Cerro Grande Prescribed Fire

Board of Inquiry
Final Report

National Park Service

February 26, 2001

2/26/01

To: Director, National Park Service

From: Regional Director, Midwest Region

Subject: Final Report, National Park Service Board of Inquiry, Cerro Grande Fire

Through this memo I am transmitting the final report of the National Park Service Board of Inquiry on the Cerro Grande Prescribed Fire. While it was the charge of the Board of Inquiry to make written findings on corrective action regarding individuals, I believe that the findings of the Board warrant some observations about the responsibility of the National Park Service as an agency with respect to the Cerro Grande Fire.

In the Board's review of the facts of the case, it found that while individuals adhered to the policies of the National Park Service regarding wildland fire, National Park Service policies in place at the time of the fire had weaknesses that helped contribute to the chain of events that caused the Cerro Grande Fire to escape its prescription. While any one of these policies as a single item, may not have been problematic, taken collectively they proved seriously inadequate. In addition, the Board found that there was a lack of an effective interagency management system for handling the fire. Since the fire, a host of agency and interagency activities have occurred that will provide remedies for these problems and strengthen the prescribed fire program at all levels.

In the early days of the fire, Intermountain Regional Director Karen Wade said in a televised interview that the National Park Service was "responsible for what has occurred. The buck stops with us." The Director of the National Park Service also stated that the National Park Service bore the responsibility for the fire. In addition, following the release of the May 19, 2000, investigative report on the fire, Secretary of the Interior Bruce Babbitt spoke of the "unacceptable" mistakes of oversight committed by the National Park Service.

All these remarks echo the feeling that the National Park Service as an institution bears substantial responsibility for the Cerro Grande Fire.

At the outset, I acknowledged that the Board was directed to investigate individual performance and the role it played in the Cerro Grande Fire. While the Board found no violations of policy on the part of individuals, questionable judgment was exercised on several occasions. The prescribed fire program should not be judged by the events of the Cerro Grande Fire, the lessons learned and the subsequent changes in management of the program will clearly serve to make it more effective in future applications. What follows are the findings of the Board in this regard.

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EXECUTIVE SUMMARY

On May 4, 2000, Bandelier National Monument employees began the Cerro Grande prescribed burn. The ensuing series of events and decisions led to a subsequent wildland fire declaration and, three days later, pushed by strong winds, the wildland fire spread outside the project area threatening the Los Alamos National Laboratory and destroying 235 structures in and around Los Alamos, New Mexico.

The Cerro Grande Fire quickly took on a national focus. On May 11, 2000, the Secretary of Interior directed an interagency investigation of the incident and, on May 18th, appointed an independent review board to assess the findings and recommendations from the investigation. The review board concluded that the investigation's findings and recommendations were logical and valid—with the exception of those findings dealing with the National Weather Service (NWS).

A Board of Inquiry was established to: consider the facts and circumstances of the incident and those that may have contributed to it; consider legal and policy requirements that apply to the facts of the incident and determine compliance with those requirements; conduct an objective critique of the actions of individuals directly responsible for the incident, including a review of operational procedures; and make written findings to the convening official for the purpose of recommending corrective action. In the course of its investigation and review, the Board of Inquiry interviewed 26 witnesses and participants, many of whom had not been interviewed during the initial investigation.

The Board of Inquiry reviewed relevant documents and used the initial May 18th Investigation Team Report as a basis for its review. The Board of Inquiry found that the initial investigation report was a significant accomplishment produced in a remarkably compressed timeframe, however, this report was not always consistent with the facts and in some cases, inappropriately evaluated performance. At the conclusion of its review, the Board of Inquiry was able to determine a clear understanding of the planning effort and the sequence of events that led to the fire's escape in the implementation phase. The Board also made a considerable effort to respond to each of the findings brought forward in the Investigation Report. The Board's narrative accompanying each finding is intended to frame issues in the context of policy requirements and reconcile differences in the evidence as it may affect decisions dealing with personnel actions.

Causal factors and final impacts of this action are still being assessed. Root causes for the escape of the Cerro Grande prescribed fire will be debated for some time. It is unlikely that any individual or group will be able to determine the precise reason or a single cause of this incident. However, document searches and witness interviews have produced a clear picture of the role the park staff and cooperators played in both starting and subsequently suppressing the fire.

A multitude of factors, many of which are common causes (i.e., system flaws or failures), as well as special causes (i.e., personal decisions and actions) interacted to produce a chain of events that influenced the outcome of this fire. The events

beginning on May 4th, were indicative of normal prescribed fire activities. Problems that evolved shortly after ignition put the park staff on an irreversible pathway ultimately resulting in the escape of the fire.

INTRODUCTION

From February to April, 2000, staff at Bandelier National Monument in New Mexico prepared and approved a Prescribed Fire Plan for the Upper Frijoles 1 and 5 Burn Units. This burn plan covered a project area of approximately 1000 acres located in the northwest portion of Bandelier National Monument and adjacent to the Santa Fe National Forest in north-central New Mexico (Figure 1).

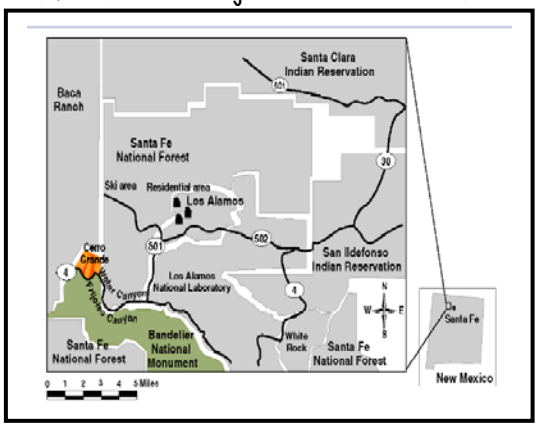


Figure 1. General area map of the Cerro Grande Wildland Fire (taken from the United States General Accounting Office Report [US General Accounting Office 2000]).

The primary purpose of this prescribed fire was to reduce hazard fuels in the burn unit. The burn plan defined implementation of the full project to be completed in three sequential phases (Figure 2). On May 4th, Phase I of the prescribed fire was ignited and eventually escaped the planned boundaries. It ultimately spread into the town of Los Alamos, New Mexico, destroying 235 structures and also spread onto lands administered or owned by the Santa Fe National Forest, the Los Alamos National Laboratory, and the San Idelfonso and Santa Clara Pueblos.

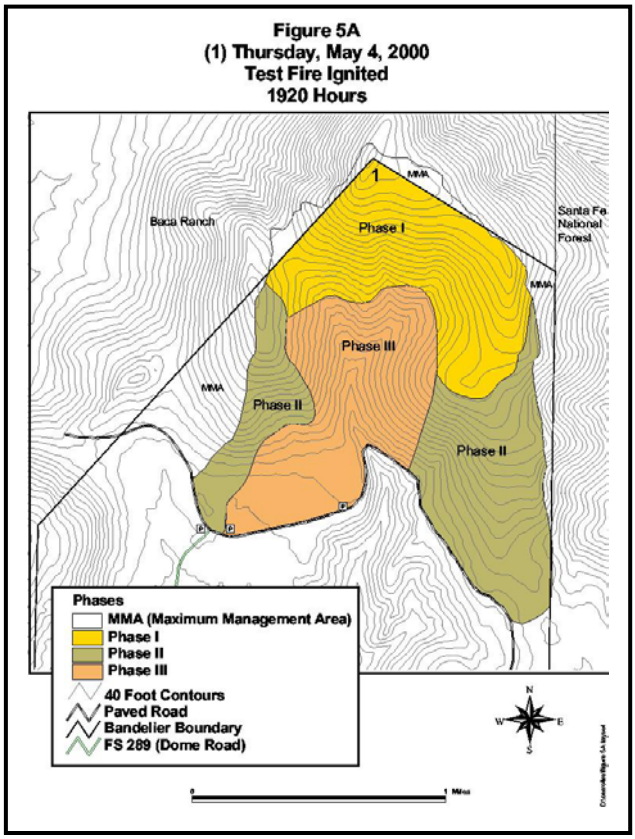


Figure 2. General location of the Upper Frijoles Prescribed Fire Units (Cerro Grande Prescribed Fire) with individual phases defined (Figure 5A, taken from Investigation Team Report).

On May 11th, Secretary of the Interior Bruce Babbitt formed an interagency investigation team to examine events and circumstances from the beginning of planning the prescribed fire until it was converted to a wildland fire with

management responsibilities formally delegated to a Type I Incident Management Team (IMT) (May 8th). The investigation team completed its assignment and prepared a final report by May 18th, 2000. The report, "The Cerro Grande Prescribed Fire Investigation Report," (National Park Service, Bureau of Land Management, U.S. Forest Service, Department of Energy, and New Mexico Energy, Minerals, and Natural Resources Department 2000), hereinafter referred to as the "Investigation Team Report," was presented to the Secretaries of Interior and Agriculture and included findings and recommendations.

Following completion of the Investigation Team Report, an Independent Review Board was appointed by NPS Director Stanton on May 18th. This Board was assigned to review the findings and recommendations presented in the Investigation Team Report. The Independent Board of Review submitted its final report (State of Florida, Bureau of Land Management, U.S. Forest Service, and White Mountain Apache Tribe 2000) on May 26th to the NPS Director.

On June 6, 2000, National Park Service (NPS) Director Robert Stanton commissioned a Board of Inquiry to review the facts and circumstances surrounding the Cerro Grande prescribed fire and it's escape as a wildland fire. Director Stanton charged the group with the following objectives:

- Consider the facts and circumstances of the incident and those that may have contributed to it.
- Consider legal and policy requirements that apply to the facts of the incident and determine compliance with those requirements.
- Conduct an objective critique of the actions of individuals directly responsible for the incident, including a review of operational procedures.
- Make written findings to the convening official for the purpose of recommending corrective action.

The findings of the Cerro Grande Prescribed Fire Board of Inquiry (hereinafter called the "Board"), were developed through review of the Bandelier National Monument (BAND) Fire Management and Prescribed Fire Plans. In addition, the Board reviewed the Investigation Team Report, the Independent Review Board's report (National Park Service 2000), the General Accounting Office Report on Lessons Learned from the Cerro Grande (Los Alamos) Fire (General Accounting Office 2000), received testimony from the principal government officials who developed those plans, and from 26 separate witnesses who participated in the planning and implementation of the prescribed fire and subsequent wildland fire suppression activities. Most interviews were conducted face-to-face but all were fully documented as both audio recordings and written transcriptions. Over 1,600 pages of transcripts were developed from these interviews. The Board reviewed and used the Investigation Team Report as the basis for its review. Based on this, the Board developed findings that respond to, but are not limited to, the items enumerated in that report.

During the course of the Board investigation, review, and deliberations, it became readily apparent to members that the May 18th report served as a good beginning point for this review. However, Board members acknowledge the fact that it was developed under an extremely compressed timeframe. This limitation precluded its authors from having the time required and ability to fully investigate all facts and circumstances surrounding the fire and it's outcome. Board members further recognize that this timeframe made it impossible for the Investigation Team to interview all key personnel having first hand knowledge of prescribed fire planning and implementation, dispatch coordination procedures, and firefighting strategies and tactics and to consider these areas in relation to compliance with all applicable legal and policy requirements. It became apparent to the Board during the course of review and dialog with key witnesses, that the Investigation Team Report was not always consistent with the facts and, sometimes, inappropriately, measured performance against policy requirements believed to be consistent with the 1995 Federal Fire Policy, but not yet adopted in agency manuals or handbook direction. The magnitude of loss also certainly influenced the swift reaction and call to accountability, as reflected in the rapid completion and release of the Investigation Report.

The Board of Inquiry's review was carried out over a span of 5 months (June – October 2000). This duration was necessary to fully clarify all pertinent elements of the original investigative report as well as other associated issues and informational aspects. As a result, the Board uncovered a wide array of information, including opposing viewpoints, differences in perception, and both corroborating and conflicting information. The Board used all this information to generate its findings, some of which directly contradict findings in the May 18th investigation team report.

The Board's review of the facts and circumstances surrounding the Cerro Grande incident focused on the prescribed fire and wildland fire activities until a Type I Incident Management Team assumed management responsibility. The Board's review is founded on the actions of five principal individuals responsible for managing the prescribed fire and it's subsequent escape. Those individuals are: Roy Weaver, former BAND Superintendent, now retired; Al King, BAND Fire Management Officer (FMO); Mike Powell, BAND Acting Assistant Fire Management Officer; Charisse Sydoriak, BAND Chief of Resources; and Paul Gleason, Intermountain Region Wildland Fire Specialist. Decisions and actions of these individuals were evaluated in the context of laws, policies, and guidelines in effect for the National Park Service on May 4th, 2000. It should be noted that findings refuting those in the May 18th Investigation Team Report, are most often the result of that report's use of certain wildland fire standards endorsed by both the Department of Interior and the Department of Agriculture in the Federal Wildland Fire Management Policy and Program Review (USDI/USDA 1995), but never fully implemented at agency levels.

This document represents the Board's final report. It contains specific information regarding the chronology of events involved with this fire, the Board's findings in relation to laws, procedures, and policies, and in comparison to the investigation team report's findings, conclusions, and recommendations. General recommendations for follow-up measures presented here reflect the view of the Board based on knowledge of past management actions, professional assessment of actions taken in relation to past experiences in similar situations, and training. These measures are

recommended to deciding officials as a beginning point for determining final accountability for this fire event.

BOARD OF INQUIRY PROCESS

Members of the Board of Inquiry included:

Bill Schenk	Regional Director, Midwest Region
Len Dems	Fire Management Officer, Grand Teton National Park
Pete Hart	Superintendent, New River Gorge National River
Wally Hibbard	Associate Regional Director, Operations, Southeast Region
Mary Martin	Superintendent, Mojave National Preserve
Jerry Williams	Director, Fire and Aviation Management, U. S. Forest Service, Northern Region

Throughout the proceedings and deliberations of the Board of Inquiry, Janet Spaulding, Esq., represented the Department of the Interior, Office of the Solicitor.

The specific employees under review included:

Roy Weaver	Superintendent, Bandelier National Monument
Charisse Sydoriak	Chief, Resources Management, Bandelier National Monument
Al King	Fire Management Officer, Bandelier National Monument
Mike Powell	(Acting) Assistant Fire Management Officer, Bandelier National Monument
Paul Gleason	Wildland Fire Management Specialist, National Park Service Intermountain Mountain Regional Office

These employees designated the following individuals as their representative on the Board of Inquiry:

Tim Sexton	Fire Ecologist, National Park Service, National Interagency Fire Center, Boise, Idaho
Tom Zimmerman	Fire Science and Ecological Applications Program Leader, National Park Service, National Interagency Fire Center, Boise, Idaho

Mr. Sexton and Mr. Zimmerman were active participants in the Board and it's deliberations.

Steve Botti, Fire Program Manager, with the National Park Service, National Interagency Fire Center in Boise, Idaho, accompanied the employees throughout the interview process, but did not participate in the Board's deliberations.

Chairman Schenk convened the Board on June 28, 2000 at 8:30 am in the Conference Room of the Camel Rock Suites, Santa Fe, New Mexico. Typically, the Board initiated

its proceedings at 8:00-8:30 am and concluded by 5:00-5:30 pm daily. All proceedings were audio recorded and transcribed by a court recorder.

In addition to the individuals mentioned above, Rick Gale, Deputy Chief Ranger for the National Park Service participated in some of the interviews.

All individuals appearing before the Board of Inquiry were asked by Chairman Schenk to introduce themselves, give a brief description of their background, and describe their involvement with the Cerro Grande Fire. Board members, Janet Spaulding, and the five employees identified above asked additional questions.

Individuals interviewed on June 28, 2000 included:

Roy Weaver	Superintendent, Bandelier National Monument
Mike Powell	(Acting) Assistant Fire Management Officer, Bandelier National Monument/Burn Boss Cerro Grande Prescribed Fire
Al King	Fire Management Officer, Bandelier National Monument/Ignition Specialist, Cerro Grande Prescribed Fire

On June 29, 2000 the following individuals were interviewed:

Al King	Fire Management Officer, Bandelier National Monument/Ignition Specialist, Cerro Grande Prescribed Fire (continuation of interview from previous day)
Charisse Sydoriak	Chief, Resources Management, Bandelier National Monument/Resource Advisor and Situation Unit Leader, Cerro Grande Fire
Paul Gleason	Wildland Fire Management Specialist, National Park Service Intermountain Mountain Regional Office, Fire Observer/Relief Burn Boss/Incident Commander, Cerro Grande Fire

All of the interviewed employees listed above were given, and signed, a Garrity warning.

The Board reconvened on July 25, 2000 at 8:30 am in the Southwest Support Office of the National Park Service in Santa Fe, New Mexico. Dave Davies, Employee Relations Specialist, National Park Service, WASO, provided technical personnel expertise. Individuals interviewed on that day included:

Holly Snider	Firefighter, Bandelier National Monument
Edward Hiatt	(Acting) Assistant Fire Module Leader, Bandelier National Monument
Ryan Swartz	Crew Member, Bandelier National Monument
Joseph Leon	Dispatcher, Santa Fe Zone Dispatch Center (permanently employed with the Bureau of Land Management, Santa Fe, NM)
John Romero	Center Manager, Santa Fe Zone Dispatch Center, Santa Fe National Forest
Vernon Ely and	Respectively, Coordinator, Southwest Coordination Center,

David Boyd	U. S. Forest Service, and Coordinator, Southwest Coordination Center, Bureau of Land Management (joint interview)

On July 26, 2000, the Board interviewed the following individuals:

Kirk Smith	Superintendent, Mormon Lake Hot Shots, U. S. Forest Service/Division Supervisor, Cerro Grande Fire
Russ Copp	Assistant Fire Management Officer, Blue Ridge and Happy Jack Districts of Coconino National Forest/Division Supervisor, Cerro Grande Fire (interview conducted by telephone)
Richard Romero	(Detail) Dispatcher, Santa Fe National Forest Dispatch Office
Dick Burick	Deputy Laboratory Director, Los Alamos National Laboratory

On July 27, 2000, the Board interviewed the following individuals:

Eugene Darling	Team Leader, Emergency Management and Fire Management Officer, Los Alamos National Laboratory
Thomas Lonnie	Montana Deputy State Director, Bureau of Land Management, Fire Investigative Team Member, Cerro Grande Prescribed Burn
Mike Powell	(reinterview)
Paul Gleason	(reinterview)
Kevin Joseph	North Zone Fire Management Officer, Santa Fe National Forest

The wildland fire situation that developed in late July and persisted at an extreme level through early September in the western United States precluded the Board from reconvening until the middle of September.

The Board and the principals subject to review, participated in a conference call on August 11, 2000, to conduct an interview with representatives from the National Weather Service concerning its involvement in the Cerro Grande Prescribed Fire. The following individuals were interviewed:

Charlie Liles	Albuquerque Office of the National Weather Service (NWS)
Tim Connor	Dept. of Commerce, Legal Division- Washington, D.C.

On September 19, 2000 the Board reconvened in the National Park Service Southwest Support Office in Santa Fe. Chairman Bill Schenk and all Board members were present. Nancy Fischer, Employee Relations Specialist with the WASO National Park Service office joined the Board deliberations and provided technical personnel expertise.

On September 19th, the Board interviewed the following individuals:

Kathy Allred	Pilot, U. S. Forest Service
Matthew Snider (by conference call),	(Acting) Fire Use Module Leader, Bandelier National Monument
Dick Bahr	Fuels Management Specialist, National Park Service, National

Interagency Fire Center, Boise, Idaho

On September 20, 2000, the Board interviewed:

Joe Stutler	Fire Operations Specialist, U. S. Forest Service, Pacific Northwest Region
Paul Orozco	Fire Staff Officer, U. S. Forest Service, Santa Fe National Forest

Roy Weaver, Charisse Sydoriak, Al King, Mike Powell, Paul Gleason and Steve Botti then left the proceedings and the Board deliberated in executive session on September 20 and 21, 2000.

The final meeting of the Board of Inquiry was held from October 10 – 13th at the Midwest Regional Office in Omaha, NE. All board members plus Janet Spaulding and Nancy Fischer were present for this meeting. During this time, the Board deliberated over the information acquired from the previous interviews and developed the basis for this report. Individual writing responsibilities were assigned and the report was developed by Board members at their respective home units over the next few weeks. The report was compiled, reviewed, and finalized by Board members through telephone conferencing communications. This document, while not necessarily portraying each Board member's exact viewpoint, does represent the consensus opinion of Board members. Chairman Bill Schenk then provided the final report to NPS agency managers.

CHRONOLOGY OF EVENTS

This section presents a summary of the chronology of events surrounding the Cerro Grande Prescribed Fire. A brief review of actions taken prior to May 4th is presented followed by a more detailed description of events that occurred after May 4th.

Planning for the Cerro Grande Prescribed Fire began in February of 2000. From March to April, activities associated with burn plan preparation and weather and fuel condition monitoring took place. In mid- to late February, Mike Powell was detailed into the vacant Assistant Fire Management Officer position at Bandelier National Monument. One of his first assignments was to prepare the Prescribed Fire Plan for Units 1 and 5. In preparation for this plan development, Mike contacted John Lissoway on March 22, 2000, the previous Fire Management Officer, now retired. The Prescribed Fire Plan was completed on April 19th. Live fuel moisture samples were collected on April 10th with dead fuel moisture samples collected from the burn site on April 14th. On April 18th, weather data was retrieved from the Cerro Grande weather station located near the southeast corner of the burn unit. From mid-March to mid-April, at least three snowstorms passed over the burn area; one storm

deposited 16 inches of snow on the site. Verbal reports from various personnel who had been on-site, indicated snowbanks present in the shaded areas and duff that was moist or wet. Plans to burn the unit in April were not feasible due to minor dusting of snow, excessive wind conditions, and the lack of an agreement with the Baca Ranch. On April 28th, dead fuel moisture content measurements were taken on the burn unit. The National Weather Service was contacted on May 3rd and a weather forecast was obtained.

The chronology of events that occurred on the Cerro Grande Prescribed Fire from Thursday, May 4, 2000, the day the prescribed burn began, until the arrival of the Type I Incident Management Team on Monday, May 8, 2000 is described in Table 1.

Table 1. Cerro Grande Prescribed Fire chronology of events.

THURSDAY, May 4th	
TIME	EVENT
Morning of May 4th	Mike Powell prepared the amendment to the prescribed fire plan, excluding the 32 acres of private land from the project.
1300	Roy Weaver approved this amendment.
1400	Mike Powell notified Santa Fe Zone Dispatch (Zone Dispatch) of the intent to implement the fire plan. The dispatcher expressed concerns about sending mixed messages to the public by having Bandelier conduct a prescribed fire when the Forest Service had already suspended prescribed fire activities on national forest lands and wildland fires were currently burning. Mike Powell and fire program assistant made notifications to the various agencies and individuals on Bandelier prescribed fire notification list.
1830	Al King notified Zone Dispatch of the prescribed fire. Mike Powell conducted the prescribed fire briefing.
1900	Al King called the National Weather Service confirming that the spot weather forecast was still accurate.
1920	The test fire was ignited near the summit of Cerro Grande. Twenty fire personnel (the ten person Black Mesa crew and ten NPS employees) were on the scene (Figure 2).
Approx. 2000	The test fire was successfully completed, and the fire behavior was within expected parameters; the decision was made to continue the prescribed fire by Mike Powell. Crews began the blackline by burning down the northeast edge of the fire from the test fire area. Progress was slow using the ignition pattern outlined in the plan. They changed the ignition pattern to speed up the progress and the burn boss made the decision to stop suppressing the fire on the interior side of the ignition lines.
Approx. 2200	Ignition was completed on the northeast edge of the fire area. Mike Powell began walking back to the test fire areas. Upon reaching it, he discovered the fire had burned through the blackline on the northeast and was burning southwest into the canyon faster than anticipated.

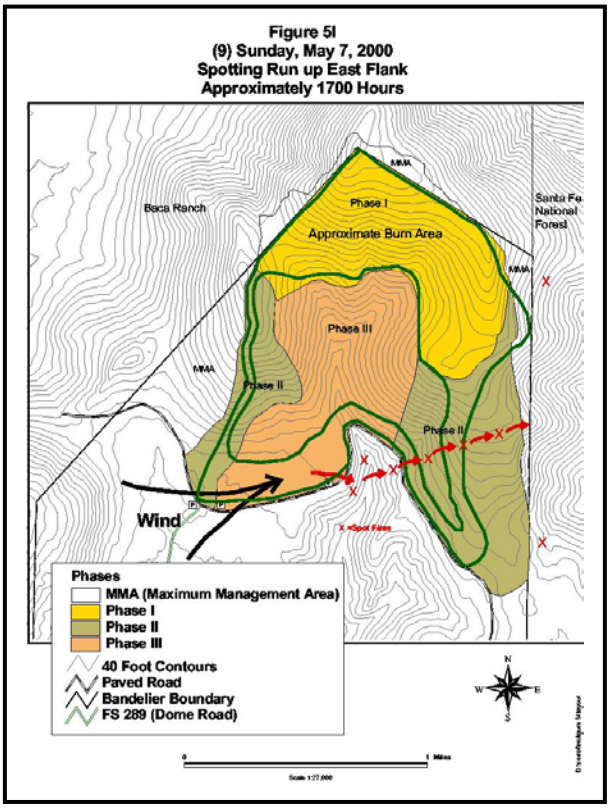
2300	The ignition crew of three and a holding crew of 12 arrived back at the test fire area to suppress the fire burning outside the test fire. Holly Snider and Ed Hiatt arrive on fire from assignment on Unit 40 (another prescribed fire unit completed earlier).
Approx. 2315	Ignition began down the northwest edge of the unit. Crews reached the upper saddle and spent the next 1½ hours bringing the fire back from the knob into the saddle, securing the line at 0230 hours.
FRIDAY, May 5th	
TIME	EVENT
Approx. 0100	Between 0100 and 0130 hours, the burn boss, Mike Powell, had concerns about the fatigue level of the Black Mesa Crew and sent them down the mountain to get some sleep. Five NPS personnel, Paul Gleason, and the remainder of the Black Mesa 10-person crew hiked down to the vehicles to get some sleep.
0230	Mike Powell then left the fire, going to the office in the NPS housing area to order contingency resources.
0317	Mike Powell called Santa Fe Zone Dispatch. He stated his intent was to order a 20-person hand crew to be on-site by morning; but was told to call back in the morning. The Dispatcher stated the burn boss called to report the fire progress and his intent to order a Type 3 helicopter and 20-person crew in the morning. ** (FACTS IN DISPUTE).
0600	The fire observer, Paul Gleason, woke Mike Powell and expressed urgency regarding the arrival time of needed resources and the need to contact key park staff regarding the fire situation. The interior fire had backed below where the blacklining operations had stopped.
0630	Mike Powell stated that he attempted to contact dispatch, but there was no answer. Dispatch stated that they were on duty and received no phone call. ** (FACTS IN DISPUTE).
0700	Supervisory Dispatcher arrives at work and stated that he called the Burn Boss. **** (FACTS IN DISPUTE).**
0720	Supervisory Dispatcher reported situation to Santa Fe N.F. FMO. NPS did not want to declare a wildland fire.
0730	Mike Powell stated that he called the Zone Dispatch, to request a Type 1 20-person hand crew and a Type 3 helicopter. **** (FACTS IN DISPUTE).** The supervisory dispatcher then called Al King, the park FMO, and explained that the prescribed fire needed to be converted to a wildland fire so the requested resources could be obtained. Al King and the Zone Dispatcher reached agreement whereby resources would be ordered for a wildland fire currently burning on the national forest, but would be diverted to the prescribed fire.
1000	Paul Gleason, Mike Powell, and Al King discussed a change in

	command of the prescribed fire, as Mike Powell needed sleep. The decision was made that Paul Gleason would now become the burn boss. Shortly thereafter, the holding crew on the northeast side reported fire slopover outside the line and they were having difficulty containing it. They requested water drops and additional firefighters.
1030	The Type 3 helicopter (H312) arrived, dropping off two personnel on the northeast side of the fire and departed to the helibase to pick up the bucket and begin water drops.
1100	A Type I hand crew (Santa Fe Hotshots) arrived at the fire. Five people went up the west line and 13 people went up the east line to the northeast side of the fire to assist in containing the slopover. A second Type I Crew (Mormon Lake Hotshots) was called to the Cerro Grande Prescribed Fire.
1255	An air tanker was requested for the slopover on the northeast side and arrived at approximately 1600. At this point, the burn boss (former fire observer) made the decision to convert the prescribed fire to a wildland fire, which then became the Cerro Grande Fire. Paul Gleason then assumed responsibility for the fire as the Incident Commander (IC) and additional resources were ordered. Efforts then focused on suppressing the fire.
Approx. 1630	A spot fire was detected one-quarter mile east of the main fire in Water Canyon, which the Type 1 hand crew contained. Another Type I hand crew arrived at the fire and started walking in.
1630	Paul Gleason briefed park management on the Cerro Grande fire situation.
2115	The Wildland Fire Situation Analysis (WFSA) was completed by Paul Gleason, Al King, and Charisse Sydoriak, and approved by Roy Weaver.
2255	Zone Dispatch requested the current fire weather observations to send to the National Weather Service (NWS). During the nighttime hours, crews began burning out the east handline (the part of a natural or constructed fire barrier that is scraped or dug to mineral soil) and improved the west saw line.
2355	NWS issued a spot weather forecast, calling for a fire weather watch on Saturday, May 6th.
SATURDAY, MAY 6TH	
TIME	EVENT
Between 0001 and 0800	One hand crew went off-shift, which left one hand crew on the fire to continue suppression actions.
0230	The hand crew began blacklining operations along the east and west sides of the fire to stay ahead of the fire as it backed down the hill
0728	The hand crew requested an air tactical group supervisor, after a second spot fire was observed outside the fire area to the east, which was successfully contained.
1425	Roy Weaver and key fire staff met with the interagency cooperators (Los Alamos National Laboratory. U.S. Forest

	Service and Los Alamos County) to discuss the suppression strategy and tactics selected in the WFSA.
1846	The crews continued firing operations to secure the handline along the east side of the fire.
1900 – 2300	Handcrew burned out along west fireline.

SUNDAY, MAY 7th	
TIME	EVENT
0730	The hand crew for the day operational period replaced the night crew on the east line and continued firing operations down to and west along State Road 4.
0800	Air attack reported a spot fire on the park/forest boundary.
1000	All burning operations along State Route 4 were halted due to down slope wind conditions.
1150	Winds increased from the west and a spot fire occurred across State Route 4 into Frijoles Canyon.
1230	The spot fire was growing rapidly and a Type I Incident Management Team and two Type 1 crews, two Type 2 crews, and one Type 3 helicopter were requested.
1240	A decision was made by Paul Gleason to evacuate Graduation Flats and American Springs.
1300	Interagency road closures and evacuation procedures were initiated. The Santa Fe National Forest Supervisor and forest FMO were notified of these actions.
1450	Spot fires were reported along the eastside of the fire, increasing in intensity with the potential to threaten Los Alamos National Laboratory.
1700	The spot fire to the east of the fire had grown to approximately 100 acres with additional spotting up to one-quarter mile ahead of the main fire (Figure 3).
1845	A decision was made to burn out sections along State Route 501 and Camp May Road to protect Los Alamos.
2100	An interagency meeting was held to develop a unified command delegation of authority and a revision of the WFSA.
MONDAY, May 8th	
TIME	EVENT
0100	The Type I Incident Management Team was briefed by the agency administrators and took over the fire operations at 0600 hours.

Figure 3. Projection of wind direction and fire spread on May 7th (Figure 5I, taken from Investigation Team Report).



FINDINGS AND DISCUSSION

The following represents the full presentation of the Board of Inquiry's findings and discussion of these findings. The information presented here is a complete review of the facts and circumstances of the incident and those that may have contributed to it. This section reviews legal and policy requirements of NPS employees that apply to the facts of the incident and evaluates responsibility and performance of the five employees in complying with those requirements. As part of the review of compliance with necessary requirements, this section presents the Board's objective critique of the actions of the individuals directly involved in the incident. This entire discussion has been formulated by measuring findings against the findings and recommendations stated in the May 18th Investigation Team Report. In addition, the 12 safety elements listed on page 15 of the investigation team report have been addressed individually in terms of their contribution to safety but not in regard to their contribution to complexity, as was the intent of the original report.

Table 2 lists the Cerro Grande Prescribed Fire Board of Inquiry Findings and Discussion.

Table 2. Cerro Grande Prescribed Fire Board of Inquiry Findings and Discussion, including Investigation Team Report Findings, responsibility, and performance in terms of NPS policy, procedures, and standards.

Investigation Team Finding	Responsibility	Board of Inquiry Findings/Performance
Finding 1.A.: The complexity rating process completed for the Upper Frijoles 1 and 5 (Cerro Grande) prescribed fire plan did not follow the National Park Service rating system. The range of numeric values assigned by Bandelier (i.e, 1,2,3, did not comply with the Worksheet Numeric Rating Guide in RM-18, which has a numeric ratings range of 1,3,5 (USDI National Park Service 1998). This error in and of itself resulted in the prescribed fire being rated as low-moderate complexity (87) by Bandelier staff rather that moderate-high (137) when the correct values were used.	Mike Powell, Burn Boss; Al King, FMO; Charisse Sydoriak, Chief of Resources; Fire Management Program Center - Boise	**The Board finds that the complexity rating process completed for the Upper Frijoles 1 and 5 prescribed fire plan did not follow the National Park Service rating system. However, this was not due to an oversight by the Bandelier staff but due to the fact that the version of the Wildland and Prescribed Fire Complexity Rating Worksheet Numeric Rating Guide posted on the internet at the National Park Service (NPS) Fire Management Program Center (FMPC) home page was incorrect at the time of the Cerro Grande Prescribed Fire. The document created in hyper text markup language (html) (an authoring language used to create documents on the world wide web) on the NPS FMPC home page was found to present a numeric rating guide that incorrectly listed the guide to numeric rating values as 1, 2, and 3 instead of 1, 3, and 5.** It is assumed that when the internet html version was created, either the file was retyped by contractor employees and the numbers were inadvertently changed at that time or a conversion from a Word file to the html file took place and as part of the conversion process, an auto-numbering routine changed the numbers to read sequentially (1, 2, 3) rather than the actual numbers of 1, 3, 5. During the ensuing time following completion of the website, all five federal wildland fire management agencies had access to the internet html file but the inaccuracy went undetected and unreported. The Reference Guide was

		removed from the web once the error was found during the Cerro Grande investigation. **The Board finds that the Bandelier staff complied with the NPS policy requirement listed in RM-18, Chap. 10: Section B.4., Project Assessment, "*Complexity: Identification of the level of complexity of the prescribed fire",* but due to circumstances unknown to them, used an incorrect version of the complexity rating system.**
Finding 1.B.: There are different prescribed fire complexity rating systems being used by different agencies, and within the southwest geographic area there are no standard systems among agencies.	Wildland Fire Management Agencies	**Agency Administrators in the Southwest federal wildland fire community have not addressed the need to standardize complexity ratings. There is no requirement in the Federal Wildland Fire Management Policy to develop a specific standardized complexity rating. The Board finds that the Bandelier staff had neither responsibility nor control over the lack of a standardized complexity rating system among agencies in the Southwest Area.** No NPS policy, procedures, or standards were violated by the situation presented by Finding 1.B. **The Board generally agrees with the Investigation Team Report recommendation.** Wildland fire management agencies should develop a standard complexity rating system framework. This framework should incorporate locally developed standards based on common fuel, weather, and topographic influences.
Finding 1.C.: A number of the prescribed fire complexity elements in the rating guide were consistently underrated based on the	Mike Powell, Burn Boss; Al King, FMO; Charisse Sydoriak,	**The Board agrees that at least one of three different complexity elements (Threats to Boundaries, Fuels and Fire Behavior, Objectives) in the rating guide was underrated. The increase in rating any of**

investigation team report. This underrating coupled with the apparent misuse of the system identified in Finding A resulted in a significant misclassification of the complexity. An analysis of where each complexity element was underrated is shown in Table 1 of the Investigation Team Report.	Chief of Resources	**these elements when applied to the correct complexity rating would result in a final complexity rating of high.** Complexity determinations are not absolute and interagency training teaches their interpretation using intuitive judgment and experience. Using intuitive judgment and experience to refine the rating worksheet, several subject matter experts have rated complexity for this project as "high". The increase in complexity would likely have been the basis for increased numbers and skill levels of personnel on-site. However, there was no policy requirement at the time of this burn that tied staffing to complexity level. The FMO, Al King, and Chief of Resources, Charisse Sydoriak, are responsible for review of the complexity rating. The Board finds that because both have an extensive background in fire management, each are qualified to complete this review. During the planning process for this burn, considerable discussion of complexity took place between the Chief of Resources and Burn Boss. Originally this project was rated as low. Based on discussion between the FMO and Chief of Resources, the complexity rating was increased to moderate. Complexity determinations are made during burn plan development and may occur several months in advance of project implementation. **The Board believes that complexity should have been re-evaluated on the day of the burn to account for any changes that may have occurred**

		since the plan was finalized, but policy does not require it.
Finding 1.D.: The prescribed fire plan was not substantively reviewed before it was approved by the agency administrator (Superintendent).	Roy Weaver, Superintendent	Contrary to the Investigation Team Report finding, the Board finds that the Burn Plan was reviewed and approved by the Superintendent and principal staff. Although "substantive review" is not defined in policy, materials and testimony submitted to the Board indicate that the Superintendent, Chief of Resources, and Fire Management Officer were involved in discussions of this specific prescribed fire at seven planning meetings over a period of approximately 18 months. These discussions and meetings indicate substantive review to the Board. The Board finds that the Bandelier staff complied with the NPS policy requirement listed in DO-18, 5.7a: "*All prescribed fire projects will have a burn plan approved by the Superintendent*." **The Board believes that future policy modifications should include considerations of off-site technical review of burn plans.**
Finding 1.E.: The prescribed fire planner did not receive sufficient oversight, guidance, and support to prepare the prescribed fire plan.	Al King, FMO; Charisse Sydoriak, Chief of Resources	The Board finds that the Prescribed Fire Planner (Burn Boss), Mike Powell,developed a burn plan that had significant staff involvement. The plan addressed all required elements. However, as referenced above in Finding 1.C.,1.F., and 1.G., the Board feels that while the planner received specific guidance, several weaknesses in the plan occurred despite the review and oversight by the FMO and Chief of Resources. During the course of the plan development, the Prescribed Fire Planner (Burn Boss), Mike Powell, received feedback and input from the previous and current FMOs, and Chief of Resource Management, Charisse Sydoriak, on prescription development and content. Testimony indicated that the

		plan was reviewed by the FMO, Al King, and Chief of Resources, Charisse Sydoriak, and went through several revisions based on their reviews. The initial statements provided to the Investigation Team were subsequently clarified through testimony to this Board. **The Board finds that the Bandelier staff complied with the NPS policy requirement listed in DO-18, 5.7b:** "All burn plans will be prepared using a systematic decision-making process, and contain measurable objectives, predetermined prescription, and environmental compliance documentation," and in RM-18, Chap. 10, B., Prescribed Fire Plans.
Finding 1.F.: The prescribed fire plan prescription was inadequate for all phases of the burn due to wide elevation variations, varying aspects, and different fuel types. The prescription necessary to meet objectives at the upper elevations would cause unacceptable resource damage on the lower elevations of the burn unit.	Mike Powell, Burn Boss; Al King, FMO; Charisse Sydoriak, Chief of Resources; Roy Weaver, Superintendent	**The Board finds that the prescribed fire plan addressed policy requirements for prescription parameters.** The project area was comprised of three phases representing different fuel types (e.g., grass, ponderosa pine, aspen). Although each fuel type (phase) had a flame length requirement to meet objectives, the prescription parameters were not specific to each phase (different fuel types) of the prescribed burn project. Each phase had different objectives which would require differing prescription parameters. The wide range of prescription parameters used in this burn plan, given the variability of elevation, slope, aspect, and fuels, would indicate that a Type I Burn Boss would be desirable to tailor components of the prescription to each phase in order to achieve the objectives (Reference Finding 3.A.). Based on the Board's assessment that complexity on this project should have been rated as high, it would have indicated a Burn Boss, Type 1 (highest level), but the Burn Boss assigned to the burn was a type 2 (lower qualification level). The Board concurs with the summary statement by the Fire Behavior

		Analyst, Dan O'Brien, provided in the Investigation Team Report Appendix 6. This summary states, "Improvements could be made in the format and content of the Upper Frijoles Unit 1 and 5 fire plan. Prescription parameters need to be tightened down to limit tree mortality, and large fuel moistures more closely monitored to better measure unit consumption. Given the multiple fuel profiles existing in the unit, prescriptions specific to each profile would better serve to implement and monitor ignitions on the ground. Spotting and containment calculations also need to be added to the fire plan to provide a sound, scientific basis for establishing containment and contingency objectives. As it is currently written, the plan is implementable given a fire boss with local expertise and experience who understands the plan's intent. A fire boss without this background would have more difficulty in appropriately implementing the plan." **The Board feels that for landscape scale prescribed burns having different fuel types, elevations, aspects, and slopes, multiple objectives, prescriptions should be tailored to meet objectives.**
Finding 1.G.: The prescribed fire plan prescription projected flame lengths in excess of the limits set in the Bandelier National Monument Fire Management Plan.	Mike Powell, Prescribed Fire Planner (Burn Boss); Al King, FMO; Charisse Sydoriak, Chief of Resources	**The Board concurs with this finding.** NPS policy does not require establishment of prescribed fire flame lengths in a Fire Management Plan (FMP). However, NPS policy requires that the use of prescribed fire is permissible only when a FMP that authorizes and describes such activities has been completed and approved (DO-18, 5.6). Prescribed fire plans must be consistent with descriptions established in FMPs. Because flame lengths were established as limits in the FMP, they should have been carried forward into the Prescribed Fire Plan as limits or revised in the FMP.

		This finding represents a procedural inconsistency. However, the Board does not believe that this inconsistency influenced the outcome. The flame length discrepancy was only one foot (eight feet flame length specified in the FMP and nine feet described in the Burn Plan).
Finding 1.H.: Bandelier National Monument personnel did not receive or solicit comments from all cooperating agencies in the planning process. After the incident, cooperating agencies expressed concern about the decision to ignite the prescribed fire.	Mike Powell, Burn Boss; Al King, FMO; Charisse Sydoriak, Chief of Resources	**The Board finds that all individual and cooperating agencies on the standard notification list for Bandelier National Monument prescribed fires were contacted during the planning process and prior to ignition.** NPS policy and Federal Wildland Fire Management Policy require notification of cooperators but not concurrence. The Board finds that the Bandelier staff complied with the NPS policy requirement listed in DO-18, 5.7d: "*All burn plans will address the need for alerting park neighbors and appropriate public officials to the objectives and timing of the planned burn*," and RM-18, Chap. 10. B.6. Prescribed Fire Plans: "*Cooperation: Provisions for interagency and intra-agency pre-burn coordination and, where applicable, public involvement and burn day notification to appropriate individuals, agencies and the public.*" **The Board finds that after the incident, several cooperating agencies did express concern about the decision to ignite. Although the project was discussed at several meetings, the complexity and magnitude of the prescribed fire may not have been uniformly perceived among cooperators.**
Finding 1.I.: The prescribed fire plan amendment prepared the day of the burn did not consider the full consequences of the changes	Mike Powell, Prescribed Fire Planner (Burn Boss); Al King, FMO;	During the original planning process, the Baca Ranch had considered participation in the project, but after the proposed land acquisition by the U.S. Government became likely, the Baca Ranch elected to not participate

and actions necessary for successful completion and coordination of the prescribed fire.	Charisse Sydoriak, Chief of Resources; Roy Weaver, Superintendent	as part of this project. The amendment removed these 32 acres of private property from the burn unit on the west flank. The burn plan amendment described implementation actions necessary to keep fire off that private property, and developed a contingency plan to implement if the fire escaped onto those lands. The amendment to the burn plan was approved by the Superintendent and complied with the NPS policy requirement listed in RM-18, Chap. 10. B.5.: *"Prescribed Fire Prescription: Any changes to prescriptive parameters must be approved by the same level of authority required for plan approval."* **The Board finds that the prescribed fire plan amendment did not affect the outcome. The escape did not occur on the Baca Ranch for which the amendment was developed.**
Finding 1.J.: The contingency plan inadequately identified actions needed to keep the prescribed fire within the prescribed parameters and necessary actions to be taken if it escaped.	Mike Powell, Prescribed Fire Planner (Burn Boss); Al King, FMO; Charisse Sydoriak, Chief of Resources; Roy Weaver, Superintendent	The Board finds that completion of the contingency plan component of the prescribed fire plan complied with the NPS policy requirement listed in RM-18, Chap 10. B. 7.: "*Contingency Plan: Identification of contingency actions to be taken if the fire exceeds prescription parameters and/or line holding capabilities and cannot be returned to prescription. If the Contingency Plan actions cannot maintain the prescribed fire within planned parameters, use the Wildland Fire Situation Analysis (WFSA) process to determine appropriate strategy."* **The contingency plan within the prescribed burn plan was adequate for the calculated complexity level of moderate and its amendment adequately addressed the policy requirements. However, the Board**

		believes that had the prescribed fire plan contained a higher complexity rating, additional holding resources would have been on-site which would have in turn influenced the call-up requirements of the contingency plan. **NOTE TO READER: *The Board finds a strong link between the complexity rating, holding resources, and contingency plan. Although reference to this situation is frequently repeated in this document, it is because of the inseparable relationship among complexity rating, holding resources, and contingency plan.*** **The Board recognizes that three factors influenced contingency decisions. The three factors are:** Complexity rating, Northern Pueblo Agency (NPA or Black Mesa) crew release, Holding Resources/slopover. Complexity rating: A higher complexity rating as determined to be appropriate by the Investigation Team and Board of Inquiry (See Finding 1.C.) should have resulted in more holding resources being on-site which would have influenced the need for call-up of contingency resources. With more holding resources on-site, managers would have had greater flexibility to mitigate the loss of some personnel (early release of Northern Pueblo Agency (NPA) crew). Northern Pueblo Agency (NPA) Crew Release: The Burn Boss, Mike Powell,

		had planned to use the NPA crew during the ignition phase and the remaining night operational period as a holding crew on 5/4. However, based on a concern surrounding the crew's ability to complete their assigned responsibilities during the operational period, the Burn Boss, Mike Powell, decided at approximately 2400 hours to send them off the fire for rest. After learning that the crew was not prepared to spend the night, he released them to their home units rather than resting them at the base of the project site. Once this crew was released, the NPS personnel became holding resources for the remainder of the night. Because these NPS resources were originally planned to be holding resources for the next day operational period, there was now a need to obtain new staffing for use the next day. Attempts by the Burn Boss, Mike Powell, to fill this need were unsuccessful and were not aggressively pursued throughout the night. Notably the Burn Boss, Mike Powell, was the only individual aware of the inability to fill this need immediately. The remaining individuals on the burn assumed the necessary resources would arrive the next morning. **The Board finds that when the Northern Pueblo Agency crew was released, an order for replacement resources for the next day operational period should have occurred immediately.** A fundamental error occurred at approximately 0300 hours. At this time Mike Powell called Santa Fe Dispatch to obtain additional resources for the following day. However, no sense of urgency was conveyed to the dispatch office. There is disagreement between Mike Powell and Santa Fe

		Dispatch regarding this conversation. Mike Powell did not obtain confirmation of crew availability and arrival times before going off-duty for rest. At 0600 hours, when the NPS Regional Wildland Fire Specialist, (RWFS) Paul Gleason, (acting as a project observer) woke Mike Powell, Paul Gleason found that no additional resources had been confirmed and no estimated arrival times were available. Gleason then insisted that the order be placed and followed up on immediately. Any delay in getting day operational period resources in place would further exceed adherence to the work/rest guidelines by the NPS resources. **The Board finds that Mike Powell did not aggressively pursue filling the order. The Board further finds that it was Mike Powell's responsibility to take aggressive steps to ensure that the resources needed for the next day operational period had been located and confirmed. Because of the need to relieve the NPS resources (whose work period began at 0700 hours on 5/4) from the extended 24 hour period, the Board does not believe that it was prudent to wait until the morning to obtain confirmation on the additional resources.** <u>Holding Resources/slopover:</u> The importance of holding resources in dealing with the burn complexity and the possibility of escapes is most clearly illustrated by the slopover on 5/5. Mike Powell's failure to more aggressively pursue obtaining additional resources to replace the NPA crew adversely compounded holding problems. Work/rest guidelines were compromised and those resources on site had most likely become over-extended (holding resources at 0800 hours on 5/5 had been on duty for approximately 25 hours). Had the contingency resources been secured

		for the start of the day operational period on 5/5 (0600 – 0800 hours), rested personnel starting their work shift would have been on site at the time the slopover occurred. When the slopover occurred, it required the resources on site and precluded the ability of remaining resources to hold the remainder of the prescribed fire. Without adequate resources on site, personnel were unable to hold the fire in Phase 1. This limited available future options and the ability to remain consistent with the original prescribed fire plan which was to complete Phase 1 and then evaluate options for Phase 2. This led to the declaration of a wildland fire. The lack of contingency resources on site put personnel in a position of reliance on aerial retardant support and other means of holding. Decisions made at the following times were crucial to the outcome. Each was irreversible and placed them on a path with diminishing future options: 2100 hours (5/4) – decision to stop extinguishing interior portions of blacklining operation in phase I, 2400 hours (5/4) – decision to keep the Bandelier personnel as holding resources throughout the night operational period, thus precluding their ability to perform these duties during the next day (5/5) operational period without confirmed replacements, 0300 hours (5/5) – Mike Powell called dispatch (no sense of urgency was conveyed) and made a decision to delay confirmation of resource assignment and time of delivery until the morning. **The Board is concerned about the passive and somewhat uncertain**

		communication link between those on the fire site and dispatch.
Finding 2.A.: The GO/NO-GO Checklist was not completed prior to the burn.	Mike Powell, Burn Boss	**The Board finds that all items were discussed in the pre-burn briefing by the Burn Boss, Mike Powell, the Ignition Specialist, and the Holding Specialist, Al King, but discussion of these items was not formally documented in writing.** **NPS policy does not require formal written documentation.**
Finding 2.B.: Contingency resources were not ordered and placed on standby prior to implementation of the prescribed fire.	Mike Powell, Burn Boss	**NPS policy does not require standby of contingency resources prior to ignition.** Standby is not consistently interpreted but for the purpose of this report, standby is interpreted to mean off-site resources unassigned to other activities and available for immediate support of the prescribed fire project. Mike Powell stated that resources identified in the contingency plan were confirmed prior to ignition (one retardant aircraft within 2 hours, one type III helicopter within 4 hours, and two type I or II crews within 4 hours). **However, the Board finds that there was disagreement and confusion between the park and Santa Fe Dispatch regarding ordering protocols, timing of availability, and payment processes. This confusion may have led to delays in delivery of planned contingency resources. However, Santa Fe Dispatch mobilized resources to Bandelier to support the prescribed fire despite the dispatchers' uncertainty involving assignment of suppression resources to prescribed fire support, confusion regarding appropriate individual agency management payment codes, and the direction of the Southwest Area's Mobilization Guide.** The resource allocation processes within the Southwest Geographic Area

		are not altogether consistent with National Wildland fire Coordinating Group direction. During this review, members of the Southwest Area Coordination Center reflected concerns about the inability of agencies to resolve this issue. **The Board believes that agency procedures should be standardized so that contingency resources identified in the plans can be ordered through normal wildland fire procedures to ensure their availability. However, since normal/standard interagency accepted procedures are not fully defined, understood, and endorsed by all agencies, the Board recommends that agencies should jointly develop these standards.**
Finding 2.C.: On the early morning of May 5, USDA Forest Service contingency resources were ordered and did not arrive until approximately 1100 hours. Lateness of arrival of contingency resources influenced control of an isolated spot fire but did not affect the escape of the fire.	Mike Powell, Burn Boss; Al King, FMO	The Board concurs with the Investigation Team Report finding that the resources did arrive late (see Finding 1. J.). The Board disagrees with the Investigation Team Report finding that this late arrival did not contribute to the escape of the prescribed fire. There were insufficient resources on-site to contain the slopover (not an isolated spot fire) that occurred on 5/5. Lateness of arrival of contingency resources influenced control of the slopover but more importantly, in the view of the Board, the lateness of these resources precluded the ability of on-site holding resources to maintain the prescribed fire within the boundaries of phase I. The prescribed fire was declared a wildland fire at 1300 hours on 5/5. The need for resources to contain the slopover triggered the declaration of a wildland fire. At this time, the selected Wildland Fire Situation Analysis (WFSA) option was to initiate suppression operations as an indirect attack and burnout at Highway 4, east fire road, and other existing firelines. The burnout operations associated with the suppression strategy directly influenced the escape of the fire onto Forest Service and private lands.

Finding 2.D.: Once the prescribed fire was declared a wildland fire, wildland fire suppression tactics were used that were not in accordance with the Wildland Fire Situation Analysis. This resulted in additional fire being introduced into the unit, which ultimately produced the source of spotting and escape when high winds developed on Sunday, May 7.	Paul Gleason, Incident Commander (ICT3)	**The Board finds that the wildland fire suppression tactics used after the prescribed fire was declared a wildland fire were in accordance with the Wildland Fire Situation Analysis.** **However, the Board believes that the location, timing, and holding of the west flank firing operation during the suppression phase on May 6th contributed to the escape of the fire.** **Although there is disagreement among witnesses on the fire at the time of the escape to the east, the Board believes that the most plausible explanation is that the escape initiated from the west flank.** The focus of on-the-ground suppression actions were on the east flank. This area was most threatened based on the prevailing winds, fuels, and topography. The majority of fire spread across the unit was influenced by slope effects. On the west flank when the fire reached the flats, fire spread came under the influence of the prevailing winds. Now fire movement was pushed by the prevailing west wind and spotted into Frijoles Canyon and spotted onto and the east slope and outside the eastern boundary. The fire in the flats along the west flank posed a significant risk given the fact that a red flag warning for high westerly winds had been issued for both 5/6 and 5/7.
Finding 2.E.: Numerous safety violations occurred, i.e., unanchored fireline, unheeded work/rest guidelines, aviation SAFECOM, lack of	Mike Powell, Burn Boss (primary)	**The Board finds that the fireline was anchored.** Prior to the burn, in the wooded west flank area chain saws and handtools

identified escape routes, and others. (for the purposes of this safety item discussion, this refers to the safety elements listed in Finding 2.E. on page 18 of the Investigation Report).		were used to clear the proposed west fireline. An anchor was created where the east and west lines connected by burning out minimal areas followed by extinguishing the fire with crews. As the firing progressed from this initial point, crews continued to extinguish the fire. The anchor point created at the Cerro Grande summit was utilized as firing progressed to the east. This anchor remained valid and useable despite short time periods when fire moved back to the west toward the Baca Ranch. This fire was quickly extinguished upon discovery which maintained the integrity of the original anchor point. **The Board finds that the work/rest guidelines were exceeded.** DO-18, 5.16 states, *"All fire business and personnel management activities must comply with all instructions prescribed in Reference Manual-18, Fire Management Compendium, Interagency Incident Business Management Handbook (NWCG Handbook 2), and 5 CFR, parts 550, 551 and 532."* The Interagency Incident Business Handbook (NWCG Handbook 2) recommends a 2:1 work/rest ratio (e.g., 16 hours work requires 8 hours rest). During the prescribed fire, work/rest guidelines were exceeded (See Item 6 for a more detailed description). During the suppression action, it is not unusual for work/rest guidelines to be exceeded during the mobilization and initial operational periods. Incident Commanders have the authority to approve work period lengths in excess of the 2:1 work/rest guidelines in the initial phases of action. (*See Incident Business Management Handbook, NWCG Handbook 2).*

		The Board finds that a wildland fire suppression Incident Commander decision caused the 14 hour helicopter pilot duty day to be exceeded by 17 minutes. Exceeding the duty hour limitation represents a reportable incident requiring an aviation SAFECOM (SAFECOM is a report required for all aviation incidents, accidents, or maintenance related issues). Proper reporting procedures were followed and any additional review and actions will be conducted by the appropriate aviation management staff. This SAFECOM did not contribute to the escape of the prescribed or suppression fire. **The Board finds that escape routes were not identified in the burn plan, however, all personnel on-site at the time of ignition were briefed and knew the location of escape routes and safety zones. Two crewmembers were off-site at the time of the briefing and were not briefed.** During interviews, those two crewmembers stated that they knew the location of escape route and safety zones from information from on-site personnel and their pre-ignition work on the burn site (Refer to Item 9). **The Board finds that the Bandelier staff complied with the NPS policy requirement listed in RM-18, Chap. 10. B.5.:** "Briefing: Identify and analyze the safety hazards unique to the individual prescribed fire project and specify personnel safety and emergency procedures."

The following 12 items refer to the safety elements listed on page 15 of the Investigation Report. For the purposes of this report, the Board has addressed each item individually.		
Unanchored fireline.		Refer to Finding 2.E. above.
There was no handline along the boundary of adjacent landowner (Baca Ranch).	Mike Powell, Burn Boss	The Board finds that the Prescribed Fire Plan did not require construction of a handline in this area and NPS policy does not require handline or mechanical fireline to be constructed on prescribed fires. The plan called for fire perimeter holding to be accomplished through the use of water from backpack pumps to extinguish burning edges and taking advantage of changes in fuels and terrain to limit fire spread rather than construction of a handline. Further, the burn plan amendment called for no fire introduced into the Baca Ranch area. This portion of the burn plan was successfully implemented.
No escape routes were identified.	Mike Powell, Burn Boss	Refer to Finding 2.E. above.
Incident Action Plan did not conform to National Wildland fire Coordinating Group standards.	Paul Gleason, Type 3 Incident Commander	**The Board finds there are no National Wildland Fire Coordinating Group (NWCG) and NPS policy standards for Incident Action Plans.**
Staff not available for extended periods, 0200 – 0300 crew's relief created personnel shortage.		Refer to Finding 1.J. above
Inadequate staffing resulted in extended hours and extreme shift periods lasting 12 hours prior to ignition.	Mike Powell, Burn Boss; Al King, FMO	**The Board finds that extended hours and an extreme shift period did occur prior to ignition.** This resulted from management decisions to ignite later in the day and to utilize Bandelier staff to preposition tools and equipment. With the unplanned release of the NPA crew further shift extensions of Bandelier personnel became necessary to meet holding plan requirements. Expectations were that the shift periods would extend only until the arrival of a replacement crew at 0800 hours on 5/5. When the burn boss left the fire and contacted dispatch at approximately 0300 hours, 5/5, he learned that the replacement resources were not going to meet the desired 0800 arrival time. This resulted in extended shifts of

		30 – 35 hours. **The Board finds that insufficient measures were taken to obtain the necessary resources during the early morning hours. Contact with the Bandelier FMO (the Burn Boss' immediate supervisor) should have occurred to review other alternatives.**
A Spot weather forecast was issued at 1220: ignition was 1930. Weather observations were taken at Cerro Grande summit the morning of May 4th, up to 1100 period. No further weather observations were taken until 1735.	Mike Powell, Burn Boss; Al King, Holding Boss	**The Board finds that continuous weather readings were taken during the entire period. Readings were being taken by both personnel on-site and through a portable weather station located on the burn site. Observations were collected hourly.**
Weather observations were in compliance. Holding Specialist had a telephone consultation with NWS at 1900.	Mike Powell, Burn Boss; Al King, Holding Specialist	**The Board finds that the telephone consultation with the NWS at 1900 confirmed that the 1220 Spot Weather Forecast was still valid overnight.**
Two single resources were not on the fire and were not briefed; dealing with a flare-up on another prescribed fire in the park.	Mike Powell, Burn Boss	The Board finds that two individuals were not briefed during the pre-burn briefing. At this time these people were on another assignment at a different location. However, they stated that they were familiar with the burn site as a result of assisting with pre-burn preparations. Upon their arrival at the prescribed burn, they received adequate information from personnel on-site to perform their assignment. (Refer to Item 2.E.).
No resources were identified to relieve current personnel assigned to the fire and the plan was unclear as to where the fire would be stopped.	Mike Powell, Burn Boss; Al King, FMO; Charisse Sydoriak, Chief of Resources; Roy Weaver, Superintendent	**The Board finds that there was no written documentation within the burn plan regarding resource scheduling.** The burn boss stated that his intention was for the Northern Pueblo Agency crew to relieve Bandelier personnel during the night operational period. Bandelier personnel would return for the following day operational period. Phase I operations would likely have been completed during the day operational period of 5/5. No

		additional resources would have been required during that operational period. (Refer to Item 2.E.). **The Board finds that the burn plan does define in general terms the boundaries of each phase. This is not a required element for prescribed fire plans.**
Costs were an issue; as an AD crew, the Black Mesa crew could only be used 24 hours prior to ignition and 24 hours after being taken off active assignment. Cost preparation for the unit had not been completed.	Al King, FMO; Charisse Sydoriak, Chief of Resources; Roy Weaver, Superintendent	**The Board finds the reference to the Black Mesa (Northern Pueblo Agency) crew to be true, however, it is unclear how this relates to safety.** There is a funding table presented in the burn plan (section 8) that describes project costs. FIREPRO funding was authorized for this prescribed fire project.
The complexity of the fire exceeded the management capability of the organization.		Refer to Finding 1.C., 1.F., and 1.J., above.
End of 12 safety elements		
Finding 2.F.: The weather forecast from Albuquerque on Friday afternoon, May 5, did not provide any wind predictions in the 3-5 day forecast for the period Sunday, May 7 through Tuesday, May 9. This is a period with area wind gusts greater than 30 mph on both Sunday and Monday. This information is critical for multi-day incidents.		The Board concurs with the finding of the Independent Review Board that the National Weather Service (NWS) did comply with existing policies in providing weather information. The NWS Albuquerque Office does not routinely provide predicted winds in the 3-5 day outlook due to inability to provide reliable information, because of constantly changing conditions. (See Independent Review Board Report and telephone interview results conducted August 11th).
Finding 2.G.: There are a significant number of other issues with regard to coordination and use of National Weather Service forecasting in		See comments on Issues 1 – 12 below.

the implementation in the prescribed fire. These issues and recommendations are identified below:		
Issue 1:Moderate drought existed in northern New Mexico and surrounding regions in the spring of 2000, having built since the fall of 1999. NPS did not adequately account for the effects of this drought in planning or implementing the Cerro Grande prescribed fire.	Mike Powell, Burn Boss; Al King, FMO; Charisse Sydoriak, Chief of Resources	**The Board finds that moderate drought existed in northern New Mexico during the spring of 2000 as confirmed through accepted measures of drought (Potential Assessment distributed by the National Interagency Coordination Center in Boise, ID; the Palmer Drought Index; and the National Fire Danger Rating System Energy Release Component).** But fire managers accept that long-term forecasting of developing or continuing drought, while useful, may not be markedly reliable (as evidenced by the declaration of the prognosis for the worst fire season in the Southwest in 50 years in March of 1999, followed immediately by a severe winter snowfall that rendered the declaration inadequate and strongly contributed to the disintegration of conditions favoring the long-term drought). Because of this inability to correctly anticipate developing conditions, it was difficult for BAND personnel to know the magnitude and persistence of the drought. On the burn site, the situation was representative of springtime conditions prior to vegetation green-up, the time of the highest annual live fuel moisture conditions. The project area at 10,000 feet had received .25 inches of precipitation on April 30th and snow had been on the site three weeks prior to that date. Energy Release Component (ERC), an indicator of fire danger incorporating drought conditions, showed a sharp decline after these precipitation events. **The Board finds that Bandelier personnel did not have adequate**

		indications of the likelihood and speed with which the drought conditions could return or escalate. The Board finds that this issue is not an identified violation of policy, procedures, or standards.
Issue 2: Light precipitation fell at the burn site on April 29 thru May 1. However, the prevailing warm, dry pattern under a ridge of high pressure aloft returned on May 2.	None applicable	**The Board finds that this issue is not an identified violation of policy, procedures, or standards but is statement of fact.**
Issue 3: The NPS followed policy in asking for, receiving, and making use of a site-specific (spot) weather forecast from the National Weather Service Forecast Office in Albuquerque for the Cerro Grande Prescribed Fire.	Mike Powell, Burn Boss; Al King, FMO; Charisse Sydoriak, Chief of Resources	The Board concurs with the Investigation Team Report issue. Bandelier staff complied with NPS policy listed in RM-18, Chap. 10. B.5.: "*Prescribed Fire Prescription: A prescribed fire prescription containing those key parameters needed to achieve desired results. Prior to ignition, compare prescription elements, both individually and collectively, against local weather forecasts and any other predicted conditions.*"
Issue 4: On the night of May 4 and the morning of May 5, the Haines Index, which is a measure of atmospheric stability and dryness and indicates the potential for large fire growth, did not contribute to the escape of the Cerro Grande Prescribed Fire.	None applicable	**The Board finds that this issue is not an identified violation of policy, procedures, or standards but is statement of fact.**
Issue 5: Onsite weather observations provided by the NPS for the Cerro Grande Prescribed Fire on May 4 and 5 were generally well covered in the spot forecast provided by the National Weather Service.	None applicable	**The Board finds that this issue is not an identified violation of policy, procedures, or standards but is statement of fact.**
Issue 6: The 11 MPH wind gust that occurred during the late evening hours of May 4th was at ridge-top level and was within forecast ridge-top	None applicable	**The Board finds that this issue is not an identified violation of policy, procedures, or standards but is statement of fact.**

wind speeds provided by the National Weather Service.		
Issue 7: The standards for wind speed measurements used in National Fire Danger Rating System (NFDRS) fire weather observations are: 1) the anemometer height is 20 feet above the surface, or 20 feet above the vegetative cover, and 2) the standard observation time is 10 minutes. These standards often cause confusion among fire personnel, who don't measure 10 minute or 20-foot winds.	None applicable	**The Board finds that this issue is not an identified violation of policy, procedures, or standards but is statement of fact.**
Issue 8: The NWS Albuquerque practices regarding Fire Weather Watches and Red Flag Warnings may have caused some confusion. Some Fire Weather Watches and Red Flag Warning did not specify affected areas, cause, and valid period.	None applicable	**The Board finds that this issue is not an identified violation of policy, procedures, or standards but is statement of fact.**
Issue 9: Red Flag Warnings can remain in effect for more than 24 hours for continuous wind events.	None applicable	The Board finds that this issue is not an identified violation of policy, procedures, or standards but is statement of fact.
Issue 10: At times fire management personnel did not have a current spot forecast because the burn boss at the incident had set up no regular schedule for spot forecasts.	Mike Powell, Burn Boss	The Board finds that Spot Weather Forecasts were provided for and requested at least once daily. Activities were conducted with a valid forecast for the period of operation. Morning Spot Weather Forecasts were re-validated for evening operational periods. However, the Board finds no regular schedule for Spot Forecasts was established. The Board finds that this issue is not an identified violation of policy, procedures, or standards and is not a contributory factor to the outcome.

Issue 11: After May 4, there was a decrease in communications and feedback between the NPS fire management personnel and NWS forecasters in Albuquerque.	Mike Powell, Burn Boss; Al King, FMO; NWS Fire Weather Forecasters	**The Board finds that Bandelier staff requested daily spot weather forecasts from the NWS in Albuquerque. This constitutes a communication and feedback loop between the fire management staff and fire weather forecasters. However, continued communication could facilitate better information transfer pertaining to accuracy of forecasts and updated information from the forecaster. This feedback and information transfer is not limited to one-way communication but should be initiated as needed by both the fire staff and weather forecasters.**
Issue 12: The Incident Action Plan (IAP) for Sunday, May 7 did not include a weather forecast for the day operational period.	Paul Gleason, Incident Commander Type 3	**The Board finds there are no National Wildland fire Coordinating Group (NWCG) and NPS policy standards for Incident Action Plans and no requirements for inclusion of written weather forecasts. Although weather forecasts are typically attached to Incident Action Plans at the type 1 and 2 levels, there is great variation in IAP content at the type 3 level.** **The Board finds that all operational personnel interviewed stated that they were briefed on the weather forecast for that period.**
Finding 2.H.: Conditions adjacent to the prescribed fire boundary were not given adequate consideration with regard to fire behavior, fuel conditions, and public safety in the event the fire crossed the planned burn boundaries.	Mike Powell, Burn Boss; Al King, FMO	**The Board finds that fire behavior, fuel conditions, and public safety for areas adjacent to the burn area were evaluated during the planning process according to NPS standards and policy.** Evaluations were completed through field observations, reconnaissance, and consultation with cooperators. **However, given the outcome of this incident, it is apparent to the Board that "adequate consideration" is a judgment call.** Testimony revealed that there is little or no agreement regarding how much pre-burn evaluation is adequate.

		It is clear to the Board that the immediate project area was thoroughly evaluated as were the boundaries on the project area. However, it is not clear that risk was more broadly evaluated at landscape scales outside of the immediate project area. Evaluating risk in the context of landscape scales is much more complex than evaluating risk at simple project scales. **The Board feels that judgments regarding adjacent lands should have more thoroughly considered drought, potential magnitude and persistence of winds, and the risks of exposure due to extended operations.**
Finding 2.I.: The current wildland fire situation in the Southwest was not given full consideration when the prescribed fire was initiated.	Mike Powell, Burn Boss; Al King, FMO	**The Board finds that at the time of this burn the Southwest Geographic Area was at Area Preparedness Level III.** At Preparedness Level III the fire danger and commitment of resources to existing wildland fire suppression are not significant and no restrictions are placed on the application of prescribed fire. Even though other large wildland fires and some prescribed fires were on-going which required commitment of suppression resources (some were in the demobilization phase), competition for local resources was not significant. At Preparedness Levels IV and V restrictions are placed on prescribed fire in an attempt to reduce potential competition for available firefighting resources. At the time of this prescribed fire, the Southwest Area was beginning to transition from late spring conditions to summer conditions. The project area at 10,000 feet received $\frac{1}{4}$ inch of precipitation on April 30th and snow was on the site three weeks before this time. Energy Release Component

		(ERC), an indicator of fire danger based on observed weather conditions, showed a sharp decline after these precipitation events. However, the speed with which this condition would reverse was widely unknown. It was only on the day that this prescribed fire was initiated, the Santa Fe National Forest suspended prescribed burning on national forest lands. **The Board finds that Bandelier personnel were not aware of any information about adverse resource draw down and availability other than what is contained in the Daily Situation Report and statement of current preparedness level.**
Finding 2.J.: The preparedness level coordination and allocation of resources for all wildland fire use is not adequately addressed in the Southwest Geographic Area Mobilization Guide.	Southwest Geographic Area wildland fire management agencies and Geographic Area Coordinating Group	**The Board concurs with the Investigation Team Report recommendation that Preparedness Level coordination and allocation of resources for all fire use (wildland fire use and prescribed fire) should be addressed in the Southwest Geographic Area Mobilization Guide, specifically strengthening the criteria for prescribed fire.**
Finding 2.K.: Actions taken to notify cooperating agencies and interested parties of this prescribed fire did occur within the time frame specified in the prescribed fire plan. The communications that did happen on May 4, however, did not adequately reflect the complexity and full nature of the prescribed fire about to be undertaken.	Mike Powell, Burn Boss; Al King, FMO	**The Board finds that notification did comply with the NPS policy requirement listed in RM-18, Chap. 10. B.6.:** "Cooperation: Provisions for interagency and intra-agency pre-burn coordination and, where applicable, public involvement and burn day notification to appropriate individuals, agencies and the public." The Board finds that on the day of the burn, notification consisted of alerting cooperators to the fact that the burn would be commenced. Specific project scope and complexity was discussed at several earlier meetings during the planning phase. See Finding 1.H.
Finding 3.A.: The technical and operational experience of the burn boss was not adequate to	Al King, FMO	**The Board finds that given the complexity determined by Bandelier personnel, the Burn Boss, Mike Powell, was qualified to plan and**

plan and conduct the prescribed burn given its true complexity.		**conduct this project. However, since this burn should have been rated as a higher complexity, the Investigation Team Report Finding is a valid observation. But, at the time of this burn, NPS policy as written (DO-18, RM-18) did not require a higher qualification level of burn boss for high complexity burns. This aspect of policy was under review at the time of burn implementation and was proposed to be changed to reflect the need to have a type I burn boss on complex burns.** Two type I burn bosses were on the site at the time of the burn but were not the designated lead burn boss.
Finding 3.B.: Personnel implementing this prescribed fire met established National Wildland fire Coordinating Group standards for tasks performed on the fire.	None	**The Board concurs with the Investigation Team Report finding.**

SUMMARY OF INDIVIDUAL FINDINGS

The following section presents the Board's findings in regard to individual actions. It also contains recommendations from the Board. The Board feels that it is appropriate to take actions to assure that future applications in regard to prescribed and wildland fire planning and implementation activities do not repeat the Cerro Grande experience. To remove the principal employees involved with the fire from federal service is not warranted. To whatever extent some of these people made mistakes, they are not the mistakes identified in the Investigation Team Report. To take advantage of their training, experience, ability, and past record of success in the prescription fire program, along with additional training and new experience, which can be obtained from relocation, is the recommended course for National Park Service to follow.

ROY WEAVER
Superintendent (retired)

The Board finds that Roy Weaver fulfilled his responsibilities at the project level. He was familiar with the objectives; he discussed the project with cooperators; he asked questions of his staff during burn plan development; and he took responsibility for approving the plan. He surrounded himself with a staff that was fully qualified and capable of managing the fire program at Bandelier NM.

The Board has some concerns about the Superintendent's role at the interagency level. It is clear to the Board that differences of opinion and hard feelings separate agencies in this sub-geographic area. More direct upper management exchange of information on fire and emergency planning efforts may have better addressed adjacent landowner and agency concerns regarding the park's prescribed fire program.

The Board recommends that no action be taken.

CHARISSE SYDORIAK
Chief of Resource Management

The Board finds that Charisse Sydoriak clearly had program responsibilities for fire management at Bandelier National Monument. She supervised the wildland fire management staff and served as the principal advisor to the Superintendent on fire management issues. She had regular involvement with staff and managers of other agencies dealing with fire management activities in the region. Her training, background, and experience in fire management were extensive.

At the programmatic level, Ms. Sydoriak clearly fulfilled her responsibilities. She directed development of the burn plan and provided for a review of the burn plan.

At the project level, complexity determination for this burn is at issue and has been identified as a critical factor in the outcome of this action. Based on her extensive background, the Board feels that Ms. Sydoriak has the capability to critically evaluate those elements that affect complexity associated with landscape scale prescribed fires. In light of several exacerbating factors, including the proximity of private land, potential fire behavior, local attitudes and concerns, and objectives that influenced the complexity of this prescribed fire, the Board finds that she and her staff did not fully recognize and account for the risks surrounding this project.

The Board recognizes that the complexity rating process followed all required and professionally accepted procedures to arrive at the outcome. In addition, the Board acknowledges that Ms. Sydoriak assisted in increasing the complexity rating from low to moderate based on intuitive judgment and experience. The complexity rating was still lower than likely to have been calculated using the correct form.

The Board recommends that, if Ms. Sydoriak continues to work in a position that provides oversight to fire management in any capacity, she be sent to training that will provide her additional knowledge in wildland fire management. Possible training coursse include: S-580, Advanced Fire Use Applications and Fire Management Leadership.

AL KING
Fire Management Officer

Al King was the Fire Management Officer at Bandelier National Monument and was responsible for overall fire program management and technical guidance for wildland fire management. His role in the Cerro Grande Prescribed Fire planning phase was to provide supervisory oversight, conduct technical review of the burn plan, and provide recommendations for approval. At the implementation phase of the Cerro Grande Prescribed Fire, his role was to serve as Holding Specialist during project implementation. While serving as the Holding Specialist during the fire, he maintained responsibilities of the park FMO.

The Board finds that Al King was responsible to ensure accurate complexity analysis. He followed all required and professionally accepted procedures to arrive at the outcome. In addition, based on intuitive judgment and experience he participated in the process that raised the rating to a higher complexity level. The complexity rating was still lower than likely to have been calculated using the correct form.

The Board finds that although he was Holding Specialist on the day of the burn, as the park FMO, he was in position to exercise professional judgment over staffing levels and necessary adjustments to maintain subsequent staffing cycles. There were several key decision points where Al King could have influenced the burn boss' decisions. These include:

- Decision to allow the lower edge of the blackline to burn freely. While this did not immediately create control problems, it deviated from the original plan. Its effects were not recognized and resulted in an increase in holding needs,
- Decision to release the NPA crew without securing replacements,
- Decision to obtain one hotshot crew and one helicopter rather than more resources.

The Board recommends that Mr. King receive training to improve his skill and ability in prescribed fire planning and review and supervision. Courses could include Fire Program Management.

MIKE POWELL
Fire Use Module Leader

Mike Powell was the principal author of the Cerro Grande Prescribed Fire Plan. He prepared this plan in consultation with the FMO, Chief of Resources, and previous FMO and with reference to previous burn plans. He then served as the Prescribed Fire Burn Boss during the implementation of the project. In the role of Burn Boss, he was responsible for organizing, staffing, and directing activities consistent with the burn plan objectives. The plan was prepared, reviewed, and modified consistent with policy requirements.

The Board finds that Mike Powell used an incorrect complexity rating form that led to a lower calculated complexity rating than what has been judged to be more appropriate by various subject matter experts. The Board does not fault Mike Powell because the final rating that was developed in the burn plan was a direct result of using an incorrect rating form posted on agency internet websites. Review of the burn plan led to agreement among Bandelier staff that the complexity rating should be increased from a low to moderate level.

In his role as burn boss, the Board finds that Mike Powell failed to provide for adequate staffing and did not make necessary adjustments to maintain subsequent staffing cycles. When staffing became a problem, he failed to communicate to others regarding the inability to secure these resources. When the Northern Pueblo Agency crew was released near midnight on 5/4, Mike Powell failed to provide for adequate staffing in their absence. At approximately 0600 hours, when it was observed that the fire was backing faster than anticipated, Mike Powell failed to fully anticipate holding needs through the day operational period. Although Mike Powell had been replaced as burn boss, his actions regarding holding resources continued to affect operations throughout the operational period. Specifically when the slopover occurred on the morning of 5/5, it required nearly all holding resources to contain it and left the lower edge of the fire perimeter in Phase I unattended. Later that afternoon when the fire moved into the Phase II area, holding options became greatly diminished. This sequence of events led to the Wildland Fire Situation Analysis alternative of indirect attack which required more firing over more operational periods, greatly increasing the overall risks. Ultimately, firing operations associated with the indirect strategy led to the escape of the fire out of the Cerro Grande project area.

The Board also finds that Mike Powell in his capacity as burn boss did not adequately adjust actions when observed fire behavior became different than anticipated fire behavior. As an example, it was assumed that the fire backing in Phase I would self-extinguish. When it became apparent that this was not the case, Mike Powell did not increase staffing to assure control of the lower perimeter in Phase I. This decision eventually allowed the fire to move into the Phase II area, which further exacerbated holding problems on the project. These series of decisions/actions set the stage for greater difficulty of containment of the burn within Phase I and increased the likelihood of exceeding work/rest guidelines, and reduced tactical options as the project progressed.

After making the 0300 telephone call to the Santa Fe Dispatch and finding that his request for additional resources could not be confirmed within the desired timeframe, Mike Powell should have contacted the Dispatch Center manager and the Bandelier FMO to expedite this process.

The Board recommends that Mr. Powell undergo re-certification as Prescribed Fire Burn Boss through the interagency prescribed fire qualification system. This will include both completion of formal training courses and on-the-job training assignments under a qualified evaluator.

PAUL GLEASON
Regional Wildland Fire Specialist

Paul Gleason had no role in the planning of this burn and served as an observer during the initial implementation stages. He first stepped out of that role at 0600 hours on 5/5 when he urged the burn boss to act on securing replacement orders for holding resources. While he had planned to leave the area that day, circumstances caused him to volunteer to assume command of the fire as burn boss. He became the Type III Incident Commander (IC) when the prescribed fire was declared a wildland fire at 1300 hours on 5/5.

In his role as Incident Commander he was responsible to develop and implement safe tactics. Tactics must be consistent with observed and predicted weather, among other considerations. It is also the IC's responsibility to implement the operational management plan, including firing operations.

The Board finds the preferred Wildland Fire Situation Analysis (WFSA) alternative to be reasonable and valid. The WFSA called for implementation of a firing operation along the east and west fire perimeters. The timing and location of these operations were critical given a red flag warning for high west-south-west winds. The Board believes that Paul Gleason provided sound direction to the firing operation with respect to timing and location.

The Board recognizes that at the time Paul Gleason volunteered to assume command, he was left with few options for influencing the successful outcome of this fire.

The Board recommends that no action be taken.

CONCLUSIONS

After thorough review of available documents, witness testimony, and subject matter expert analysis of the events surrounding the fire and it's ignition and suppression activities, the Board finds that the escape of the Cerro Grande Prescribed Fire occurred as the result of many factors, of which five were the most critical:

The complexity rating assigned to the prescribed burn did not accurately reflect the situation prevailing in the area on the date of ignition and as a result, sufficient holding resources were not available for the initial stages of the firing activity.

The Burn Boss failed to recognize the extreme importance of obtaining replacement crews from contingency resources in sufficient time to deal with the daytime burning period on Friday May 5th.

Confusion over the delivery and timing of contingency resources on the morning of May 5th, created delays that resulted in the holding resources for the day not being able to prevent further spread of the fire into the second phase of the burn plan.

The extension of the firing line on the West side of the fire created a source of fire which ultimately made a run into heavy fuels in the lower end of the burn unit, jumped the road into Frijoles Canyon, and ultimately escaped.

Extreme wind events that were not anticipated or predicted caused the initial run of the fire out of the burn unit and into Frijoles Canyon.

It is clear that the principals involved with the fire carried out their actions with the full expectation that they would succeed, and were within the parameters of policy, guidelines, and regulations related to prescribed fire activities, on the day of ignition. Their actions were commensurate with those of prescribed fire practitioners in other federal wildland fire management agencies in regard to planning and implementing prescribed fire activities. After-the-fact review indicated that there were errors in judgment and planning that may have led to the escape of the fire and it's ultimate destruction of natural resources and private residences.

While the Board did find errors in judgment, it also finds that the planning and implementation actions of the principals were not arbitrary, capricious, or unreasonable in light of the information they had prior to the burn and were in compliance with DO-18, RM-18, and other applicable sections of the National Wildland fire policies.

SUMMARY

The full project- and program-level implications of the Cerro Grande Prescribed Fire will affect both federal and non-federal entities for some time to come. The outcome of this incident should serve as a significant milestone in prescribed fire management for all federal wildland fire management agencies as fuel hazard treatment efforts using prescribed fire increase in volume and complexity and increasingly take on landscape-scale application. The uncertainties surrounding treatments that can extend over several operational periods during the active growing season, are substantial and, largely, unaccounted for in terms of readily accepted, endorsed, and understood practices, and grossly under-addressed in local, regional, and national training courses and agency workshops.

Especially at landscape scales, when prescribed burning occurs under relatively high-risk conditions in order to achieve objectives, complexities escalate significantly and demand highly professional planning and implementation. Agency prescribed fire programs are evolving into significantly larger spatial and temporal scales without adequate means to measure and mitigate the social, environmental, and economic risks that are inherently involved. Agencies need to identify lessons learned, strengthen training programs, clarify guidance and procedures, and disseminate this information to all employees to expand beyond this event and ensure response to prescribed fire needs.

The Cerro Grande Prescribed Fire demonstrates the need for all land managing agencies to come to common agreement on future guidelines and protocols for dealing with complex prescribed burns and to advocate for the highest levels of interagency understanding, standardization, and cooperation. A better understanding and use of risk assessment and complexity analysis, a commonly understood and endorsed definition of the use and availability of contingency resources, and interagency provisions for providing sufficient funding to carry out the program are but a few examples of items to be addressed.

Following the Cerro Grande Prescribed Fire, the Secretary of Interior directed a review of the Federal Wildland Fire Management Policy, issued in December 1995. It is clear to the Board, based on the Cerro Grande Incident, that the fire policy has not been widely or uniformly adopted by federal wildland fire management agencies. The Board does not recommend revision of this policy. Changes in policy are not warranted in the context of the outcome at Cerro Grande. In fact, changes in the policy at this time, are likely to only introduce an element of confusion among practitioners and our publics, lead to a general lack of full understanding causing a failure to obtain endorsement, and, inadvertently, lead to serious problems in executing complex, landscape-scale projects like Cerro Grande. Rather, the Board recommends that policy emphasis be placed on interagency adoption of the 1995 policy in a timely and consistent manner by all agencies.

This Board of Inquiry was assigned to: consider the facts and circumstances of the incident and those that may have contributed to it; consider legal and policy requirements that apply to the facts of the incident and determine compliance with

those requirements; conduct an objective critique of the actions of individuals directly responsible for the incident, including a review of operational procedures; and make written findings to the convening official for the purpose of recommending corrective action. This report is the culmination of the most comprehensive investigation of the Cerro Grande Prescribed Fire completed to date. It has uncovered a disparity in facts and differences in perception of the circumstances surrounding this fire that may never be resolved. It does, however, provide the most complete summary of the facts and circumstances available and reviews all applicable legal and policy requirements. This report represents the completion of the written documentation of the findings and recommendations.

The Cerro Grande Prescribed Fire had tragic results. Employees at all levels of the National Park Service, including the management and staff at Bandelier National Monument, have expressed deep regret for the impact it had on the lives of those people in Los Alamos who experienced property loss. We can and must gain from this experience. We must use the lessons learned as a basis to improve and enhance the prescribed fire program throughout the country and all agencies, for indeed we will need to continue to employ these methods to protect life and property in the future.

REFERENCES

National Park Service, Bureau of Land Management, U.S. Forest Service, Department of Energy, and New Mexico Energy, Minerals, and Natural Resources Department. 2000. The Cerro Grande Fire Investigation Report. National Interagency Fire Center. Pages.

National Park Service, USDA Forest Service, Bureau of Indian Affairs, U.S. Fish and Wildlife Service, Bureau of Land Management, 1998. Wildland and Prescribed Fire Management Policy, Implementation Procedures Reference Guide. National Interagency Fire Center, Boise, ID. 154 p.

State of Florida, Bureau of Land Management, U.S. Forest Service, and White Mountain Apache Tribe. 2000. Cerro Grande Prescribed Fire: Independent Review Board Report. National Park Service. Washington, D.C. 15 pages.

U.S. General Accounting Office. 2000. Fire Management: Lessons Learned from the Cerro Grande (Los Alamos) Fire. GAO/T-RCED-00-257. U.S. General Accounting Office. Washington, D.C. 52 pages.

U. S. Department of the Interior/U.S. Department of Agriculture. 1995. Federal wildland fire management policy and program review. Final Report. Boise, ID: National Interagency Fire Center; 45 p. (www.fs.fed.us/land/wdfire.htm).