

# PRESCRIBED FIRE PLAN

ADMINISTRATIVE UNIT(S): Brookhaven National Lab (BNL)

PRESCRIBED FIRE NAME: Brookhaven National Lab Northeast Units

PREPARED BY: Brian Kurtz, RXB2 DATE: 09/18/2007

The Nature Conservancy Reviewed: 09/23/2008

TECHNICAL REVIEW BY: Bryan Gallagher DATE: 10/03/2008

NYSDEC

NATURAL RESOURCE REVIEW BY: Tim Green DATE: 09/22/2008

BNL FIRE REVIEW BY: Charles LaSalla DATE: 09/23/2008

EMERGENCY PLANNING REVIEW BY: George Goode DATE: 09/22/2008

DOE REVIEW BY: Gerald Granzen DATE: 10/23/2008

COMPLEXITY RATING: LOW

APPROVED BY: Michael Holland DATE: 10/23/2008

Michael Holland, DOE-BHSO

APPROVED BY: Michael Bebon DATE: 10/24/2008

Michael Bebon, BNL

Plan Rewrite: October 2012

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**ELEMENT 2: AGENCY ADMINISTRATOR PRE-IGNITION APPROVAL  
CHECKLIST – BNL & DOE ADMINISTRATORS**

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 shall be completed before a prescribed fire can be implemented. For the purposes of BNL, the agency administrator is Michael Holland for the Department of Energy and Michael Bebon for the Laboratory. 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
X		Is the Prescribed Fire Plan up to date? <i>Hints: amendments, seasonality.</i>
X		Will all compliance requirements be completed? <i>Hints: cultural, threatened and endangered species, smoke management, NEPA.</i>
X		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>
X		Will all elements of the Prescribed Fire Plan be met? <i>Hints: Preparation work, mitigation, weather, organization, prescription, contingency resources</i>
X		Will all internal and external notifications and media releases be completed? <i>Hints: Preparedness level restrictions</i>
X		Will key agency staff be fully briefed and understand prescribed fire implementation?
	X	Are there any other extenuating circumstances that would preclude the successful implementation of the plan?
X		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: Brian Kurtz Date: 9/18/2007 Annual Review  
Prescribed Fire Burn Boss Type II 09/23/2008

Approved by: Michael Holland Date: 10/23/2008  
Michael Holland, DOE-BHSO

Approved by: Michael Bebon Date: 10/24/2008  
Michael Bebon, BNL

Approval expires (date): 10/23/2009

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**ELEMENT 2: PRESCRIBED FIRE GO/NO-GO CHECKLIST**

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

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
_____	_____
DOE Representative                      Date	BNL Representative                      Date

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**ELEMENT 3 COMPLEXITY ANALYSIS SUMMARY**

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

<b>COMPLEXITY RATING SUMMARY</b>	
	<b>OVERALL RATING</b>
<b>RISK</b>	LOW
<b>CONSEQUENCES</b>	LOW / MODERATE
<b>TECHNICAL DIFFICULTY</b>	LOW
<b>SUMMARY COMPLEXITY DETERMINATION</b>	LOW
<p><b>RATIONALE:</b> The proposed action requires standard burn methods, coordination, safety mitigation and communication. BNL has a community of private residences to the north and infrastructure to the west and southwest of the unit. These areas are not immediately adjacent to the burn unit. Any fire outside of the intended unit has the potential for containment prior to impacting these values. Contingency planning addresses these potential consequences with staffing for at least one engine or brush truck by the BNL fire department, as well as the ability to receive mutual aid resources provided by local volunteer fire departments (Ridge and Manorville). The safety and risk factors are mitigated by low fuel loading / fuel bed depth and wide roads surrounding unit.</p>	

## ELEMENT 4: DESCRIPTION OF PRESCRIBED FIRE AREA

### A. Physical Description

1. Location: Brookhaven National Laboratory

Brookhaven National Laboratory (“BNL”) is located in Upton, Town of Brookhaven, County of Suffolk, New York. BNL is a federal facility owned by the Department of Energy. The Northeast Units are located in the northeastern corner of BNL, immediately west of East Firebreak Road.

Legal Description: Lat. 40 52' 56.18" N      Long. 72 50' 59.67" W

2. Size: Northeast Units: 58.4 acres
3. Topography: Northeast Units: flat
4. Project Boundary: The prescribed fire blocks are rectangular in shape and are surrounded by woods roads and firebreaks 20 - 80 feet wide on all four sides. Fire vehicles can access all sides of the unit. The Northeast Units is divided into 4 subunits, each approximately 15 acres in size.

### B. Vegetation/Fuels Description:

1. On-site fuels data:

The 58.4 acre unit consists of hardwood forest with a canopy height of from 40 to 60 ft. Overstory species at the site include red oak (*Quercus rubra*), black oak (*Quercus velotina*) and pitch pine (*Pinus rigida*). The average percent density of overstory trees throughout the entire burn unit consists of 37% live oaks, 42% dead oaks, 19% live pines, and 2% dead pine. The dominant overstory species varies per stand in each subunit (see charts below).

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<b>Sub Unit</b>	<b>Stand</b>	<b>Species</b>	<b>% Density</b>	<b>BA</b>
A	1	Oak – live	3	5
		Oak – dead	74	50
		Pine – live	23	73

<b>Sub Unit</b>	<b>Stand</b>	<b>Species</b>	<b>% Density</b>	<b>BA</b>
A	2	Oak – live	29	45
		Oak – dead	58	25
		Pine – live	13	20

<b>Sub Unit</b>	<b>Stand</b>	<b>Species</b>	<b>% Density</b>	<b>BA</b>
B	3	Oak – live	45	58
		Oak – dead	45	36
		Pine – live	10	28

<b>Sub Unit</b>	<b>Stand</b>	<b>Species</b>	<b>% Density</b>	<b>BA</b>
C	4	Oak – live	45	36
		Oak – dead	38	30
		Pine – live	17	50

Note: BA = basal area of tree (the cross sectional area taken at 4.5 feet above ground level)

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<b>Sub Unit</b>	<b>Stand</b>	<b>Species</b>	<b>% Density</b>	<b>BA</b>
C	5	Oak – live	40	54
		Oak – dead	51	25
		Pine – live	4	8
		Pine – dead	5	13

<b>Sub Unit</b>	<b>Stand</b>	<b>Species</b>	<b>% Density</b>	<b>BA</b>
D	6	Oak – live	69	55
		Oak – dead	13	8
		Pine – live	11	23
		Pine – dead	7	5

<b>Sub Unit</b>	<b>Stand</b>	<b>Species</b>	<b>% Density</b>	<b>BA</b>
D	7	Oak – live	27	20
		Oak – dead	20	7
		Pine – live	53	63

These stands have been affected in the recent past by multiple defoliations by the orange striped oakworm and other insect defoliators, resulting in the high number of dead standing oak snags in the project area (see above).

The understory is dominated by blueberry species (*Vaccinium spp.*), black huckleberry (*Gaylussacia baccata*) and to a lesser extent by black oak (*Quercus velutina*). It is moderate in density and averages 25,529 stems per acre (huckleberry/blueberry). The understory layer ranges from 0.1 to 2 feet in height (avg. 1.6 feet). Slash depth ranged from 0.1 to 6.5 feet (avg. 8.5 inches). Leaf litter depth ranges from 1 to 8 inches (avg. 3 inches). The principal fuels of the forest stands at the burn site will be the leaf litter, portions of the woody understory, and downed woody material. Average weighted fuel bed depth for this unit is 0.41 ft. A custom fuel model has been developed for these units based on down woody fuel transects and harvest plots. The southern most 8.6 acres of subunit A, was burned through the

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use of prescribed fire in October 2006.

2. Adjacent fuels data: Fuels outside the unit are similar in structure and composition to the fuels inside the project area. Overstory fuels east of the firebreak become more dominated by pitch pine and pine needle litter than inside the unit.

### **C. Description of Unique Features:**

The prescribed fire area is adjacent to an area fenced in to protect a former scientific study site active between 1961 and 1978. This enclosure is just west of the prescribed fire unit on the west side of Old Margin Path (fire break). Inside the enclosure are historical trenching grounds most recently used by the military during World War I and the inner fence and abandoned structures of the scientific study. The East Firebreak Road, as well as the North Firebreak Road, are also the right-of-way for high tension power lines (138 kV and 69kV).

The lack of fire over the last 75 years, has led to a reduction in suitable habitat conditions for a variety of wildlife. The subunit is currently utilized by white-tailed deer and eastern wild turkey. The habitat potentially could be utilized by whippoorwill and other migratory songbirds. No threatened or endangered species are known to exist in the unit.

## **ELEMENT 5: GOALS AND OBJECTIVES**

### **A. Goals:**

Maintain a buffer along eastern and northern portions of the lab where hazardous fuels are reduced while the role of fire is restored in maintaining oak-pine and pine-oak forests.

1. Provide for firefighter and public safety (in the event of wildfire) through the reduction of hazardous fuels.
2. Minimize smoke impacts during wildfire events, by conducting prescribed fires when conditions allow for better lift, direction and dispersal, thereby minimizing impacts to sensitive receptors. Gain additional information on smoke behavior in this region of the Central Pine Barrens.
3. Improve conditions that will increase the probability of oak seedling germination and success.
4. Demonstrate differences in seasonality of treatments for both fire behavior and fire effects to enhance effectiveness of future prescribed fire actions.
5. Gain information regarding fire behavior within the treatment unit.
6. Provide training opportunities to enhance the experience of regional interagency prescribed fire and wildfire suppression crews.

### **B. Objectives:**

1. Reduce existing litter, i.e. 1 and 10 hour fuels, by 30 - 90%.
2. Top kill 30 - 90% of the shrub component of the understory.
3. Expose 2 - 30% of bare mineral soil sites over the unit area
4. Monitor and record smoke and fire behavior for future local reference.
5. Provide experience for crew members in ignitions and holding operations and trainee roles.

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**ELEMENT 6: FUNDING:**

**A. Cost:** Contribution of equipment and expendables by partner agencies.

**B. Funding source:** The burn will be conducted utilizing a combination of cooperating agencies including, but not limited to, New York Wildfire and Incident Management Academy, The Nature Conservancy, New York State Department of Environmental Conservation, as well as the US Fish & Wildlife Service. Each respective cooperating agency will cover the costs of their personnel and use of their equipment.

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**ELEMENT 7: PRESCRIPTION**

**A. Environmental Prescription:**

Characteristic	Lower Value	Upper Value
Wind Direction	NE, N, W, S, SE	Restricted East
Wind Speed (Midflame)	0 mph	10 mph
Wind Gusts	0 mph	15 mph
Temperature	30	95
Relative Humidity	25%	70%
1- Hour Fuel Moisture	6%	18%
Mixing Height	1000'	

**B. Fire Behavior Prescription:**

CHARACTERISTIC	Head Fire Growing Season	Backing Fire Growing Season	Head Fire Dormant Season	Backing Fire Dormant Season
FUEL MODEL: Custom FM based on dwf transects, harvest plots, and SO tally @ 6% 1hr, 7% 10hr				
Rate of Spread (chains/hr)	2.8 – 22.3	0.4-0.5	3.6 – 28.1	0.5 – 0.6
Flame Length (ft)	2.7 – 7.1	1.1-1.2	3.1-7.9	1.3

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### ELEMENT 8: SCHEDULING

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

Burn Dates	January 1 – December 31
Time of Day	0900 - 2000 hrs (see constraint below)

**B. Projected Duration:** The prescribed fire treatment is not expected to last more than one operational period (typically a workday – nominally up to 12 hours). There is a potential that the prescribed fire area may be broken down into sub-units, in which case the prescribed fire treatments could be on more than one day.

**C. Constraints:** Smoke must be directed away from highways and residences; rise sufficiently and disperse to avoid impacts to surrounding areas, including laboratory areas. No prescribed fire will take place if any impairment to BNL’s water distribution system exists that would prevent operation of the nearest fire hydrants. No ignition activities will be conducted which would start 30 minutes prior to sunset.

### **ELEMENT 9: PRE-BURN CONSIDERATIONS**

#### **A. Considerations:**

1. On Site: Permits and notifications, internal line construction to separate subunits, consideration of specific snags to be felled or protected, special features to be protected, weather recording, monitoring. Smoke may be visible from nearby buildings. Notify Laboratory personnel.
2. Off Site: Smoke may be visible from adjacent residences. Neighbor notification.

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

The National Weather Service (NWS) Fire Weather Forecast (Upton Office) will be monitored prior to the burn. The fire weather forecast is prepared and issued daily by the local National Weather Service Forecast Office. On the day of the burn, a Spot Weather Forecast will be obtained from the local NWS Office through an agreement with the NWS Fire Weather Focal Point. The NWSFO-Upton and Fire Weather Focal Point or Public Forecaster can be reached at 1-631-924-0383 or 1-800-226-0217.

The onsite fire weather will be monitored by a crew member.

**C. Notifications:** Record notifications on contact list (attached).

A press release will be issued a minimum of 1 time per year to local newspapers to alert the public and interested parties to the upcoming prescribed burn seasons at BNL.

Notifications will be the responsibility of BNL's Natural Resource Manager in conjunction with CEGPA.

## **ELEMENT 10: BRIEFING**

### **Briefing Checklist:**

- Burn Organization
- Burn Objectives
- Description of Burn Area
- Expected Weather & Fire Behavior
- Communications
- Ignition plan
- Holding Plan
- Contingency Plan
- Wildfire Conversion
- Safety

## **ELEMENT 11: ORGANIZATION AND EQUIPMENT**

**A. Positions:** The following is the minimum staffing requirements to implement the prescribed burn. Additional resources may be used as available and assigned positions by the Burn Boss.

A single Burn Boss will oversee the project (RxB2). Two squad bosses will be required to supervise the divisions (FFT1). An additional 7 basic firefighters (FFT2) can fill other positions on the fireline. A minimum of ten personnel total, including the safety officer, will be involved with any prescribed burn.

All personnel will have as a minimum in training the fire courses S130/S190 (or equivalent) and physical requirements will include a score of “arduous” (or equivalent) for the pack test for hand crews and a score of “moderate” (or equivalent) via the field test for members of engine crews. (Note: State Agencies have similar requirements for qualifications that are considered appropriate for fire management and prescribed fire.) Personnel may include ( but are not limited to) staff from the U.S. Fish & Wildlife Service, National Park Service, New York State Department of Environmental Conservation, U.S. Department of Agriculture, New York State Parks, The Nature Conservancy, BNL Fire Rescue Group, local volunteer firefighters and other qualified individuals.

Organization will be as follows:

Burn Boss - will coordinate and direct the activities during the burn.

Holding Crew 1 - at least a two-person engine crew headed by a squad boss. (Minimum of 3)

Holding Crew 2 - at least a two-person engine crew headed by a squad boss. (Minimum of 3)

Igniters - Minimum of 2

Smoke/Weather Observer - one or more individuals stationed downwind of the fire on alert for spotting or smoke behavior. This lookout may also serve as weather monitor. Minimum 1

Safety Officer- this individual is responsible for monitoring the safety operations of and around

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the fire, and the perimeter area to ensure that unauthorized access does not occur. The Safety Officer monitors fire operations to ensure all workers are conducting operations in a safe manner and to identify safety issues prior to ignition for mitigation and/or avoidance. If 'normal' operational safety concerns are identified, this individual notifies the Burn Boss (as warranted) of conditions to determine necessity for shutting down operations. In the event of a concern that is immediately dangerous to life and health, the safety officer may direct the shutdown. This position will be filled with a BNL or DOE representative and does not require fireline qualifications.

### **B. Equipment:**

A minimum of one Type 6 engine.

A minimum of one additional engine consisting of a Type 4, 5, 6, or 7.

A minimum of 4 drip torches.

Equipment will be provided and used as determined by the burn boss and made available through the caches of cooperating agencies. Equipment typically includes (but is not limited to) backpack pumps, council rakes, chain saws, wildland engines, drip torches, etc. Each individual on the fire line shall have proper PPE including Nomex Clothing, hard hat, leather boots, eye and ear protection, and fire shelter.

### **C. Supplies**

20-30 gallons of drip torch fuel.

Drinking water.

### **D. Training Burn:**

A small portion of a unit may be burned as part of a live fire training exercise. If the active fire area is less than one acre in size and anchored to roads or previously burned areas fewer crew and equipment will be required. A training exercise may be conducted with one RxB2, one squad boss, and a minimum of 4 additional personnel. One engine and a backup portable pump will be required. Additional engines may take the place of the portable pump. Ecological and

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fuel management objectives may not be met during a training burn. Note that training burns can be conducted on the “cool side” of the prescription (low winds, high RH, high 1hr fuel moisture) as they are small in nature and primarily for demonstration purposes.

No ecological harm occurs from low intensity prescribed fire which provides optimal conditions for training individuals in basic wildland/prescribed fire techniques.

## **ELEMENT 12: COMMUNICATION**

### **A. Radio Frequencies**

At least one radio will be distributed to the burn boss, each holding crew, lookout/smoke spotter and the lead igniter. Radios will also be distributed to each engine. A cellular phone will be on site with the burn boss, smoke spotter and one will be with each squad. Clear text will be used in all communications. Specific communication plans and frequencies will be discussed during briefing and agreed upon by cooperating agencies prior to implementation.

1. Command Frequency(s): to be determined onsite and radio reception verified
2. Tactical Frequency(s): to be determined onsite and radio reception verified
3. Air Operations Frequency(s): to be determined, as needed

**Telephone Numbers:**      **BNL Fire Department EMERGENCY: 631-344-2222**  
BNL Fire-Rescue Duty Captain: 631-344-2351  
Tim Green (cell): 631-872-8794  
George Goode, Emergency Management  
(cell): 631-872-8804

Cellular service and radio transmissions will be verified prior to ignition.

**ELEMENT 13: PUBLIC AND PERSONNEL SAFETY, MEDICAL**

**Safety Hazards:** Fire behavior, smoke impacts to fireline personnel, tripping, dehydration and fatigue (especially in summer months), significant number of snags inside the unit, pockets of catbrier outside unit, tick borne illness, ground nesting bees.

**Measures Taken to Reduce the Hazards:** Each individual on the fire line shall have proper PPE including Nomex Clothing, hard hat, leather boots, eye and ear protection, and fire shelter.

Observers shall have Nomex Clothes, hard hat, full foot cover foot protection (no open-toed shoes), and eye protection.

Personnel being exposed to smoke should be rotated into positions where the smoke is less (based upon fire behavior and their operational position).

Dehydration and fatigue will be discussed with the firefighters at the crew briefing on burn day. It will be the responsibility of squad bosses to monitor personnel.

Snags along the perimeter of the firebreaks will be assessed and felled as necessary before the burn.

Equipment will be provided and used as determined by the burn boss and made available through the caches of cooperating agencies. Equipment typically includes (but is not limited to) shovels, pulaskis, swatters, council rakes, chain saws, wildland engines, drip torches, backpack pumps, etc.

Personnel will be aware of tick and bee presence and avoid areas of high activity. Personnel will check themselves post fire to remove ticks within a 24 hour time period.

Hazards and safety issues will be part of the crew briefing to discuss any issues with the on-site team members.

**Emergency Medical Procedures:** Minor injuries will be handled at the scene. At least one First Aid trained crew member with proper equipment will be on scene.

**Major injuries – call 631-344-2222 from cell phone.**

**Emergency Evacuation Methods:** BNL Fire Department will coordinate evacuation (in the event it is necessary). The unit is surrounded by 2-wheel drive dirt roads. There is a heli-spot at the lab if air evacuation is required.

**Emergency facilities:**

University Medical Center Stony Brook Emergency Room; 631-689-8333

The following are important contact numbers for emergency communication. :

Fire:

BNL Fire Department	344-2222
Suffolk County Dept of Fire, Rescue and Emerg. Services	924-5252
New York State DEC Forest Rangers	444-0291
USFWS Long Island NWR Complex - Office	286-0485
Manorville Fire Department	878-6614/874-3760
Brookhaven Town Fire Marshal	451-6262
Mastic Fire Department	281-2022
Ridge Fire Department	924-3256/924-4080

Medical:

Suffolk County Fire Communication Center	924-5252
University Medical Center Stony Brook Emergency Room (Ext - 1)	689-8333

Nearest Phone:

Cellular phone on site	To be assigned
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Other:

National Weather Service Forecast Office – Upton	924-0383
Long Island Railroad	588-0600
BNL Sewage Treatment Plant (just SW of the burn)	344-2982

**ALL EMERGENCY RESPONSE CAN BE REACHED THROUGH 911, THE ABOVE NUMBERS ARE DIRECT LINES**

**ELEMENT 14 TEST FIRE**

**A. Planned location:** A test fire will be ignited on the down wind side of the burn unit. If results of the test fire are satisfactory, ignition will continue anchored into the test fire. With prevailing northwest winds during the spring, the test fire would anchor into the southeastern most portion of the prescribed fire area that was burned in October 2006. If the burn is conducted during the summer, with prevailing southerly winds, the test fire would anchor off of North Firebreak Road or other internal control line.

**B. Test Fire Documentation:**

1. Weather conditions On-Site: Recorded by weather monitor prior to ignition.
2. Test Fire Results: Recorded by Burn Boss notes.

## ELEMENT 15: IGNITION PLAN

- A. Firing Methods:** The decision on how the units will be burned is at the discretion of the Prescribed Fire Burn Boss with consideration given to weather parameters, fire behavior and smoke behavior characteristics, control factors, and firefighter safety.

Ignition will be performed from the ground primarily by drip torch application. Firing patterns and directions may change depending on wind direction or other parameters. Pre-determined ground contacts (drop points) along portions of the burn unit will be used to help communicate the progress of ignition operations.

General ignition directions will work from the downwind side and progress into the predominant wind direction. Fire behavior will be manipulated using various ignition techniques.

- B. Devices:** The primary ignition source for the burn unit will be hand ignition by drip torch. Fusees and/or a Very pistol with ignition flares may be also used.
- C. Techniques:** Objectives will be to create a safe and secure black line along the downwind burn unit boundaries while adding fire to the interior portions of the unit. Backing, flanking, and strip fires may be utilized to achieve objectives. Fire behavior will be manipulated using various ignition techniques. Primary ignition patterns used may include backing, flanking, and strip-head fires. Dot, chevron and ring head fires may also be used to achieve desired intensity and rate of spread, depending upon conditions.
- D. Sequences:** Firing operations will begin on the downwind side of the unit along the control lines (see project map). Ignition along each division will create a 10-30' wide black line working off the downwind burn unit boundaries. Burn Boss and interior igniters will coordinate with holding crews to ensure proper pace and intensity.

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**E. Patterns:** All ignition team members will use good care and communication to ensure safety of all personnel around the burn unit. Strip and dot firing patterns utilizing the contour and prevailing winds may be used to create an even backing, flanking and/or strip head fire through the interior of the burn unit.

**F. Ignition Staffing:** Two igniters, FFT2 qualifications or higher, will be used during perimeter firing operations. Depending upon conditions, the Burn Boss may use additional igniters in the interior of the unit to achieve objectives.

## **ELEMENT 16: HOLDING PLAN**

**General Procedures for Holding:** Woods roads surrounding the burn unit will be used as burn unit boundaries for holding operations. Internal control lines constructed prior to ignition may be utilized for burning sub units.

Division supervisors (squad bosses) will be responsible for the holding crews and equipment throughout the burn. A minimum of one type 6 wildland engine, one additional type 4, 5, 6 or 7 wildland engine, or portable pumps and six backpack pumps will be available to assist in holding activities. A minimum of three people will be assigned to holding for each division with a minimum of two divisions required for the burn.

Natural and existing barriers (changes in vegetation, burned areas, and trails) will be utilized to contain fire within the burn unit. Division supervisors (squad bosses) may assign Squad Bosses for each division to maintain span of control, as necessary. The Prescribed Fire Burn Boss and Division supervisors shall work together to ensure that the ignition pattern and timing do not present any holding concerns on the burn and is coordinated with appropriate holding actions.

Beyond what the wildland engines can carry, the primary water source will be the fire hydrants, which are approximately 0.75 miles away from the burn unit. The secondary water sources may include portable ponds, additional engines and/or water tenders. Just east of First Street on Forest Path is an old concrete draft site. Here, only 0.5 miles from the burn unit, the Peconic River may be used as an additional water source.

All crew members should denote on the project map the divisions, drop points, access roads, water sources, staging areas and other information during the pre-fire briefing.

**Critical Holding Points and Actions:** Critical holding areas are outside any woods road being used as a firebreak, particularly the enclosed area to the west, which would have access problems associated with it. Concentrated efforts along these boundaries to minimize spread and impacts of any slop-over or spot fires will be taken.

**Minimum Organization or Capabilities Needed:** The holding crews will consist of a minimum of 2 squad bosses and 4 FFT2's (total).

## ELEMENT 17: CONTINGENCY PLAN

**A. Trigger Points:** If spot fires and/or slop-overs can not be contained with on-scene resources and/or immediately threaten private property, the Burn Boss will declare it a wildfire and contact the BNL Fire Department (631-344-2222) and NYSDEC for assistance.

**B. Actions Needed:** In the event of a significant spot fire or slop-over, the nearest resource will size up the fire and report size, location, fuels, fire behavior, and recommended tools and personnel needed for containment. Spot fires outside the burn perimeter within the capability of on-scene resources are considered within the prescription. Ignition of the prescribed fire will cease, if safely possible. Resources will be assigned to take appropriate suppression action on both the prescribed fire and wildfire until contingency resources arrive on scene.

If the fire is declared a wildfire, an incident command post (ICP) shall be set-up in a safe location. The BNL duty fire captain will establish a unified command with the burn boss.

**C. Additional Resources and Maximum Response Time(s):** If the fire exceeds the capability of the crews on hand and/or *immediately threatens private property*, a call will be placed for assistance from local resources through the BNL Fire Department. Typical response time for the BNL Fire Department to the outer portions of the site is within 8 minutes. The contingency plan will be reviewed in the crew briefing.

### **D. STOP WORK AUTHORITY**

Any crew member, the Safety Officer, DOE representative, BSA Representative, or BNL Fire Chief shall have “stop work” authority. Anyone who notices safety issues that may threaten life, health or property has the authority to “stop work.” They shall immediately notify either the Safety Officer or the Burn Boss, identify the safety concern, and request that work be stopped to address the concern appropriately.

If no fire has been ignited, the Burn Boss must terminate the burn in an orderly fashion. If ignition of the unit has begun, the Burn Boss will first take steps to contain the prescribed fire in a safe and effective manner. The Burn Boss may need to continue with and/or complete ignition in order to safely and effectively contain the prescribed fire in the shortest amount of time with the least impact to safety and resources.

## **ELEMENT 18: WILDFIRE CONVERSION**

- A. Wildfire Declared By:** Burn Boss
- B. IC Assignment:** Burn Boss will assume the role of Incident Commander until Unified Command is established or command is transferred to local fire chief.
- C. Notifications: Immediate** - BNL Fire Department to dispatch contingency resources. Secondary (if not present) - Tim Green, Natural Resources Manager at 631-872-8794 and George Goode, Emergency Management at 631-872-8804 (after contingency resources have been requested). Natural resources manager will notify Suffolk County Parks or other public landowners whose property may be threatened.
- D. Extended Attack Actions and Opportunities to Aid in Fire Suppression:** The Burn Boss will coordinate with the BNL fire chief, or designee, to establish a unified command structure and determine appropriate actions for available resources (personnel and equipment). The unified command may turn down resource assignments if safe and appropriate tactics are not utilized.

### **ELEMENT 19: SMOKE MANAGEMENT AND AIR QUALITY**

**A. Compliance:** The weather conditions will be monitored throughout the burning operational period, starting before the test fire is ignited. The smoke dispersal will be monitored through the burn; by the Burn Boss and other burn crew members.

**B. Permits to be Obtained:** A New York State Burn Permit is required for all prescribed burns in Suffolk County. Prescribed burn will not take place without an approved Burn Permit.

#### **C. Smoke Sensitive Areas/Receptors:**

Special safety precautions needing attention include the Long Island Railroad tracks to the south of the burn area and the potential for smoke on roads and impacts to BNL facilities to the west and southwest.

The potential for smoke on roads will be addressed by the use of a spotter or observer. The spotter will be mobile and located downwind from the burn unit. Responsibilities will include monitoring roads and railroads, to ensure smoke is not impacting traffic and facilities/residences. If smoke begins to settle or drift at low altitude toward smoke-sensitive areas, rate of burning will be adjusted to ensure lift and dispersal, or burn will be shut down if safely possible. The smoke spotter will be equipped with a hand-held radio and cell phone and will report directly to the burn boss.

The closest sensitive areas to the burn site are included in the following table. Due to the small size of the burn area and short burn time, with the proper weather conditions, the smoke produced should dissipate in a short period of time.

**D. Impacted Areas:**

FEATURE	DIRECTION	DISTANCE (FT)
Long Island Railroad	South	8,500
RHIC ring	West	5,280
Ridge Housing	North	5,000
Long Island Expressway	South	12,000

**E. Mitigation Strategies and Techniques to Reduce Smoke Impacts:**

NECESSARY TRANSPORT WIND DIRECTION, SPEED AND MIXING HEIGHT.

Desired smoke behavior is good lift and dispersal with low concentrations of smoke. With appropriate lofting conditions (unstable atmospheric conditions) any wind direction will be suitable to transport the smoke away from sensitive areas. A critical component for this burn to ensure adequate mixing and removal of smoke is unstable atmospheric conditions. A minimum mixing height of 1000' is suggested.

VISIBILITY HAZARDS.

If smoke poses a significant visibility hazard (visibility reduced to 0.25 mile or less) over any highway, road or railroad tracks then the fire ignition pattern will be adjusted, ignition suspended and/or the fire will be suppressed until weather conditions change

ACTIONS TO REDUCE VISIBILITY HAZARDS

A smoke/weather observer will be used in part to monitor smoke conditions. Signs will be posted, as necessary and appropriate, along roads and within communities on the downwind side of the burn that have the potential to be impacted by smoke.

## **ELEMENT 20: MONITORING**

- A. Fuels Information (forecast and observed) Required Procedures:** Fine dead fuel moisture may be calculated based on spot weather forecast data. The plan calls for fine dead fuel moisture levels between 6% and 18% inclusive in order to initiate the burn.
- B. Weather Monitoring Required and Procedures:** The morning of the burn, a spot weather forecast will be obtained from the National Weather Service in Upton. Prior to initiating the burn, wind direction, midflame wind speed, temperature and relative humidity data will be collected using a belt weather kit at the burn site.
- C. Fire Behavior Monitoring Required and Procedures:** During the test burn the Burn Boss will confirm appropriate fire behavior. The Burn Boss will communicate with the igniters during firing to monitor fire behavior.
- D. Monitoring Required To Ensure That Prescribed Fire Plan Objectives Are Met:** Pretreatment overstory stand and understory fuels data was collected on each of the subunits. Immediate post fire effects surveys within several days assist in documenting first order fire effects. The growing season after prescribed fire implementation is conducted, post treatment surveys should be conducted.
- E. Smoke Dispersal Monitoring Required and Procedures:** See smoke management section for additional details.

## **ELEMENT 21: POST-BURN ACTIVITIES**

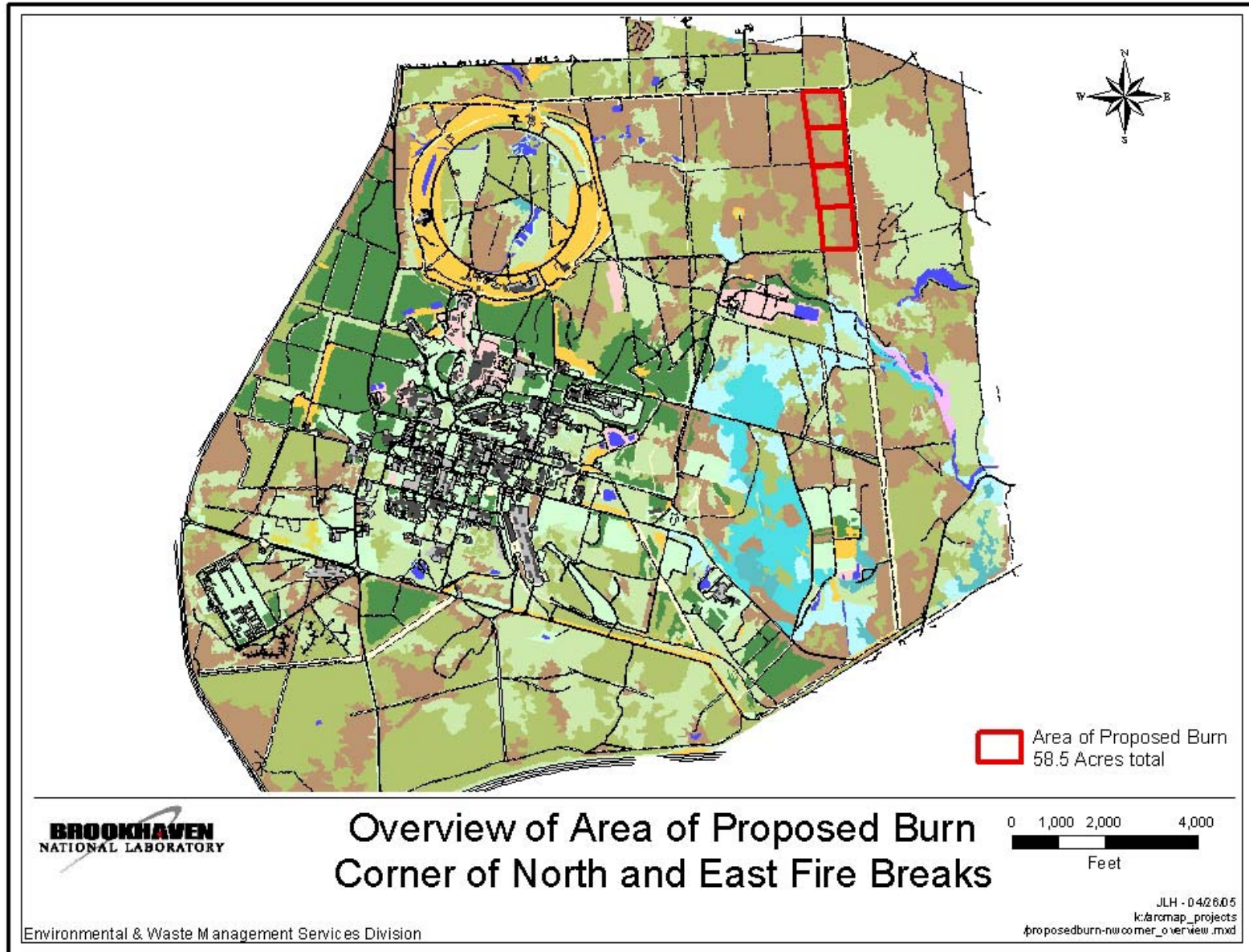
**Post-burn Activities That Must be Completed:** Light rehabilitation of firelines between subunits may be warranted as determined by BNL's Natural Resource Supervisor. An After Action Review (AAR) will be conducted by the Burn Boss and crew. A post fire report may be used to summarize fire operations, conditions, and monitoring results.

## **APPENDICES**

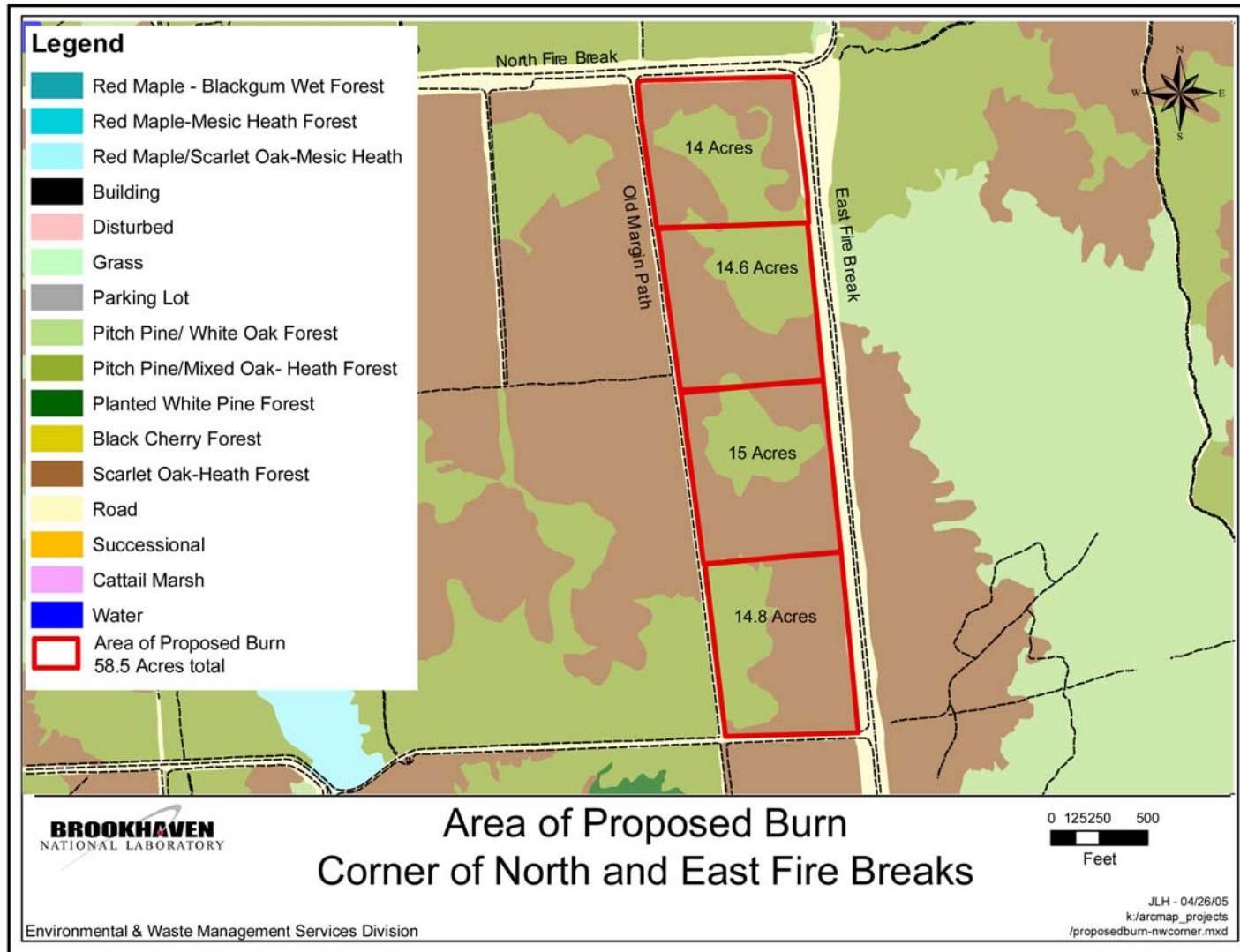
- A. Maps: Vicinity, Project, Hydrant, and Contingency**
- B. Technical Review Checklist**
- C. Complexity Analysis**
- D. Job Hazard Analysis**
- E. Fire Behavior Modeling Documentation or Empirical Documentation (unless it is included in the fire behavior narrative in Element 7; Prescription)**

**A: MAPS**

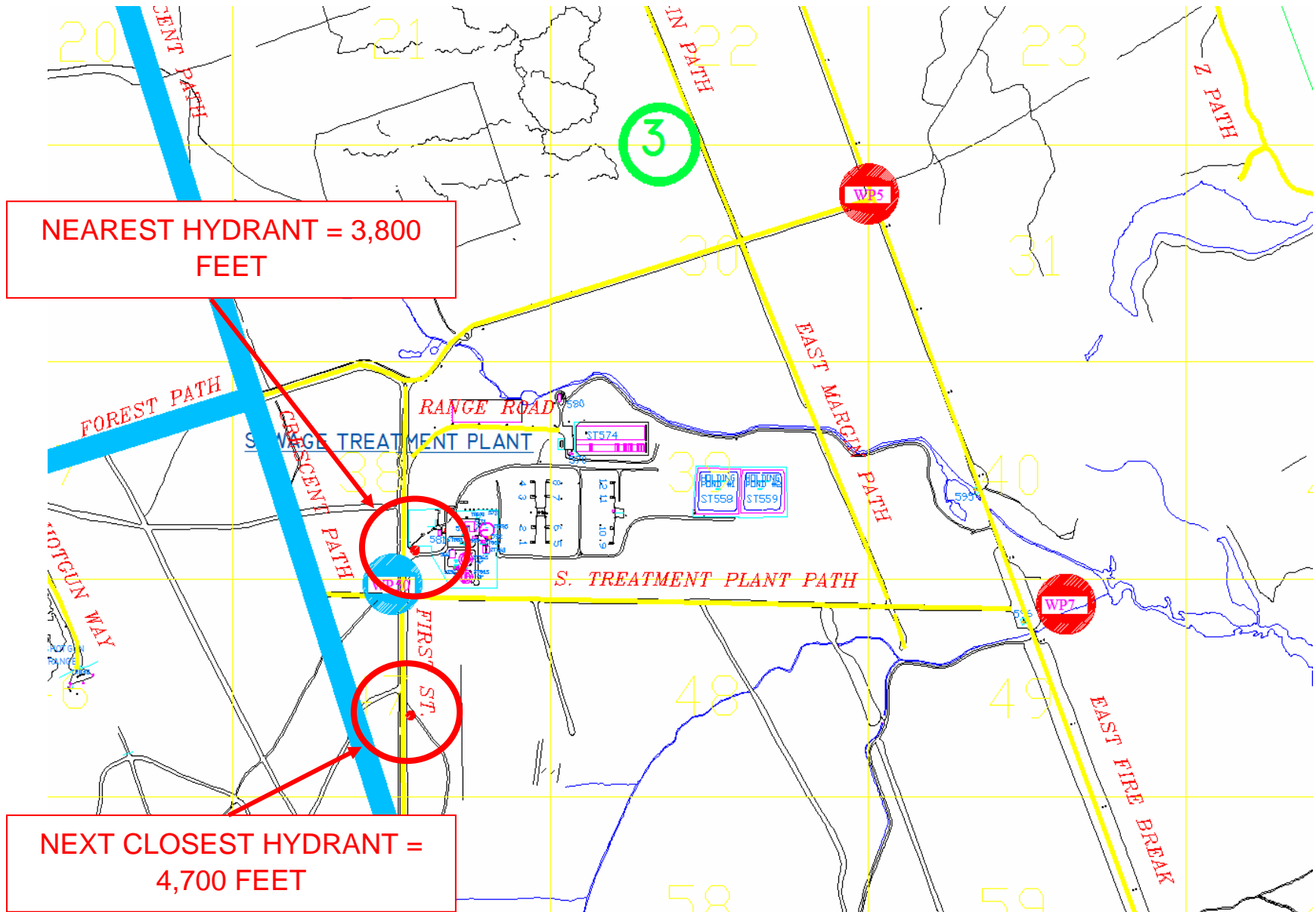
**1. Vicinity Map:**



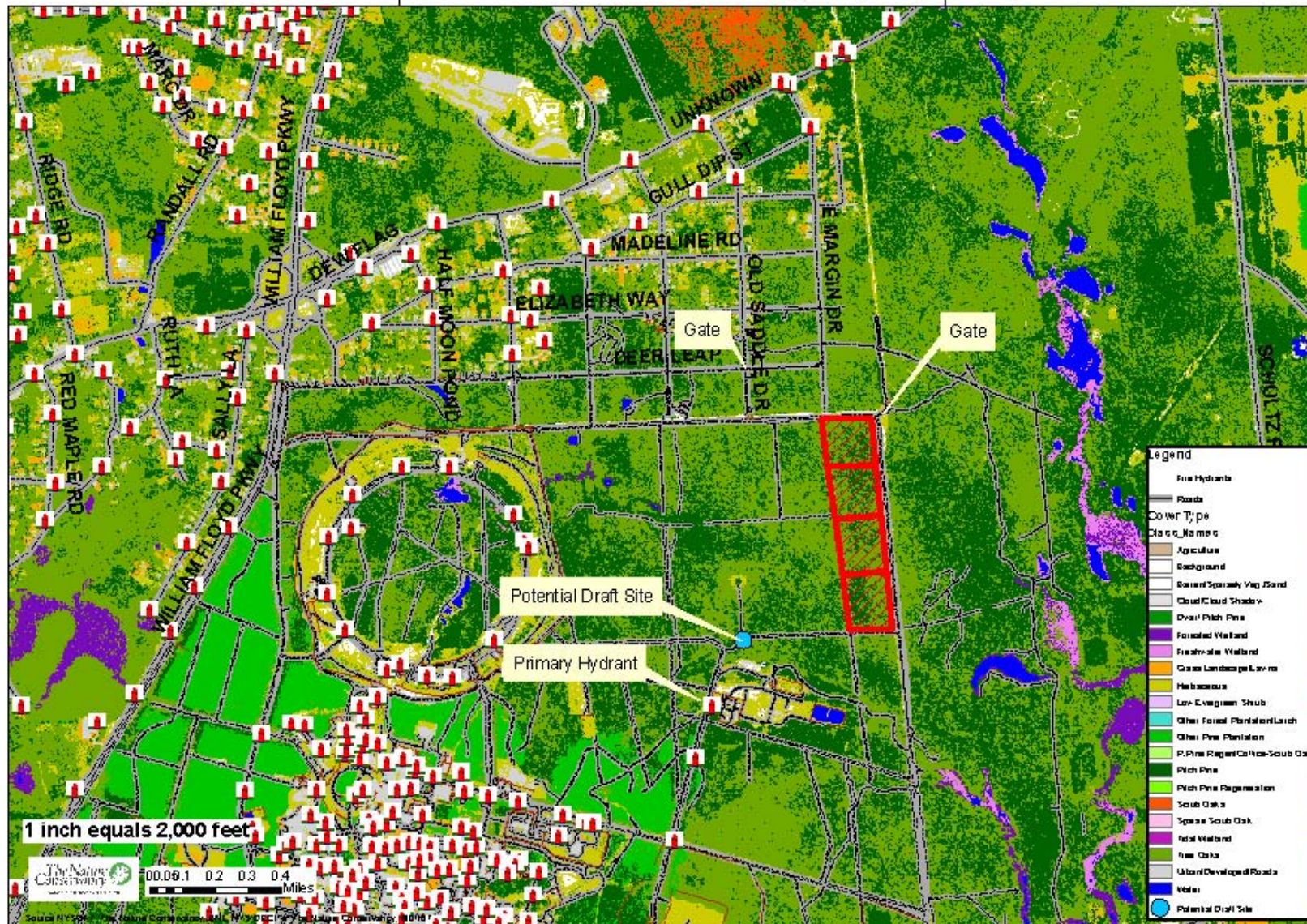
**2. Project Map:**



### Hydrants Near Prescribed Fire Unit



### Brookhaven National Lab Northeast Burn Units Contingency Map



**B. TECHNICAL REVIEWER CHECKLIST**

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

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.**

**C: COMPLEXITY ANALYSIS**

Prescribed Fire Complexity Rating System Guide Worksheet

Instructions: This worksheet is designed to used with the Prescribed Fire Complexity Rating descriptors on  
Page 6.

Project Name Brookhaven National Lab Northeastern Units Number \_\_\_\_\_

Complexity elements:

**1. Potential for Escape**

Risk	Rationale
<b>Preliminary Rating:</b>  <span style="background-color: yellow;">Low</span> Moderate High	The site is surrounded by roads and firebreaks. There are limited ladder fuels and torching of mature trees not expected to be significant. Similar oak-pine fuels surround the unit. Spots can be extinguished within a reasonable time.
<b>Final Rating:</b>  Low Moderate High	
Potential Consequences	Rationale
<b>Preliminary Rating:</b>  Low <span style="background-color: yellow;">Moderate</span> High	An escape would not damage vegetation, habitat or other values in the immediate area, however there is the potential to impact other properties and structures if initial spot fires are not contained successfully
<b>Final Rating:</b>  Low Moderate High	
Technical Difficulty	Rationale
<b>Preliminary Rating:</b>  <span style="background-color: yellow;">Low</span> Moderate High	Given the low potential for escape, low fuel heights (and lack of ladder fuels), and consistency in fuel loading, a small crew and single Burn Boss can safely accomplish this project.
<b>Final Rating:</b>  Low Moderate High	

**2. The Number and Dependency of Activities**

Risk	Rationale
<p><b>Preliminary Rating:</b></p> <p><b>Low Moderate High</b></p>	<p>Ignition will begin on the downwind side of the unit, establishing blackline along the perimeter and adding additional ignition on the interior to achieve objectives. Holding resources will utilize existing roads and internal breaks.</p>
<p><b>Final Rating:</b></p> <p><i>Low Moderate High</i></p>	
Potential Consequences	Rationale
<p><b>Preliminary Rating:</b></p> <p><b>Low Moderate High</b></p>	<p>The Burn Boss will be coordinating ignition rates and patterns and communicating with the holding resources through face to face and radio communication. There are no other concurrent activities in the area and the two holding teams do not have collateral assignments.</p>
<p><b>Final Rating:</b></p> <p><i>Low Moderate High</i></p>	
Technical Difficulty	Rationale
<p><b>Preliminary Rating:</b></p> <p><b>Low Moderate High</b></p>	<p>Communication will be simple. All supervisory staff will have radios with backup batteries available. The unit is relatively flat enabling visual coordination and communication as well.</p>
<p><b>Final Rating:</b></p> <p><i>Low Moderate High</i></p>	

**3. Off-Site Values**

Risk	Rationale
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	Due to the wide roads and firebreaks risk to structures and improvements (power lines) is low. Fuels inside and outside the unit are similar. There should be little to no visitor usage that would cause a threat to off-site values.
<b>Final Rating:</b> Low Moderate High	
Potential Consequences	Rationale
<b>Preliminary Rating:</b> Low <span style="background-color: yellow;">Moderate</span> High	Just outside the burn unit are power lines and a small management station with good defensible space. If an escape would move off property to the north private property could be impacted. Suffolk County and New York State open space could be impacted to the east. There should be little to no visitor usage. No negative impacts to surrounding vegetation or habitat would be expected if fire were to impact the off-site area.
<b>Final Rating:</b> Low Moderate High	
Technical Difficulty	Rationale
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	The protection of the off site values should be able to be accomplished with trained crew on scene. No special management, equipment or skills are anticipated to be needed.
<b>Final Rating:</b> Low Moderate High	

**4. On-Site Values**

Risk	Rationale
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	There are no natural resources at risk in, or near the burn unit that would be negatively affected by the proposed action.
<b>Final Rating:</b> Low Moderate High	
Potential Consequences	Rationale
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	Problems during the prescribed fire are unlikely to impact any unique or significant natural resource.
<b>Final Rating:</b> Low Moderate High	
Technical Difficulty	Rationale
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	No special skills or operating procedures are required. Significant resource damage in the unit is unlikely to occur if suppression of fire is required.
<b>Final Rating:</b> Low Moderate High	

**5. Fire Behavior**

Risk	Rationale
<p><b>Preliminary Rating:</b></p> <p><b>Low</b> Moderate High</p>	<p>Fuels consist primarily of huckleberry, blueberry, sedge, and oak-pine litter. Fuels are relatively uniform and flat. Fire behavior is expected to be similar throughout the unit. One fuel model should represent the area.</p>
<p><b>Final Rating:</b></p> <p>Low Moderate High</p>	
Potential Consequences	Rationale
<p><b>Preliminary Rating:</b></p> <p>Low <b>Moderate</b> High</p>	<p>Fuels outside of the unit are similar to within the unit. Snags shall be monitored as a source of potential embers. Fire behavior east of the unit may have the potential to be more intense due to a higher pitch pine component and some low to moderate slopes.</p>
<p><b>Final Rating:</b></p> <p>Low Moderate High</p>	
Technical Difficulty	Rationale
<p><b>Preliminary Rating:</b></p> <p><b>Low</b> Moderate High</p>	<p>Based on the character of the unit, this is not a technically difficult prescription. The number and size of any spot fires should not require additional suppression resources as long as conditions remain within prescription. Slopovers are unlikely due to wide roads and firebreaks. Direct attack tactics should be successful on most spot fires and slopovers.</p>
<p><b>Final Rating:</b></p> <p>Low Moderate High</p>	

**6. Management Organization**

Risk	Rationale
<p><b>Preliminary Rating:</b> <u>Low</u> Moderate High</p>	<p>A single level of supervision (Burn boss, igniters, holders) should be adequate to coordinate ignition and holding operations. A single person may fill several positions (ex. Weather/Smoke). All of the required minimum prescribed fire positions must be staffed with fully qualified personnel.</p>
<p><b>Final Rating:</b> <i>Low Moderate High</i></p>	
Potential Consequences	Rationale
<p><b>Preliminary Rating:</b> <u>Low</u> Moderate High</p>	<p>Problems related to supervision or communications are expected to be minimal. Sufficient radios and backup batteries will be available, visual contact can be made and maintained due to the size of the unit, and roads surround entire management unit.</p>
<p><b>Final Rating:</b> <i>Low Moderate High</i></p>	
Technical Difficulty	Rationale
<p><b>Preliminary Rating:</b> <u>Low</u> Moderate High</p>	<p>Primary staff are from the local area and are familiar with fuel types. Outside staff will be briefed about local fire behavior and techniques prior to ignition.</p>
<p><b>Final Rating:</b> <i>Low Moderate High</i></p>	

**7. Public and Political Interest**

Risk	Rationale
<p><b>Preliminary Rating:</b></p> <p><i>Low <b>Moderate</b> High</i></p>	<p>Smoke from the fire may be visible from adjacent communities and roadways. Some political controversy with animal rights groups have surfaced after past prescribed fire activities, while other environmental groups support the activity. Results of fire program have the interest of partner agencies and media outlets.</p>
<p><b>Final Rating:</b></p> <p><i>Low Moderate High</i></p>	

Potential Consequences	Rationale
<p><b>Preliminary Rating:</b></p> <p><i>Low <b>Moderate</b> High</i></p>	<p>Unexpected or adverse events would attract media and political attention that may delay implementation of other similar projects around the area and the DOE complex. Communication planning has helped minimize impacts of unintended events in the past on other properties.</p>
<p><b>Final Rating:</b></p> <p><i>Low Moderate High</i></p>	
Technical Difficulty	Rationale
<p><b>Preliminary Rating:</b></p> <p><i><b>Low</b> Moderate High</i></p>	<p>No special fire information function is required. Standard notification procedures will cover adequate flow of information.</p>
<p><b>Final Rating:</b></p> <p><i>Low Moderate High</i></p>	

**8. Fire Treatment Objectives**

Risk	Rationale
<p><b>Preliminary Rating:</b>   <span style="background-color: yellow;">Low</span> Moderate High</p>	<p>Fire objectives can be accomplished under a wide variety of conditions. Deep fire or complete duff removal is not necessary. Vegetation and fuels monitoring are conducted prior to and after treatments are applied. Fire weather and behavior are monitored on site during the incident.</p>
<p><b>Final Rating:</b>   Low Moderate High</p>	
Potential Consequences	Rationale
<p><b>Preliminary Rating:</b>   <span style="background-color: yellow;">Low</span> Moderate High</p>	<p>Failure to meet objectives in the short term will have few adverse impacts on the natural resources. Fuel reduction objectives can only be accomplished with this activity.</p>
<p><b>Final Rating:</b>   Low Moderate High</p>	
Technical Difficulty	Rationale
<p><b>Preliminary Rating:</b>   <span style="background-color: yellow;">Low</span> Moderate High</p>	<p>Pre treatment monitoring is easy to complete following established protocols. Monitoring during burn by the burn boss will determine rates and intensity of ignition.</p>
<p><b>Final Rating:</b>   Low Moderate High</p>	

**9. Constraints**

<b>Risk</b>	<b>Rationale</b>
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	Only weather related constraints have been identified at this time. Smoke dispersion needs to be managed to ensure no impacts to roads, residences, and intake fans of accelerator facilities.
<b>Final Rating:</b> Low Moderate High	
<b>Potential Consequences</b>	<b>Rationale</b>
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	Project can be implemented whenever it is in prescription.
<b>Final Rating:</b> Low Moderate High	
<b>Technical Difficulty</b>	<b>Rationale</b>
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	Constraints should have little impact on achieving resource management objectives.
<b>Final Rating:</b> Low Moderate High	

**10. Safety**

Risk	Rationale
<p><b>Preliminary Rating:</b></p> <p><b>Low</b> <i>Moderate High</i></p>	<p>Safety issues include fatigue, heat stress, tripping hazards, jackpots of fuel, tick born illness, and high percentage of snags within the unit. Internal igniters will need to be aware of hazards. In event of a spot fire to the west of the unit, cultural resources exist that personnel must consider during suppression activities. Unsound snags near the control line will be felled prior to implementation of prescribed fire.</p>
<p><b>Final Rating:</b></p> <p><i>Low Moderate High</i></p>	
Potential Consequences	Rationale
<p><b>Preliminary Rating:</b></p> <p><i>Low</i> <b>Moderate</b> <i>High</i></p>	<p>Most safety issues can be easily mitigated. Internal igniters need continuous attention to snags regarding fire behavior and potential for falling limbs and trunks. Watch heat stress during growing season fires conducted with high temperatures and humidity.</p>
<p><b>Final Rating:</b></p> <p><i>Low Moderate High</i></p>	
Technical Difficulty	Rationale
<p><b>Preliminary Rating:</b></p> <p><b>Low</b> <i>Moderate High</i></p>	<p>Attention to LCES addresses the safety concerns identified above.</p>
<p><b>Final Rating:</b></p> <p><i>Low Moderate High</i></p>	

**11. Ignition Procedures/Methods**

Risk	Rationale
<b>Preliminary Rating:</b>  <span style="background-color: yellow;">Low</span> Moderate High	Understory vegetation and topography are low. Burn Boss and division supervisors will be able to maintain visual contact with internal igniters.
<b>Final Rating:</b>  Low Moderate High	
Potential Consequences	Rationale
<b>Preliminary Rating:</b>  <span style="background-color: yellow;">Low</span> Moderate High	Ignition tools and techniques are standard for prescribed fires, so no special training or techniques are needed.
<b>Final Rating:</b>  Low Moderate High	
Technical Difficulty	Rationale
<b>Preliminary Rating:</b>  <span style="background-color: yellow;">Low</span> Moderate High	Although flares or other ignition devices may be used to supplement ignition, primary ignition by drip torches using standard patterns is planned.
<b>Final Rating:</b>  Low Moderate High	

**12. Interagency Coordination**

Risk	Rationale
<p><b>Preliminary Rating:</b></p> <p><b>Low</b> Moderate High</p>	<p>Burn site is entirely within Brookhaven National Lab. State and NGO personnel will assist with burn as in past projects. No special coordination will be required. Units may be burned during the New York Wildfire &amp; Incident Management Academy. The Incident Management Team may coordinate activities if conducted during this time period.</p>
<p><b>Final Rating:</b></p> <p>Low Moderate High</p>	
Potential Consequences	Rationale
<p><b>Preliminary Rating:</b></p> <p><b>Low</b> Moderate High</p>	<p>Project can be completed as planned. No State or local permits are required as long as project has an approved plan.</p>
<p><b>Final Rating:</b></p> <p>Low Moderate High</p>	
Technical Difficulty	Rationale
<p><b>Preliminary Rating:</b></p> <p>Low <b>Moderate</b> High</p>	<p>Project requires the use of MOU's between the BNL, NYS-DEC, and TNC unless conducted during the NYS Wildfire Academy. These are in place.</p>
<p><b>Final Rating:</b></p> <p>Low Moderate High</p>	

**13. Project Logistics**

Risk	Rationale
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	No logistical support is anticipated. Supplies are available within each agency. Ignition is expected to be completed in one day with rapid burnout of ignited fuels.
<b>Final Rating:</b> Low Moderate High	
Potential Consequences	Rationale
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	Risk of an escaped fire will not be compromised by logistics
<b>Final Rating:</b> Low Moderate High	
Technical Difficulty	Rationale
<b>Preliminary Rating:</b> <span style="background-color: yellow;">Low</span> Moderate High	No logistical support is anticipated
<b>Final Rating:</b> Low Moderate High	

**14. Smoke Management**

Risk	Rationale
<b>Preliminary Rating:</b> <b>Low</b> Moderate High	Smoke impacts will be mitigated by burn location, wind direction, mixing height, short period of burning (1 day), and monitoring. Easterly winds will be restrictive due to potential impacts to accelerator facility intake vents.
<b>Final Rating:</b> Low Moderate High	
Potential Consequences	Rationale
<b>Preliminary Rating:</b> Low <b>Moderate</b> High	Public or firefighter exposure to smoke should be minimal and of short duration. Impacts can be extremely costly if interfering with accelerator facilities.
<b>Final Rating:</b> Low Moderate High	
Technical Difficulty	Rationale
<b>Preliminary Rating:</b> <b>Low</b> Moderate High	Limitations on wind direction and mixing height will be important in planning and implementing burn to mitigate smoke impacts. No other special operational procedures should be required.
<b>Final Rating:</b> Low Moderate High	

Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

Unit Name: Brookhaven National Lab Northeast Units

COMPLEXITY RATING SUMMARY

RISK OVERALL RATING LOW

POTENTIAL CONSEQUENCES OVERALL RATING LOW / MODERATE

TECHNICAL DIFFICULTY OVERALL RATING LOW

**SUMMARY COMPLEXITY RATING LOW**

RATIONALE: The proposed action requires standard burn methods, coordination, safety mitigation and communication. BNL has a few private residences to the north and infrastructure to the west and southwest of the unit. These areas are not immediately adjacent to the burn unit. Any fire outside of the intended unit has the potential for containment prior to impacting these values. Contingency planning addresses these potential consequences with BNL fire department near the burn site and fully staffed. The safety and risk factors are mitigated by low fuel loading / fuel bed depth and wide roads surrounding unit.

Prepared by: Brian Kurtz Date: 9/18/2007

Approved by: Tim Green Date: 10/01/2007

(Agency Administrator)

Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

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Unit Name: Brookhaven National Lab Northeast Units

## **D. JOB HAZARD ANALYSIS**

**See following pages.**

<p align="center">U.S. Department of Agriculture Forest Service</p>	<p align="center"><b>1. WORK PROJECT/ACTIVITY</b> <b>Prescribed Burning</b></p>	<p align="center"><b>2. LOCATION</b> <b>Brookhaven National Lab</b></p>	<p align="center"><b>3. UNIT</b> <b>North East Units</b></p>
<p align="center"><b>JOB HAZARD ANALYSIS (JHA)</b> References-FSH 6709.11 and -12 (Instructions on Reverse)</p>	<p align="center"><b>4. NAME OF ANALYST</b> <b>Brian Kurtz</b></p>	<p align="center"><b>5. JOB TITLE</b> <b>Forest and Fire Conservation Manager, TNC</b></p>	<p align="center"><b>6. DATE PREPARED</b> <b>08/15/07</b></p>
<p align="center"><b>7. TASKS/PROCEDURES</b></p>	<p align="center"><b>8. HAZARDS</b></p>	<p align="center"><b>9. ABATEMENT ACTIONS</b> <b>Engineering Controls * Substitution * Administrative Controls * PPE</b></p>	
<p><b>Holding operations including construction of fireline, securing perimeter of fire, and mop-up.</b></p>	<p>Inhalation of Smoke</p>	<p>Brief all personnel and supervisors to be aware of smoke inhalation and exposure. Rotate resources when impacts to individuals begin to occur.</p>	
		<p>Assign smoke monitor to assess conditions and report to Burn Boss.</p>	
<p><b>Ignition via drip torch or fusee.</b></p>	<p>Burns</p>	<p><b>Wear proper PPE including fire resistant clothing, hard hat, eye protection, leather boots, and gloves. Maintain situational awareness and be aware of jackpots of flashy fuels and fuels with long residual times (down dead logs).</b></p>	
<p><b>All tasks</b></p>	<p>Tripping hazards.</p>	<p>Ensure crew entering interior of unit is aware of tripping hazards. Ensure interior crew maintains situational awareness. Wear PPE to protect against hazard.</p>	
	<p>Heat Stress/Cold Stress</p>	<p>Ensure crew briefed regarding consumption of water and food. Recognize signs early and inform fireline supervisor. Rotate arduous tasks when feasible. For cold stress proper gloves and cold weather gear should be worn (based on predicted weather).</p>	
	<p>Eye injuries</p>	<p><b>Wear eye protection in all phases of operations particularly during mop-up.</b></p>	
	<p>Snags.</p>	<p>Ensure interior crew maintains situational awareness. Wear PPE to protect against hazard. Fell snags that may threaten safety of interior igniters as well as those that may threaten personnel on holding lines.</p>	
	<p>Tick borne illness</p>	<p>Based on Seasonal Risk, Brief crew regarding presence of ticks and body check to be done after operations completed. Mitigate by spraying clothing with commercially available permethrin based products.</p>	
	<p>Ground nesting bees</p>	<p>Brief crew regarding the presence of ground nesting bees. If high activity is detected, avoid the area of concern. Identify (at briefing) personnel with allergic reactions and ensure appropriate first aid (epipen) is available.</p>	
	<p>Moving machinery i.e. wildland engines</p>	<p>All wildland engines must have head lights on for maximum visibility. Any wildland engine backing up must have a spotter to assist the driver in backing up safely.</p>	
<p><b>10. LINE OFFICER SIGNATURE</b></p>			

**JHA Instructions (References-FSH 6709.11 and .12)**

The JHA shall identify the location of the work project or activity, the name of employee(s) involved in the process, the date(s) of acknowledgment, and the name of the appropriate line officer approving the JHA. The line officer acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.

**Blocks 1, 2, 3, 4, 5, and 6: Self-explanatory.**

**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).

**Block 8:** Identify all known or suspect hazards associated with each respective task/procedure listed in block 7. For example:

- 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.

**Block 9:** Identify appropriate actions to reduce or eliminate the hazards identified in block 8. Abatement measures listed below are in the order of the preferred abatement method:

- 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 (chain saws, rock drills, and portable water pumps).
- e. A combination of the above.

**Block 10:** 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.

**Blocks 11 and 12: Self-explanatory.**

**Emergency Evacuation Instructions (Reference FSH 6709.11)**

Work supervisors 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.

Be prepared to provide the following information:

- a. Nature of the accident or injury (avoid using victim's name).
- b. Type of assistance needed, if any (ground, air, or water evacuation).
- c. Location of accident or injury, best access route into the worksite (road name/number), identifiable ground/air landmarks.
- d. Radio frequencies.
- e. Contact person.
- f. Local hazards to ground vehicles or aviation.
- g. Weather conditions (wind speed & direction, visibility, temperature).
- h. Topography.
- i. Number of individuals to be transported.
- j. Estimated weight of individuals for air/water evacuation.

The items listed above serve only as guidelines for the development of emergency evacuation procedures.

**JHA and Emergency Evacuation Procedures Acknowledgment**

We, the undersigned work leader 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:

SIGNATURE      DATE

SIGNATURE      DATE

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Administrative Unit: BROOKHAVEN NATIONAL LABORATORY

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Unit Name: Brookhaven National Lab Northeast Units

## **E. FIRE BEHAVIOR MODELING DOCUMENTATION OR EMPIRICAL DOCUMENTATION**

Fire behavior model from multiple BEHAVE Runs is available and on file for this burn unit. The BEHAVE Runs constitute 94 pages of data.