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WILDFIRE DEBRIS OPERATIONS



The 1st Coordinated Wildfire Debris Removal Program in the US

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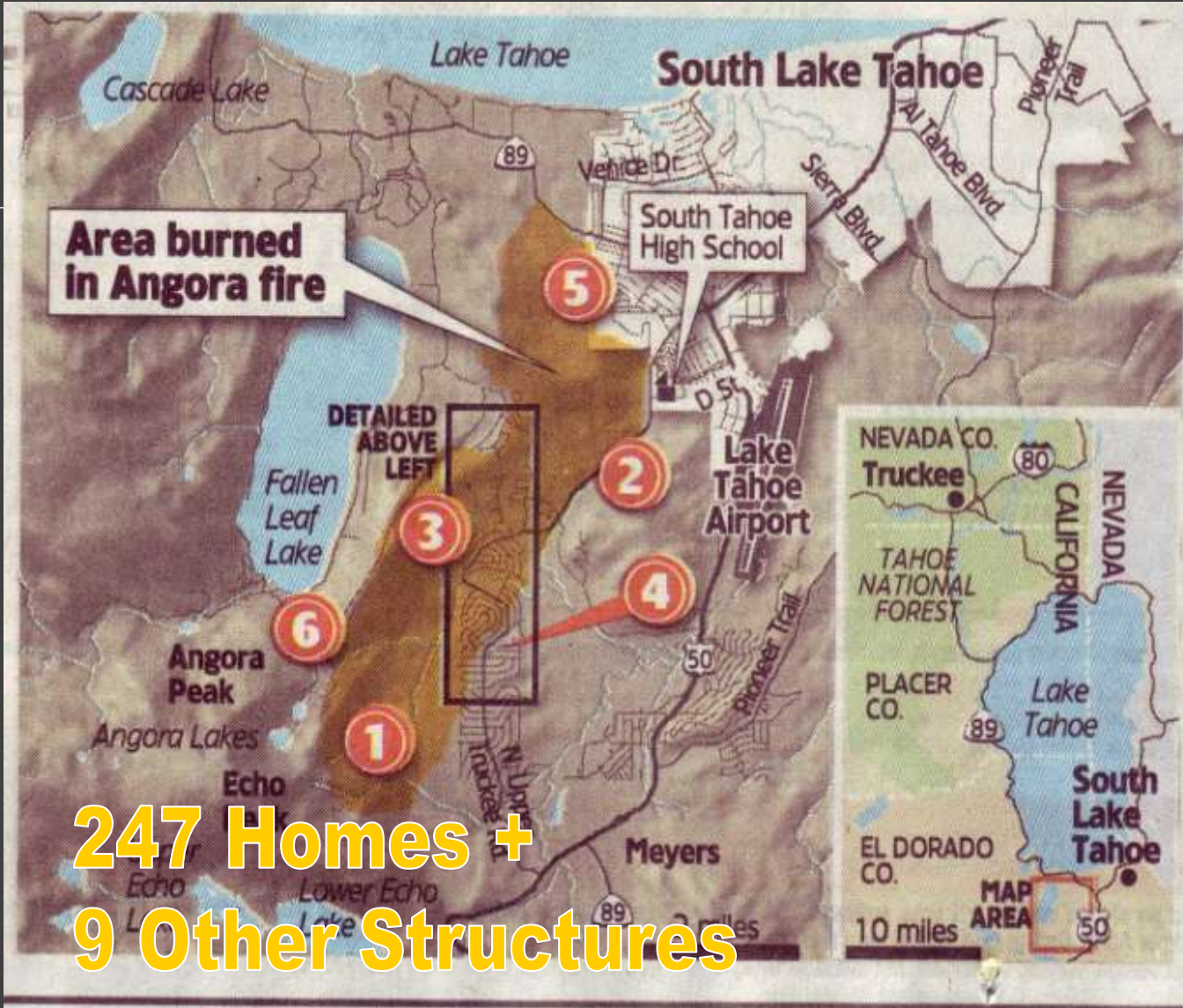
Bio



Angora Fire 2007

South Lake Tahoe, CA





**247 Homes +
9 Other Structures**

Source: Sacramento Bee, July 1, 2007

Angora Protocols



HOW?

1. New Executive Order – *comprehensive structural debris removal as a single project*
2. El Dorado County – Risk and Commitment (OES, ROE, DROC, EDEM)
3. OES – Funding Concept and Coordination
4. CalRecycle – Removal Plan and Contractor, \$Funds
5. No FEMA Funding



New Governor's Order



Key to the Responses

On July 2, 2007, the Governor issues Executive Order S-09-07

“That State agencies shall work with local officials to put into place and implement a comprehensive structural debris removal plan that will treat the removal of structural debris as a single organized project.”

Additional Orders since 2007

*“State statutes, rules, regulations and requirements **are hereby suspended** to the extent they apply to the following activities: (a) removal, storage, transportation, and disposal of hazardous and non-hazardous debris that result from the fires and that are subject to the jurisdiction of agencies within the California Environmental Protection Agency and the California Resources Agency, (b) necessary restoration, and (c) related activities. Such statutes, rules, regulations and requirements are suspended only to the extent necessary for expediting the removal and cleanup of debris from the fires, and for implementing any restoration plan. ”*

Debris Removal

CLEANUP

COMMITMENT

CUSTOMER SERVICE



The Cleanup

Develop a cleanup process that treats the debris removal after a wildland fire as a single unified project while protecting the public and environment and not impacting the community a second time



Debris Removal Goals

Maximize voluntary participation in coordinated program.

Remove all debris for proper disposal and recycling by September 1, 2007. (Started July 13)

Erosion control installed by October 15, 2007.

Complete the project in 120 DAYS

- This process leads to County approval for permits to rebuild structures in a short time line.

Health and Safety

Community Safety Plan

Incident Safety Plan

Air Monitoring

Site workers in Level C

Independent Inspections

Resources



HISTORY

Initial Wildfire Disaster

Local Agency Requesting Assistance

OES & CalEPA – Assist with coordinating state agencies and resources

ARB – Conduct air monitoring & plume modeling during fire

Debris Removal

Phase I DTSC – Conduct HHW/Asbestos assessment/removal

(USEPA – Assist with HHW assessment and removal for fires with a federal declaration & provided GIS support)

Phase II CalRecycle – Organize and oversee debris removal operations

Typical Home Site



Removal Operations



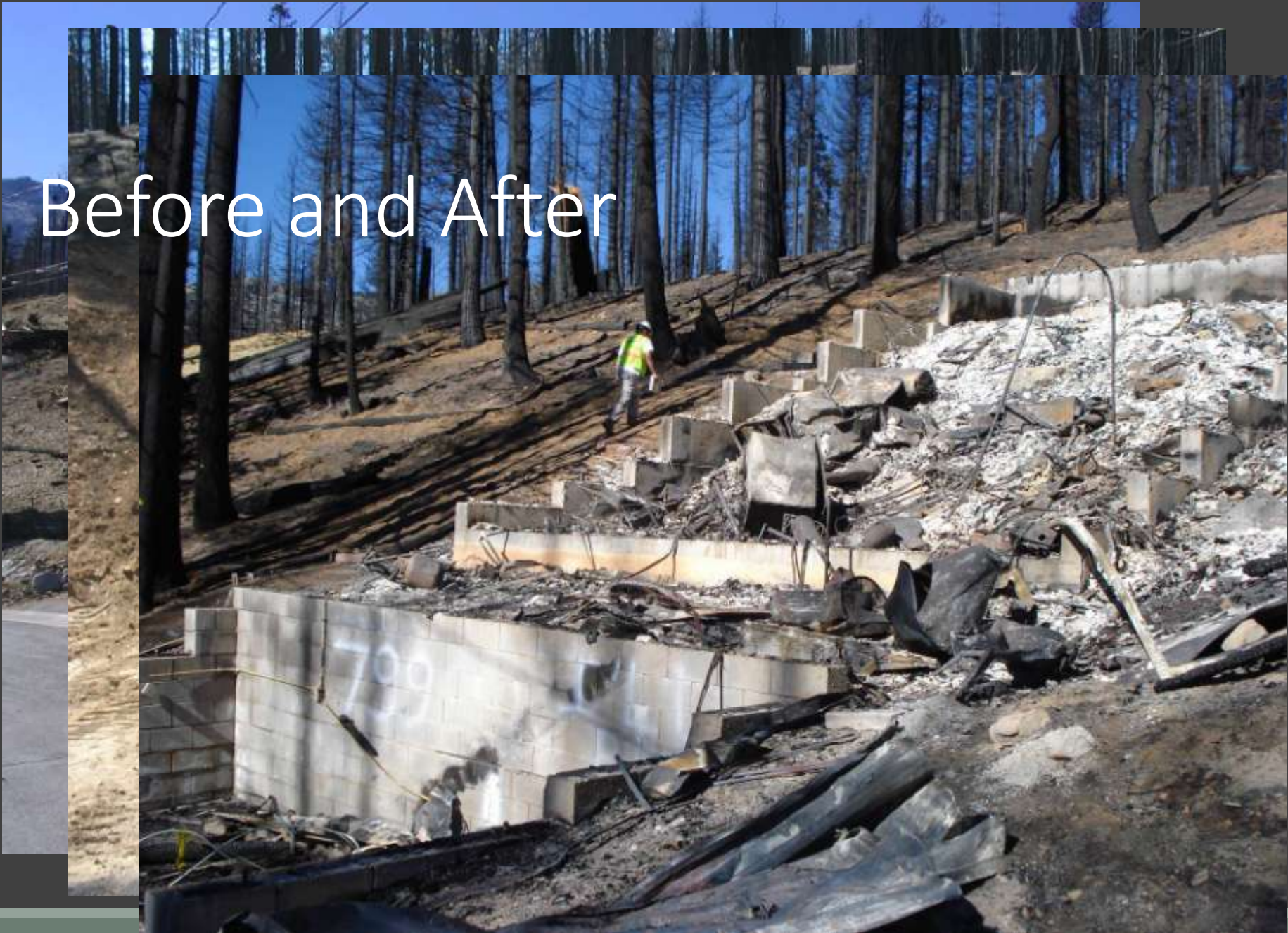
Haz Mat Operations

Limit exposure from heavy metal and asbestos

Structure area is the exclusion zone



Before and After



Before and After



Wildfire Responses (State and Federal Declared Disasters)

*SoCal Fires – 2007 & 2008

*Butte County Fires - 2008

*Station Fire – LA County - 2009

*No Debris Mission

*Monterey County Fires – 2008 & 2013

*Rim Fire (Tuolumne County) – 2013

Boles Fire (Weed, CA) – 2014

Round Fire (Mono Co.) – 2015

Rocky/Jerusalem Fires (Lake Co.) – 2015

Forks Complex Fire (Trinity Co.) - 2015

Butte Fire & Valley Fires– 2015-2016

Ponderosa, Wall, Detwiler, Thomas, Tubbs, Atlas, Nuns, Cherokee, Redwood Valley Complex, La Porte, Cascade, Sulphur - 2017

HISTORY

Now Program is Two Phases

- Phase 1. Health Order to remove HHW and other items such as asbestos
- Phase 2. Debris Operations

DTSC's (Phase I)

1. Assess and remove household hazardous waste
2. Assess and remove easily-identifiable and easily-removable asbestos-containing material
3. Provide transportation and disposal services for all waste removed from impacted properties
4. Assess and remove mercury contamination, radiological debris, and other hazardous material during Phase II of the debris removal

Fire-Related Exposures

Provide a Certified Asbestos Consultant (CAC) to assess each impacted home for asbestos

Provide licensed Hazardous Waste Contractors to assess and remove household hazardous waste from the impacted homes

Provide licensed Asbestos Removal Contractors to remove asbestos

Provide DTSC Emergency Response staff during the duration of the response to assist with assessment and oversight of removal-related activities

DTSC Emergency Response staff work closely with the requesting agency during duration of response

DTSC coordinates with CalRecycle during the later stages to return for additional removal actions as needed

Access to Impacted Properties

Cities or Counties can declare a Public Health Emergency to gain access,

OR

Pursue access agreements with property owners

Requesting agencies staff will need to accompany DTSC during the duration of the response

Examples of Household Hazardous Removed

Auto & Solar Batteries

Auto Fluids

Household Cleaners

Fertilizers

Latex/Oil-Based Paint

Pesticides

Pool Chemicals

Solvents

Used Oil and Oil Filters

Burned e-waste

Propane Tanks and other cylinders (Less than 30-gal.)

Also products labeled *Corrosive, Flammable, Toxic, and Poison*

Potential Hazards Encountered

Workers involved in collecting hazardous wastes from burned residences face numerous hazards due to the remote location, weather, long work hours and the 'unknown' nature of each site surveyed.

Physical and Biological Hazards:

- Musculoskeletal hazards
- Heavy equipment / vehicle traffic
- Extreme heat and cold
- Confined spaces / Unstable structures
- Worker stress / fatigue
- Electrical hazards
- Rough terrain, unstable ground (4x4 access, ash pits, rock/mud slides)
- Open wells and septic tanks
- Smoldering fires / hot spots

- Sun exposure, dry climate
- Sharps (nails, glass, metal, etc.)
- Mosquitoes, ticks, spiders, scorpions
- Plants (poison oak, needles, thorns)
- Rattlesnakes, mountain lions, bears
- Rabid skunks, raccoons, dogs / squirrels (fleas with plague)
- Falling trees and branches
- Illegal activities discovered (looting, marijuana, methamphetamine)

Potential Hazards Encountered cont.

Chemical Hazards:

- Asbestos (in building materials / naturally occurring in road dust)
- Crystalline silica (ash and road dust)
- Ash (toxic mixture)
- Smoke (smoldering fires)
- Compressed gas cylinders
- Gasoline / chemical containers
- Pool chemicals

- Batteries (lead and acid)
- Paints and thinners
- Pesticides, herbicides, fertilizers
- Ammunition, explosives
- Lead, arsenic, mercury
- Light ballasts (PCBs)
- Fire retardants
- Electrical transformers

Workers and volunteers must receive adequate training regarding the above hazards, including a safety briefing at the beginning and end of each day. They must use the appropriate protective clothing and equipment, stay hydrated during the day and have a means of communicating with others at all times.

Potential Hazards Encountered cont.

Health and Safety Plan:

A site specific health and safety plan which addresses each of these sections must be developed and followed by all workers who must enter burn debris areas:

- Site Background
- Key Personnel
- Hazard Assessment
- Training
- PPE
- Temperature Extremes
- Medical Surveillance
- Monitoring and Air Sampling
- Site Control
- Decontamination
- Emergency Action Plan
- Confined Space Entry
- Toilet Facilities / Sanitation
- Illumination

Additional Information:

<http://tools.niehs.nih.gov/wetp/index.cfm?id=2455>

Asbestos Assessment and Removal

Phase I -CAC will assess and identify the easily removable pieces of asbestos

Note: Assumed asbestos, not verified by a lab method

An Asbestos Removal Contractor will remove the previously identified pieces of easily removable asbestos for proper disposal

If there is an approved debris mission by CalOES

Phase II- If the asbestos is not easily removable, it will be marked with paint, roped off, and left for debris removal by CalRecycle.

Currnet Phase II - Debris Removal Operations

CalRecycle & Local Agencies are lead for debris removal operations

DTSC's Emergency Response Program continue to provide support to CalRecycle and Local Agencies after completion of initial HHW assessment

Additional HHW routinely discovered during debris removal operations

Ventura City/County Recovery

Debris Removal Steps

1. Site Assessment
2. Asbestos Survey and Removal
3. Vehicles / Chimneys
4. Metals
5. Ash/Debris
6. Concrete
7. Soil Confirmation Sampling
8. Erosion Control
9. Final Inspection





Ventura City/County Recovery

Damaged property.



Ventura City/County Recovery

Crew working with monitor.



Ventura City/County Recovery

Property with initial debris removal completed.

Summary of Debris Removal Operations

Incident	Year	Properties	Duration	Tonnage Collected	Cost
Angora Fire, El Dorado County	2007	256	11 Weeks	73,004	\$7 Million
San Bruno PG&E Natural Gas Line Explosion, San Mateo County	2010	35	4 Weeks	7,913	\$2 Million
Boles Fire, City of Weed	2014	134	7 Weeks	30,691	\$6.4 Million
Round Fire, Mono County	2015	41	5 Weeks	9,239	\$5.0 Million
Trinity Complex of Fires, Trinity County	2015/16	60	3 Weeks	1,446	\$2.1 Million
Rocky and Jerusalem Fires, Lake County	2015	83	4 Weeks	9,545	\$4.7 Million
Valley Fire, Lake County	2015/16	1,140	18 Weeks	252,434	\$93.3 Million
Butte Fire, Calaveras County	2015/16	883	24 Weeks	235,263	\$113.7 Million
Erskine Fire, Kern County	2016	301	8 Weeks	50,446	\$20.2 Million
Clayton Fire, Lake County	2016	157	6 Weeks	34,498	\$10.2 Million
Detwiler Fire, Mariposa County	2017	113	8 Weeks	28,368	\$9.8 Million
Helena Fire, Trinity County	2017	67	6 Weeks	21,972	\$7.6 Million
Wind Fire, Nevada, Yuba and Butte Counties	2017	255	6 Weeks	73,177	\$20.1 Million
Sulphur Fire, Lake County (Gooseneck Point)	2017	12	4 Weeks	252	\$1.4 Million
Thomas Fire, Ventura County	2018	672	12 Weeks	213,512	\$65.1 Million
Mud Slides, Santa Barbara County	2018	Unknown	6 weeks	33,000 ¹	\$1.3 Million
Klamethon Fire, Siskiyou County	2018	Unknown	Unknown	Unknown	Unknown
Carr Fire, Shasta County	2018	Unknown	Unknown	Unknown	Unknown
Mendocino Complex, Lake County	2018	Unknown	Unknown	Unknown	Unknown
Pawnee Fire, Lake County	2018	Unknown	Unknown	Unknown	Unknown

Debris Removal (Recovery) Responding Agencies

Federal Partners

- USEPA
- USACE
- FEMA
- NIOSH

Local Partners

- County/City Governments and Agencies
 - Environmental Health
 - Department of Public Works
- Tribal Governments
- Local Air Pollution Control Districts
- Solid Waste Local Enforcement Agencies

State Partners

- Cal OES
- Cal EPA
- CalRecycle
- DTSC
- Regional Waster Quality Control Boards (R1, R2, R3, R5 and R6)
- DOF
- DGS
- CARB
- Cal OSHA
- CalTrans, DFW, DWR, and others

Private Partners

- Hazardous and Solid Waste Management Industry
- Debris Removal Contractors
- Engineering Support Consultants

Is the Ash Hazardous or Toxic?

The ash is an immediate threat to public health and safety (source: Cal/EPA)

- Ash Sampling Studies from 2004, 2007, 2015
- Residual structural ash contains concentrated amounts of heavy metals, such as arsenic, barium, beryllium, copper, chromium, cadmium, lead, and zinc
- Asbestos is also present in older home sites



What is this?



And



And



And



And



Exposures



Exposures



Exposures



Is your opinion changing?

We need clear guidance and all levels of government, Federal, State, Tribal, County, and City

We need more CIH as field leads not office oversight

Questions and Answers

