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

Date of Report: 05-17-19

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

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

[x] 2. Interim Report # 1
[x] 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: Sugarloaf

B. Fire Number: CO-ARF- 000354

C. State: CO

D. County: Grand

E. Region: R02

F. Forest: Arapaho-Roosevelt

G. District: Sulphur

H. Fire Incident Job Code:

I. Date Fire Started: 06/28/2018

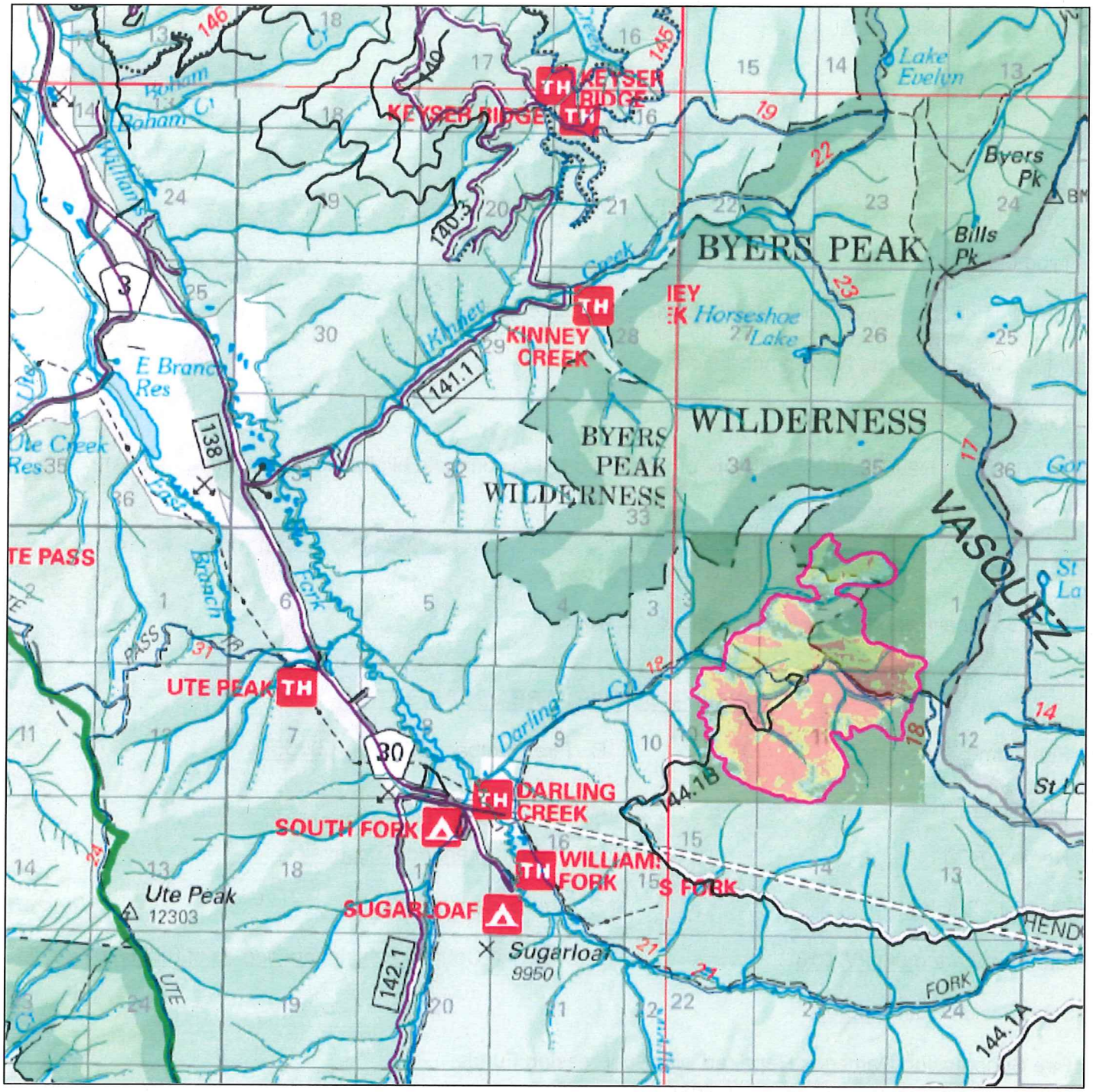
J. Date Fire Contained: Uncontained as of 07/09/2018

K. Suppression Cost: Approx.

L. Fire Suppression Damages Repaired with Suppression Funds
1. Fireline waterbarred (miles):
2. Fireline seeded (miles):
3. Other (identify):

M. Watershed Number: Darling Creek drainage, tributary to the Upper Williams Fork River (HUC 140100011004)

N. Total Acres Burned: 1214 (from 07-06-2018 BARC Imagery)
NFS Acres(1214) Other Federal ( ) State ( ) Private ( )



O. Vegetation Types: Mosaic of conifer forest, aspen and grass/herbaceous. Forested areas are either Lodgepole dominated or Spruce-Fir dominated. In most cases, Lodgepole trees were dead or dying due to the ongoing Mountain Pine Beetle epidemic in the area. However, dead/dying trees were not continuous/uniform across the burned area

P. Dominant Soils:

MUID	Acres	Percent Area
7700C	366	30
7757D	151	12
7710D	119	10
7757D	109	9

7202B	104	9
7700C	95	8
7700B	72	6
7701C	49	4
8772C	25	2
RL	20	2

Q. Geologic Types: The general lithology is metamorphic rock of granitic origins. The geologic formations are Xb Biotitic gneiss, schist, and migmatite and Yg Granitic rocks of 1,400-m.y. age group (age 1,350-1,480 m.y.)

R. Miles of Stream Channels by Order or Class: 1st order: 3.7 mi, 2nd order: 2.25 mi

S. Transportation System
The Northern Sector Road and the Darling Creek Trail exist within the burned area.

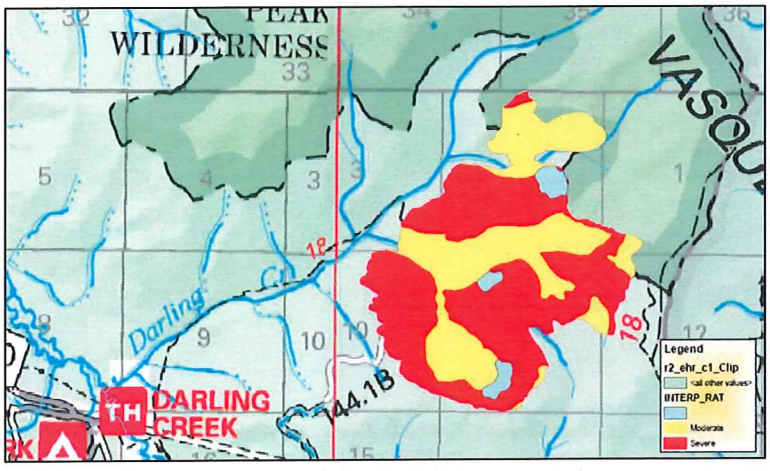
PART III - WATERSHED CONDITION

A. Burn Severity (acres):

SBS	Acres	Percent Area
H	472	39
L	132	11
M	418	34
U	193	16
	1215	**100**

B. Water-Repellent Soil (acres: The degree and extent of water repellent soils is unknown but, for the purposes of this assesment, it is assumed that at least 50% of the moderate and high soil burn severity areas have fire induced water repellent layers.

C. Soil Erosion Hazard Rating (acres): 0 (low) 475 (moderate) 696 (high) 43 (Un-rated)



D. Erosion Potential: ____ tons/acre. Erosion modelling was not conducted for the purposes of this analysis

E. Sediment Potential: ____ cubic yards / square mile
Precipitation events of highest concern is are high intensity thundershowers. Increases in peak flows and sediment delivery and flashier timing are expected to occur in response to these precipitation events.

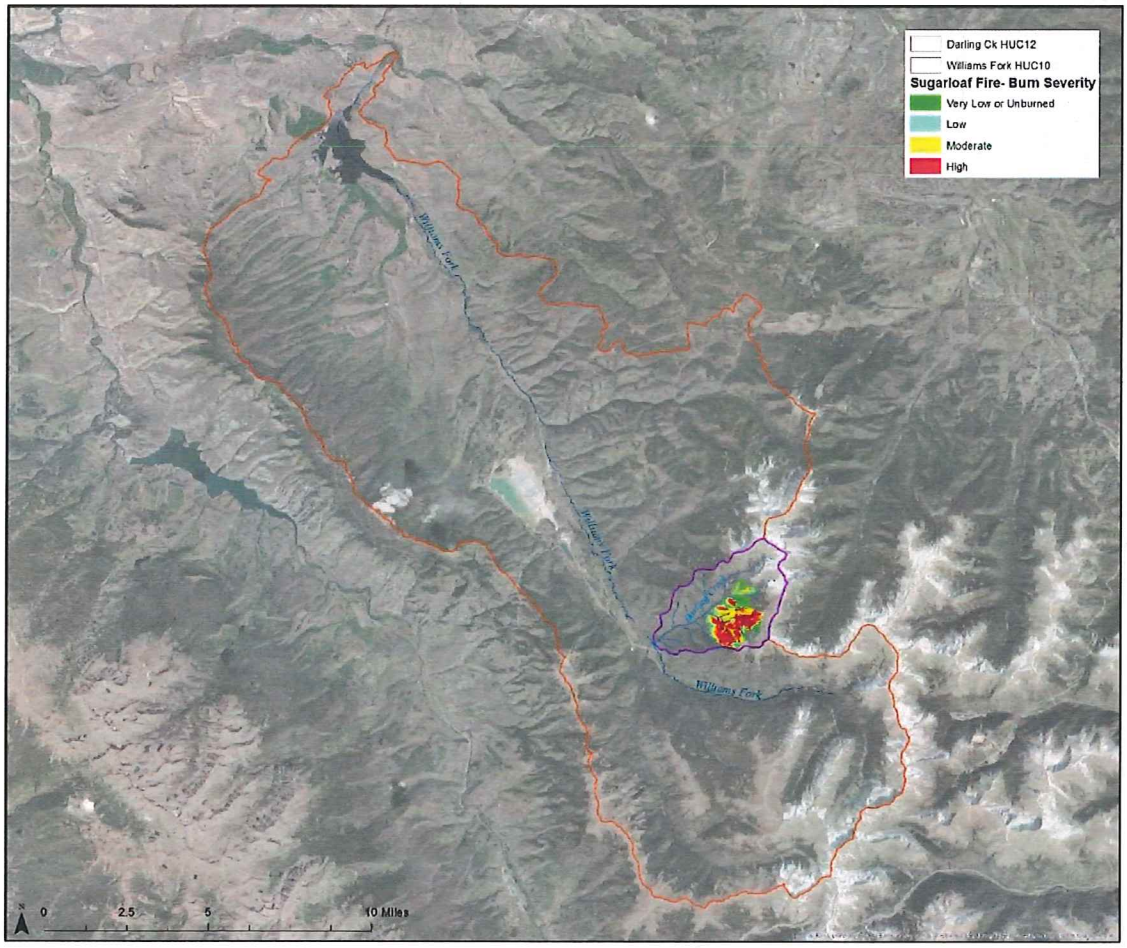
Based on field review and soil properties, erosion assumptions are:

- Before the fire, minimal, if any, occurred on forest hill-slopes within the burned area.
- Rates of soil erosion are likely to increase dramatically on steep hill-slopes impacted by moderate and high soil burn severity.
- Recovery to of the hill-slopes to pre-fire rates of erosion is likely to occur within 3-5 years following the fire.

Debris flow modeling was not conducted for this fire but it is reasonable to assume debris flows could occur within stream channels or crenulations within the burned area. It also appears likely these processes could continue downstream into the mainstem of Darling Creek.

Debris flows are likely to subside as channel gradients decrease below the burned area and would not occur within the Williams Fork River. However, it is likely that higher and flashier sediment laden flows could make it to the Williams Fork River. Downstream from the confluence, any flashy peak flows would be largely absorbed in the larger, lower gradient system with a meandering channel and expansive effective floodplains. These characteristics allow an opportunity for sediment and ash to drop out of the Williams Fork and the concentration of suspended and dissolved materials would be diluted within the larger river but could be transported downstream as far as the Williams Fork Reservoir.

The Sugarloaf Fire burned approximatly 1,214 acres in the steep slopes on the southeast side of Darling Ck. The Darling Creek drainage is a 6th level hydrologic unit of 5,791 acres. Darling is a contributor to the much larger Williams Fork, which is a 5th level hydrologic unit of 148,233 acres. The Darling drainage makes up 4% of the Williams Fork drainage and 0.9% of the Williams Fork burned in the Sugarloaf Fire.



PART IV - HYDROLOGIC DESIGN FACTORS

A. Estimated Vegetative Recovery Period, (years): 3-5 grass/shrub

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

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

D. Design Storm Duration, (hours): ____

E. Design Storm Magnitude, (inches):

F. Design Flow, (cubic feet / second/ square mile): ____

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

H. Adjusted Design Flow, (cfs per square mile):

PART V - SUMMARY OF ANALYSIS

A. Describe Critical Values/Resources and Threats:

Human life and safety on National Forest System (NFS) lands.

A threat to safety of road users on the Northern Sector Road (FSR 144.1B) exists within burned area perimeter. Users could be directly impacted by post-fire runoff or debris flows, dangerous road conditions and/or loss of access/egress. Denver Water, Forest Service or power company personnel are likely to be the only people accessing the Northern Sector Road by vehicle.

*The probability that the safety of USFS, Denver Water and/or power company personnel could be impacted by the threats listed above is **possible** provided they are informed and plan entries into the burned area accordingly. However, the magnitude of consequences for impacts on life or safety are considered to be **major**. Therefore, the BAER risk is **high** and BAER response actions are recommended.*

Recommended BAER response actions to lower the risk for possible impacts on the life and/or safety of forest personnel and/or agency partners who may need to use the road to work within the burned area include:

- Clear and effective communication about changed watershed conditions, increased potential for flooding/debris flows, potential impacts to the road and/or potential for loss of access/egress.

Similar threats exist for trail users on the Darling Creek Trail #18 within and downtream from the burned area.

*The probability that the safety of trail users could be impacted by post-fire runoff or debris flows or dangerous trail conditions is **likely**. The magnitude of consequences for impacts on life or safety are considered to be **major**. Therefore, the BAER risk is **very high** and BAER response actions are recommended.*

Recommended BAER response actions to lower the risk for possible impacts on the life and/or safety of trail users include:

- The trail and burned area remained closed to public and USFS access following the fire in 2018. In 2019, the forest recommendation is to re-open the trail and install warning signs to lower the risk of potential impacts to the life and/or safety of area users and USFS personnel.

Additionally, structurally compromised burned trees pose a threat throughout most of the burned area.

PROPERTY

Roads
FS Road 144.1B (Northern Sector Road) is a native suface road that contours through steep burned terrain.

Increased post fire runoff, erosion, sediment deposition and/or debris flows may impact the road surface, cut-slope, fill-slope, or road drainage features.

*The probability that the road could be impacted by the threats listed above is **very likely**. The magnitude of consequences are considered to be moderate. Therefore, the BAER risk is **very high** and BAER response actions are recommended.*

Recommended BAER response actions to lower the risk for possible impacts to the Northern Sector Road include:

- Various road storm proofing treatments such as inside ditch cleaning, de-berming, rolling dip installation
- Culvert inlet cleaning and/or improvements or culvert removal

Note: Discussion about potential road treatments with Denver Water and power companies is pending. Because Denver Water currently uses and maintains the road, the District Ranger intends to discuss road treatment options with them.

Trails

The Darling Creek Trail contours through steep burned terrain. Increased post fire runoff, erosion, sediment deposition and/or debris flows may impact the trail surface.

*The probability that the trail could be impacted by the threats listed above is **very likely**. The magnitude of consequences are considered to be **moderate**. Therefore, the BAER risk is **very high** and BAER response actions are recommended.*

Recommended BAER response actions to lower the risk for possible impacts to the Darling Creek Trail in 2019 include:

- Trial tread stabilization (storm proofing) treatments such as de-berming, outsloping and installation of rolling dips and bars and improvement of existing trail drainage features to lower the risk of trail damage caused by post-fire runoff in year 1 following the fire (2019) .
- Removal of hazardous fire impacted (structurally compromised) trees to protect the safety of BAER trail workers.

The District Ranger did not want personnel to enter the area for any reason, including trail tread stabilization, in 2018.

Non USFS Property Downstream from Burned Area

The BAER Team did not conduct extensive inventory of values at risk off NFS lands or conduct risk analysis for these values. However, the team did note the following as potential values at risk. The primary purpose of the BAER Assessment is not to conduct extensive analysis off effects off NFS lands. However, the BAER Team recommends contacting Denver Water, Henderson Mine personnel and other potentially affected parties to share the findings of the BAER watershed response assesment.

Denver Water Stream Gage: Denver Water personnel may determine that a stream gaging station on Darling Creek could be at increased risk from post fire flooding or sedimentation. The gage is no longer used.

Henderson Mine Conveyor: BAER personnel determined that the conveyor is not at risk for impacts from post wildfire flooding, sedimentation or debris flows.

Trail End Ranch: BAER personnel determined that life, safety or property is not considered to be at risk at this site based on review of the area taken from the heli-spot site.

Henderson Pump Station: Hendrson Mine personnel may determine that the Henderson Pump Station may be at slight increased risk if pumps are operated when pulses of sediment move downstream following rainfall events.

Williams Fork Reservoir: Suspended and dissolved materials could potentially make it as far as the Williams Fork Reservoir. Denver Water personnel may choose to evaluate potential imapcts on storage or water quality.

NATURAL RESOURCES

Water Quality

Williams Fork Reservoir: See statement (above)

Noxious Weeds: Native or naturalized communities on NFS lands where invasive species or noxious weeds are absent or present in only minor amounts.

Increased risk for establishment and spread of noxious weeds exists within the burned area. Doreen?

Soil Productivity: Soil productivity and hydrologic function on NFS lands: Disurbance by wildfire and high rates of post fire soil erosion are natural disturbance processes in this ecosystem. As such, adverse impacts on long term soil productivity are not expected to occur.

Critical Habitat: Critical habitat or suitable occupied habitat for federally listed threatened or endangered terrestrial, aquatic animal, or plant species on NFS lands:

- There is no identified or expected critical habitat or suitable occupied habitat for federally listed threatened or endangered plant species within the Sugarloaf fire perimeter or within the down-gradient areas on NFS lands. Therefore no critical T&E plant BAER values at risk.
- There is no identified, expected, or otherwise known TES habitat for aquatic or fisheries species in the Sugarloaf fire burn area or in downstream areas that would be impacted by run-off events. There are no critical T&E fisheries BAER values at risk.

The Sugarloaf burn area, and potentially affected adjacent areas, are suitable habitat for the federally threatened Canada lynx (of which no critical habitat has been designated within the Southern Rocky Mountains). The Southern Rockies Lynx Amendment (SRLA) directs vegetation management projects to mimic or approximate natural succession and disturbance processes within lynx habitat (VEG O1) and to manage wildfire to restore ecological processes to maintain or improve lynx habitat (VEG O3). Within the larger context of the Williams Fork LAU (Lynx Analysis Unit), the Sugarloaf fire is a natural disturbance and ecological process within lynx habitat that will contribute to maintenance of diverse lynx habitat in the short and long term and does not present a risk to T&E wildlife BAER values at risk.

Native Plant Communities: There is a risk of spread of noxious weeds into native plant communities within the Sugarloaf burn area as existing weed populations take advantage of additional bare ground. Several species of noxious weeds occur along the 'North Sector Road' within Denver Water's operational/permitted area and infrastructure and within the burn perimeter (Canada thistle, yellow toadflax, oxeye daisy).

The SRD Weeds Program Manager recommends that the road and roadside area within the burn perimeter be surveyed for noxious weeds in September 2018 (post monsoon) and again during the 2019 growing season (July/August) and weeds treated with herbicide where found. Because the Jones Pass snow cornice precludes USFS vehicle access to the area until September annually, the SRD Weeds Program Manager will work with Denver Water, through their Off-License Agreement and Noxious Weed Management Plan, to survey and treat weeds on and along the road within the burn perimeter. If safe to do so (given fire behavior) , the September 2018 survey could be performed with USFS and Denver Water personnel, with follow-up treatment and monitoring during the 2019 and subsequent growing seasons to be conducted by Denver Water. No BAER funds are requested for this work.

CULTURAL AND HERITAGE RESOURCES

Within the area burned by the Sugarloaf fire, there have been no historic properties or potential historic properties identified, to date. Though limited to no previous formal cultural resource inventories have been conducted in the burned area, the types of significant cultural resources that generally typify the area are prehistoric and are not expected to be those susceptible to immediate damage from surface burning. Due to

the severity of the fire, it can be expected that if there are prehistoric resources in the area, the burning will increase the visibility of surface artifacts and those deposited close to the surface (within what is generally known as the taphonimically active zone). This increased exposure endangers newly exposed artifacts and temporally diagnostic materials to looting, which severely lessens the information potential that of those types of materials can provide. Area closures, proposed by the forest, will minimize the access to the burned areas and lessen the danger of looting, hence preserving information potential, if present.

B. Emergency Treatment Objectives:

The objective of implementing an area closure of the burned area is:

- To protect life/safety (trail/forest users)

The objective working with Denver Water to implement Noxious Weed Detection Surveys and Treatments is:

- To provide for recovery of native vegetation by preventing the establishment and spread of noxious weeds in the recently burned area

The objective working with Denver Water to discuss potential post fire road storm proofing treatments is:

- To develop an implementation plan for road storm proofing and road storm inspection/response

The objective of meeting with Denver Water and Henderson Mine representatives following completion of the BAER assessment is:

- To Share information on burned area conditions, anticipated watershed responses, potential impacts on the safety of their field personnel and other downstream values at risk.

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

Land __ % Channel __ % Roads/Trails __ % Protection/Safety __ %

D. Probability of Treatment Success

	Years after Treatment		
Land			
Channel			
Roads/Trails			
Protection/Safety			

E. Cost of No-Action (Including Loss):

F. Cost of Selected Alternative (Including Loss):

G. Skills Represented on Burned-Area Survey Team:

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

Team Leader: Eric Schroder

Email: eschroder@fs.fed.us Phone: 303 541 2538 FAX: 303-541-2515

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.)

Land Treatments: Noxious Weeds Detection and Treatment (Denver Water – No BAER funds requested)

Channel Treatments: None proposed

Roads Treatments: Storm Proofing and Storm Inspection and Response (Denver Water – No BAER funds requested)

Trail Treatments: Storm proofing treatments, implemented with hand-tools, include out-sloping, de-berming, water-bars, and other suitable treatments outlined in the BAER Treatments Catalog to protect the trails from accelerated post fire flows and soil erosion. Trail work would also include removal of foot bridges along stream intersections where there is high potential for plugging or loss of infrastructure.

Treatments are recommended for approximately 2 miles of the Darling Creek Trail. Trails within and directly below steep moderate and high SBS areas would be treated. Trail work will be prioritized for trail sections with the highest risk of damage during runoff and flood events.

Removal of hazardous fire impacted (structurally compromised) trees to protect the safety of BAER trail workers is also recommended.

Item	Unit	Unit Cost	# of Units	Cost
GS-9 Trails Program Manager (Miles Miller)	Day	$341/Day	7	$ 2,387
GS-6 Trail Crew Leader (Kendra Fortin)	Day	$171/Day	7	$ 1,197
GS-5 Trail Crew (Amy Sullivan	Day	$139/Day	7	$ 973
Rocky Mountain Youth Corps Trail Crew	Week	$7800/Week	1	$ 7,800
C-Falling Team	Day	$500/Day	3	$ 1,500
Per Diem	Day	$28/Day	21	$ 588
Misc. Supplies	Unit	$500	1	$ 500
Mileage and Transportation	Mile	$0.**58**/Mile	1400	$ 812
Total Cost				**$15,757**

Protection/Safety Treatments:

Installation of 6 warning signs is recommended to protect life/safety of trail/forest users.

Item	Unit	Cost
Project Oversight (Rec. Staff)	1 days@$341/day	$341
Signs (installed)	6 signs	$1,800
	Total	$2,141

Project Management, Inter-Agency Coordination and Information Sharing:

Note: Coordination with Denver Water, Henderson Mill and Grand County.

Item	Unit	Cost
District Weeds Program Manager	3 days@$400/day	$1,200
Engineer	2 days@$350/day	$700
	Total	$1,900

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.)

Treatment effectiveness monitoring is recommended to observe and document treatment effectiveness and determine treatment repair or maintenance needs. Accessibility and condition of the Darling Creek Trail, as well as presence and condition of public safety signs will need to be monitored throughout the season. A USFS Engineer will need to monitor both implementation and effectiveness of road treatments installed by Denver Water on FS Road 144.1B (Northern Sector Road)

Treatment	**Unit**	**Cost**
Protection/Safety Treatments, Trail Treatments, Road Treatments	GS-09 Trail Manager for 1 day	$341
	Trail Crew (2) for 6 days	$1,860
	Engineer for 2 days	$700
	Total	$2,901

Part VI – Emergency Stabilization Treatments and Source of Funds

			NFS Lands				Other Lands		
Line Items	Units	Unit Cost	# of Units	BAER $	Other $	# of units	Fed $	# of Units	Non Fed $
A. Land Treatments									
Coord. Nox. Weeds Treatme	days	400	3	$1,200	$0		$0		$0
Coord Engineering Treatments		350	2	$700					
Insert new items above this line!				$0	$0		$0		$0
Subtotal Land Treatments				$1,900	$0		$0		$0
B. Channel Treatments									
Insert new items above this line!				$0	$0		$0		$0
Subtotal Channel Treat.				$0	$0		$0		$0
C. Road and Trails									
Trail Storm Proofing	each	15,757	1	$15,757					
Subtotal Road & Trails				$15,757					
D. Protection/Safety									
Signs (installed)	each	357	6	$2,141	$0		$0		$0
				$0					
Insert new items above this line!				$0	$0		$0		$0
Subtotal Structures				$2,141	$0		$0		$0
E. BAER Evaluation									
				$3,765			$0		$0
Insert new items above this line!							$0		$0
Subtotal Evaluation					$0		$0		$0
F. Monitoring									
Engineer (Roads)	days	350	2	$700					
Trail Manager	days	341	1	$341					
Rec. Crew (Trails)	days	310	6	$1,860	$0		$0		$0
Insert new items above this line!				$2,901	$0		$0		$0
Subtotal Monitoring									
G. Totals				$22,699	$0		**$0**		**$0**
Previously approved				$7,500					
Total for this request				**$15,199**					

PART VII - APPROVALS

1. _____ 5-17-2019
Forest Supervisor (signature) Date

2. _____ _____
Regional Forester (signature) Date