certified Pile Burn Manager and Certified Broadcast Burn Manager – of which the Certified Broadcast Burn Manager requires more training and experience to obtain.

The Pile Burn Manager applicant, upon successful completion of proficiency requirements, is intended to possess adequate knowledge, skills, and experience to safely, and in accordance with 19.20.5 NMAC, direct, conduct, and implement a prescribed pile burn.

The Broadcast Burn Manager applicant, upon the successful completion of proficiency requirements, is intended to possess adequate knowledge, skills, and experience to safely, and in accordance with 19.20.5 NMAC, direct, conduct, and implement a broadcast burn. This qualification involves a more robust and comprehensive set of knowledge and skills that require verification of capability through demonstration of complex firing operations, management, and associated techniques.

For individuals to initiate a proficiency workbook for pile burn manager certification, they must first successfully pass the Forestry Division nine element course (passing score of 70 percent or better).

For individuals to initiate a proficiency workbook for broadcast burn manager certification, they must first successfully pass the NWCG S-190 wildland fire behavior (eight hours) or a Forestry Division approved substitute course; NWCG S-290 intermediate fire behavior (32 hours) or a Forestry Division approved substitute course; and a burn plan writing course approved by the Forestry Division.

An individual may be evaluated multiple times to build proficiency in skills leading to a “final” evaluation. The applicant must have real-life proficiency demonstration documented in this proficiency workbook for each task listed under the specific burn manager position they are applying for, either pile burn or broadcast burn manager.

“Documented” is defined as having a qualified evaluator physically present to witness the applicant’s demonstration of the required actions, skills, decisions, and tasks to effectively gauge and verify the applicant’s abilities while they are performing the required proficiencies. Verification by the evaluator is considered “documented” when the evaluator signs their initials with a date, next to each required task for the position in which the applicant is applying. An evaluation record will be completed by all evaluators documenting the applicant’s progress after each evaluation opportunity or demonstration of skills. Evaluation of the applicant’s execution of proficiencies may occur during one or more evaluation opportunities and may involve more than one evaluator during any opportunity. Evaluators can then recommend that the applicant is ready to undergo the final evaluation to become fully qualified if they feel confident in the applicant’s skills, decision making, and successful performance of proficiencies.

Successful performance of all tasks will result in one “final” evaluation. There will only be one “final” evaluator and the applicant should only attempt a final evaluation if they have satisfactorily completed all tasks and a previous evaluator recommends the individual to undergo a final evaluation. The final evaluation will be conducted by the final evaluator and pending this person’s determination, the applicant will either be recommended to receive full certification or may need to complete additional tasks, before retrying a final evaluation.

For pile burn manager certification, the evaluator must be a pile burn manager certified pursuant to 19.20.5.9 NMAC; Forestry Division personnel; or an individual with at least NWCG prescribed burn boss Type 3 qualifications.

For broadcast burn manager certification, the evaluator must be a broadcast burn manager who is certified pursuant to 19.20.5 NMAC; Forestry Division personnel; or an individual with at least NWCG prescribed burn boss Type 2 qualifications.

RESPONSIBILITIES

1. The **Forestry Division** is responsible for:
   - Ensuring that the applicant meets the requirements under 19.20.5.9 or 10(A) NMAC.
   - Issuing applicable proficiency workbooks to individuals to document task performance.
   - Explaining to the applicant the purpose and processes of the workbook as well as the applicant's responsibilities.
   - Assisting with the coordination of evaluation opportunities.

2. The **Applicant** is responsible for:
   - Reviewing and understanding instructions in the proficiency workbook and associated requirements of 19.20.5 NMAC.
   - Identifying desired objectives/goals for individual proficiencies.
   - Providing background information to an evaluator regarding skills, experience, or other relevant information as applicable to training and performance.
   - Notifying the local Forestry Division district office when the workbook is completed and providing them a copy. Be sure to keep your original workbook for personal records.

3. The **Evaluator** is responsible for:
   - Being qualified and proficient in the position that is being evaluated as required by 19.20.5 NMAC.
   - Meeting with the applicant to review prior experience, current qualifications, and desired objectives/goals for the current training opportunity where an evaluation will be conducted.
   - Reviewing the required tasks with the applicant and describing what they entail.
   - Explaining to the applicant the evaluation process that will be used, and which proficiencies may be attained during a particular evaluation event.
   - Identifying tasks to be performed during the evaluation event.
   - Accurately evaluating and recording demonstrated performance of tasks. Satisfactory performance shall be documented by dating and initialing the completion of the task. Unsatisfactory performance shall be documented in the individual evaluation record attached to this workbook.
   - Completing the individual evaluation record found at the end of each workbook.
   - Signing the final evaluator's verification statement inside the front cover of the workbook when all tasks have been initialed and the applicant has demonstrated skills proficient to lead a pile or broadcast burn independently.

QUALIFICATIONS

All tasks under the pile burn manager proficiency are considered required proficiencies for the broadcast burn manager certification, which has additional proficiencies due to the elevated skills and decision making required for this position. An applicant cannot proceed with broadcast burn manager certification without completion of pile burn manager certification proficiencies.

Applicants must successfully complete all tasks. The Forestry Division recommends that applicants work multiple prescribed burns with an experienced certified prescribed burn manager. Be sure to document the fuel types and complexity of the burn the applicant is being evaluated on. Prescribed burn plans can be attached to this workbook as further demonstration of the documentation of performance.

Evaluation Task Instructions

PROFICIENCY EVENT CODING

Each task has a code associated with the type of event where the task may be completed. The codes are O = other/training, RX = prescribed fire. The codes are defined as:

O = Tasks shall be completed in any event (classroom, simulation, daily job, etc.).
RX = Tasks shall be performed on a PRESCRIBED BURN event, either pile or broadcast, managed by a Certified Prescribed Burn Boss/manager.

While tasks can be performed in any situation, they must be evaluated on the specific type of event for which they are coded. For example, tasks coded RX must be evaluated on a prescribed fire and so on. Performance of tasks other than on the specific type of event required is not valid for qualification *i.e.* if tasks are required under the "RX" event and task proficiencies were conducted under an "O" event, these task proficiencies are not valid under the "RX" event and you will not be validated for performing this proficiency.

The required tasks for each qualification are listed below and if bullets appear under any of the numbered task, these indicate the items or actions related to the task and are provided as examples that the applicant may need to consider while performing the task. The bullets are not all-inclusive. Evaluations shall only be conducted, and evaluator(s) shall initial ONLY the numbered tasks. DO NOT evaluate and initial each individual bullet.

INSTRUCTIONS FOR THE PROFICIENCY WORKBOOK EVALUATION RECORD FORM

Evaluation Record #
Each evaluator must complete an evaluation record for each evaluation opportunity. Each evaluation record should be numbered sequentially. Place this number at the top of the evaluation record page and also use it in the column labeled "Evaluation Record #" for each numbered task the applicant has satisfactorily performed.

Applicant Information
Print the applicant's name, event name, and the Forestry Division's district office address and phone number.

Evaluator Information
Print the evaluator's name, position on the event, and address and phone number.

Event Information
Event Name: Print the event name.
Duration: Enter the date(s) during which the applicant was evaluated.
Event Kind: Enter the kind of incident (O or RX).
Location: County, Forest, Ranch, Area, Unit where event occurred.
Prescribed Fire Type: Circle the prescribed fire being conducted (Pile Broadcast).

Fuel Model: Circle the Fuel Model letter that corresponds to the predominant fuel type in which the evaluation opportunity occurred. Refer to the Smoke Management Element for Fuel Model Descriptions.

G = Grass Group (includes FBPS Fuel Models 1 – 3):
1 = short grass (1 foot); 2 = timber with grass understory; 3 = tall grass (1½ - 2 feet)

B = Brush Group (includes FBPS Fuel Models 4 – 6):
4 = chaparral (6 feet); 5 = brush (2 feet); 6 = dormant brush/hardwood slash; 7 = southern rough

T = Timber Group (includes FBPS Fuel Models 8 – 10)
8 = closed timber litter; 9 = hardwood litter; 10 = timber (with litter understory)

S = Slash Group (includes FBPS Fuel Models 11 – 13)
11 = light logging slash; 12 = medium logging slash; 13 = heavy logging slash

Evaluator's Recommendation
For 1 – 4, initial only one line as appropriate; this will allow for comparison with your initials in the Qualifications Record.

Record additional remarks/recommendations on an Individual Performance Evaluation, or by attaching an additional sheet to the evaluation record.

Evaluator's Signature
Sign here to authenticate your recommendations.

Date
Document the date the evaluation record is being completed.

Evaluator's Relevant Qualification (or agency certification)
The evaluator must list their qualifications or certification relevant to the position they supervised.

Common Tasks for the **Pile Burn Manager** Certification

These tasks are not intended to be completed in any specific order, opportunities for evaluation for one or multiple tasks may be available for each individual event.

TASK	**CODE**	**EVAL. RECORD #**	**EVALUATOR: Initial & date upon completion of task**
1. Review and understand 19.20.5 NMAC in relation to prescribed burn certification and training implementation.	O		
2. Be able to adequately describe the differences between pile burning and broadcast burning, ignition techniques, hazards, and differences in considerations for personal safety.	O/RX		
3. Identify environmental factors or influences that may affect safe and effective pile burning. • Wind. • Humidity. • Aspect. • Fuel moisture of non-target fuels.	O/RX		
4. Identify fire behavior characteristics that may affect safe and effective pile burning. • Intense heat. • Excessive fire brands emanating from piles and landing on receptive fuels. • Flame whirling. • Creeping or smoldering fire beyond the radiant heat bubble of a pile.	O/RX		
5. Demonstrate your duties and responsibilities as a pile burn manager by explaining these and the importance of including consideration listed below but are not limited to: • burn plan familiarity; • safety; • communication; • contingency; • weather; • expectations; • smoke management; • burning techniques; and • hazards.	O/RX		
6. Ensure all who are participating in the burn are aware of your burn plan and implementation of burning actions including hazards and mitigations: • their individual duties or responsibilities; • safety considerations and identification of hazards; • values at risk; • communication methods and procedures; and • burn progression and timing.	RX		

TASK	CODE	EVAL. RECORD #	EVALUATOR: Initial & date upon completion of task
7. Identify areas of concern throughout the pile burn area and develop plans to address them. • Riparian/wetland areas. • Historical/cultural/special sites. • Wildlife areas. • Areas of high or excessive fuels.	O/RX		
8. Conduct a test fire and observe and interpret the results and implications for your pile burn.	RX		
9. Identify what issues could affect a prescribed burn and the GO NO GO decisions. • *Make the "Go/No-Go" decision based on current and expected fire behavior and weather.* • *Will objectives be met?* • *Is it safe to continue?* • *Do you have enough help if things get out of hand?*	RX		
10. Ensure adequate tools, water, and the right amount of individuals are present on the burn to accomplish the burn safely and completely. 10a. Ensure contingency tools and resources are adequate for anticipated and observed fire behavior. • Modify or cease burning if contingencies are not adequate.	RX RX		
11. Identify smoke issues to manage during your pile burn. • Have you conducted the appropriate smoke notifications? • Registered your burn with New Mexico Environment Department – Air Quality Bureau, if required?	O/RX		
12. Comply with any applicable burn permit requirements. Describe what a burn permit is, when it may be required, and where you apply for a permit. • Burn permit acquired from county or municipality if required? • Are you in compliance with your permit? • Are burn notifications complete? • Have you contacted the appropriate local fire departments (FDs), county FDs, Forestry Division district office, your neighbors?	O/RX		
13. Demonstrate your knowledge for safe and proficient use of firing devices associated with prescribed burning and proper fuel mixtures associated with any such devices. • Fuzees, flare guns, drop torches. • What are recommended fuel mix ratios? • Where can you find these and similar equipment? • What are safe storage requirements for these devices?	O/RX		

TASK	CODE	EVAL. RECORD #	EVALUATOR: Initial & date upon completion of task
14. What is the process for declaring a wildfire, who do you contact once you have declared a wildfire? • Local. • County. • State. • Federal.	O		
15. Describe the types of burning actions for a successful pile burn. • Igniting a pile down wind and on flat ground in an open area. • Choosing an ignition point on the pile that will burn the pile effectively. • What type of hand tools may be needed for your burn? • What type of burning device *i.e.*, match, flare, drip torch, etc. is best for the piles to be burned?	O/RX		
16. Identify all the proper Personal Protective Equipment (PPE) you and other people assisting with your burn should have before burning starts.	O/RX		
17. Define "Risk" in relation to your pile burn and how do you intend to mitigate that risk?	O/RX		
18. Identify other safety concerns and how you- are going to mitigate them. • Do you have back up/contingency resources if things get out of hand? • Is there adequate or easily accessible water available? • Where are your safe areas and escape routes and does everyone on the burn know where they are? • Do you have back up or secondary communication? • Is there anyone that should be notified in the event things get out of hand? Do you have their contact information readily available and does everyone on the burn have this information?	O/RX		
19. Determine the length of time that may be needed to complete your pile burn project. • Consider your start and end times for burning. • Length of time needed to burn down your piles, dependent on size of piles, size of fuels. Time of day when you intend to burn can affect how piles burn and the intensity of the fire.	O/RX		
20. Securing the burn perimeter and making sure your piles are out. • Is there an adequate break in fuels between your pile burn area and the surrounding landscape/forest, or are fuel moistures or snow on the ground sufficient to prevent fire spread?	O/RX		

TASK	CODE	EVAL. RECORD #	EVALUATOR: Initial & date upon completion of task
• After assessing environmental conditions, *i.e*. snow or rain, do you have adequate equipment, water, tools to put a fire that burns beyond the pile burn perimeter? • Did you check all your piles to make sure nothing was left smoldering or heat was still being emitted? • Patrol the piles burned until piles are out. Check to ensure that piles are not still smoldering or contain heat, make sure all piles are out – no heat is felt by the touch of your hand in and around the ash footprint of each pile you burned. • Adjust patrol and mop-up standards for forecasted weather after pile burn, *i.e*. upcoming dry or windy conditions.			
21. Span of control is the limit of your decision-making ability to effectively manage personnel and resources before it becomes overwhelming. The rule of thumb is a 1:5 ratio meaning for every one supervisor or manger the max. number of people/resources that individual can effectively manage is no greater than five (there is no hard and fast rule to this, this will depend on each individual and their experience, abilities, conditions on the ground that dictate an adequate span of control). Are you working within your span of control? • Are you working within your comfort level/capability/experience to supervise participants on your pile burn *i.e*., is your gut comfortable with it? • Is communication present and available among all your participants or resources? • Do all participants involved understand the scope of the work and what their roles and responsibilities are? Do you understand these? • Are emergency procedures in place and how will all participants be notified if an emergency occurs *i.e*., injury or accident while burning is still on-going, fire occurs outside your pile burn area, equipment breaks down, etc.	O/RX		

Broadcast Burn Manager Specific Tasks

These tasks are not intended to be completed in any specific order, opportunities for evaluation for one or multiple tasks may be available for each individual event.

TASK	CODE	EVAL. RECORD #	EVALUATOR: Initial & date upon completion of task
1. Is there an approved broadcast burn plan in place for your planned burn area and have you read and understood the plan?	O		
2. Weather and observations are consistent with the parameters of the burn plan.	O/RX		
3. Are lookouts, communication escape routes, and safety zones (LCES) in place and have all personnel been briefed on these?	RX		
4. The burn unit/area has been identified and personally viewed and scouted prior to implementation. • Review type, number, and placement of resources to meet incident objectives. • Review priorities, hazards, and fire sensitive areas. • Evaluate use of alternative ignition devices (*e.g.*, fusses, drip-torch). • Identify safety zone(s) and escape route(s).	RX		
5. Ensure contingencies are in place for your broadcast burn. • Are local officials informed? • Have local fire resources been notified?	RX		
6. Conduct ignition operations according to plan and standards (*e.g.*, RX Orders, and RX Watch Out Situations) Ensure actions are done in a safe manner in accordance with LCES, prescribed burn plan, and other applicable standards. • Communicate these at all times with all personnel involved in the burn, make sure they know and understand them. • Frequently check to ensure these are being followed and are known. 6a. Address any fatigue issues with personnel or any other actions that cause concern or potential safety hazards. • Ensure safety guidelines are followed. • Advise personnel on the burn of potential/impending safety hazards and appropriate mitigation actions.	RX		
7. Consistently evaluate/reevaluate fire behavior and personnel safety. • This is on-going and should never stop until all burning actions have been complete for the day.	RX		
8. Are all personnel, equipment, resources assigned a task, role, or responsibility. Have they completed these or in place and ready? • Mop-up and patrol. • Lighting sections of the fire. • Monitoring or evaluating the fire behavior, smoke, or lighting actions. • Part of contingency resource(s). • Putting in hand or wet line.	O/RX		

TASK	CODE	EVAL. RECORD #	EVALUATOR: Initial & date upon completion of task
• Are instructions clear and understood, allow feedback and clarification.			
9. Have you documented or provided a brief written report, as may be required by local fire department, county, Forestry Division, or other entities, as appropriate? • Resources and personnel involved on the burn. • Accidents, injuries, or none to report. • Effects of the burn. • Brief from After Action Review (AAR). • Go-No Go checklists. • Weather reports or observations. • Evaluations or workbook signatures. • Other pertinent information that may be important to pass on to others or for future burns.	RX		
10. Have burn plan objectives and your objectives for the burn been relayed to all personnel assisting, do they understand how to achieve these safely and within their assigned tasks? • Smoke issues and lighting patterns or progression, the expected fire behavior. • Protective measures and actions for cultural or special resources/areas of concern. • Roles of all personnel involved and their duties and responsibilities. • Monitoring and communication of changes. • Are trigger points established and understood. • Maps provided. • Safety and communication procedures. • Evacuation procedure, routes, locations. • Contingency plan known, resources known. • Necessary permits on hand.	O		
11. What is the process for declaring a wildfire, who do you contact once you have declared a wildfire? • Local. • County. • State. • Federal.	O		
12. View the burn area or units to verify actions are complying with prescribed burn plan and within acceptable hazard or risk analysis of the burn plan. • Verify the lighting and holding actions/alternatives are aligned with current burn activity. • Is the prescribed burn plan complexity analysis still good, given what you are seeing? • Are the safety parameters and resource protection measures still adequate? • Is LCES still adequate or need adjustments?	RX		
13. Do you have or have you requested a current weather forecast for the local area and compare that to on-site weather conditions. Are they still within the prescribed burn plan parameters?	RX		
14. Conduct the Go, No-Go decision checklist using the on-ground data. • Are the environmental conditions adequate to proceed with the burn and do they meet those as described in the burn plan?	RX		

TASK	CODE	EVAL. RECORD #	EVALUATOR: Initial & date upon completion of task
• If all are yes, proceed with test burn.			
15. Conduct a test burn as described in the burn plan. • Evaluate the fire behavior, smoke, and wind and if what you see will meet your objectives from the burn. • Be sure to take notes of your observations and test fire results. • Finish the Go, No Go checklist by signing.	RX		
16. As you proceed with the burn, be sure to observe fire effects and conditions when you light the fire, are they still consistent with burn plan parameters? • Document your observations in notes. • Compare what you see to the burn plan prescription, objectives, and your objectives. • Recommend and adjust changes to current actions and future burn plans as necessary.	RX		
17. Use the risk management process as described in the Incident Response Pocket Guide (IRPG) • Step 1: Situation Awareness. • Step 2: Hazard Assessment. • Step 3: Hazard Control. • Step 4: Decision Point. • Step 5: Evaluate.	O/RX		
18. Know and understand how to implement a contingency plan for medical or injury/life safety situations and demonstrate this. • Identify medical transport resources and provide this information at the initial brief. • Identify any EMTs or similar resources available during burning actions and provide this information at the brief. • Discuss a medical plan with the appropriate dispatch office, local fire department, county, or Forestry Division district office. • Have you considered an incident within an incident and how you will address this?	O		
19. Conduct an initial briefing for all resources and personnel prior to burn actions and follow up with an AAR at the end of burning actions for the day.	O/RX		
20. Terminate the prescribed burn according to the plan. • Mop-up and patrol until no lingering heat is found. • Check fire interior and perimeter 1, 3, 5 days after considered controlled to ensure it is out. • Once 100% sure fire has no heat within 2-chains of perimeter you may decide to declare the fire out and terminate the burn in accordance with the plan parameters.	RX		

Evaluation Record # _____

Applicant Information

Printed Name:

Circle One: Pile Burn or Broadcast Burn:

Home Address:

Phone Number/Email:

Evaluator Information

Printed Name:

Evaluator Position on Event:

Work Area:

Phone Number/Email:

Event Information

Event Name:

Duration:

Event Type: Wildfire, Prescribed Fire, Other (specify):

Location (include the county and work area):

Prescribed Fire Complexity Level (circle one): Low, Moderate, High FBPS Fuel Model Letter: G = Grass, B = Brush, T = Timber, S = Slash

Evaluator's Recommendation

(Initial only one line as appropriate)

_____ **1)** The tasks initialed and dated by me on the qualification record have been performed under my supervision in a satisfactory manner. The applicant has successfully performed all tasks in the workbook for the position. I have completed the final evaluator's verification section and recommend the applicant be considered for certification.

_____ **2)** The tasks initialed and dated by me on the qualification record have been performed under my supervision in a satisfactory manner. However, opportunities were not available for all tasks (or all uncompleted tasks) to be performed and evaluated on this evaluation opportunity. An additional evaluation opportunity is needed to complete the evaluation.

_____ **3)** The applicant did not complete certain tasks in the workbook in a satisfactory manner and additional training, guidance, or experience is recommended.

_____ **4)** The applicant is severely deficient in the performance of tasks in the workbook for the position and additional training, guidance, or experience is recommended prior to another evaluation opportunity.

Record additional remarks/recommendations on an Individual Performance Evaluation, or by attaching an additional sheet to the evaluation record.

Evaluator's Signature:_____ Date: _____

Evaluator's Relevant Qualification: _____

Note: Evaluation forms below may be duplicated as needed to document the evaluation of your proficiencies. <u>Multiple evaluations may be required by multiple evaluators before final certification.</u>

Evaluation Record # _____

Applicant Information

Printed Name:

Circle One: Pile Burn or Broadcast Burn:

Home Address:

Phone Number/Email:

Evaluator Information

Printed Name:

Evaluator Position on Event:

Work Area:

Phone Number/Email:

Event Information

Event Name:

Duration:

Event Type: Wildfire, Prescribed Fire, Other (specify):

Location (include county and work area):

Management Type (circle one):
Prescribed Fire Complexity Level (circle one): Low, Moderate, High FBPS

Fuel Model Letter: G = Grass, B = Brush, T = Timber, S = Slash

Evaluator's Recommendation
(Initial only one line as appropriate)

_____ **1)** The tasks initialed and dated by me on the qualification record have been performed under my supervision in a satisfactory manner. The applicant has successfully performed all tasks in the workbook for the position. I have completed the final evaluator's verification section and recommend the applicant be considered for certification.

_____ **2)** The tasks initialed and dated by me on the qualification record have been performed under my supervision in a satisfactory manner. However, opportunities were not available for all tasks (or all uncompleted tasks) to be performed and evaluated on this evaluation opportunity. An additional evaluation opportunity is needed to complete the evaluation.

_____ **3)** The applicant did not complete certain tasks in the workbook in a satisfactory manner and additional training, guidance, or experience is recommended.

_____ **4)** The applicant is severely deficient in the performance of tasks in the workbook for the position and additional training, guidance, or experience is recommended prior to another evaluation opportunity.

Record additional remarks/recommendations on an Individual Performance Evaluation, or by attaching an additional sheet to the evaluation record.

Evaluator's Signature:_____ Date: _____

Evaluator's Relevant Qualification: _____

Note: Evaluation forms below may be duplicated as needed to document the evaluation of your proficiencies. <u>Multiple evaluations may be required by multiple evaluators before final certification.</u>

References and Additional Information

The information presented below supplements the nine-element course and may not specifically align with the content of each of the elements. The information below is provided solely as reference material to enhance your personal knowledge to supplement that gained from the official nine-element course content.

Smoke Management

Smoke is managed by the State of New Mexico, Environment Department – Air Quality Bureau (NMED). Within the state, there are two set of rules in the New Mexico Administrative Code (NMAC) that pertain to smoke produced from burning vegetation:

Title 20 (Environmental Protection), Chapter 2 (Air Quality), Part 60 (Open Burning); and Title 20 (Environmental Protection), Chapter 2 (Air Quality), Part 65 (Smoke Management).

Open burning rules prohibit the burning of household waste but allow burning of agricultural and yard waste in certain circumstances. Smoke management rules apply to larger scale prescribed burning events (to include pile and broadcast burning) to manage forests and rangelands.

The open burning rule (20.2.60 NMAC), as it relates to smoke production from burning vegetation on private land, states the following:

1. Applies to broadcast burn areas less than 10-acres per day or pile burning that does not exceed 1000 cubic feet of pile volume per day. Any burn's smoke that is greater than said acreage or pile volume is subject to the smoke management rule (20.2.65 NMAC). Shall be conducted at least 300 feet from dwellings, workplaces, or places where people congregate.
2. Shall begin no earlier than one hour before sunrise and be extinguished no later than one hour before sunset.
3. Shall be attended to at all times.
4. Requires prior notification of local fire department or dispatch or firefighting authority.
5. If burn is greater than one acre per day or pile volume is greater than 100 cubic feet per day, then prior notification of location and date of burn to all households within ¼ mile of burn is required.
6. Allows for ignition devices to be utilized (such as a drip torch) with "no oil heavier than number two diesel" fuel to be used. The rule also states burners shall use as little auxiliary fuel as possible in the ignition process.
7. Burners shall consider alternatives to burning (such as mastication, lop and scatter, allowing for natural decomposition).
8. Burners shall allow fuels to dry out as much as possible. [Dry fuels produce less smoke when burned.]

The smoke management rule (20.2.65 NMAC), as it relates to smoke production from burning vegetation on private land, picks up where the open burning rule leaves off. If a broadcast burn is 10 acres or more per day, or, if a pile burn is 1000 cubic feet of pile volume or more per day, then the burn falls under the smoke management rule.

Two levels break up the smoke management rule: SMP I & SMP II.

SMP I: applies to burn projects that emit less than one ton per day of PM-10 emissions or burn less than 5000 cubic feet of pile volume of vegetative material per day.

SMP II: applies to burn projects that emit greater than or equal to one ton of PM-10 emissions per day or greater than or equal to 5,000 cubic feet of pile volume of vegetative material per day.

PM-10: refers to very small particles suspended in air (typically found in dust and smoke). These particles have a diameter of 10 micrometers (0.01 mm or 10 µm) or smaller. Exposure to high concentrations of PM-10 can have negative health impacts.

SMP I stipulates the following requirements:
Burners have two options:

1) Burn during the day (*i.e.*, one hour after sunrise until one hour before sunset), AND 300 feet from occupied dwellings, workplaces, or place where people congregate;

   OR, if the burner prefers, instead of a setback and time-of-day requirement, the burner may choose the following:

2) Burn during times when the ventilation category is good or better; conduct visual monitoring and document the results; and maintain those records for a period of one year. If the burn is to be conducted within a one-mile radius of a

population, then the burner shall notify NMED no later than two business days prior to the burn so NMED may determine whether to conduct instrument monitoring in addition to visual monitoring conducted by the burner.

NOTE: where allowed a waiver for either of these options is possible by contacting NMED and submitting additional paperwork. Burners shall notify the local fire authority prior to ignition. Burners shall register the burn project with NMED no later than 10 a.m. one business day prior to ignition. **(This can be done online.)**

Burner shall submit a completed burn project tracking form to NMED no later than two weeks following completion of the burn project. (This can be done online.)

For burns conducted with a one-mile radius of a population center, the burner shall 1) conduct visual monitoring and document the results, and 2) conduct public notification within the community regarding the burn no later than two days prior to, and no earlier than 30 days in advance of, igniting a burn project.

Burners shall maintain all records of actions performed pursuant to this rule for at least one year.

SMP II stipulates the following requirements:

1) Burners shall review smoke management educational material supplied by NMED or complete an approved smoke management training program prior to burning. Burners shall consider alternatives to burning and document rationale for not using alternatives. (This can be done online.) Burners shall implement at least one emission reduction technique (*e.g.*, reduce fuel load, reduce fuel burned, increase burning efficiency, or increase burn frequency) and document such action. Burners may apply for a waiver where applicable. Burning shall only be conducted when the ventilation category is "good" or better.

2) Burners may apply for a waiver in writing where applicable. Burners shall conduct visual monitoring and document results. Burners shall notify the local fire authority prior to ignition (*e.g.*, local fire department or dispatch or firefighting authority). Burners shall register a burn project with NMED no later than two weeks prior to a planned ignition. (This can be done online.) Burners shall notify NMED of the intent to burn on a specific date no later than 10 a.m. one business day prior to the planned burn project. Burners shall complete and submit to NMED a fire activity tracking form no later than two weeks following the end of the burn project.

For burns planned to be conducted with the wind blowing toward a population center, or within a 15 mile radius of a population center if wind direction is not considered, the following requirements apply:

1) NMED may require the burner to notify the department no later than two business days prior to the planned burn so NMED may determine whether to conduct instrument monitoring in addition to visual monitoring conducted by the burner; and

2) the burner shall conduct public notification no later than two days prior to, and no sooner than 30 days in advance of, igniting a burn project.

Burners shall maintain all records of actions performed pursuant to this rule for at least one year.

Windspeed Conversions

A knot is a unit of speed equal to one nautical mile (1.852 km) per hour, approximately **1.2 mph**. Therefore 3 knots roughly equals: 3.6 mph, 6 knots = 7.2 mph, 21 knots = 25.2 mph, etc.

The conversion for kilometer per hour to miles per hour is approximately: 1-km/hr. equals = 0.6 miles/hr.; for example: 5 km/hr. = 3 mph, 19 km/hr. = 11 mph, 25 km/hr. = 15 mph etc.

Description	Mean Wind Speed	Appearance of Wind Effects		
		On a Tree	*On Land*	
Calm	< 1 knot < 1 km/h	Still	Smoke rises vertically	
Light Air	1 – 3 knots 1 – 5 km/h		Smoke drifts, wind vanes are still	
Light	4 – 6 knots 6 – 11 km/h	Leaves rustle	Wind felt on face, vanes begin to move	
Gentle	7 – 10 knots 12 – 19 km/h	Leaves and small twigs move	Flags flap	
Moderate	11 – 16 knots 20 – 28 km/h	Small branches move	Dust and loose paper lifted	
Fresh	17 – 21 knots 29 – 38 km/h	Small trees in leaf begin to sway	Flags fully extended	
Strong	22 – 27 knots 38 – 49 km/h	Larger branches shake	Whistling in wires, umbrellas become difficult to use	

Figure 1: Beaufort Scale; wind effects and smoke dispersal tool.

Influence of Fuels on Smoke

Fuels, whether live or dead, determine the amount of smoke produced and the thickness of smoke. There is also some influence on smoke regarding the type of ignition technique that is employed to conduct a burn. For example, **backing fires**, those fires burning perpendicular to the dominant wind direction or downslope (characteristic of slow burning movement) usually consume more fuels due to burning slower and having higher heat causing more fuel to burn and be consumed, but the fire itself is not as active or intense (low flame usually below 1-foot high). Smoke usually tends to be lighter in color and therefore has finer particulate (ash) size so is not as thick. This is contrasted by smoke from a **headfire** (fire moving with the dominate wind direction or upslope) that tends to move through fuel rapidly typically with less heat but higher flame intensity (flames are longer or higher), leaving less combustion/consumption of fuels. Smoke from these fires is typically darker, thicker, and denser, creating more health issues and carrying larger particulate size and ash. **Flank fires,** parallel to winds or slopes and can be considered both backing and heading fires, therefore smoke production is variable incorporating characteristic elements of both types of fires.

Pile burning, depending on time of day, can be a mixed bag of smoke production and this is often due to different levels or amounts of green and dry fuels within a pile, how long the pile has been left to cure, its location on a slope or aspect, and whether there is leaf litter still present or only sticks and twigs left. How "green" fuels are, is generally indicative of the amount of moisture in the fuels (if you take a twig or branch and bend it and it doesn't break, this is a good indication that is still has a lot of moisture and will be hard to burn), which increases the amount and thickness of smoke that is produced. Fuels with a high amount of moisture or are relatively "green" tend to create smoke that is more irritating and impactful to humans. Fuels that are more cured with less moisture (you bend the twig or branch, and it breaks quickly), generally tend to produce less smoke and therefore is less irritable.

The type of fuel or size of fuel also factors into smoke production and associated characteristics. Grass or fine fuels (leaves, litter, very small twigs) tend to produce less smoke and burn for a short duration but at a high intensity; compared to branches, shrubs, large brush, logs, or timber. These are harder to ignite, but once they start burning, tend to burn longer, hotter, and produce thicker, darker, and denser smoke due to having a higher moisture content. Smaller fuels dry out faster, but also absorb moisture quicker while larger fuels take longer to cure but also take longer to absorb moisture.

Where you burn, or where your piles are located should also be considered during smoke management. Open areas, *i.e*., meadows, flatter portions of forested lands, grass, or shrublands, tend to allow for easier smoke dispersion because wind and air currents can flow easier or freely. This also tends to help piles cure or dry a little faster. Canopy cover or forest overstory tends to shelter or restrict air movement, trapping smoke where it may linger longer with slow dispersal and fuels/piles may take longer to dry out.

Fire Weather Basics

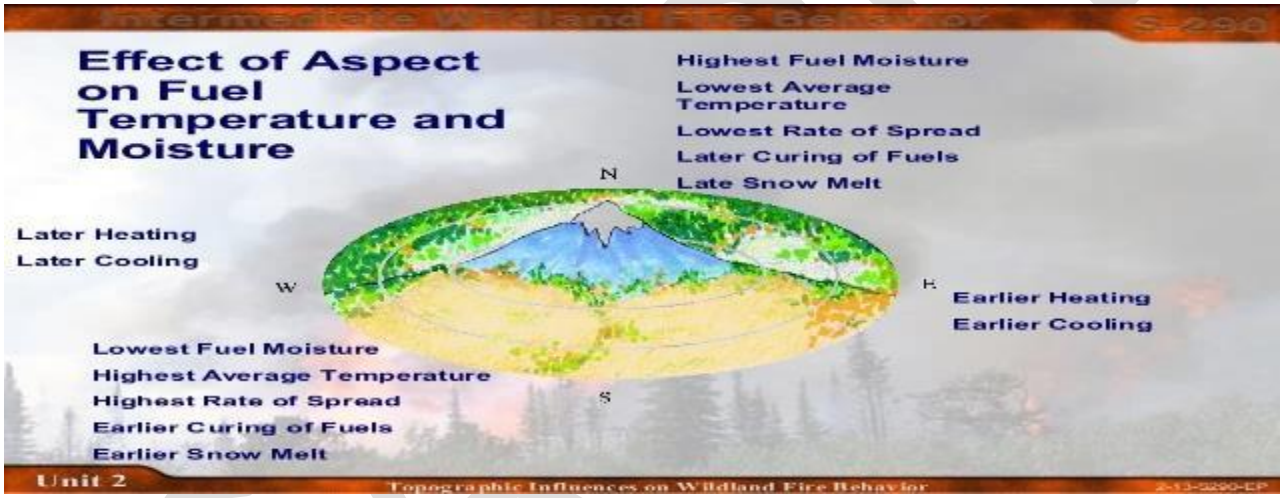
The National Weather Service provides a fire weather forecast and other localized area weather information, which can be found by visiting this website: https://www.weather.gov/abq/forecast. This site allows you to find a fire weather zone forecast for your general area and provides links for more localized or "spot" area forecasts for your specific location. Here is a link to a short YouTube video https://www.youtube.com/watch?v=SB4pk91yq24 introducing Fire Behavior, the video is centered specifically around wildland fire; however, concepts and terminology are relevant to prescribed burning actions as well as considerations. Additional weather education can be found here:

Basic Weather Education

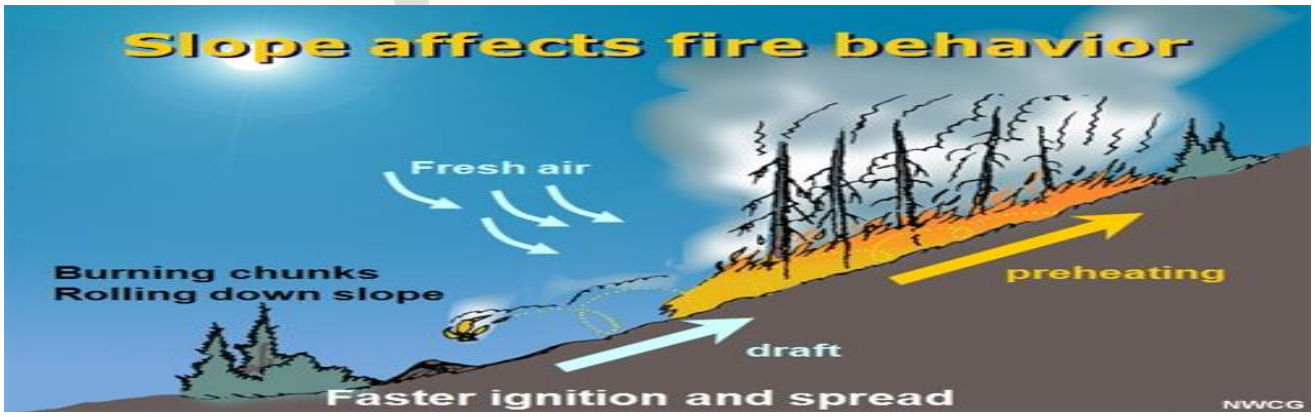
Weather is a vital factor to be evaluated and considered prior to endeavoring into prescribed burning actions and must be monitored throughout the day, even hourly, to ensure that you are still conducting your burn within safe and favorable weather conditions. Weather influences all aspects of your burn including drying of fuels, intensity of the fire, smoke production, how fast your fire will burn, etc. You must understand what your local weather is forecasted to do, prior to and the day of your burn. This will help you determine if you should proceed with prescribed burning and when prescribed burning actions are optimal to minimize potential risk and appropriate smoke management.

Remember the Fire Triangle (*link to YouTube video with more information on the fire triangle and fuel interactions* [*https://www.youtube.com/watch?v=8WPk15XqN2E*](https://www.youtube.com/watch?v=8WPk15XqN2E)) dictates that for fire to occur three things need to be present: 1) *oxygen* to sustain combustion, 2) *heat* to ignite and burn the material, and 3) *fuel* to burn. Take any of these parts of the triangle away and you don't have fire. The easiest part of the fire triangle for people to control is typically the fuel source. There are also three methods of heat transfer regarding fire: a) **radiation** – the heat you can feel from the fire like the heat coming off a stove or from the sun; this heat can dry surrounding fuels and potentially could ignite these fuels if they get hot enough, b) **convection** – hot gases and embers within smoke that can dry and ignite other fuels, and c) **conduction** – movement of heat from one fuel particle to another through direct contact, like a lighter flame contacting a piece of kindling or charcoal.

Lastly, other environmental influences on weather, primarily affecting wind and fuels, are **aspect** and **slope**. Aspect is the direction a slope is facing. Aspect can affect the fuel moisture (amount of greenness) due to the amount of exposure in relation to the sun. For example, north aspects have slopes that are predominately facing north and are less exposed to sun, have higher fuel moisture, lower average temperatures, and later snow melt. While south aspects typically have sun exposure most of the day, have the lowest fuel moistures, highest average temperatures, and little to no snow melt.



Slope is the amount or degree of incline of a hillside. Fires tend to burn more rapidly uphill than downhill, the steeper the slope, the faster the fire burns. Therefore, both aspect and slope have an influence on your fuels depending on the location of your fuels and their exposure to the sun. Once you start burning, aspect and slope can influence your surrounding fuels through the heat transfer methods of radiation, convection, and conduction.



Safety Considerations

It goes without saying but we're saying it anyway, prescribed burning possesses several inherent risks that can become life-threatening and safety considerations are paramount for any prescribed burn actions you undertake. There are several ways you can mitigate risk and provide for safety through adequate planning and consideration of all possible scenarios that present a risk, then establish mitigation actions for each scenario, and communicate both the risk and mitigation actions to all personnel involved with your prescribed burn. One of the best methods to mitigate risk is to become familiar with what the wildland fire community calls the 10s and 18s. The 10s and 18s as presented here, are a little different from the prescribed burn 10s and 18s you were exposed to through the nine-element course but still carry the same message, SAFETY! 10s and 18s refers to a set of 10 Standard Fire Orders and 18 Watch Out Situations that a taskforce in the 1950s found as common themes, which lead to trouble and the result was firefighters getting injured or killed.

Think of the **10 Standard Orders** as guidelines to work safely and that if you don't follow these guidelines then something bad, even tragic may happen. They are grouped into different categories, 1-3 relating to fire behavior, 4-6 safety considerations while directly working with fire, 7-9 are about organization and control, and 10 happens if the other nine are followed.

1. Keep informed of fire weather conditions and forecasts.
2. Know what the fire is doing at all times.
3. Base all actions on current and expected behavior of the fire.
4. Identify escape routes and safety zones and make them known.
5. Post lookouts when there is possible danger.
6. Be alert. Keep calm. Think clearly. Act decisively.
7. Maintain prompt communications with your forces, your supervisor, and adjoining forces.
8. Give clear instructions and be sure they are understood.
9. Maintain control of your forces at all times.
10. Fight fire aggressively, having provided for safety first.

18 Watch Out Situations were developed as common themes that should shout "watch out"! These provide cautionary warnings to keep in mind as you conduct burning actions and make decisions. If you "see" these Watch Out situations, you can then mitigate the risk associated with them. Many of the situations, if not recognized or mitigated have led to injuries, entrapment, or fatalities; therefore, it is important to keep these warnings in the back of your head as you perform prescribed burn actions.

1. Fire not scouted and sized up.
2. You or the fire is in country not seen in daylight.
3. Safety zones and escape routes are not identified and made known.
4. You are unfamiliar with the weather and local factors influencing fire behavior.
5. You are uninformed on strategy, tactics, and hazards.
6. Instructions and assignments are not clear.
7. There is no communication link with crew members or supervisor.
8. You or your team is constructing fireline without a safe anchor point.
9. You are building fireline downhill with fire below you.
10. You are attempting a frontal assault on the fire.
11. There is unburned fuel between you and the fire.
12. You cannot see the main fire and you are not in contact with someone who can.
13. You or your team are on a hillside where rolling material can ignite fuel below you.
14. The local weather is becoming hotter and drier.
15. Wind increases and/or changes direction.
16. You are getting frequent spot fires across the fireline.
17. Terrain and fuels make escape to safety zones difficult.
18. Taking a nap near fireline.

Another good resource, the IRPG, comes in a pocket size booklet or is available electronically *https://www.nwcg.gov/sites/default/files/publications/pms461.pdf*, there are also software applications *i.e*. apps, that allow you to download this information directly to your phone. The IRPG provides critical information on operational engagement, risk management, fire environment, all hazard response, and aviation management related to wildland fire. Most of these may not have a significant meaning to you and potentially be beyond your initial experience; however, this is still a great resource to reference due to its collection of guidelines, checklists, and best practices that it provides. As with any tool or resource, they are only as good as the skills, experience, judgement, training, and practice the individual has in wielding them. Therefore, it is up to you to develop your training and skills proportionate to your planned burning actions and the tools and resources available to you, to ensure your personal safety and those of your friends, neighbors, and community.

Reference Form – Prescribed Burn "Go/No-Go Checklist

Typically, in the "fire world" a burn plan (template attached to this workbook) is a critical component to any prescribed burn being conducted, whether it is a broadcast or pile burn. The burn plan usually includes a description of the burn area, optimal weather conditions to conduct burning actions, lists any hazards present, personnel needed to successfully implement your burn, details safety considerations, and includes important contacts and permitting requirements prior to implementing your burn. The burn plan provides a mechanism to ensure you have carefully considered the actions involved with your prescribed burn and that you have addressed, to the best extent possible, smoke management and other concerns and risks associated with your burn. It also allows for contingency planning and what you will do if things go wrong. Further, it indicates that you have also considered or completed any permitting or other requirements by the relevant authorities for your burn.

Prior to any burning activity you are required to have a checklist that you go through before attempting your burning activity. This checklist is often referred to as a "Go/No-Go Checklist" and allows you or the person that will be conducting the burn on your behalf, to determine if there are any potential problems within or around your burn area and what may be needed to mitigate them. *An example of a problem with a potential solution: there is no water available on the westside of the burn area, to mitigate the potential risk of fire escaping on that side is to create a firebreak extending 20' from the edge of the burn area to minimize the risk, further three people will need to staff that area to ensure any fire that burns near the firebreak is put out*.

On the next page is an example of a Go, No-Go Checklist that must be conducted before the start of any burn activities. This is also a proficiency requirement for both the Pile Burn Manager and Broadcast Burn Manager.

GO/NO-GO CHECKLIST --- EXAMPLE

PRESCRIBED FIRE

Burn Name and Burn Date: _____

All questions must be answered "**YES**" to proceed. If any questions are answered "**NO**", DO NOT proceed.

Preliminary Questions	**Check**
Are ALL site conditions in or adjacent to the burn unit the SAME as outlined in your prescribed burn plan or in accordance with another similar plan? If **NO, STOP**	YES
Has the prescribed burn plan been fully reviewed and approved by another individual that is qualified or trained or with a part of a fire management agency? If **NO, STOP**	YES
GO/NO-GO Checklist	**Check**
Have ALL permits and clearances been obtained?	YES
Have ALL the required notifications been made?	YES
Have ALL the pre-burn considerations and preparation work identified in the prescribed fire plan or equivalent been completed or addressed and checked?	YES
Have ALL required, current, and projected fire weather forecasts been obtained and do they align with your burn plan prescription?	YES
Are ALL prescription parameters met including safety considerations?	YES
Are ALL smoke management specifications and permits met?	YES
Are ALL planned operations, personnel, and equipment on-site, available, and operational, including having adequate communication with you and among each other?	YES
Has the availability of contingency resources applicable to today's actions been checked and are they available and aware of your burn?	YES
Have ALL personnel been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones?	YES
If all the questions were answered "**YES**" proceed with a test fire. Document the current conditions, location, and results. If any questions were answered "**NO**", DO NOT proceed.	
After evaluating the test fire, can the prescribed fire be carried out safely and will the planned objective(s) be met?	**YES**

Prescribed Burn Manager Signature:_____Date:_____

OTHER TIPS FOR SAFE AND EFFECTIVE BURNING

(Information Provided by the Forest Stewards Guild, Pile Burning Workshops)

Consider the location of your piles:

- Optimally piles should be in an open area, avoid building piles within 10-20 feet of trees you want to keep. Heat from piles can scorch or stress trees to the point where the tree may die over time or ignite due to radiant/convective heating.

Containment features to consider:

- To keep fire from creeping away from the burn pile, scrape or dig material surrounding your pile down to mineral soil, two- to 10 foot wide depending on the size of the pile. You can also spray water around the pile to reduce the spread of fire away from the pile, which is called "wet lining".
- If possible or available, it is recommended that at least 100 gallons of water be present near the main part of your burning actions. This will help reduce the spread of fire or for emergencies. If water is not available, only burn on days with substantial rain or snow.

Pile Building:

- Piles should be tall and compact to burn more completely. Wide flat piles are difficult to light and won't burn completely. Pile materials with the cut ends facing out of the pile. Overlap them in layers to create a dense pile.
- Do not pile on top of rotten logs, stumps, or other materials if possible. Smoldering is a real problem for containment and smoke management. Try to minimize piling onto this larger material as it is often a challenge to extinguish.
- Small branches and branches with needles will help get your pile started. Make sure that your pile has some amount of small branches or needles in the center of it to help get the pile lit.
- Allow piles to dry for a few weeks and up to six months for fuels to cure. Dry piles ignite easier and produce less smoke.
- Avoid including dirt and large diameter logs in piles, this can cause smoldering fire long after pile has been ignited. Keep logs over six to eight inches in diameter out of piles. Pile larger logs on the top of the pile to allow for proper consumption. Logs placed at the bottom will take longer to burn through.
- Consider covering the piles with plastic or tar paper. This will help the fuels in the pile to consume completely if rain or snow is present on the day of the burn.

Pile Burning:

- Use a drip torch or propane weed burner to light a pile. Find a spot on the pile with small branches or needles to get the fire started. Do not use gasoline to light the pile. Instead, you can create a torch mix that is 3 parts diesel: 1 part gasoline.
- Lighting a pile on the upslope or upwind side will allow the pile to burn slower as the fire backs through the pile. If piles are difficult to get going, try lighting on the downslope or downwind side.
- Once the pile has initially burned down but is still hot, throw the left-over unburned bits into the pile, this is referred to as chunking. It helps reduce the risk of an escaped pile by consuming all the fuel quickly.

Mop-up:

- The best way to ensure your pile is out is to mop-up after piles have been consumed.
- Use the back of your ungloved hand to check if there is heat left in the pile. Check the entire pile including the outside edges.
- You can mop up by mixing hot material with dry or moist dirt or water if possible. Having at least 100 gallons of water on site is always helpful.

Multiple Piles:

- If you have multiple piles to burn, don't light them all at once. Light just enough of them for you to be able to handle in case anything gets out of hand.
- If you are burning on a slope, it is also a good idea to light the piles at the top of the slope or perimeter first then work your way down. Fire naturally tends to run up slope so this will create a fire break and reduce the risk of an escaped fire outside the pile area.

Weather Forecasting and Factors:

Is it a good day to burn?

- Most piles are burned in the fall, when piles are dry and the coming wet, cold weather will help make sure fire is out after fuels are consumed.
- If you have any concerns on the planned burn day you can always contact your local fire department or the Forestry Division with any questions or concerns regarding weather factors.

Moisture to prevent fire spread:

- Look for times when there is enough moisture on the ground to prevent the fire from your piles from creeping into surrounding vegetation and surface fuels.
  - Recent snow or rain are best.
  - Remember that your pile generates a lot of radiant heat that will melt snow and dry the area around it.
  - You can also burn right before an incoming snow or rain event to put out your piles.

Wind:

- Avoid burning on windy days, this is important to make sure fire will stay within the pile and containment area.
- Winds under 10-15 mph are preferable.
- High winds, above 25 mph, can make escaped fire very difficult to control.

Timing:

- Light piles in the morning so they can burn out before it gets warmer and windier in the afternoon.
- Take a careful look at the weather on your burn day plus a day or two after when your piles may still be hot.
- Weather in New Mexico changes rapidly and may go from three inches of snow in the morning to sunny and windy in the afternoon.