

**NAVAL FACILITY ENGINEERING COMMAND, ATLANTIC
REMEDIAL ACTION CONTRACT (RAC)
CONTRACT NO. N62472-99-D-0032
CONTRACT TASK ORDER NO. 0033**

**PRESCRIBED FIRE PLAN
MEC SURFACE PREBURN 2008
NOMANS LAND ISLAND
Chilmark, Massachusetts**

April 2008

Prepared for:

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Revision
1

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4/30/08

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Pages Affected
All

TABLE OF CONTENTS

Element No.		Page No.
ELEMENT 1:	SIGNATURE PAGE	1
ELEMENT 2:	PRESCRIBED FIRE GO/NO-GO CHECKLIST	2
ELEMENT 3	COMPLEXITY ANALYSIS SUMMARY	4
ELEMENT 4:	DESCRIPTION OF PRESCRIBED FIRE AREA.....	5
ELEMENT 5:	GOALS AND OBJECTIVES.....	5
ELEMENT 6:	FUNDING:	6
ELEMENT 7:	PRESCRIPTION	6
ELEMENT 8:	SCHEDULING.....	7
ELEMENT 9:	PRE-BURN CONSIDERATIONS	7
ELEMENT 10:	BRIEFING.....	8
ELEMENT 11:	ORGANIZATION AND EQUIPMENT	9
ELEMENT 12:	COMMUNICATION.....	10
ELEMENT 13:	PUBLIC AND PERSONNEL SAFETY, MEDICAL	10
ELEMENT 14:	TEST FIRE	11
ELEMENT 15:	IGNITION PLAN	11
ELEMENT 16:	HOLDING PLAN.....	12
ELEMENT 17:	CONTINGENCY PLAN	12
ELEMENT 18:	WILDFIRE CONVERSION.....	13
ELEMENT 19:	SMOKE MANAGEMENT AND AIR QUALITY	13
ELEMENT 20:	MONITORING.....	14
ELEMENT 21:	POST-BURN ACTIVITIES	14

APPENDICES

Appendix A	Maps: Vicinity and Project
Appendix B	Technical Review Checklist
Appendix C	Complexity Analysis
Appendix D	Job Hazard Analysis
Appendix E	Fire Behavior Modeling Documentation or Empirical Documentation

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

ELEMENT 2: PRESCRIBED FIRE GO/NO-GO CHECKLIST

Instructions: The Agency Administrator's Pre-Ignition Approval is the intermediate planning review process (i.e. between the Prescribed Fire Complexity Rating System Guide and Go/No-Go Checklist) that should be completed before a prescribed fire can be implemented. The Agency Administrator's Pre-Ignition Approval evaluates whether compliance requirements, Prescribed Fire Plan elements, and internal and external notifications have been or will be completed and expresses the Agency Administrator's intent to implement the Prescribed Fire Plan. If ignition of the prescribed fire is not initiated prior to expiration date determined by the Agency Administrator, a new approval will be required.

YES	NO	KEY ELEMENT QUESTIONS
		Is the Prescribed Fire Plan up to date? <i>Hints: amendments, seasonality.</i>
		Will all compliance requirements be completed? <i>Hints: cultural, threatened and endangered species, smoke management, NEPA.</i>
		Is risk management in place and the residual risk acceptable? <i>Hints: Prescribed Fire Complexity Rating Guide completed with rational and mitigation measures identified and documented?</i>
		Will all elements of the Prescribed Fire Plan be met? <i>Hints: Preparation work, mitigation, weather, organization, prescription, contingency resources</i>
		Will all internal and external notifications and media releases be completed? <i>Hints: Preparedness level restrictions</i>
		Will key agency staff be fully briefed and understand prescribed fire implementation?
		Are there any other extenuating circumstances that would preclude the successful implementation of the plan?
		Have you determined if and when you are to be notified that contingency actions are being taken? Will this be communicated to the Burn Boss?
		Other:

Recommended by: /s/ Nort Phillips (Fire Management Services) Date: _____
FMO/Prescribed Fire Burn Boss

Approved by: _____ Date: _____
Agency Administrator

Approval expires (date): _____

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

A. Has the burn unit experienced unusual drought conditions or contain above normal fuel loadings which were not considered in the prescription development? If NO proceed with checklist., if YES go to item B.	YES	NO
B. If YES have appropriate changes been made to the Ignition and Holding plan and the Mop Up and Patrol Plans? If YES proceed with checklist below, if NO STOP.		

YES	NO	QUESTIONS
		Are ALL fire prescription elements met?
		Are ALL smoke management specifications met?
		Has ALL required current and projected fire weather forecast been obtained and are they favorable?
		Are ALL planned operations personnel and equipment on-site, available, and operational?
		Has the availability of ALL contingency resources been checked, and are they available?
		Have ALL personnel been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones?
		Have all the pre-burn considerations identified in the Prescribed Fire Plan been completed or addressed?
		Have ALL the required notifications been made?
		Are ALL permits and clearances obtained?
		In your opinion, can the burn be carried out according to the Prescribed Fire Plan and will it meet the planned objective?

If all the questions were answered "YES" proceed with a test fire. Document the current conditions, location, and results

Burn Boss

Date

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

ELEMENT 3: COMPLEXITY ANALYSIS SUMMARY

PRESCRIBED FIRE NAME			
ELEMENT	RISK	POTENTIAL CONSEQUENCE	TECHNICAL DIFFICULTY
1. Potential for escape	LOW	LOW	LOW
2. The number and dependence of activities	MODERATE	LOW	MODERATE
3. Off-site Values	LOW	LOW	LOW
4. On-Site Values	LOW	LOW	LOW
5. Fire Behavior	LOW	LOW	LOW
6. Management organization	MODERATE	MODERATE	MODERATE
7. Public and political interest	LOW	LOW	LOW
8. Fire Treatment objectives	LOW	MODERATE	LOW
9. Constraints	MODERATE	MODERATE	LOW
10. Safety	MODERATE	MODERATE	MODERATE
11. Ignition procedures/ methods	LOW	LOW	MODERATE
12. Interagency coordination	LOW	LOW	LOW
13. Project logistics	LOW	LOW	LOW
14. Smoke management	LOW	LOW	LOW

COMPLEXITY RATING SUMMARY	
	OVERALL RATING
RISK	LOW
CONSEQUENCES	LOW
TECHNICAL DIFFICULTY	LOW
SUMMARY COMPLEXITY DETERMINATION	LOW

ELEMENT 4: DESCRIPTION OF PRESCRIBED FIRE AREA

A. Physical Description

- 1. Location:** Nomans Land Island is located in and is surrounded by the Atlantic Ocean, approximately 2.7 miles south of Gay Head on the island of Martha's Vineyard.
- 2. Size:** 628 acres
- 3. Topography:** The general slope is to the north with scattered moraine hills, valleys and bogs.
- 4. Project Boundary:** The project boundary is the entire island with the exception of the following: 20-foot connex container near center of Island (see Figures 1-1 and 1-2) and steep cliffs on the south and east shores.

B. Vegetation/Fuels Description:

- 1. On-site fuels data:** Under-story: Vegetated wetlands and small ponds with open water are scattered throughout the island and comprise 30-40% of the landscape. Due to the time of year of the burn and generally wet conditions prevailing in the months preceding the burn window, it is highly unlikely, however, that wetland areas will burn. Portions of the upland area contain dense stands of grass that may behave more like Fuel Model (FM) 3 than FM 1. Grasses comprising FM 3 situations are generally ≥ 2.5 feet tall and flame lengths and rates of spread are much higher than in shorter grass fuels. Other grassland areas contain only scattered cover due to past military activity on the area. Upland shrub areas (FM 6) may burn with high intensity, especially in areas where grasses are mixed with shrubs. Shrubs near and especially downwind of wetland areas are less likely to burn. Over-story: No to very little over-story exists within the unit.
- 2. Adjacent fuels data:** There are no adjacent fuels.

C. Description of Unique Features: There are no specific features within the unit that require significant holding and protection activities needing specialized management. The area around the location of the connex box will be cleared of vegetation prior to the conductance of burn activities.

ELEMENT 5: GOALS AND OBJECTIVES

A. Goals: The goal of the prescribed burn is to reduce vegetative cover in order to allow for an effective unexploded ordnance (UXO) visual sweep, while also meeting ecological management goals of maintaining open, early successional habitat on the island.

B. Objectives:

1. Resource objectives: Reduce vegetative cover by $\geq 50\%$ in upland areas.
2. Prescribed fire objectives: Hazard reduction to allow for an effective UXO surface sweep and clearance of the Island.

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

ELEMENT 6: FUNDING:

A. Cost: TBD

B. Funding source: Department of the Navy.

ELEMENT 7: PRESCRIPTION

A. Environmental Prescription:

	Prescription	Forecast	Test Fire (On Site)
FUEL MODELS	1/3/6		
MID-FLAME WIND SPEED (MPH)	5-20		
WIND DIRECTION REQUIRED	270°->360°->030°		
20-FOOT WIND SPEED (MPH)	12 - 50		
MIXING HEIGHT/TRANSPORT WS OR DISPERSION INDEX	>1700 ft		
RELATIVE HUMIDITY (%)	≤ 70		
FINE FUEL MOISTURE (1 HR.)	6 - 10		
10-HOUR TIME LAG (%)	7 - 15		
100-HOUR TIME LAG (OPT) (%)	> 15		
1000-HOUR TIME LAG (OPT) (%)	N/A		
LIVE FUEL MOISTURE (%)	80 - 200		
TEMPERATURE (°F)	30 - 85		
LONG TERM DROUGHT INDICATOR (PDI,KBDI,1000Hr)	N/A		

B. Fire Behavior Prescription:

	Prescription	Forecast	Test Fire
FUEL MODELS	1/3/6		
MAX HEADFIRE RATE OF SPREAD (FT/MIN)	270/702/199		
MAX BACKFIRE RATE OF SPREAD (FT/MIN)	7/5/1		
MAX HEADFIRE FLAME LENGTHS (FT)	7.5/30.5/13.8		
MAX BACKFIRE FLAME LENGTHS (FT)	1.4/3.1/1.4		
PROBABILITY OF IGNITION	>30		

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

ELEMENT 8: SCHEDULING

A. Ignition Time Frames/Season(s): Spring

B. Projected Duration: Ignition should be completed within a 2 hour period.

C. Constraints: See constraints section of the NWCG Complexity Analysis-Appendix C of this plan.

ELEMENT 9: PRE-BURN CONSIDERATIONS

A. Considerations:

1. On Site:

Burn Unit:

The burn will be completed via aerial ignition.

Equipment: Any specialized ignition equipment will be required to undergo a thorough pre-burn (PM) checklist. Operational deficiencies and critical inventory shortages will be documented and turned into the burn boss on the morning of the burn. The burn boss will decide if all resources are in working order prior to burn implementation based on the submitted checklists. These checklists will be archived in the final fire folder.

2. Off Site:

Adjacent Units: There are no adjacent units.

Air Traffic: Burn Flight crews will contact Martha's Vineyard Air Traffic Control prior to ignition, and if possible, issue a Notice to Airmen concerning the location of the aerial ignition activities.

B. Method and Frequency for Obtaining Weather and Smoke Management Forecast(s):

Prior to burn:

1. The Burn Boss will obtain the Fire Weather Forecast from the National Weather Service (NWS) Taunton Office for the Massachusetts Fire Weather Zone 23 area via the internet: <http://fire.boi.noaa.gov/FIREWX/BOSFWFBOX.html>
2. Because it is unlikely that there will be an opportunity to obtain on-site fire weather observations to support the decision to burn, the burn boss will have to rely on coastal marine forecasts available from the National Weather Service Forecast Office in Taunton. Nomans Land Island is in Massachusetts Fire Weather Zone 23. Without on-site wind and humidity observations, issuance of spot weather forecasts by NWS is problematic. Jeff Osiensky, regional fire weather forecaster has indicated, however, that he will try to provide assistance in evaluating Island weather conditions. If Jeff is not on duty, obtain assistance from on duty fire weather forecaster.

During burn:

1. Weather will be observed and documented in the Fire Observers Handbook during the ignition from the helicopter by the Burn Boss.
2. The Burn Boss will also call the Fire Weather Operations Desk of the Taunton Office (NWS) if conditions change, unusual weather presents itself, or if the observed weather is not as forecasted by the NWS.

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

C. Notifications:

BURN DAY:

Contact	When	Phone #	Who	Yes	No
U.S. Coast Guard, Menemsha Station (Chilmark)	AM	508.645.2611	Dispatcher		
Martha's Vineyard Airport Control Tower	AM	508.696.4631	Dispatcher		
Chilmark Police	AM	508.645.3310	Dispatcher		
State Police (Oak Bluffs)	AM	508.693.0545	Dispatcher		
Local Radio (WMVY-Tisbury)	AM	508.693.5000	Dispatcher		
Nort Phillips	AM	541.991.0693	Burn Boss		

ELEMENT 10: BRIEFING

Briefing Checklist:

PRESCRIBED BURN BRIEFING/INCIDENT ACTION PLAN OUTLINE:

1. Location:
 - A. Map of burn
 - B. Travel/Vicinity map (optional)

2. Description of burn area:
 - A. Objectives
 - B. Vegetation type
 - C. Acreage
 - D. Slopes
 - E. Roads/Access
 - F. Values at risk
 - G. Water sources
 - H. Natural/manmade barriers

3. General and spot weather forecast:
 - A. Wind direction and speed.
 - B. Relative Humidity
 - C. Temperature
 - D. Fuel moisture
 - E. Atmospheric Stability
 - F. Predicted Changes

4. Fire behavior:
 - A. Fire intensity
 - B. Flame length/height
 - C. Rate of Spread
 - D. Spotting distance
 - E. Probability of Ignition
 - F. Special considerations

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

5. Burn Organization:

- A. Organizational chart/position assignments
- B. Equipment assignments
- C. Other resources
- D. Escape fire organization/Transfer of Command

6. Communications:

- A. Procedures
- B. Frequencies/channels
 - 1. Ignition/Holding (tactical)
 - 2. Command/dispatch
 - 3. Aircraft
 - 4. Other

7. Safety:

- A. Escape Routes
- B. Safety zones
- C. Hazards
- D. Potential problems
- E. Smoke management
- F. PPE
- G. Refueling procedures/Vehicle Travel
- H. Job Hazard Analyses

8. Emergency Medical Evacuation Plan:

- A. Notification procedures
- B. On-site Medical treatment/EMT
- C. Mobilization of patient

9. Wildfire Conversion:

- A. Incident Commander Identification.
- B. Notifications
- C. Briefing location
- D. Suppression Actions

ELEMENT 11: ORGANIZATION AND EQUIPMENT

A. Positions:

Personnel Requirements:	Prescribed Fire Burn Boss	1
	Helicopter Pilot	1
	Aerial Ignition Specialist	1
	Experienced PSD Operator	1

B. Equipment:

Equipment Requirements:	PSD and kit	1
	Handheld Radios	N/A
	Aircraft Crash Kit	N/A
	Aircraft wind sock	N/A
	40lb BC Fire Extinguisher	N/A

Note – the above N/A items are not needed since the only planned landings are on an established airport with facilities.

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

C. Supplies:

Supply Requirements:	AA Batteries	100
	Extra Radio Clam Shells	4

ELEMENT 12: COMMUNICATION

A. Radio Frequencies:

All crew members will be in the helicopter during the fire and will be in constant communication via headset.

B. Telephone Numbers:

Contact	Phone #
U.S. Coast Guard, Menemsha Station (Chilmark)	508.645.2611
Martha's Vineyard Airport Control Tower	508.696.4631
Chilmark Police	508.645.3310
State Police (Oak Bluffs)	508.693.0545
Local Radio (WMVY--Tisbury)	508.693.5000
Taunton NWS	508.822.0634 508.828.2672
Nort Phillips	541.991.0693

ELEMENT 13: PUBLIC AND PERSONNEL SAFETY, MEDICAL

A. Safety Hazards:

See Job Hazard Analysis (JHA) in Appendix D of this plan.

B. Measures Taken to Reduce the Hazards:

Pre-burn briefing/coordination: A thorough pre-burn briefing will be conducted by the Burn Boss and all participating individuals on the project will be required to attend. This briefing will clarify the Burn Boss's intent, formalize the Risk Management Process and answer any questions from the burn staff. A written Incident Action Plan should supplement the briefing and each person is required to have one.

Communications Establishment: All parties on the contact list will be notified at the start and stop of ignition. The Burn Boss, prior to the ignition of the initial fire line, will establish communications protocol and appropriated use of frequencies.

Escape Routes and Safety Zones: Will identify safety zones from the air prior to ignition.

Personnel Protective Equipment: All personnel will wear required PPE in accordance with all applicable regulations.

Job Hazard Analysis: To be reviewed by fire personnel during briefing. Job Hazard Analysis for prescribed fire operations, and associated tasks will accompany the Incident Action Plan or ensured that every participant involved has read the document and signed as proof.

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

C. Emergency Medical Procedures:

Prompt notification to the Burn Boss and suspension of ignition. Qualified personnel will administer appropriate First Aid.

D. Emergency Evacuation Methods:

Non life threatening Injuries: Patient will be transported to local area hospital.

Life threatening Injuries: Patient will be transported via Medevac.

E. Emergency facilities:

Hospitals							
Name	Address	Travel Time Minimum	Phone	Helipad		Burn Center	
				Yes	No	Yes	No
Martha's Vineyard Hospital	1 Hospital Road Oak Bluffs, MA	5	508.693.0410		X		X
St. Luke's Hospital	101 Page Street New Bedford, MA	20	508.997.1515	X			X

ELEMENT 14: TEST FIRE

A. Planned location: Downwind side of Burn Unit.

B. Test Fire Documentation: To be filled out day of burn.

1. Weather conditions On-Site:

2. Test Fire Results:

ELEMENT 15: IGNITION PLAN

A. Firing Methods: Aerial ignition devices (AID) are ping-pong-ball sized plastic vessels that contain potassium permanganate. The devices are injected with ethylene glycol as they pass through a dispensing machine mounted on the side of a helicopter, and the mixing of the two chemicals produces and exothermic reaction that results in a 1-2 foot tongue of flame being emitted from the device for a period of ½-2 minutes following ejection from the machine. The flames ignite spot fires when the device falls in available fuel on the ground. Firing will commence on the down-wind side (east end) of the Island, with AID dropped in an approximately 100 foot by 100 foot grid on approximately north-south lines. Lines will parallel to each other and will be seeded from east to west across the Island. A 100 foot by 100 foot grid would produce approximately 2,500 spot fires in the 600+ acre unit. Spot fires landing in available fuels will expand until they reach an adjacent spot, with each fire burning approximately ¼ acre. Spot fires will extinguish as they coalesce, with individual spots burning for 15-30 minutes. Once fire is on the ground and producing smoke, the aircraft cannot return to the downwind portion of the unit until smoke has substantially cleared. Particular care should be takes to seed areas downwind of wetlands or ponds, as head fires from spots ignited upwind of wetland are unlikely to spread to these protected areas.

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

B. Devices: Aerial Ignition Devices.

C. Techniques, Sequences, and Patterns: **Phase 1:** After the weather forecast is obtained and the results favorable for a test burn, the Burn Boss will designate a test fire line location on the downwind side of the unit. Fire behavior will be observed and monitored for intensity, rate of spread, and fuels consumption. If test results are adequate and approval of burn boss is given, Phase 2 will be initiated.

Phase 2: Aerial Ignition will begin on the downwind side of the unit.

Phase 3: The helicopter will ignite the working from the downwind side to the upwind side.

D. Ignition Staffing (Minimum): 1 Firing Boss, 1 helicopter pilot, 1 ping-pong ball machine operator.

ELEMENT 16: HOLDING PLAN

A. General Procedures for Holding: There will be no direct attempt to hold the fire within prescribed lines. Fires should burn to the edge of the cliffs along the shore and extinguish themselves.

MOP UP AND PATROL PLAN:

The fire will be permitted to burn until all flames have extinguished themselves. Every effort will be made to extinguish all smoke by 1600 hours EST. High fuel moistures in the heavier fuels should limit the extent of prolonged burning. If prolonged burning does occur, the site will be checked the following day, with mop-up continued during daylight hours, if necessary. The decision that the burn is over will be made by the fire leader.

B. Critical Holding Points and Actions: None.

C. Minimum Organization or Capabilities Needed: Same as ignition crew.

ELEMENT 17: CONTINGENCY PLAN

A. Trigger Points:

1. Fire behavior indicates that flame length and rate of spread exceeds the production capabilities of available resources.
2. Fire intensity, severity, and/or smoke production and duration exceed the maximum limits established by the prescription to be acceptable to the objectives set forth in this plan.

B. Actions Needed:

The burn plan identifies resources needed to safely and successfully ignite, execute, and hold prescribed fire throughout the range of prescriptive parameters identified. The contingency resources identified within the prescribed fire plan are identified for those rare events that occur and lead to a situation where the burn may become a problem. The contingency plan is divided into three phases A, B and C.

Phase A:

The prescribed burn proceeds as planned, and fire is kept within unit perimeters and prescription parameters.

Phase B:

N/A

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

Phase C:

If trigger points (Element 17A of this plan) are reached, the Burn Boss will decide if ignition should be halted and/or any other measures necessary.

C. Additional Resources and Maximum Response Time(s): None.

ELEMENT 18: WILDFIRE CONVERSION

A. Wildfire Declared By: Burn Boss.

B. Incident Commander (IC) Assignment: The Burn Boss will assume role as IC and coordinate suppression efforts with resources.

C. Notifications:

1. IF THE PRESCRIBED FIRE BECOMES AN UNWANTED WILDFIRE, THE BURN BOSS WILL NOTIFY THE CONTACT LIST TO UPDATE THEM ON THE ADDITIONAL SMOKE AND POSSIBLE DURATION OF BURNING.

D. Extended Attack Actions and Opportunities to Aid in Fire Suppression:

There will be no additional aid needed.

ELEMENT 19: SMOKE MANAGEMENT AND AIR QUALITY

A. Compliance:

The following Atmospheric/Meteorological Requirements can be implemented with **NO burn day amendments allowed.**

Wind Direction	Minimum Mixing Heights	Minimum Transport Wind Speeds	Implement if Light FOG (night) Forecasted?	Minimum Ventilation/Dispersion Index	Other
270°->360°->030°	>1700 Feet	7.8 mph	YES	20	NONE

B. Permits to be Obtained: Town of Chilmark to be notified in advance and request for open burning approval to be submitted to Massachusetts Department of Environmental Protection (MassDEP).

C. Smoke Sensitive Areas/Receptors:

The Martha's Vineyard Airport and its flight approach paths are northeast of the burn units. Winds from the west-southwest counterclockwise through south would put smoke over Martha's Vineyard, which is three miles distant from Nomans Land Island. The southeastern Massachusetts shoreline is 15 miles to the northwest of the Island. Winds southeast counterclockwise through east would push smoke back toward the mainland.

Project Name: Nomans Land Island 2008

Unit Name: MEC Surface Pre-Burn 2008

D. Impacted Areas:

If smoke does impact critical Smoke Sensitive Areas/Receptors, the Burn Boss will begin the Contingency plan for adverse smoke impact addressed below.

E. Mitigation Strategies and Techniques to Reduce Smoke Impacts:

The specific smoke mitigation measure for this unit is:

1. Thorough mop up will be accomplished primarily on downwind sides of the unit, primarily in the direction of public smoke receptors.

Contingency plan for adverse smoke impact: In the event that unforeseen changes of Meteorological conditions occur, in which adverse deviations of smoke plume spread, and/or dispersion indexes result, which impact or threaten to impact the above smoke sensitive targets, the burn boss will initiate an appropriate response which may include the following:

1. Maintain communication with the weather observer, NWS weather service station personnel (Taunton), and other predictive services. Phone number is: 508.823.1900.
2. If needed, the burn will be terminated.

ELEMENT 20: MONITORING

A. Fuels Information (forecast and observed) Required and Procedures:

Morning of the burn: The Burn Boss will use the forecasted indices of the Fire Weather Forecast and calculate 1 hr and 10 hr fuel moistures using Page 76 of the IRPG.

During the burn: The Burn Boss will use the observed weather conditions and calculate the 1 hr and 10 hr fuel moistures using Page 76 of the IRPG.

B. Weather Monitoring Required and Procedures:

See Element 9 B of this Plan.

C. Fire Behavior Monitoring Required and Procedures:

The dedicated weather observer will document flame length, rate of spread, and spotting distances on specified intervals.

D. Monitoring Required To Ensure That Prescribed Fire Plan Objectives Are Met:

1 hour and 10 hour fuels consumption will be monitored during the test fire line and subsequent unit ignitions.

E. Smoke Dispersal Monitoring Required and Procedures:

The Burn Boss will document smoke dispersion behavior during the test fire line and subsequent unit ignitions.

ELEMENT 21: POST-BURN ACTIVITIES

Post-burn Activities That Must be Completed:

1. If time permits, an After Action Review (AAR) will be conducted with all parties involved.
2. Equipment will be refurbished and defective and damaged equipment taken "out of service".
3. The Burn Boss will notify all parties on the contact list that operations have ended.

Appendix A

Maps: Vicinity and Project



- Legend**
- Proposed Base Camp 1
 - Proposed Base Camp 2
 - Area To Be Cleared and Grubbed Prior to Burn

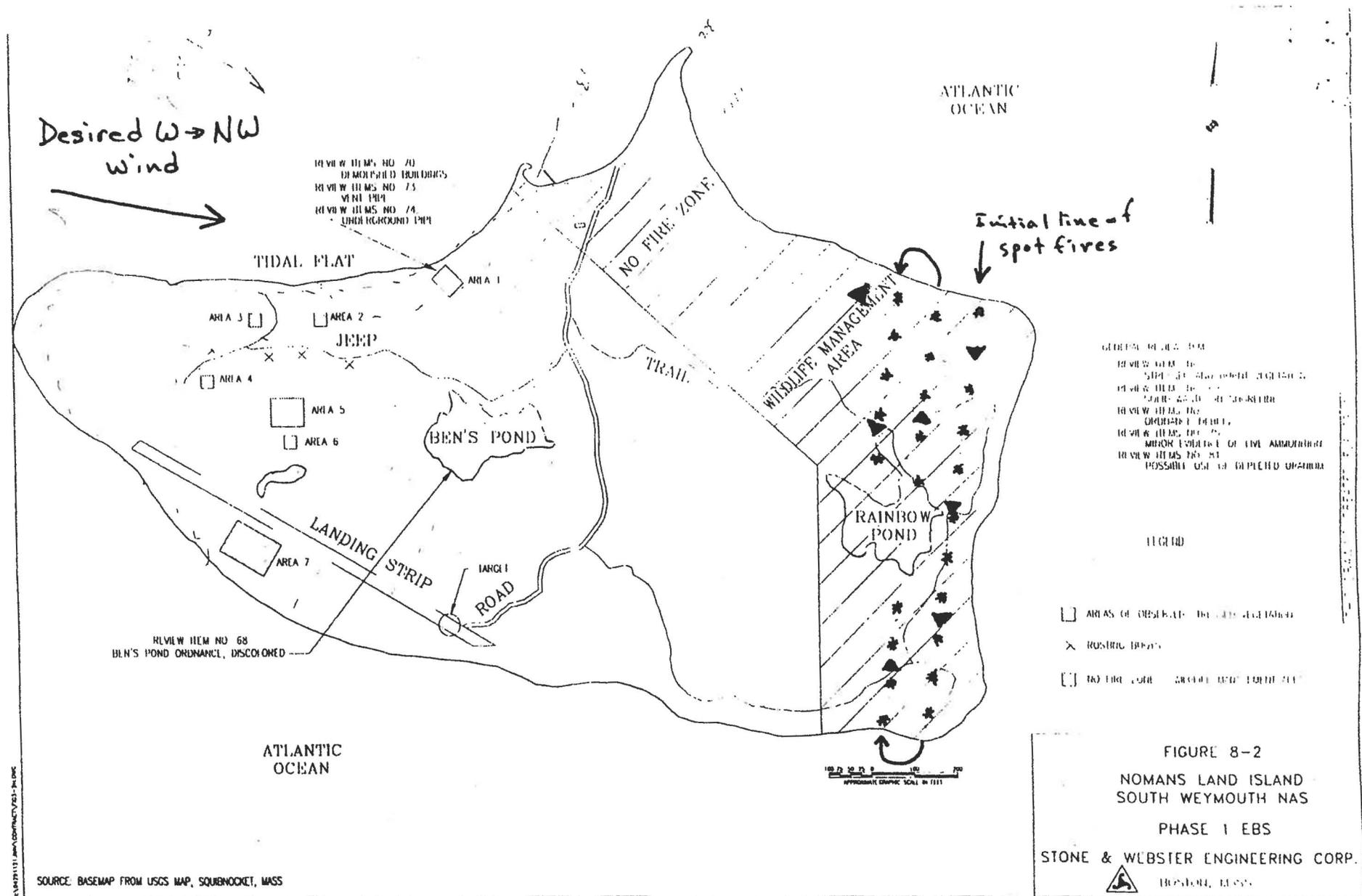


0 100 200 400 600 Feet

DRAFT: MARCH 13, 2008
Figure 1-2
2008 Controlled Burn
Location of 20-Foot
Connex Box
(Not to Be Impacted by Burn)

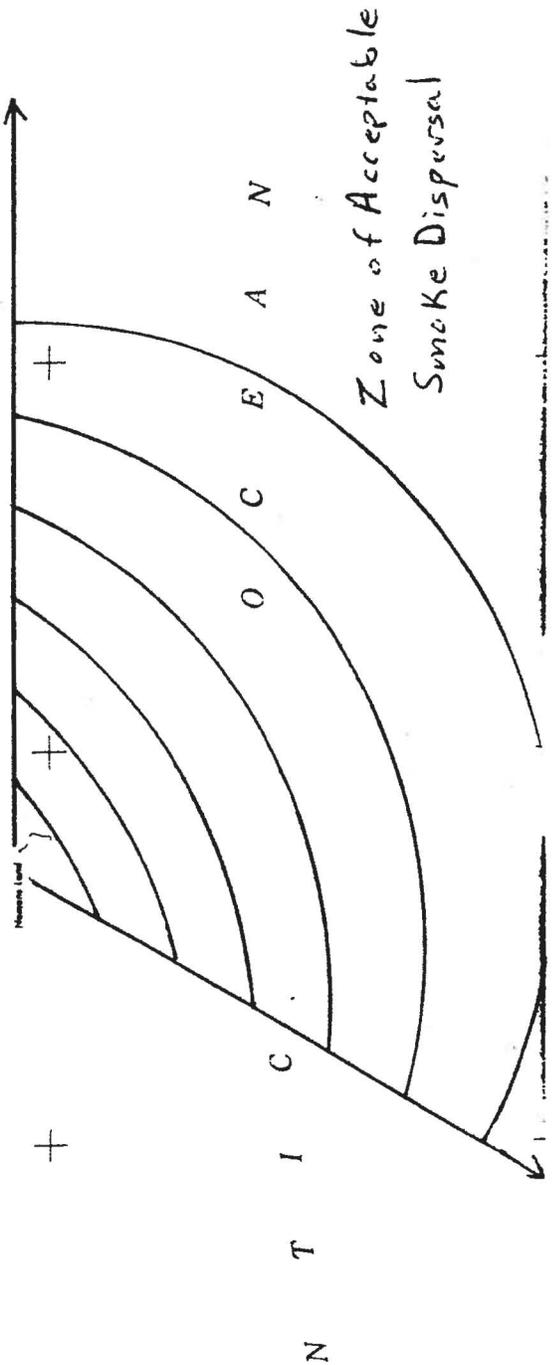
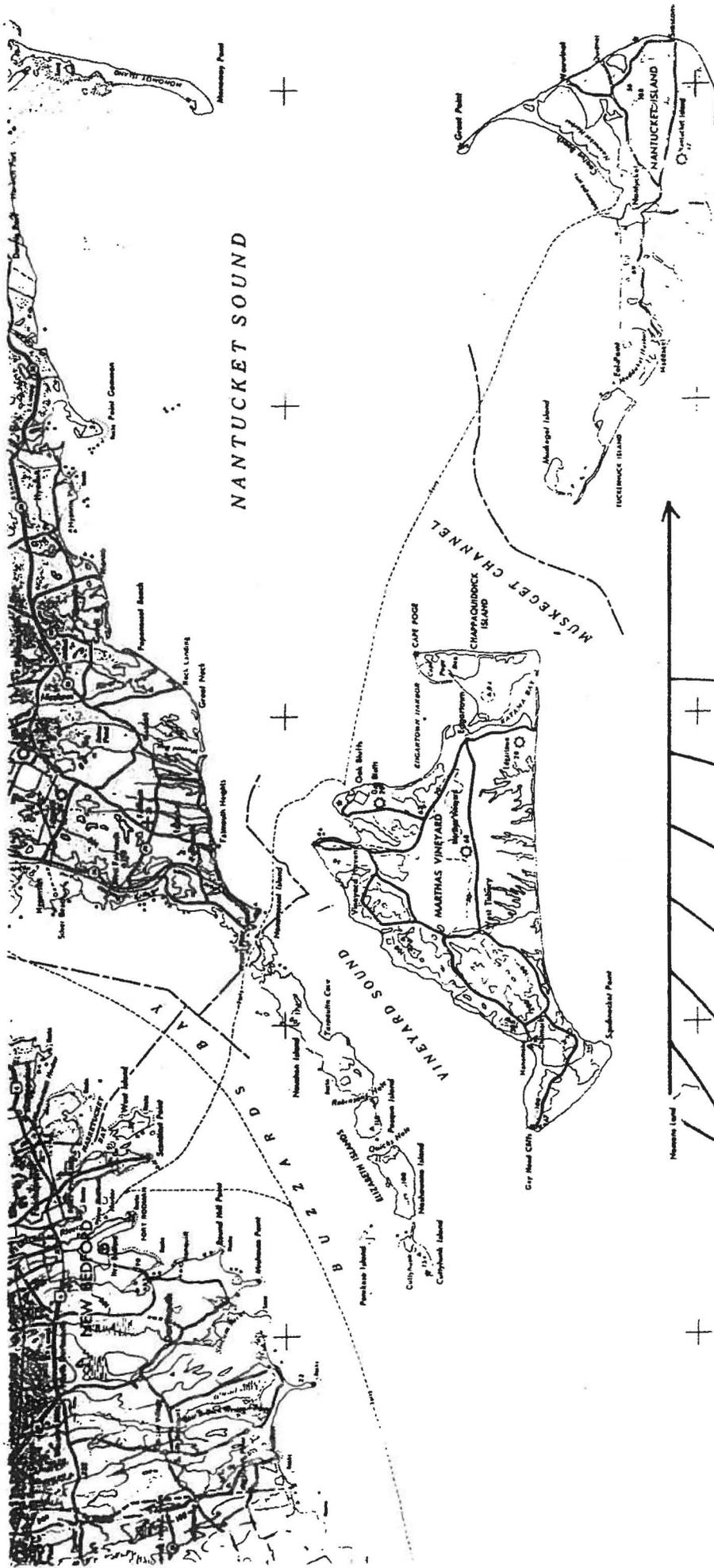
Nomans Land Island
Chilmark, Massachusetts





Aerial Ignition Plan

* ▣ indicates grid with 100ft by 100ft ignitions



Appendix B

Technical Review Checklist

TECHNICAL REVIEWER CHECKLIST

PRESCRIBED FIRE PLAN ELEMENTS:	S /U	COMMENTS
1. Signature page		
2. GO/NO-GO Checklists		
3. Complexity Analysis Summary		
4. Description of the Prescribed Fire Area		
5. Goals and Objectives		
6. Funding		
7. Prescription		
8. Scheduling		
9. Pre-burn Considerations		
10. Briefing		
11. Organization and Equipment		
12. Communication		
13. Public and Personnel Safety, Medical		
14. Test Fire		
15. Ignition Plan		
16. Holding Plan		
17. Contingency Plan		
18. Wildfire Conversion		
19. Smoke Management and Air Quality		
20. Monitoring		
21. Post-burn Activities		
Appendix A: Maps: Vicinity and Project		
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Appendix C: Complexity Analysis		
Appendix D: Job Hazard Analysis		
Appendix E: Fire Behavior Modeling Documentation or Empirical Documentation		
Other		

S = Satisfactory

U = Unsatisfactory

Recommended for Approval:

Not Recommended for Approval:

Technical Reviewer

Qualification and currency (Y/N)

Date

Approval is recommended subject to the completion of all requirements listed in the comments section, or on the Prescribed Fire Plan.

Appendix C
Complexity Analysis

COMPLEXITY ANALYSIS

Prescribed Fire Complexity Rating System Guide Worksheet

Project Name Nomans Land Island UXO Pre-Clearance Number _____
 Complexity elements:

1. Potential for Escape

Risk	Rationale
Preliminary Rating: Low Moderate High	Escape fire will not occur as the burn unit is an island 2.7 miles away from the nearest land.
Final Rating: Low Moderate High	
Potential Consequences	Rationale
Preliminary Rating: Low Moderate High	There is no concern of escape fire and therefore there are no potential consequences.
Final Rating: Low Moderate High	
Technical Difficulty	Rationale
Preliminary Rating: Low Moderate High	There are no holding operations planned for the burn unit. The fire will be allowed to burn to the Island's extents.
Final Rating: Low Moderate High	

2. The Number and Dependency of Activities

Risk	Rationale
Preliminary Rating: Low Moderate High	The unit will be aurally ignited using specialized firing equipment, therefore special management or skilled positions will be needed.
Final Rating: Low Moderate High	
Potential Consequences	Rationale
Preliminary Rating: Low Moderate High	Aerial ignition will complete the burn and coordination will be established before and during the project to maximize coordination amongst the crew.
Final Rating: Low Moderate High	
Technical Difficulty	Rationale
Preliminary Rating: Low Moderate High	Communication between the Burn Boss and remaining personnel will be continuous throughout the project therefore limiting chances tactical confusion. A pre-burn briefing and an accompanying Incident Action Plan will greatly minimize confusion over strategic/tactical operations, communication procedures and safety practices.
Final Rating: Low Moderate High	

3. Off-Site Values

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Escape fire to off-site values will not occur as the burn unit is an island 2.7 miles away from the nearest land.
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	There is no concern of escape fire and, therefore, there are no potential consequences.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Protection of private property will not require special management needs or equipment during the implementation.
Final Rating: <i>Low Moderate High</i>	

4. On-Site Values

Risk	Rational
Preliminary Rating: <i>Low Moderate High</i>	On site values do not require additional complexities or special management considerations during planning, preparation, or implementation phases.
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Due to the lack of additional complexities or special management considerations/abatement needed, implementation will not damage special features or cause failure to the project as a whole.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	If any special features are found, they will be easily protected from adverse effects associated with implementation.
Final Rating: <i>Low Moderate High</i>	

5. Fire Behavior

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	The burn will be allowed to burn to the Island's extents and will extinguish at the shoreline. The fire behavior is predictable.
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	There is no vegetation outside of the burn unit.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Safety precautions pertaining to the predicted fire behavior will be addressed during the pre-burn briefing.
Final Rating: <i>Low Moderate High</i>	

6. Management Organization

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Staffing for the project will consist of two levels of supervision. The staff will include a qualified Burn Boss, a helicopter pilot and a ping-pong machine operator.
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Problems may be encountered if tactical operations are not communicated clearly between supervisors and subordinates. Communication breakdown may compromise safety for assigned personnel. A pre-burn briefing with all assigned personnel will take place on the morning of the burn. The briefing will include: objectives, tactical operations, communication procedures, safety, weather, fire behavior, and contingency plans. Every assigned personnel will receive a written Incident Action Plan to include the above. This will limit the potential for confusion greatly and provide for an organized implementation of the project.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	All assigned personnel on the project will be qualified for the tasks required. Qualified personnel will be used in positions and individuals assigned to training positions will have a qualified person working above them.
Final Rating: <i>Low Moderate High</i>	

7. Public and Political Interest

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Smoke should not be visible from either Martha's Vineyard or the Mainland.
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Due to the fact that an escape fire is unexpected, damage to the public perception of the Island will not occur.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Community meetings are not needed prior to the burn. Media is not anticipated and an information officer will not be required. Pre-burn notifications do not require any extra complexity.
Final Rating: <i>Low Moderate High</i>	

8. Fire Treatment Objectives

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Objectives are fairly limited and the range of results for fuel loading reduction ranges should be obtained if the unit is burned under the prescribed parameters. Favorable weather and fuel conditions will be monitored prior to the burn to allow for implementation. A test fire done by direction of the Burn Boss will be evaluated for effectiveness and determination will be made to proceed or not with burn unit ignition.
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Favorable conditions (burn parameters) will be needed during the prescribed season and a limited window of opportunity is a concern resulting in the postponement of the burn. Short and long term adverse effects on the natural resources are not anticipated.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Measures to achieve the burn objectives are easy to complete and involve fairly simple ignition tactics. Special firing configurations will not be used and fire intensity and behavior can be influenced by the planned ignition sequence. Burn monitoring during the ignition phase will be implemented for objective attainment. Documentation of post burn of monitoring will be obtained.
Final Rating: <i>Low Moderate High</i>	

9. Constraints

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Poor weather is the main constraint. A drought, precipitation, or stagnant weather patterns outside the suggested burn parameters may cause postponement and/or cancellation of the project.
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Due to the narrow window of opportunity (season), optimal burn parameters may not be achieved, therefore resource objectives and range of results may not be satisfied. If the burn unit is not ignited within the scheduled time frames, a lengthy postponement may cause an increase in fuel loadings. Limitations on the available tactics are not an issue therefore decreasing chances of unexpected or adverse events.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Due to no constraints being put on equipment use and tactical operations, the project should be completed within the given time frames. The organizational structure should remain constant with little or no changes being made prior to project execution.
Final Rating: <i>Low Moderate High</i>	

10. Safety

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	A thorough pre-burn briefing will address multiple topics, including pertinent safety issues and topics associated with the burn. Tactics, operational assignments, weather/fire behavior, the use of specialized equipment/ techniques will be discussed in detail. Special safety topics such as wind shifts, working with aircraft and specialized fire equipment and snag avoidance will be discussed.
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Due to the scope and size of the project, there is limited potential for serious injuries and accidents to occur for the public and assigned personnel. A safety officer is not required for this project; however, the Burn Boss will be continuously monitoring the progress of the ignition, communicating weather and fire behavior and designating escape routes throughout the project duration.
Final Rating: <i>Low Moderate High</i>	

Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Safety mitigation measures will be continuously monitored and communicated to all personnel. Aerial ignition will be used with an approved Project Aviation Safety Plan approved and adhered to during implementation. The Burn Boss and a dedicated weather observer will remain in contact with one another so wind shifts or other adverse weather effects are identified quickly. Public safety in terms of escape fire is not expected, however, smoke management issues will need to be addressed prior to implementation. (See Smoke Management).
Final Rating: <i>Low Moderate High</i>	

11. Ignition Procedures/Methods

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	The firing method for this unit will be by aerial ignition. Since a helicopter is to be used for aerial ignition, a trained Burn Boss RXB2 or higher will be used and have familiarity with the use of a PSD and aerial ignition as a whole. Only experienced and trained aviation personnel will be involved. Due to the relatively small size of the unit and non-irregular shape of the unit, ignition will be moderate in complexity and supervision from an Ignition Specialist will be adequate. Sequence and timing of the burn unit will be non-complex. The Burn Boss should have decent visibility of ignition stages.
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	If increased spotting, torching or increased fire behavior is observed, ignition tactics will be modified to produce minimal fire behavior.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Aerial firing methods and use of specialized equipment (Helicopter/PSD) will be used requiring trained specialists and requirements; therefore, safety needs, strategic and tactical thoroughness will be needed to address their use.
Final Rating: <i>Low Moderate High</i>	

12. Interagency Coordination

Risk	Rationale
Preliminary Rating: Low Moderate High	The prescribed fire project will not involve the use of other land management agency personnel/equipment. Pre-burn coordination with the contact list is required and vital to the success of the project.
Final Rating: Low Moderate High	
Potential Consequences	Rationale
Preliminary Rating: Low Moderate High	Project success does not require interagency coordination.
Final Rating: Low Moderate High	
Technical Difficulty	Rationale
Preliminary Rating: Low Moderate High	As there is no requirement for interagency coordination, there will be no technical difficulty in implementing.
Final Rating: Low Moderate High	

13. Project Logistics

Risk	Rationale
Preliminary Rating: Low Moderate High	This project will require quality logistics support for its success. Communication and radio interoperability is a special logistical need for the success of the project.
Final Rating: Low Moderate High	
Potential Consequences	Rationale
Preliminary Rating: Low Moderate High	A potential problem could be an equipment breakdown of a critical resource (helicopter/PSD) that would delay or cancel implementation of the project. This could create obvious safety concerns. On the morning of the burn, resources to be used on the project will be checked thoroughly for mechanical problems/deficiencies using preventative maintenance checklists. Prior to the burn, these checklists will be submitted to the Burn Boss for review.
Final Rating: Low Moderate High	
Technical Difficulty	Rationale
Preliminary Rating: Low Moderate High	Logistical support will be low in complexity. Coordination and communication between personnel will be required. Some additional effort may be needed to arrange travel schedules and lodging.
Final Rating: Low Moderate High	

14. Smoke Management

Risk	Rationale
Preliminary Rating: <i>Low Moderate High</i>	The project is expected to produce fairly light smoke for a short duration. Very little to no smoldering will be expected due to the lack of a substantial duff and herbaceous component; therefore, excessive smoke output and emissions will not be an issue. Smoke is not anticipated to the public roads off of the Island due to the prescribed atmospheric and meteorological conditions. **See Smoke Management section within the plan for further mitigations**
Final Rating: <i>Low Moderate High</i>	
Potential Consequences	Rationale
Preliminary Rating: <i>Low Moderate High</i>	Reductions in visibility and public safety dangers are not anticipated. Communications with the NWS office and fire weather forecaster will be established with specific smoke management issues addressed. This will include, wind direction, mixing heights and transport speeds, dispersion and/or stagnation indexes and the probability of fog.
Final Rating: <i>Low Moderate High</i>	
Technical Difficulty	Rationale
Preliminary Rating: <i>Low Moderate High</i>	**See smoke management portion of the plan. ** A fire forecast will be obtained and only if dispersion indexes are favorable will the implementation occur. Due to the light fuels and limited smoldering, smoke problems emanating from the Island are not anticipated. Due to the fuel type, nighttime inversions should not pose a problem due to the lack of heavy fuel smoldering, so smoke patrols or extended shifts will not be needed. Mop up will be minimal.
Final Rating: <i>Low Moderate High</i>	

COMPLEXITY RATING SUMMARY

RISK OVERALL RATING _____ Low _____

POTENTIAL CONSEQUENCES OVERALL RATING _____ Low _____

TECHNICAL DIFFICULTY OVERALL RATING _____ Low _____

SUMMARY COMPLEXITY RATING _____ Low _____

RATIONALE: This project has an overall rating of low complexity. The tally per each element is listed below.

Risk:

High	0
Moderate	4
Low	10

Potential Consequences:

High	0
Moderate	4
Low	10

Technical Difficulty:

High	0
Moderate	4
Low	10

Prepared by: _____ Date: _____

Approved by: _____ Date: _____
(Agency Administrator)

Appendix D

Job Hazard Analysis

Aerial Ignition PSD Job Hazard Analysis

Helicopter Manager/Pilot review with all participants as part of preflight briefing.

JOB HAZARD ANALYSIS (JHA) <i>(Instructions on next page)</i>	1. WORK PROJECT/ACTIVITY Plastic Sphere Dispenser Operations	2. LOCATION Nomans Land Island	3. UNIT
	4. PREPARED BY Kirsten Myers	5. JOB TITLE Engineer	6. DATE 3/18/08
7. TASKS/HAZARDS	8. ABATEMENT ACTIONS		
Unqualified Personnel	Sphere Dispenser Operator shall have prior experience. Pilot and helicopter will be properly FAA qualified under FAR Part 135 rules. Pilot will be knowledgeable in fire behavior and trained in use of the fire shelter.		
Unknown Responsibilities	The project briefing will cover responsibilities and emergency procedures.		
Aircraft Avoidance	See and avoid. Check Military Training Routes (MTR) in advance. Practice risk management. Fly established airport patterns, initiate and stay in radio contact.		
Weather	Use weather advisory. Maintain VFR minimums, cancel mission if necessary.		
High/Hot/Heavy	Performance planning complete/insure accurate load calculations. Do not place the aircraft in performance related situations.		
Low level obstacles	Complete a high level recon, no unnecessary low level flights.		
Doors off helicopter operations	Use secondary restraint harness in addition to seat belt. Remove/secure loose items from cabin. Know Velocity Never to Exceed (VNE).		
Pilot not familiar with area	Supply hazard maps. Complete high-level recon prior to low-level work, identify project area.		
Noise, rotor wash	Wear ear and eye protection.		
Unplanned aircraft events	All personnel equipped with required PPE and trained in crash procedures. Review Crash Rescue/Medevac plan. Utilize Personnel Flotation Device when required.		
Hazardous materials	Qualified personnel will handle, review MSDS, inform pilot.		
Communications	Maintain communications at all times, establish back-up alternate frequencies. Take handheld radio along. Call in prior to landing.		
Rotor hazards	Pilot perform aircraft safety briefing, approach/depart safely or after shutdown and rotors stop.		
Multiple project aircraft	Adequate aerial supervision. Maintain aircraft separation and positive communications.		
PSD Equipment	Bench testing will be completed prior to any operational mission and conducted a safe distance away from aircraft.		
Spheres/Glycol	MSDS sheets on-site and reviewed, personnel briefed on hazards, transportation of hazmat complies with agency direction.		
Ignition Issues	Conduct orientation flight with Ignition Specialist, hang fire mitigation and escaped fire contingency established, must complete all operational checklists prior to starting operations.		
Aircraft Fueling	Vendor responsibility. No agency personnel on board. Aircraft shutdown unless closed circuit, open port in accordance with NFPA 407 3-21, 4073-21.2(b). Trained personnel staff extinguisher.		
Missing Aircraft, Crash/Search & Rescue	Duties assigned for extraction, suppression and flight following.		
PSD Malfunctions	Malfunctions will be addressed in project briefing. Operator will immediately notify pilot of problem and take appropriate action to correct. If malfunction cannot be corrected in the air, the helicopter will land. If fire occurs that the operator cannot extinguish, the pilot will be notified and the machine jettisoned.		
9. LINE OFFICER OR DESIGNEE SIGNATURE Nort Phillips	10. TITLE Burn Boss		11. DATE

PSD Job Hazard Analysis (continued)

JHA Instructions	Emergency Evacuation Instructions		
<p>The JHA shall identify the location of the work project or activity, the name of employee(s) writing the JHA, the date(s) of development, and the name of the appropriate line officer approving it. The supervisor acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.</p> <p>Blocks 1, 2, 3, 4, 5, and 6: Self-explanatory.</p> <p>Block 7: Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP).</p> <p>Identify all known or suspect hazards associated with each respective task/procedure listed in Block 7. For example:</p> <ol style="list-style-type: none"> a. Research past accidents/incidents b. Research the Health and Safety Code, FSH 6709.11 or other appropriate literature. c. Discuss the work project/activity with participants d. Observe the work project/activity e. A combination of the above <p>Block 8: Identify appropriate actions to reduce or eliminate the hazards identified in Block 7. Abatement measures listed below are in the order of the preferred abatement method:</p> <ol style="list-style-type: none"> a. Engineering Controls (the most desirable method of abatement). For example, ergonomically designed tools, equipment, and furniture. b. Substitution. For example, switching to high flash point, non-toxic solvents. c. Administrative Controls. For example, limiting exposure by reducing the work schedule; establishing appropriate procedures and practices. d. PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chainsaws, rock drills portable water pumps). e. A combination of the above. <p>Block 9: The JHA must be reviewed and approved by a line officer. Attach a copy of the JHA as justification for purchase orders when procuring PPE.</p> <p>Blocks 10 and 11: Self-explanatory.</p>	<p>Project Supervisor and crew members are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a person(s) becomes seriously ill or injured at the worksite.</p> <p>Be prepared to provide the following information:</p> <ol style="list-style-type: none"> a. Nature of the accident or injury (<i>avoid using names</i>). b. Type of assistance needed, if any (<i>ground, air, or water evacuation</i>). c. Location of accident or injury, best access route into the worksite (<i>road name/number</i>), identifiable ground/air landmarks. d. Radio frequency(s). e. Contact person. f. Local hazards to ground vehicles or aviation. g. Weather conditions (<i>temp., wind speed & direction, visibility</i>). h. Topography. i. Number of person(s) to be transported. j. Estimated weight of passengers for air/water evacuation. <p>The items listed above serve only as guidelines for the development of emergency evacuation procedures.</p>		
<p>JHA and Emergency Evacuation Procedures Acknowledgment</p> <p>We, the undersigned Project Supervisor and crew members, acknowledge participation in the development of this JHA (as applicable) and accompanying emergency evacuation procedures. We have thoroughly discussed and understand the provisions of each of these documents:</p>			
SIGNATURE	DATE	SIGNATURE	DATE

Job Risk Analysis: Aircraft manager/pilot review with all participants as part of preflight briefing

Is everything approved with clear instructions, aviation plan signed and reviewed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Are communications and flight following established, including repeater tones?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Can terrain, altitude, temperature or weather that could have an adverse effect be mitigated?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Are all aerial hazards identified and known to all participants?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Have mitigating measures been taken to avoid conflicts with military or civilian aircraft	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Have adequate landing areas been identified and or improved to minimum standards	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Are all agency personnel qualified for the mission?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Is the pilot carded and experienced for the mission to be conducted?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Are pilot flight and duty times compromised?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Are there enough agency personnel to accomplish the mission safely?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Will adequate briefings be conducted prior to flight to include Pilot, Passengers and Dispatch?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Are all involved aware that the pilot has the final authority, but if any passenger feels uncomfortable, that they can decline the flight?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Is the aircraft capable of performing the mission with a margin of safety?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Have manifests of cargo and passengers, load calculations and/or weight & balance completed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Is the aircraft properly carded?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Do all personnel have the required PPE?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Fuel planning, adequate fuel on board, fuel truck location, availability of commercial fuel?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Remember; maps of areas/sites, handheld radios, cell phones, day/survival packs, sic sacks	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Is there an alternative method that would accomplish the mission more safely?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Will the mission be conducted at low levels? (Below 500' AGL)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Can the same objective be achieved by flying above 500' AGL?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA

Job Hazard Analysis: Aircraft manager/pilot review with all participants as part of preflight briefing

Hazard	Hazard Mitigation
MTR's	Check routes in advance. Practice risk management, confirm that Dispatch has made contact with schedulers to de-conflict
Private aircraft	See and avoid
Airport traffic	Initiate and stay in radio contact
Weather	Use weather advisory. Maintain VFR minimums, cancel mission if necessary
Terrain/Altitude/Temperature	Do not place the aircraft in performance related situations
Low level obstacles	Complete a high level recon, no unnecessary low level flight
Unimproved landings	Recon LZ. Download on first load. Stay in radio contact.
Doors off helicopter operations	Use approved secondary restraint harness. Remove or secure loose items from cabin. Know VNE
Pilot not familiar with area	Supply hazard maps. Complete high level recon prior to low level work, project area identified
Noise, rotor wash	Wear ear and eye protection
Internal and external loads	Qualified personnel assigned to the mission. Do not allow for over-flight of personnel, structures, other aircraft or traffic
Unplanned aircraft events	All personnel equipped with required PPE and trained in crash procedures
Hazardous materials	Qualified personnel will handle, inform pilot
Non aviation personnel	Maintain control, provide through briefings
Communications	Maintain communications at all times, establish backup options, and know alternate frequencies. Take handheld radio along. Call in prior to landing. If radio contact is lost, gain altitude, check frequencies/tones, if unable to re-establish, return to best suitable landing area and check in
Allowable Payload/CG issues	Complete/insure accurate load calculations and/or Weight and Balance
Wintertime operations	Use appropriate clothing for varying altitudes/climatic conditions, consider survival kit
Prop/Rotor hazards	Pilot perform aircraft safety brief, Approach/Depart safely or after shutdown & prop/rotor stop
Multiple project aircraft	Adequate aerial supervision. Carded managers for each aircraft. Maintain aircraft separation and positive communications
Sphere Dispenser Operator	Certified annually, duties and responsibilities assigned and understood, review IAIG, and use proper PPE to include approved harness. Pre and Post operational briefings will be performed
PSD Equipment	Use only approved equipment with current retrofits as per IAIG. Equipment checks prior to operations
Spheres/Gylcol	MSDS sheets on site and reviewed, fire protection in place, personnel briefed on hazards, emergency contingency plan reviewed and in place, Transportation of Haz-Mat complies with Agency direction, "No Smoking" signs posted, no ignition sources
Communications	Flight following established, checked and followed, Communication plan posted at base with discrete freq identified, parking tender outfitted with radio for takeoff/landings
Ignition Issues	Conduct orientation flight with Ignition Specialist, hang fire mitigation and escaped fire contingency established, must complete all operational checklists prior to starting operations
Aircraft Fueling	Vendor responsibility. No agency personnel onboard. Aircraft shutdown unless closed circuit, open port in accordance with NFPA 407 3-21, 4073-21.2(b). Trained personnel staff extinguisher
Missing Aircraft, Crash/Search & Rescue	Duties assigned for evacuation , suppression and flight following. Dispatch/Helibase responsible to have current Aviation Incident Response/Crash SAR Plan posted and ready to implement
Project Manager signature:	Date:

Aerial Ignition pre-planning checklist

Prescribed Burn plan approved	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Aviation Safety Plan approved	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Burn blocks prepped for aerial ignition	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
PSD/Helitorch Equipment serviced and ready	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Flight Helmets for all occupants of A/C	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Adapters needed/available	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Extra Gelling Agent/Propane/Spheres available/where	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Backup/spare PSD/Helitorch	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Crash rescue equipment ready	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Helispots prepared and approved	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Fire Suppression needs (extinguishers, foam, Engine, CAF) Available	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Enough qualified people available	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
PSD Operator(s)	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Helicopter mgr (s)	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Helibase mgr.	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Helitorch mgr.	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Parking Tender (s)	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Mix Master	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Mixing Crew	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Fire Protection Group	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
Approved aircraft availability	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
A/C and Fuel truck reserved/scheduled the week before	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.
	<input type="checkbox"/> yes	<input type="checkbox"/> no	<input type="checkbox"/> N.A.

Cost

Location of A/C

PSD Air Operations/Safety GO/NO GO Checklist: The helicopter operations on this project require the use of this checklist, if all items are not checked as satisfactory and maintained in that state for the duration of the mission, flying operations will be aborted

Helibase Safety

- Approved Project Aviation Safety Plan
- Qualified Helibase/Helispot Manager assigned.
- Helibase/helispot meet established standards.
- Organizational chart posted, assignments known.
- Communications chart posted. Frequency assignments known.
- Helibase/helispot fire protection meets established standards.
- Crash rescue/evacuation kits on the helibase/helispot.
- Current Aviation Incident Response Plan posted at Dispatch/Helibase and ready to implement.
- All personnel briefed. Aerial ignition personnel briefed on in-flight operations.
- Separation of aircraft (if more than one used).
- Personal protective equipment meet established standards.
- Flight hazard map posted/hazards known to pilot.

Aircraft/Pilot(s)

- Check pilot and aircraft approval cards.
- Check pilot and aircraft limitations.
- Load calculations prepared and posted.
- Check aircraft radios.
- Remove all loose articles from aircraft.
- Fire shelter on board aircraft for each person.
- Water bucket ordered with aircraft (optional).
- Approved Secondary Restraint Harness and approved aircraft hardpoint to attach to.

Plastic Sphere Dispenser

- Installation correct with restraints in place.
- Mechanical operation satisfactory.
- Extinguisher (water reservoir) system filled and operational.
- Glycol reservoir filled and tightly capped.
- 20-second ignition delay achieved.
- Intercom and aircraft-to-ground communications operable.
- Pilot has been briefed and agrees that all is in order.
- Sphere containers secured.
- Knife available for emergency use.
- Additional container of water available.
- Tool kit/Premo Mark III manual on board aircraft (optional).

Burning Operations

- All persons briefed and assignments known.
- Maps/photos of project area used/posted.
- Special weather considerations known/discussed.
- Communication plan posted and frequency assignments known.
- Emergency operations plan known and discussed.
- Personal protective equipment meets established standards.
- Special safety considerations known and discussed.

Support Equipment/Personnel

- Adequate support equipment/personnel to complete mission.
- Pump/engine operational checks.
- Radios/communications operationally checked.
- Support equipment/personnel propositioned before actual operations begin.
- Adequate supply of plastic spheres and glycol to complete project.
- PSD checklist complete.

The following signatures certify that all of the above checklist items have been accomplished.

PSD Operator

Date

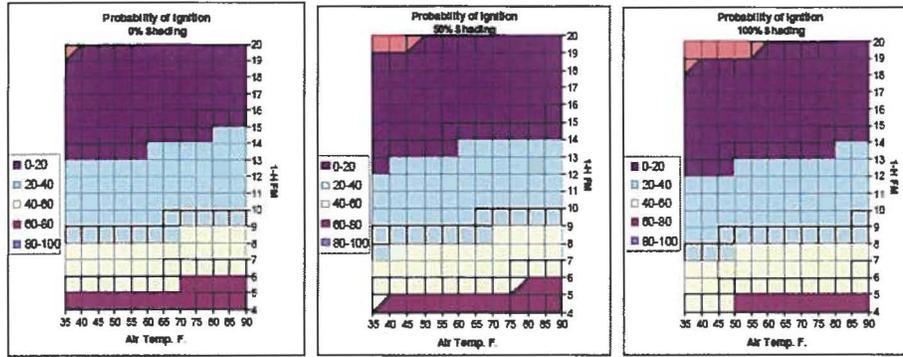
Burn Boss/Ignition Specialist

Date

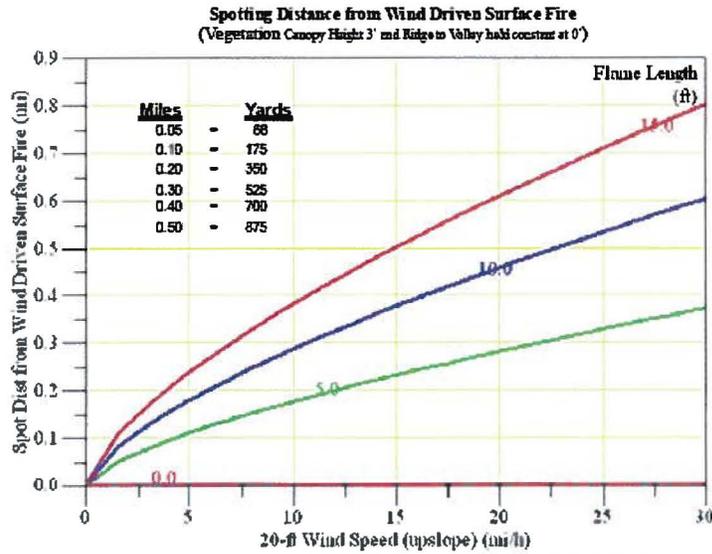
Appendix E

Fire Behavior Modeling Documentation or Empirical Documentation

Probability of Ignition [Run in BEHAVE by Remsoft Professional vs 5.0]:



Spotting Distance [Run in BEHAVEPLUS v.3.0.2]



Fire Size [Run in BEHAVEPLUS v.3.0.2]

