USDA-FOREST SERVICE FS-2500-8 (6/06)

Date of Report: July 13, 2011

BURNED-AREA REPORT
(Reference FSH 2509.13)

PART I - TYPE OF REQUEST

A. Type of Report

[x] 1. Funding request for estimated emergency stabilization funds
[ ] 2. Accomplishment Report
[ ] 3. No Treatment Recommendation

B. Type of Action

[x] 1. Initial Request (Best estimate of funds needed to complete eligible stabilization measures)

[ ] 2. Interim Report #____
[ ] Updating the initial funding request based on more accurate site data or design analysis
[ ] Status of accomplishments to date

[ ] 3. Final Report (Following completion of work)

PART II - BURNED-AREA DESCRIPTION

A. Fire Name: Pacheco

B. Fire Number: NM-SNF-000198

C. State: NM

D. County: Santa Fe

E. Region: Southwestern (03)

F. Forest: Santa Fe (10)

G. District: Espanola (06)

H. Fire Incident Job Code: P3F5AR

I. Date Fire Started: June 18, 2011

J. Date Fire Contained: July xx, 2011

K. Suppression Cost: 8.84 million (as of July 3, 2011)

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles): 6.0 miles (hand), 1.1 miles (dozer)
2. Fireline seeded (miles): 7.1 miles
3. Other (helispots): 2 helispots seeded and brushed back

M. Watershed Number:
130201011201 – Rio Nambe
130201011101 - Rio Frijoles

N. Total Acres Burned: 10,250 (as of June 3, 2011)
NFS Acres (10,061) Other Federal -Nambe Pueblo (158 est.) State ( ) Private (31)

O. Vegetation Types:
Engelman spruce/Corkbark fir/White fir/Douglas Fir
White fir/Douglas fir/Ponderosa pine/Gambel oak
Ponderosa pine/Pinyon/Gambel oak

P. Dominant Soils:
Dystric Cryochrepts, LSC 7, lo-sk, mixed
Typic Dystrochrepts, LSC 6, lo-sk, mixed
Typic Ustorthents, LSC 5, lo-sk, mixed, non-aid, frigid and Rock Outcrop

Q. Geologic Types: Pre-cambrian granite and granite gneiss (Embudo formation)

R. Miles of Stream Channels by Order or Class: 1st order = 19.54 miles, 2nd Order = 8.11 miles (Rio Nambe and Rio Capulin).

S. Transportation System:

Trails: 25.5 miles Roads: 7 miles (closed road used for suppression access)

PART III - WATERSHED CONDITION

A. Burn Severity (acres): 4,479 (low/unburned) 2,048 (moderate) 3,723 (high)
(Burn Severity based on BARC image acquired July 3, 2011)

B. Water-Repellent Soil (acres): 5,771*

C. Soil Erosion Hazard Rating (acres): 0 (low) 3,104 (moderate) 2,952 (high)

D. Erosion Potential: 6.5 – 30.2* tons/acre

E. Sediment Potential: 33.3 – 47.3* cubic yards / square mile
* based on hydrologic modeling for the Nambe 2 and Nambe 3 drainage areas only

PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 3

B. Design Chance of Success, (percent): 65

C. Equivalent Design Recurrence Interval, (years): 25

D. Design Storm Duration, (hours): 1

E. Design Storm Magnitude, (inches): 1.78

F. Design Flow, (cubic feet / second/ square mile): 3.9 – 4.02

G. Estimated Reduction in Infiltration, (percent): 30

H. Adjusted Design Flow, (cfs per square mile): 542 – 619 [1]

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

[1] Adjusted Design Flow values does not include 25 percent bulking factor.

The Pacheco fire began on June 18, 2011 as the result of unknown causes. The burned area is located on National Forest System lands managed by the Espanola Ranger District of the Santa Fe National Forest and is located primarily within the Pecos Wilderness upstream of the Nambe Pueblo and Nambe Falls Dam. At this time the burned area is situated within the Rio Nambe, Rio Frijoles sub-watersheds.

The Rio Nambe sub watershed is the source water area for the Rio Nambe and Nambe Falls Dam. Nambe Falls Dam, a concrete and earth embankment structure is 150 feet high. Construction began on June 13, 1974 and was completed on June 28, 1976. The storage reservoir provides supplemental irrigation for the Pojoaque Valley Irrigation District and the pueblos of San Ildefonso, Nambe, and Pojoaque. The dam is located about 300 feet upstream from Nambe Falls which forms the sharp break between the Sangre de Cristo Mountains on the east and the Espanola Basin on the west. The dam is situated in a 500-foot-long southwesterly trending gorge. The concrete arch dam and thrust block are founded on a northeasterly trending fault slice of Precambrian Embudo granite complex (http://www.usbr.gov/projects/Facility.jsp?fac_Name=Nambe%20Falls%20Dam).

Nambe Falls Dam, part of the San Juan-Chama Project, consists of a system of diversion structures and tunnels for transmountain movement of water from the San Juan River Basin to the Rio Grande Basin. Authorized as a participating project of the Colorado River Storage Project, the San Juan-Chama Project provides an average annual diversion of about 110,000 acre-feet of water from the upper tributaries of the San Juan River. Primary purposes of the San Juan-Chama Project are to furnish a water supply to the middle Rio Grande Valley for municipal, domestic, and industrial uses. The project is also authorized to provide supplemental irrigation water and incidental recreation and fish and wildlife benefits.

Water is supplied for the following municipal, domestic, and industrial purposes: city of Albuquerque, 48,200 acre-feet; city and county of Santa Fe, 5,605 acre-feet; city of Los Alamos, 1,200 acre-feet; village of Los Lunas, 400 acre-feet; Twining Water and Sanitation District, 15 acre-feet; city of Espanola, 1,000 acre-feet; village of Taos, 400 acre-feet; town of Belen, 500 acre-feet; town of Bernalillo, 400 acre-feet; and Jicarilla Apaches, 6,500 acre-feet. Supplemental water is provided for irrigation of 89,711 acres in the Middle Rio Grande Conservancy District, 20,900 acre-feet; and **2,768 acres in the Pojoaque Valley Irrigation District, 1,030 acre-feet** (http://www.usbr.gov/projects/Project.jsp?proj_Name=San Juan-Chama Project).

This watershed area has been affected by wildfire in the recent past (Molina Complex, 2003). Post fire effects of the Molina Complex to Nambe Falls Dam and reservoir area included loss of water quality, loss of storage capacity, damage to recreational facilities at the dam, impacts to recreational use, and disruption of traditional cultural uses by the Nambe Pueblo. These effects are detailed in the Molina Complex Burned Area Emergency Stabilization and Rehabilitation Plan (Bureau of Indian Affairs, Southwest Regional Office, 2003).

Watershed response as a result of the Molina Complex fire, measured by peak flows, was assigned a “high” watershed response rating. This rating for watershed response reflects the fact that runoff after a rainfall event is expected to produce runoff much more rapidly and of much greater magnitude than would have occurred before the fire (Bureau of Indian Affairs, Southwest Regional Office, 2003, pg 49).

Watershed response and subsequent post fire impacts of the Pacheco fire are expected to be very similar to the impacts observed after the Molina Complex.

For the Rio Nambe sub watershed these would include:

1) Increased post-fire water yield ***(NFS lands and downstream on Tribal and private lands)***,
2) Water quality impacts ***(NFS lands and downstream on Tribal and private lands)***,
3) Erosion and sedimentation to Nambe Falls Reservoir ***(downstream on Tribal lands)***,
4) Loss of reservoir storage capacity ***(downstream on Tribal lands)***,
5) Loss of recreational opportunities and related economic benefits to Nambe Pueblo ***(downstream on Tribal lands)***,
6) Disruption and potential loss of irrigation supply to the Pojoaque Valley Irrigation District ***(downstream on Tribal and private lands)***,
7) Loss of cultural and ceremonial uses of Nambe Reservoir ***(downstream on Tribal lands)***, and

8) Potential risk to Dam Safety at Nambe Falls Dam ***(downstream on Tribal lands)***.

(Bureau of Indian Affairs, Southwest Regional Office, 2003, pg 49-57).

For the Rio Frijoles sub watershed these would include:

1) Increased post-fire water erosion ***(on NFS lands)***,
2) Impacts to aquatic biota and Rio Grande Cutthroat trout, a candidate T&E species ***(on NFS lands)***, and
3) Water quality impacts ***(on NFS lands and downstream on Tribal and private lands)***.

Burn severity is a measure of hydrologic response due to loss of canopy, groundcover and alteration of surface soil/water interactions that are caused by a wildfire.

Burn Severity mapping for the Pacheco burned area was accomplished using a BARC image acquired June 25, 2011 and validated by aerial recon on topographic maps. The initial Burn Severity map accompanies this report.

Aerial recon of burn severity classes indicate the areas of high burn severity are located on steep to very steep slopes above the Rio Nambe and Rio Capulin. Slopes within the high burn severity areas range from 35 to 75 percent. Soils within the high burn severity areas are variable with moderatey deep soils with cobble and stone surfaces occuring along ridge lines and deeper, less rocky soils present on smooth mountain side slopes. Rock outcrop is also a minor component of these soils. Prior to the fire, these areas supported a mixed conifer forest and spruce-fir vegetation type in the upper elevations with a Ponderosa pine forest type and pinyon-juniper woodland type in the lower elevations.

No field survey of the areas of High Burn Severity have been conducted at this time, but aerial recon and professional experience would indicate a moderate to high degree of water repellency has likely developed in areas of High Burn Severity. This conclusion is based on the following observations made during the aerial recon; 1) ash color (black to gray), 2) LWD and vegetative consumption as evidenced by shadows of ash on ground surface, and 3) pre-fire vegetation density and fuel loading. Potential erosion and sediment delivery rates are also exasperated by the steep terrain and highly erosive soils common within the burned area.

Critical Values Identified

Critical Values identified (FSM 2523.1 Exhibit 01) during the Pacheco BAER assesment are:

1) Human Life and Safety (recreational uses at Nambe Falls Dam and Pecos Wilderness trail users),
2) Property (Nambe Falls Dam, downstream irrigation infrastructure, Pecos Wilderness trail system),
3) Natural Resources (water use for irrigation supply, water use for recreational fisheries, Rio Grande cutthroat trout - candidate species T&E, water quality loss of ONRW designated streams, and loss of soil productivity and hydrologic function of burned NFS lands), and
4) Archaeological Resources, and Traditional Cultural Resources and Uses (Lands within the burn area are considered traditional cultural use areas; Nambe Reservoir is a source of economic livelihood and provides water to a number of acequia systems used for traditonal agricultural uses in the Nambe Valley. The watershed provides resources including plants, animal and mineral for traditional practices in the Pueblo of Nambe, and traditional Hispanic communities in the area. There are no archaeological properties affected).

The Pacheco BAER team evaluated the risk to those critical values per FSM 2523.1 Exhibit 02.

The risk matrix (below), Exhibit 2 of Interim Directive **2520-2010-1** was used to evaluate the Risk Level for each value at risk identified during Assessment:

Probability of Damage or Loss	Magnitude of Consequences		
	Major	Moderate	Minor
	Loss of life or injury to humans; substantial property damage; irreversible damage to critical natural or cultural resources.	– Injury or illness to humans; moderate property damage; damage to critical natural or cultural resources resulting in considerable or long term effects	Property damage is limited in economic value and/or to few investments; damage to natural or cultural resources resulting in minimal, recoverable or localized effects
	RISK		
Very Likely (>90%)	**Very High**	**Very High**	**Low**
Likely (>50% to <90%)	**Very High**	**High**	**Low**
Possible (>10% to <50%)	**High**	**Intermediate**	**Low**
Unlikely (<10%)	**Intermediate**	**Low**	**Very Low**

The Very High and High Risk are unacceptable risk levels due to threats to human life, property, infrastructure and resources, therefore treatments should be applied. An Intermediate Risk could be unacceptable if human life or safety is the critical value at risk.

Rio Nambe Sub Watershed

Threats to Human Life and Safety:

There is a **High** risk *(probability >10% to <50% and magnitude = major)* of Injury or Loss of Life due to the effects of the Pacheco fire. A large percentage of the High Burn Severity within the Rio Nambe and Rio Capulin drainages discharges runoff directly to Nambe Falls Dam and Reservoir downstream of the burned area. Aerial recon of the high burn severity areas would indicate a moderate to high degree of water repellency potentially developed on soil surfaces as a result of the fire. Modeling of pre and post fire discharge in the Rio Nambe drainage indicate a large increase in discharge (3.9 cfs pre fire and 542 cfs post fire). With anticipated bulking of post fire discharge, it is expected that large amounts of sediment and debris will be delivered during post fire rainfall events and could place users of the Nambe Falls Dam recreational facilities downstream at risk.

There is a **High** risk *(probability >10% to <50% and magnitude = major)* to receational users of the Pecos Wilderness Trail system. Several well known and popular trails into the Pecos Wilderness are within the Pacheco burned area and are situated within the valley floors of the Rio Nambe and Rio Capulin. There is also cultural use of these trails by local pueblos. Increased flood flows and sedimentation and debris pose serious threats to these trail users.

Threats to Property:

There is a **Very High** risk *(probability >90% and magnitude = major)* of property damage to existing infrastructure of Nambe Falls Dam. As described above, increase in peak flows resulting from areas of high burn severity, pose a potential threat of flood waters and floatable debris impacting infrastructure at Nambe Falls Dam and downstream irrigation infrastructure on private and Tribal lands. Increased levels of erosion and sedimentation will reduce storage capacity of Nambe Falls Dam and floatable debris assoicated with post fire runoff could endanger the dam spillway. Sediment passing through Nambe Falls Reservoir may also impact downstream irrigaiton facilities.

There is a **High** risk *(probability >50% to <90% and magnitude = moderate)* of damage or loss to the Pecos Wilderness Trail system. As described above, these trails are situated within the valley floors of the Rio Nambe and Rio Capulin. Increased flood flows and sedimentation and debris will cause extensive damage to these trails.

Threats to Natural Resources:

There is a **High** risk *(probability >50% to <90% and magnitude = moderate)* of loss to water used for agricultural supply downstream as a result of the Pacheco fire. Water quality and supply may be impacted by sedimentation and deposits of ash flows into irrigation facilities (headgates, ditches, etc.) within the Pojoaque Valley Irrigation District. The stilling effects of Nambe Falls Reservoir is expected to mitigate some of these potential impacts.

There is a **Very High** risk *(probability >90% to <50% and magnitude = moderate)* of loss to water quality to Outstanding National Resource Waters (ONRW) designated waters on burned NFS lands as a result of the Pacheco fire. Increased magnitude of post-fire flows and associated erosion and sediment delivery will directly impact water quality and aquatic environments of the Rio Nambe and Rio Capulin, both of which have been designated and ONRW by the State of New Mexico. loss of upland terrestrial vegetation in areas of high burn severity will cause sedimentation and ash deposition to occur in the Rio Nambe and Rio Capulin. Ash and sediment delivered to surface water of these streams will impact aquatic biota and may cause temporary loss of aquatic habitat for fish and macroinvertebrates within the affected stream reaches and downstream of the fire in Nambe Falls Reservoir. This effect would be expected to last for 2 or more years, until adequate vegetative groundcover can be restored on the hillslopes and hydrologic recovery of the watershed area occurs.

There is a **High** risk *(probability >50% to <90% and magnitude = moderate)* to riparian habitats associated with the Rio Nambe and Rio Capulin due to changes in peak flow from the affected drainage areas. Damage to riparian vegetation resulting from delivery of sediment laden discharge into the riparian zone would be expected to occur, possibly resulting in further impacts to aquatics and water quality (loss of shade, etc).

There is a **High** risk *(probability >50% to <90% and magnitude = moderate)* to aquatic habitats associated with the Rio Nambe and Rio Capulin due to increased sedimentation and deposition of ash. This will negatively impact fish and macro-invertebrate populations. The Rio Grande cutthroat population located within the Rio Nambe and Rio Capulin are considered a recreation population due to hybridization. This impact is expected to persist for several years post fire along the affected steam reaches. Minimal buffer distances to filter storm flow and reduce sediment delivery will not likely be adequate to mitigate this expected impact to aquatic habitats.

There is a **High** risk *(probability >50% to <90% and magnitude = moderate)* of increased levels of surface soil erosion as a result of the Pacheco fire. Erosion within the high burn severity areas are predicted to increase dramatically over the next 3 to 5 years. Loss of vegetative cover and groundcover within the burned area and the development of water repellency will result in increased levels of soil erosion (sheet and rill/gully) and increase the potential for debris flows to ephemeral and perennial channels within the fire perimeter. These new surface erosion sources pose a threat to long-term soil productivity, and an increased risk of water quality impacts and threats to downstream resources, such as water quality and aquatic habitats.

Rio Frijoles Sub Watershed

Threats to Human Life and Safety:

There is a **High** risk *(probability >10% to <50% and magnitude = major)* of Injury or Loss of Life to users of the Pecos Wilderness trail system due to the effects of the Pacheco fire. Several well known and popular trails into the Pecos Wilderness are within the Pacheco burned area and are situated within the valley floors of the Rio Frijole. There is also cultural use of these trails by local pueblos. Increased flood flows and sedimentation and debris pose serious threats to these trail users.

Threats to Property:

There is a **High** risk *(probability >50% to <90% and magnitude = moderate)* of damage or loss to the Pecos Wilderness Trail system. As described above, these trails are situated within the valley floors of the Rio Nambe and Rio Capulin. Increased flood flows and sedimentation and debris will cause extensive damage to these trails.

Threats to Natural Resources:

There is a **Low** risk *(probability >90% to <50% and magnitude = minor)* of loss to water quality to Outstanding National Resource Waters (ONRW) designated waters on burned NFS lands as a result of the Pacheco fire. Increased magnitude of post-fire flows and associated erosion and sediment delivery will directly impact water quality and aquatic environments of the Rio Nambe and Rio Capulin, both of which have been designated and ONRW by the State of New Mexico. loss of upland terrestrial vegetation in areas of high burn severity will cause sedimentation and ash deposition to occur in the Rio Nambe and Rio Capulin. Ash and sediment delivered to surface water of these streams will impact aquatic biota and may cause temporary loss of aquatic habitat for fish and macroinvertebrates within the affected stream reaches and downstream of the fire in Nambe Falls Reservoir. This effect would be expected to last for 2 or more years, until adequate vegetative groundcover can be restored on the hillslopes and hydrologic recovery of the watershed area occurs.

There is a **High** risk *(probability >50% to <90% and magnitude = moderate)* to riparian habitats associated with the Rio Nambe and Rio Capulin due to changes in peak flow from the affected drainage areas. Damage to riparian vegetation resulting from delivery of sediment laden discharge into the riparian zone would be expected to occur, possibly resulting in further impacts to aquatics and water quality (loss of shade, etc.)

There is a **High** risk *(probability >10% to <50% and magnitude = moderate)* to aquatic habitats associated with the Rio Frijoles due to increased sedimentation and deposition of ash. This will negatively impact fish and macro-invertebrate populations. The Rio Grande cutthroat trout population located within the Rio Frijoles is considered a conservation population and is of genetic importance to the species as a whole. This impact is expected to persist for several years post fire along the affected steam reaches. Minimal buffer distances to filter storm flow and reduce sediment delivery will not likely be adequate to mitigate this expected impact to aquatic habitats.

There is a **High** risk *(probability >50% to <90% and magnitude = moderate)* of increased levels of surface soil erosion as a result of the Pacheco fire. Erosion within the high burn severity areas are predicted to increase dramatically over the next 3 to 5 years. Loss of vegetative cover and groundcover within the burned area and the development of water repellency will result in increased levels of soil erosion (sheet and rill/gully) and increase the potential for debris flows to ephemeral and perennial channels within the fire perimeter. These new surface erosion sources pose a threat to long-term soil productivity, and an increased risk of water quality impacts and threats to downstream resources, such as water quality and aquatic habitats.

Forest Service Manual Policy applicable to this analysis is FSM 2320 – Wilderness Management and FSM 2520 Watershed Protection and Management (id_2520-2010-1).

B. Emergency Treatment Objectives:

- Comply with direction of FSM 2320 in defining type, scale and scope of any treatments prescribed within the Pecos Wilderness. Propose, where possible, only those treatments that address risk to wilderness values and life and property downstream. Where proposed treatments are needed to protect life and property values at risk off forest, consider effects to wilderness values.
- Consider direction for treatment within wilderness as outlined in FSM 2523.2 when protection of life, property or other critical resources outside of wilderness. “Treatments in wilderness may be appropriate if there is an unacceptable risk to the wilderness resource or if locating treatments in wilderness would provide the best option for protection of life, property or other critical resources outsde of wilderness (FSM 2323.43). Non-structural prevention and stabilization treatments are always preferred over structural measures”.

- Reduce risk of injury or loss of life from post fire flooding and debris flows to users of Nambe Falls Reservoir and users of the wilderness trail system.
- Protect downstream water infrastructure (Nambe Falls Dam, recreational infrastructure, and dowstream irrigation water infrastructure) from damage due to flooding, floatable debris, and ash/sedimentation.
- Minimize impacts to wilderness trail infrastructure.
- Re-establish vegetative ground cover on high burn severity areas to prevent unacceptable soil loss and sediment bulking of flood flows, reduce the risk of invasive species establishment, and accelerate hydrologic recovery.
- Minimize impacts to surface water quality, riparian habitats, and aquatic habitats resulting from erosion and sedimentation to the Rio Nambe, Rio Capulin, and Rio Frijoles.

C. Probability of Completing Treatment Prior to Damaging Storm or Event:

Land **65**% Channel **N/A** % Roads/Trails **30** % Protection/Safety **85** %

If treatments are not able to be implemented before first damaging storm, the need for treatments would be reassessed.

D. Probability of Treatment Success

	Years after Treatment		
	1	3	5
Land	70	75	75
Channel			
Roads/Trails	80	85	90
Protection/Safety	70	70	70

E. Cost of No-Action (Including Loss): $2,141,000
F. Cost of Selected Alternative (Including Loss): $11,691,000

G. Skills Represented on Burned-Area Survey Team:

[x] Hydrology	[x] Soils	[ ] Geology	[x] Range	[x] Recreation
[x] Forestry	[x] Wildlife	[ ] Fire Mgmt.	[ ] Engineering	[ ]
[ ] Contracting	[ ] Ecology	[ ] Botany	[x] Archaeology	[ ]
[x] Fisheries	[ ] Research	[ ] Landscape Arch	[x] GIS	

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H. **Treatment Narrative:**
(Describe the emergency treatments, where and how they will be applied, and what they are intended to do. This information helps to determine qualifying treatments for the appropriate funding authorities. For seeding treatments, include species, application rates and species selection rationale.)

Treatments are only proposed for the Rio Nambe sub-drainage due to the higher magnitude of effects expected from post-fire runoff to critical values.

Protection/Safety Treatments:

Administratively close the burned area and trails accessing the area for the first post-fire storm season. Place warning signs at trail head access points to warn trail users of potential for flooding and debris flows during storm events. Interpretive information might also be placed on the signs to explain what has happened with the burn and the treatments that were implemented.

Issue a letter to the Santa Fe County authorities (County Commission, Office of Emergency Management), BIA, pueblo governments (Nambe Pueblo, Pojoaque Pueblo, and San Ildefonso), and various other government entities from the Forest Supervisor providing the results of the BAER assessment and outlining values at risk determined to be at an increased risk of flooding or damage due to the Pacheco fire. This letter would include a table providing the list of locations that were assessed for increased potential of post-fire flows. This table would include watershed areas, acreage of low, moderate, and high intensity burn severity and the multiplication factor for use to calculate increased peak flows that may result due to the effects of the fire.

A request was submitted for the Pacheco burned area be added to the National Weather Service Severe and Hazardous Warning Information network for a minimum of 2 years. At least two warnings for the area have been released to date. Advise the residents of the Nambe Pueblo of the availability of this warning information and encourage them to acquire NOAA weather radios for their use and protection.

Land Treatments:

In order to determine areas appropriate for treatment, the burn severity was intersected with the soil map units and slope. Areas of moderate and high burn severity within drainages, rock outcrop, or on slopes greater than 60% were eliminated from treatment units.

Aerial Seed and Mulch

Aerial seed (fixed-wing) approximately 2,700 acres of moderate and high burn severity areas at a target rate of 25 Pure Live Seed (PLS) per square foot (18 lbs/acre x 5000 acres = 90,000 lbs PLS). Proposed weed free seed is cereal barley.

Consideration of Wilderness Values:

1) Prevents an unnatural loss of wilderness resource values (soil productivity, water quality, visual integrity, hydrologic function, invasive species establishment),
2) Protects life, property, and other resource values outside the wilderness, and
3) Promotes vegetation establishment in areas where natural vegetation will not return in a reasonable time.

Aerial mulch (helicopter) 1,930 acres of high burn severity areas with certified weed free straw at a rate of 1 ton per acre. This treatment is intended to reduce the threat to life and safety and risk of storm damage to downstream infrastructure by providing immediate ground cover to high burn severity areas, reduce the risk of sediment bulking of storm flows, protect existing water quality, and protect long term site productivity.

Consideration of Wilderness Values:

1) Prevents an unnatural loss of wilderness resource values (soil productivity, water quality, visual integrity, hydrologic function, invasive species establishment),
2) Protects life, property, and other resource values outside the wilderness,
3) Accelerates and promotes vegetation establishment in areas where natural vegetation will not return in a reasonable time.

To further consider loss of wilderness values, the following treatments were proposed but deemed unfeasible after further research:

- Wood straw mulch – would address the concern of invasive species establishment but still had visual concerns and concern of introduction of foreign material (Pacific Northwest) to Pecos Wilderness. Due

to the high cost and uncertainty of available product, the proposed treatment was found to be unfeasible.

- "Indigenous" seed – it was asked that if seed was proposed, that it be indigenous or naturalized species. Unfortunately, there are no indigenous species available in the amount needed for this effort.

Channel Treatments:

None recommended.

Roads and Trail Treatments:

Waterbar 10 miles of wilderness trails that are out of the drainages, but still susceptible to flood damage resulting in loss of trail infrastructure. Hazard trees would be removed before trail crew enters.

I. **Monitoring Narrative:**
(Describe the monitoring needs, what treatments will be monitored, how they will be monitored, and when monitoring will occur. A detailed monitoring plan must be submitted as a separate document to the Regional BAER coordinator.)

Aerial seed and mulch application**.**

Effectiveness: Monitor seed and straw mulch treatment success 1 year post seeding by re-visiting the treated area and visually estimating the percentage of live vegetative cover that results. Identify areas of accelerated sheet and rill erosion which may need spot treatment. Photo points and GPS locations will be included with this monitoring. This monitoring would likely be accomplished by packing in with horses for a multiple day stay due to wilderness constraints and remoteness.

References:

USDI, Bureau of Indian Affairs, Southwest Regional Office, Molina Complex Burned Area Emergency Stabilization and Rehabilitation Plan, 2003.

New Mexico Environment Department - Surface Water Quality Bureau.
2010 – 2012 State of New Mexico Clean Water Act §303(d)/§305(b) Integrated Report, Appendix A – List of Assessed Surface Waters. www.nmenv.state.nm.us/swqb

USDA Forest Service, Terrestrial Ecosystem Survey of the Santa Fe NF, 1993.

USDA, Natural Resources Conservation Service, National Engineering Handbook - Part 630 Hydrology, Chapter 9 Hydrologic Soil-Cover Complexes, July 2004.

Precipitation-Frequency Atlas of the United States NOAA Atlas 14, Volume 1, Version 4, G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley, NOAA, National Weather Service, Silver Spring, Maryland, 2006. Extracted: Sunday June 27 2010. http://hdsc.nws.noaa.gov/cgi-bin/hdsc/buildout.perl?type=pf&units=us&series=pd&statename=NEW+MEXICO&stateabv=nm&study=sa&season=All&intype=3&plat=31.652&plon=-106.816&liststation=0&slat=35.6625&slon=-105.494444&mlat=32.807&mlon=-102.431

Rapid Post-Fire Hydrologic Watershed Assessment using the AGWA GIS-based Hydrologic Modeling Tool, D.C. Goodrich, H. Evan Canfield, I. Shea Burns, D.J. Semmens, S.N. Miller, M. Hernandez, L.R. Levick, D.P. Guertin, and W.G. Kepner. http://www.epa.gov/esd/land-sci/agwa/pdf/pubs/Goodrich-ASCE-05-AGWA.pdf

Wildcat5_newf.xls, Beta version, un-published.

Part VI – Emergency Stabilization Treatments and Source of Funds Interim

			NFS Lands				Other Lands			All
		Unit	# of		Other	# of	Fed	# of	Non Fed	Total
Line Items	Units	Cost	Units	BAER $	$	units	$	Units	$	$
A. Land Treatments										
Aerial Seed (fixed wing) - includes seed	acre	85	2700	$229,500	$0		$0		$0	$229,500
Aerial Mulch (helicopter) - includes materials	acre	700	1930	$1,351,000	$0		$0		$0	$1,351,000
Implementation Team Lead / Contract admin	day	1200	14	$16,800	$0		$0		$0	$16,800
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Land Treatments				$1,597,300	$0		$0		$0	$1,597,300
B. Channel Treatments										
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Channel Treat.				$0	$0		$0		$0	$0
C. Road and Trails										
Trail Waterbars	mile	4000	10	$40,000	$0		$0		$0	$40,000
					$0		$0		$0	$0
				$0	$0		$0		$0	$0
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Road & Trails				$40,000	$0		$0		$0	$40,000
D. Protection/Safety										
Warning & Interpretatve Signs	each	200	15	$3,000	$0		$0		$0	$3,000
Insert new items above this line!				$0	$0		$0		$0	$0
Subtotal Structures				$3,000	$0		$0		$0	$3,000
E. BAER Evaluation										
	each	1	25000		$25,000		$0		$0	$25,000
Insert new items above this line!				---	$0		$0		$0	$0
Subtotal Evaluation				---	$25,000		$0		$0	$25,000
F. Monitoring										
Seeding Effectiveness (Two GS-4)	day	3000	3	$9,000	$0		$0		$0	$9,000
							$0		$0	$0
Insert new items above this line!										
Subtotal Monitoring				$9,000	$0		$0		$0	$9,000
G. Totals				$1,649,300	$25,000		**$0**		**$0**	**$1,674,300**
Previously approved										
Total for this request				**$1,649,300**						

PART VII - APPROVALS

1. */s/ Maria T. Garcia* — July 13, 2011
   Forest Supervisor (signature) — Date

2. /s/ C.L. Newman, Jr. — 7/14/2011
   Regional Forester (signature) — Date