

ANGORA INCIDENT
INCIDENT ACTION PLAN
SATURDAY DAY SHIFT
JUNE 30, 2007



**CITIZENS OF LAKE TAHOE
LAKE VALLEY FIRE PROTECTION DISTRICT
SOUTH LAKE TAHOE FIRE DEPARTMENT
LAKE TAHOE BASIN MANAGEMENT UNIT
CALIFORNIA INTERAGENCY INCIDENT MANAGEMENT TEAM 1**

<p style="text-align: center;">Incident Objectives</p>	<p>1. Incident Name</p> <p style="text-align: center;">ANGORA</p>	<p>2. Date Prepared</p> <p style="text-align: center;">06/29/07</p>	<p>3. Time Prepared</p> <p style="text-align: center;">2309</p>															
<p>4. Operational Period</p> <p style="text-align: center;">06/30/07 Saturday Day Shift 0600 - 1800</p>																		
<p>5. General Control Objectives for the incident (include alternatives)</p> <p>Protect Life and Property.</p> <p>Strategic Objectives:</p> <ul style="list-style-type: none"> - Continue to inform communities of current situations. - A strong emphasis on cost containment, focusing on efficiency and effectiveness of all suppression efforts. - Protect natural and cultural resources - coordinate planned actions with resource advisors. - Continue repair of suppression related damage. <p>Tactical Objectives:</p> <ul style="list-style-type: none"> - Keep the fire West of Lake Tahoe Blvd. - Keep the fire South of Highway 89. - Keep the fire East of Fallen Leaf Lake Road and Wilderness. - Keep the fire North of Echo Peak and Highway 50. 																		
<p>6. Weather Forecast for Period</p> <p>See Spot Weather forecast.</p>																		
<p>7. General Safety Message</p> <p>Keep a high level of situational awareness in the urban interface: electrical issues, propane, unknown hazards, traffic, both private and emergency. Watch out for SNAGS, hazard trees and power poles.</p>																		
<p>8. Attachments (mark if attached)</p>																		
<table border="0" style="width: 100%;"> <tr> <td><input checked="" type="checkbox"/> Organization List - ICS 203</td> <td><input checked="" type="checkbox"/> Incident Map</td> <td><input checked="" type="checkbox"/> Training Specialist Message</td> </tr> <tr> <td><input checked="" type="checkbox"/> Div. Assignment Lists - ICS 204</td> <td><input checked="" type="checkbox"/> Safety Message</td> <td><input checked="" type="checkbox"/> Fire Weather Forecast</td> </tr> <tr> <td><input checked="" type="checkbox"/> Communications Plan - ICS205</td> <td><input type="checkbox"/> Traffic Plan</td> <td><input checked="" type="checkbox"/> Fire Behavior</td> </tr> <tr> <td><input checked="" type="checkbox"/> Medical Plan - ICS 206</td> <td><input checked="" type="checkbox"/> Unit Log ICS 214</td> <td><input type="checkbox"/></td> </tr> <tr> <td><input checked="" type="checkbox"/> Air Operations Summary - ICS 220</td> <td><input checked="" type="checkbox"/> Human Resource Message</td> <td><input type="checkbox"/></td> </tr> </table>				<input checked="" type="checkbox"/> Organization List - ICS 203	<input checked="" type="checkbox"/> Incident Map	<input checked="" type="checkbox"/> Training Specialist Message	<input checked="" type="checkbox"/> Div. Assignment Lists - ICS 204	<input checked="" type="checkbox"/> Safety Message	<input checked="" type="checkbox"/> Fire Weather Forecast	<input checked="" type="checkbox"/> Communications Plan - ICS205	<input type="checkbox"/> Traffic Plan	<input checked="" type="checkbox"/> Fire Behavior	<input checked="" type="checkbox"/> Medical Plan - ICS 206	<input checked="" type="checkbox"/> Unit Log ICS 214	<input type="checkbox"/>	<input checked="" type="checkbox"/> Air Operations Summary - ICS 220	<input checked="" type="checkbox"/> Human Resource Message	<input type="checkbox"/>
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<p>9. Prepared by (Planning Section Chief)</p>	<p>10. Approved by (Incident Commander)</p>																	

ORGANIZATION ASSIGNMENT LIST		Food Unit	Jay Westlake
1. Incident Name Angora (CA-TMU-011011)		9. Operations Section	
2. Date 06/29/07		Chief Geoff Wilford	
3. Time 1630		Planning Ops Ranger Dorn	
4. Operational Period 06/30/07 0600 - 1800		10. Branch I - Division/Groups	
Position	Name	Branch Director	Mark von Tillow
5. Incident Commander and Staff		Deputy	
Incident Commander (Unified Command)	Rich Hawkins – USFS, Lorenzo Gigliotti – City of South Lake Tahoe, Jeff Michael – Lake Valley Fire Protection District	Division/Group A/B	Larry Turman/ Debbie Walls (T)
Deputy	Jerry McGowan	Division/Group C	Eric Nelson
Safety Officer	Jennifer Boyd, L. Szczepanik, C. Hanley, M. Tanzi, K. Kumpe (T), S. Husari	Division/Group D	Robert Bertolina
Information Officer	Chuck Dickson, T. Christofferson	11. Branch II - Division/Groups	
IE Liaison Officer	Todd Crawford	Branch Director	Pete Duncan
6. Agency Representative		Division/Group E	Val Linch, Joe Tyler (T)
Agency	Name	Division/Group S	Bill Bryant
Agency Administrators	Terri Marceron, Forest Supervisor, TMU Eli Ilano, Deputy Forest Supervisor, TMU	Division/Group V	John Flores
Resource Advisor(s)	Richard Vacirca	Division/Group Y	Ed Merrill
CalFire	Mary Huggins/Kelly Keenan	Staging	
OES	Dave Powell, Bill Bondshu	12. Law Branch	
7. Planning Section		Branch Director	Todd Crawford
Chief	Gary Montgomery	Deputy	
Deputy		Rehab Branch	
Resources Unit	J. Roberts, R. Mustatia (T), E. Ernst (T)	Branch Director	Bob Moore
Situation Unit	Todd Edwards / Gabe Schultz (T)	Division/Group	Tom Raw
Documentation Unit	Kim Sone	Division/ Group	
Demobilization Unit	Melody Fountain	Damage Assessment Branch	
Technical Specialists		Branch Director	Ethan Foote
Human Resources	Clifford Ligons	Division/Group	
Training	Julie Buel, Brian Power, Dominic Panno	Division/Group	
GIS Spec. Tech.	C Yamagiwa, S Conway , C Christofferson	Air Operations Branch	
IMET	Jim Wallmann	Air Operations Branch Director	Kent Haskins, Jerry Disney
CTSP	Jim Ott	Air Attack Supervisor	Russ Gripp
FBAN	Kelly Martin	Air Support Supervisor	Jason Nava
8. Logistics Section		Helicopter Coordinator	
Chief	Dan Turner, Rich Davis (T)	Air Tanker Coordinator	
Deputy	Jim Hogg	Finance Section	
Supply Unit	Dennis Bouslaugh	Chief	Laurie Beck, Robbin Ekman
Ordering	Jeff Carter	Deputy	
Facilities Unit	Greg Moon / Tim Gardner	Time Unit	Teresa Reniff, Kathy O'Hara
Ground Support Unit	Dave Trussel, David Corral (T)	Procurement Unit	Paulette Gordon
Medical Unit	Michael Clemens	Compensation/Claims Unit	Mona Lake
Communications Unit	Kody Kerwin	Cost Unit	Joan Disney
Receiving & Distribution	Ron Pierce, Teresa Boese		
Security Unit			

Fire Weather Forecast

FORECAST NO: 10

NAME OF FIRE: Angora

PREDICTION FOR: Saturday

SHIFT Day

UNIT: CA-TMU

SHIFT DATE: 6/30/07 0600-1800

SIGNED:

TIME AND DATE

FORECAST ISSUED: 2130 6/29/07

Jim Wallmann/Andy Church (T)

Incident Meteorologist

WEATHER DISCUSSION: An upper-level low pressure over the Pacific Northwest will continue to lift northeastward into the northern Rockies. Light winds with warmer temperatures are expected today. Afternoon minimum humidity is expected to be about 5% lower than Friday's minimums. Breezy southwest winds are anticipated for Sunday afternoon along with low afternoon humidity.

WEATHER FORECAST:

WEATHER: Mostly sunny.

TEMPERATURES: MAX 75-79 at 6300 feet. 72-75 at 7200 feet. 3-4 degrees warmer than Friday.

HUMIDITY: MIN 18-23% all elevations – 5% lower than Friday.

20-FOOT WINDS: *All Elevations:* Upslope 3-6 mph in the morning becoming southwest to 5-10 mph after 1200 with a few gusts to 20 mph in the afternoon.

LAL: 1

CWR: 0%

Haines Index: 4

STABILITY/INVERSION: Low-level valley inversion around 1000 feet AGL breaking around 1200.

SATURDAY IA FORECAST FOR THE TAHOE BASIN:

WEATHER: SUNNY.

TEMPERATURE MAX 75-80 around 6500 feet. 65-73 above 7500 feet 3 DEGREES WARMER.

HUMIDITY MIN 18-23% all elevations – 5% lower than Friday.

20-FOOT WINDS: *Slope/Valley:* Upslope 3-6 mph in the morning becoming southwest to 5-10 mph after 1200 with a few gusts to 20 mph in the afternoon.

Ridges: Southwest 5-15 mph with gusts to 25 mph along ridges (~8500 ft MSL).

HAINES INDEX 4.

LAL 1.

CWR 0%.

EXTENDED FORECAST (Winds are for average afternoon conditions):

SUNDAY 7/1

WEATHER: Sunny.

TEMP: Max: 77-83 **RH:** Min: 13-17%
Min: 42-52 Max: 40-55%

WINDS: S-SW 10-15 mph with gusts 25 mph

LAL: 1 **CWR:** 0% **HAINES:** 5

MONDAY 7/2

WEATHER: Sunny.

TEMP: Max: 79-84 **RH:** Min: 11-16%
Min: 44-54 Max: 35-50%

WINDS: Slope: S-SW 10-15 mph gusts 25 mph

LAL: 1 **CWR:** 0% **HAINES:** 5

FIRE BEHAVIOR FORECAST

FORECAST NUMBER: 09

FIRE: ANGORA FIRE

OPERATIONAL PERIOD: Day, Saturday, June 30, 2007

DATE ISSUED: 06/29/2007

TIME: 2100

UNIT: USFS Lake Tahoe Basin MU

SIGNED: /s/ Kelly Martin - FBAN

WEATHER SUMMARY: See attached Fire Weather Forecast for details.

FIRE BEHAVIOR HAS DIMINISHED GREATLY DUE TO TREMENDOUS EFFORTS TO CONTAIN AND SUPPRESS OPEN FLAME

MIN RH: 18-23% **DOWN 5% SLIGHTLY FROM YESTERDAY**

MAXIMUM TEMP: 72-75 **SLIGHTLY HIGHER THAN YESTERDAY**

WINDS (20 FT): SSW5-10G20 **WINDS WILL NOT BE AS STRONG AS**

YESTERDAY

GENERAL FIRE BEHAVIOR: Fire behavior has greatly diminished but the potential will continue to be extreme. Any new start outside the fire area has the potential to grow rapidly

What to watch for today:

1 – Deep hot stump holes that have shallow roots that are still burning

PERIMETER: Heat is still detected along the line but is now confined to stump holes, cat-face snags and some residual heat that is burning out in heavy compacted needle and duff layers. Much of the fire perimeter has burned out completely due to extremely dry duff and litter layers that has been completely consumed.

INTERIOR: Significant smokes will still be detected interior and pose a minimal threat to the line due to limited spotting potential. These large smokes will be located in areas that are difficult for firefighters to access and consist of large logs and deep stump holes. Interior torching has significantly reduced due to lack of ground fuels available to burn to initiate torching.

FIRE DANGER RATING FOR TODAY: VERY HIGH

BURNING INDEX:33 ENERGY RELEASE COMPONENT:44 IGNITION COMPONENT:37

PROBABILITY OF IGNITION: 62%

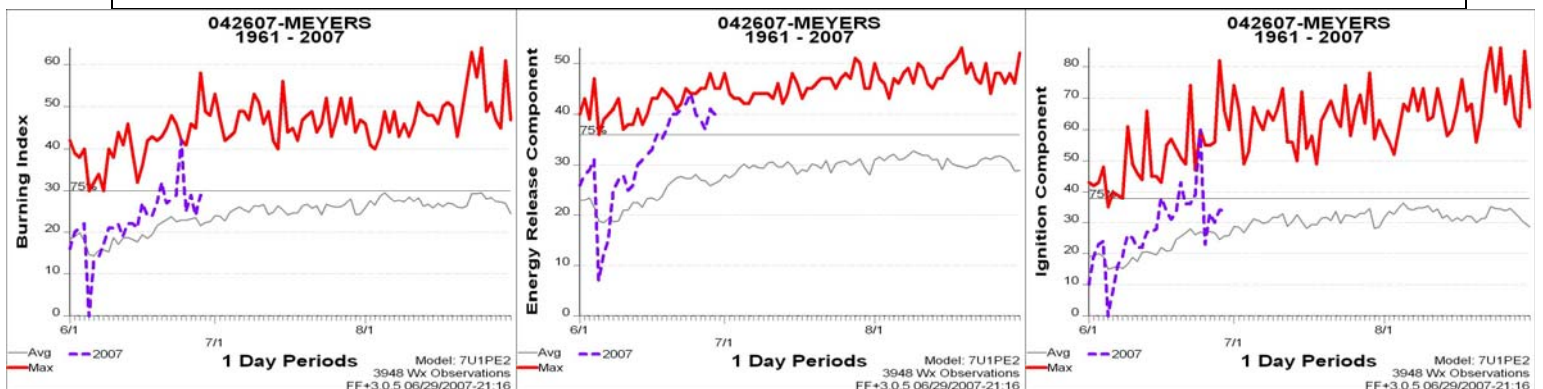
FINE DEAD FUEL MOISTURE: 5% (50% shading from the sun)

SINGLE TREE TORCHING SPOTTING DISTANCE: 1/3 OF A MILE

AIR OPERATIONS: Slight inversion lifting around 1200

SAFETY: HOT STUMP HOLES AND GREEN FIRE WEAKEN SNAGS!

ON SITE WEATHER OBSERVATIONS: Please take note of any unique observed fire behavior that you see along the line or interior.



Division Assignment List		1. Branch II		2. Division/Group E			
3. Incident Name ANGORA		4. Operational Period 06/30/07 Saturday Day Shift 0600 - 1800					
5. Operations Personnel							
Operations Chief	GEOFF WILFORD		Division/Group Supervisor	VAL LINCH, JOE TYLER (T)			
Operations Chief	RANGER DORN (T)		Air Attack Supervisor	KENT HASKINS			
Branch Director	PETE DUNCAN		Safety Officer	DOUG MCKELVEY, KEN KUMPE (T)			
6. Resources Assigned this Period							
Strike Team/Task Force/ Resource Designator	Leader	Num of Pers.	Trans. Y/N	Drop Off PT./Time	Pick Up PT./Time		
CREW - T1 - SIERRA HOTSHOTS	JORDAN, KENNETH	20	N	DP 7 - 0600	1800		
CREW - T1 - PLUMAS HOTSHOTS	SEVELSON, JACK	21	N	DP 7 - 0600	1800		
CREW - T1 - KLAMATH HOTSHOTS	CLEM, JOHNNY	21	N	DP 7 - 0600	1800		
TFLD ANGORA #1			N	DP 7 - 0600	1800		
WT - T2 - SWR #3490	RANDALL LADD	2	N	DP 7 - 0600	1800		
TFLD	ALEX MCBATH	1	N	DP 7 - 0600	1800		
EMTP	ERIC SCHROTH	1	N	DP 7 - 0600	1800		
EMT	HERNSTAK	1	N	DP 7 - 0600	1800		
7. Control Operations							
- Mop-up 400 feet in from the line.		- Snag in 600 feet.		- Back-Haul all excess equipment.			
- Patrol for spots.		- Keep 19 RD closed.		- Pick up trash.			
8. Special Instructions							
<ul style="list-style-type: none"> - Resource Advisors include M. Moore and S. Parsons - Contact Divisions when entering or leaving. - When practical, flush cut to ground level all stumps from felled trees. - In the event of a fuel spill or discovery of toxic material on NFS lands, contact communications at ICP to notify safety. - Start water bar construction on all handlines - See water bar specs. - All vehicles de-mobed must be washed. Washing station located at Lake Tahoe Blvd. and "C" Street. - All helicopter tanks and buckets to be flushed with 3% bleach/water mix. 							
9. Division/Group Communications Summary							
Function	Frequency - RX	Frequency - TX	Tone	System	Channel	System	Channel
Command	168.7000 N	170.9750 N			7		
Tactical Div/Group	173.9875 N	173.9875 N			5		
Logistics							
Air to Ground	166.3375 N	166.3375 N			6		
Prepared by (Resource Unit Leader) R. Mustatia (T), E. Ernst (T)		Approved by (Planning Section Chief)			Date Prepared 06/29/07		Time Prepared 2222

Division Assignment List		1. Branch Rehab		2. Division/Group			
3. Incident Name ANGORA		4. Operational Period 06/30/07 Saturday Day Shift 0600 - 1800					
5. Operations Personnel							
Operations Chief	GEOFF WILFORD		Division/Group Supervisor	TOM RAW			
Operations Chief	RANGER DORN (T)		Air Attack Supervisor	KENT HASKINS			
Branch Director	BOB MOORE		Safety Officer				
6. Resources Assigned this Period							
Strike Team/Task Force/ Resource Designator	Leader	Num of Pers.	Trans. Y/N	Drop Off PT./Time	Pick Up PT./Time		
CREW - T2 - CREW 31 IRON MTN	BROWN, ROBERT	19	N	ICP	0600		
BORDGES TBR D5-H	CHASEN, STEVE	1	N	ICP	0600		
DOZER - T2 - PNF 1	SIBBALD, SCOTT	2	N	ICP	0600		
EXCAVATOR	TBA		N	ICP	0600		
TFLD	KELLY, PETER	1	N	ICP	0600		
FELB	HOKANSON, MITCH	1	N	ICP	0600		
FELB	LANE, GARY	1	N	ICP	0600		
FALC	DENIZ, RYAN	1	N	ICP	0600		
FALC	MILLER, JIM	1	N	ICP	0600		
FALC	BLUE, SCOTT	1	N	ICP	0600		
FALC	TRESIDDER, STEVE	1	N	ICP	0600		
7. Control Operations							
<ul style="list-style-type: none"> - Evaluate rehab needs with resource advisors. - Survey Urban Lots - Survey closed/decommissioned roads 							
8. Special Instructions							
<ul style="list-style-type: none"> - Communications based on area of assignment. - Assess sensitive cultural sites. - Resource Advisors include D. Cruz and K. Julian - Contact Division when entering and leaving. - When practical, flush cut to ground level all stumps from felled trees. - In the event of a fuel spill or discovery of toxic material on NFS lands, contact communications at ICP to notify safety. - Start water bar construction on all handlines - See water bar specs. - All vehicles de-mobed must be washed. Washing station located at Lake Tahoe Blvd. and "C" Street. - All helicopter tanks and buckets to be flushed with 3% bleach/water mix. 							
9. Division/Group Communications Summary							
Function	Frequency - RX	Frequency - TX	Tone	System	Channel	System	Channel
Command	168.7000 N	170.9750 N			7		
Tactical Div/Group							
Logistics							
Air to Ground	166.3375 N	166.3375 N			6		
Prepared by (Resource Unit Leader)		Approved by (Planning Section Chief)		Date Prepared		Time Prepared	
E. Ernst (T)				06/29/07		2303	

AIR OPERATIONS SUMMARY

Prepared By: **Jason Nava AOB(T)** Prepared Date: **June 29, 2007** Prepared Time: **2100**

1. INCIDENT NAME: **ANGORA** 2. OPERATIONAL PERIOD DATE: **JUNE 30, 2007** START TIME: **0800** END TIME: **2000** SUNRISE: **05:36AM** SUNSET: **20:29PM**

3. REMARKS (Safety Notes, Hazards, Air Operations Special Equipment, etc.):			4. MEDEVAC AIRCRAFT:		5. TFR: NOTAM# 7/5763	
References and Attachments To Be Briefed To All Personnel: 1) MAINTAIN 1000' AGL IN TRANSIT FLIGHTS 2) WATCH FOR AIRCRAFT WITHIN FIRE PERIMETER 3) MAINTAIN COM. WITH ATGS/HLCO FOR AIRSPACE SEPATATION 4) WILDERNESS LAKES OFF LIMITS FOR WATER USE MINDON AIR TANKER BASE UNICOM/APPROACH 123.05 NOTAM# 7/5763, FREQ. 123.175			INCIDENT, H-528 CALSTAR MEDEVAC (see medical plan)		Radius: 7 NM Altitude 12,000' MSL Center point: LAT: 38 52.23 LONG: 120 02.15	

6. PERSONNEL		NAME	Phone #	7. FREQUENCY		AM	FM	8. FIXED-WING Avail / Type/ Make-Model / FAA N# / Base(s)			
AOBD		Kent Haskins	661-330-0133	AIR/AIR PRIMARY		123.175		AIRTANKERS: Order through ATGS			
AOBD(T) ASGS		Jason Nava Jerry Disney	661-805-4750 209 352-0209	A/A – BRIEFING South Lake Tahoe Unicom		122.950					
HEB-1				FW A/A Tactics-			171.1375	LEADPLANES:			
Helibase				Flight Follow							
Minden Fax			775-782-1441	AIR / GROUND			166.3375	ATGS AIRCRAFT: 17V, AT 507			
AOBD DESK		530-541-9253									
ATGS		Russ Gripp	530-598-4172					H2O: LAKES IN THE WILDERNESS ARE OFF LIMITS			
ATGS (t)		Curtis Coots	530-945-7395	Deck			163.100				
ATGS ATGS				TOLC: Local Unicom		122.950		Retardant: FIXED WING ONLY			
HLCO		H-507				RX	TX				
HLCO		Mike Eaton		Forest		172.3750	171.5150				
				Command		RX	TX				
						168.7000	170.9750				

9. HELICOPTERS (Use Additional Sheets As Necessary)

FAA N#	TY	MAKE/MODEL	BASE	AVAIL	START	REMARKS	FAA N#	TY	MAKE/MODEL	BASE	AVAIL	START	REMARKS
H-553	3	ASTAR	HELIBASE	0700	0800	STANDARD							
H-528	2	BELL 212	HELIBASE	0700	0800	STANDARD							
H-534	2	BELL 205	HELIBASE	0700	0800	STANDARD							
HT-720	1	S-54	HELIBASE	0700	0800	TANKED CRANE							

9. HELICOPTERS (Use Additional Sheets As Necessary)

FAA N#	TY	MAKE/MODEL	BASE	AVAIL	START	REMARKS	FAA N#	TY	MAKE/MODEL	BASE	AVAIL	START	REMARKS

10. TASK/MISSION/ASSIGNMENT (Type/Function includes: Air Tactical, Retardant, Recon, Personnel Transport, Water Dropping, S&R, etc.)

TYPE/FUNCTION	NAME OF PERSONNEL OR CARGO (if applicable) OR INSTRUCTIONS FOR TACTICAL AIRCRAFT	MISSION START	FLY FROM	FLY TO
Air Tactical	Coverage over incident by FW ATGS on request, H-507 AV @ Helibase.	0830	MINDEN	FIRE
Dropping Retardant: Air Tanker	FW air tankers when available as ordered by DIVS to ATGS.		MINDEN	FIRE
Dropping Water: Helicopters	as ordered by ATGS		HELIBASE	FIRE
Transport Personnel	On request		HELIBASE	FIRE
Cargo Transport	On request		HELIBASE	FIRE
Recon	Order thru AOBD		HELIBASE	FIRE
Medevac	ATGS, DIVS to Communications and MEDUL to coordinate MEDEVAC; determine nature of injury, method of transport.		HELIBASE	HOSPITAL
Mapping/Infrared	Helicopter 553 as requested		HELIBASE	FIRE
Refueling	At Southlake Tahoe airport (Helibase)			
Rappel	Available On request			
Firing				

S A F E T Y M E S S A G E

Angora Fire

June 30, 2007 Day Shift

USE **L**OOKOUTS, **C**OMMUNICATIONS, **E**SCAPE ROUTES, **S**AFETY ZONE

LCES IN PLACE EVERY TIME

Weather Environment

- Weather conditions are in our favor today.
- Conditions are extremely dry.

Fireline:

- Be alert for signs of dehydration and fatigue.
- Stay focused on the task at hand.
- Snags and weakened green trees are continuing to fall in the fire area.
- Loose rocks and gravel on steep upper slopes.
- Watch out for heavy equipment being used in Division Sierra for rehab.
- The utility companies are still hard at work in residential areas. Watch for flaggers, caution signs and cones.

Transportation issues:

- **The entire fire area is open without restrictions.**
- Only Angora Ridge Road is still closed. Angora Ridge Rd single lane, limited turnouts.
- Drive slow, lights on, use amber flashers as needed.
- Sightseers and weekend visitors - It's the start of the Fourth of July week in the Basin.
- Media are still in the area.

Prepared by: Jennifer Boyd Safety Officer **Date:** 7/29/07
Linda Szczepanik Deputy Safety Officer

The Five-D System for Effective Fireline Waterbars

Michael J. Furniss
USDA Forest Service
Pacific Northwest Research Station
Corvallis, Oregon

To make effective waterbars on firelines, just remember the 5-D System. The five D's are: **Distance, Diagonal, Divert, Discharge, and Dissipate.**

Most forest values depend on healthy soils, clean water, streams full of fish, diverse wildlife habitats, productive timberlands, beautiful places, and so on. Firefighters strive to protect our soils by suppressing the wildfires that can damage them.

Methods used to fight fires, especially firelines, can cause erosion and soil degradation, and need to be treated to properly maintain forest values. Fireline surfaces usually cause runoff during heavy rainfall and snowmelt. Without waterbars, excessive runoff will concentrate and cause rills and gullies to form. Effective waterbars can prevent this from happening.

Distance: To be effective, waterbars must break up drainage areas and runoff on the fireline so that there's not enough erosive energy available in runoff to erode the soil. To ensure that excess runoff cannot accumulate, waterbars must be placed the proper distance apart, based on the slope of the fireline. This breaks up the area that accumulates runoff, keeping it small enough to prevent damage. Erosion potential depends on slope and a table is provided on the next page that gives the maximum distance between waterbars, or between a waterbar and the next upslope drainage break.

Diagonal: After deciding where you will put each waterbar, the next decision is how to build them. An important principle in working with flowing water is: don't bully the flow, lead it. Waterbars built directly across a fireline oppose the water's energy and tend to fail. Waterbars built diagonal to the fireline lead the water off and work much better. A diagonal waterbar has a gentle slope along its base that leads the water off. A simple rule is to add 5 to the slope of the road, in percent, and build the waterbar at that many degrees from perpendicular. Or simpler yet, just build them at 30 degrees off perpendicular (see the illustration on the next page).

Divert: A good waterbar will divert the water off the fireline. To do this the waterbar must be sufficiently deep to handle all the flow for as long as it's needed. Excavation is much more effective than fill in making a durable and effective waterbar (a ditch or a dip beats a dike).

Discharge: Another feature of a good waterbar is that it will discharge the flow. A good waterbar is not a dam – it must have an open outlet.

Dissipate: Finally, a good waterbar should dissipate the flow just below the outlet to exhaust its eroding power and cause it to filter into the soil. This may require placing slash, rock, or debris below the outlet, or fudging a bit on distance to take advantage of natural features that will dissipate the water's erosive energy.

So remember, when locating and building waterbars, place them the right **distance** apart, at a **diagonal** to the fireline, so that they **divert**, then **discharge**, then **dissipate** the energy of the flowing water. Be sure to make them deep enough so they'll be durable.

Fireline slope %	Maximum Distance Apart (feet)
1-6	300
7-9	200
10-14.....	150
15-20.....	90
21-40.....	50
41-60.....	25

Recommended spacing for waterbars on firelines.
 Waterbars should be no further apart than this, but they may be closer. When in doubt, put in more. From: UDSA-Forest Service, "Sale Administrator's Handbook"

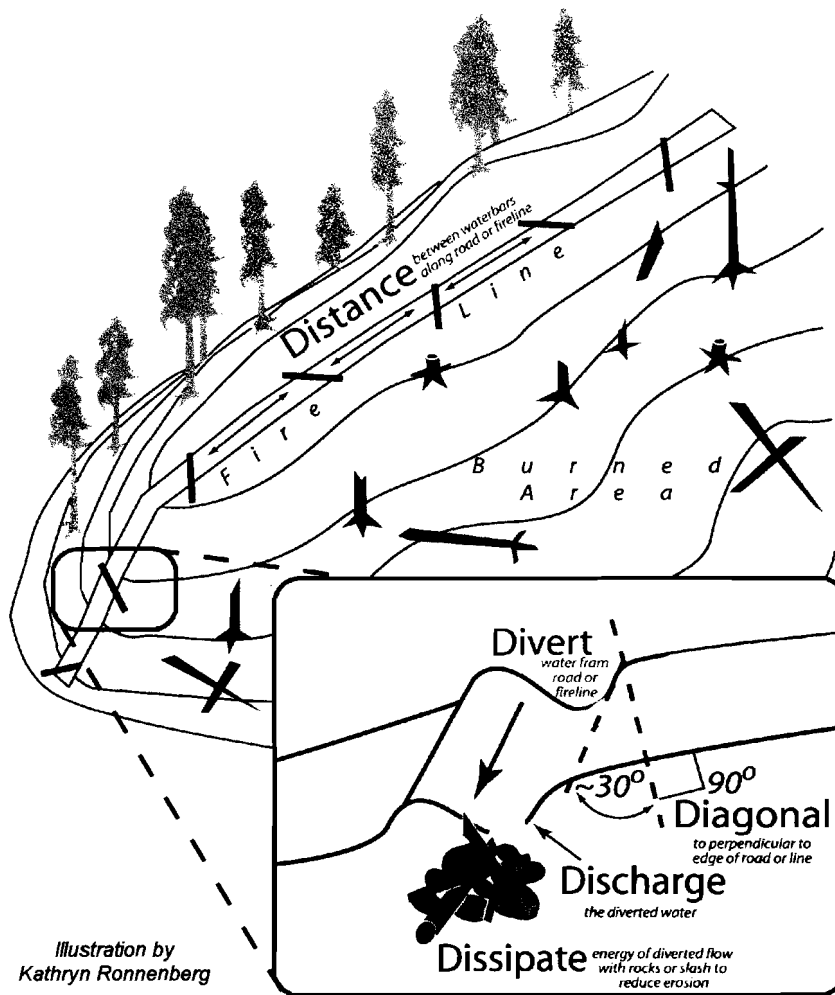


Illustration by Kathryn Ronnenberg

Reference: Hauge, C.J., M.J. Furniss and F.D. Euphrat. 1979. *Soil erosion in California's Coast Forest District*. California Geology. June. 1979

HUMAN RESOURCES MESSAGE
SATURDAY JUNE 30, 2007
ANGOLA FIRE

AS WE DEMOB:



Remember!

You Are Responsible to treat people....

With dignity & respect....

You have a Right to receive same treatment from others

TRAVEL SAFELY

**Cliff Ligons
HUMAN RESOURCE SPECIALIST**

TRAINING SPECIALIST MESSAGE

A Training Specialist is now on the incident. All federal, state, and local government agency trainees working on position task books should register with the Incident Training Specialist in order to receive proper credit for your assignment.

The Training Unit is located in the northern most trailer at ICP

Please see the Training Specialist as soon as possible!!

Julie Buel, Dominic Panno, Brian Power
Training Specialists

