

# LA-UR-11-11124

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Title: Las Conchas Fire Runoff Mitigation

Author(s): Desousa, Theodore F.

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Storm water  
Reading Room  
Fire mitigation



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# Las Conchas Fire Runoff Mitigation at Los Alamos National Laboratory

Dave McInroy

Program Director  
Corrective Actions Program

July 27, 2011



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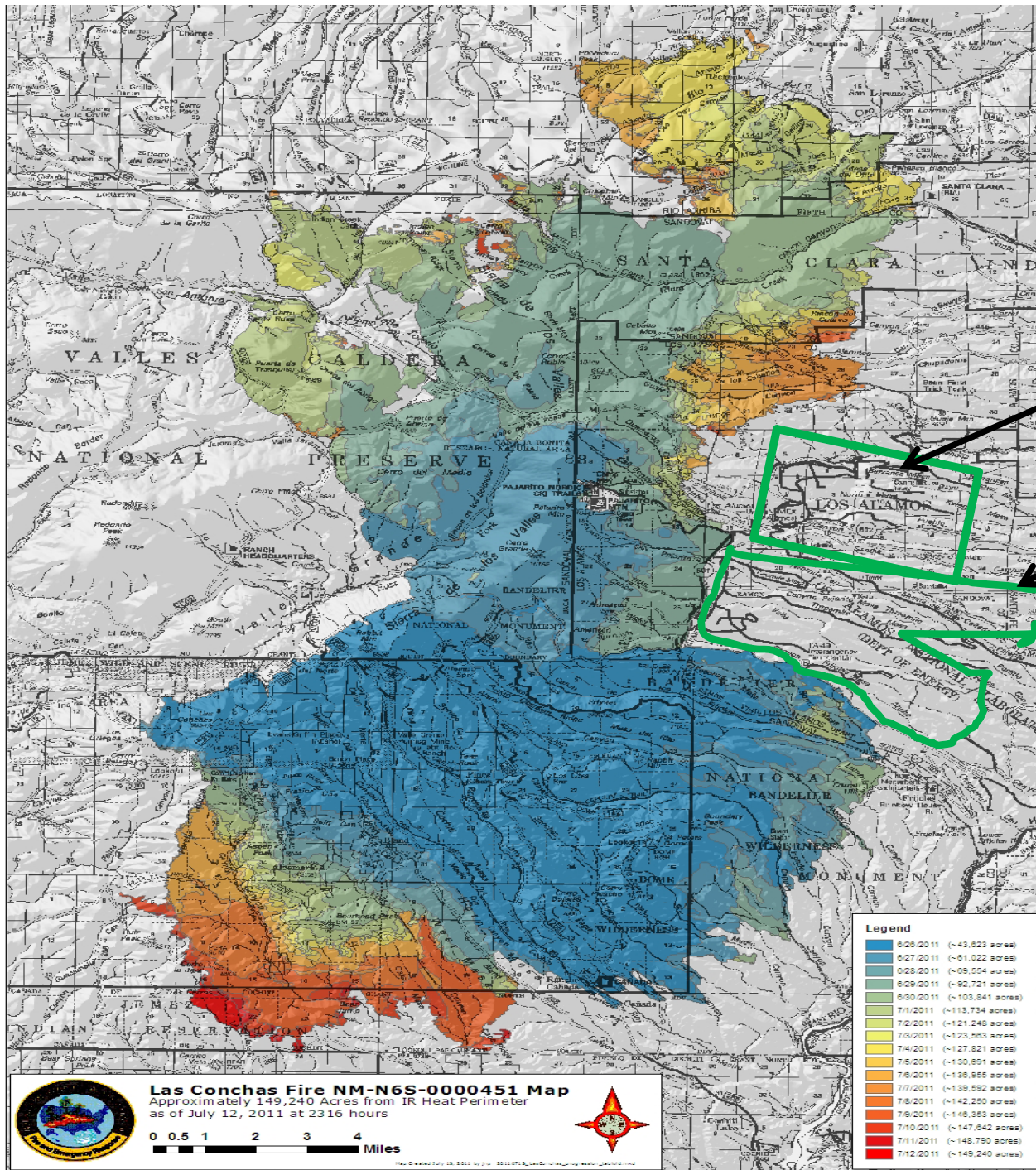
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# Presentation Outline

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- **Overview of Las Conchas Fire**
- **Cerro Grande Post Fire Mitigation**
- **Current Runoff Mitigation Efforts**



Town site

LANL  
(approx)

# Los Conchas Fire Begins Sunday Afternoon, June 26th

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## Sunday afternoon: A growing monster

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# The Cloud Sunday Afternoon

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## Growing from 4,000 to 40,000+ acres overnight

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# Los Alamos Airport – Day 9

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# Lab Threatened, but fire management actions since 2000 Cerro Grande fire were effective

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# Thanks to emergency responders, the Laboratory is in sound condition

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- **General Laboratory**

- Overall, little or no fire or smoke damage
- Utilities and infrastructure are functional

- **Summary of facility and services status**

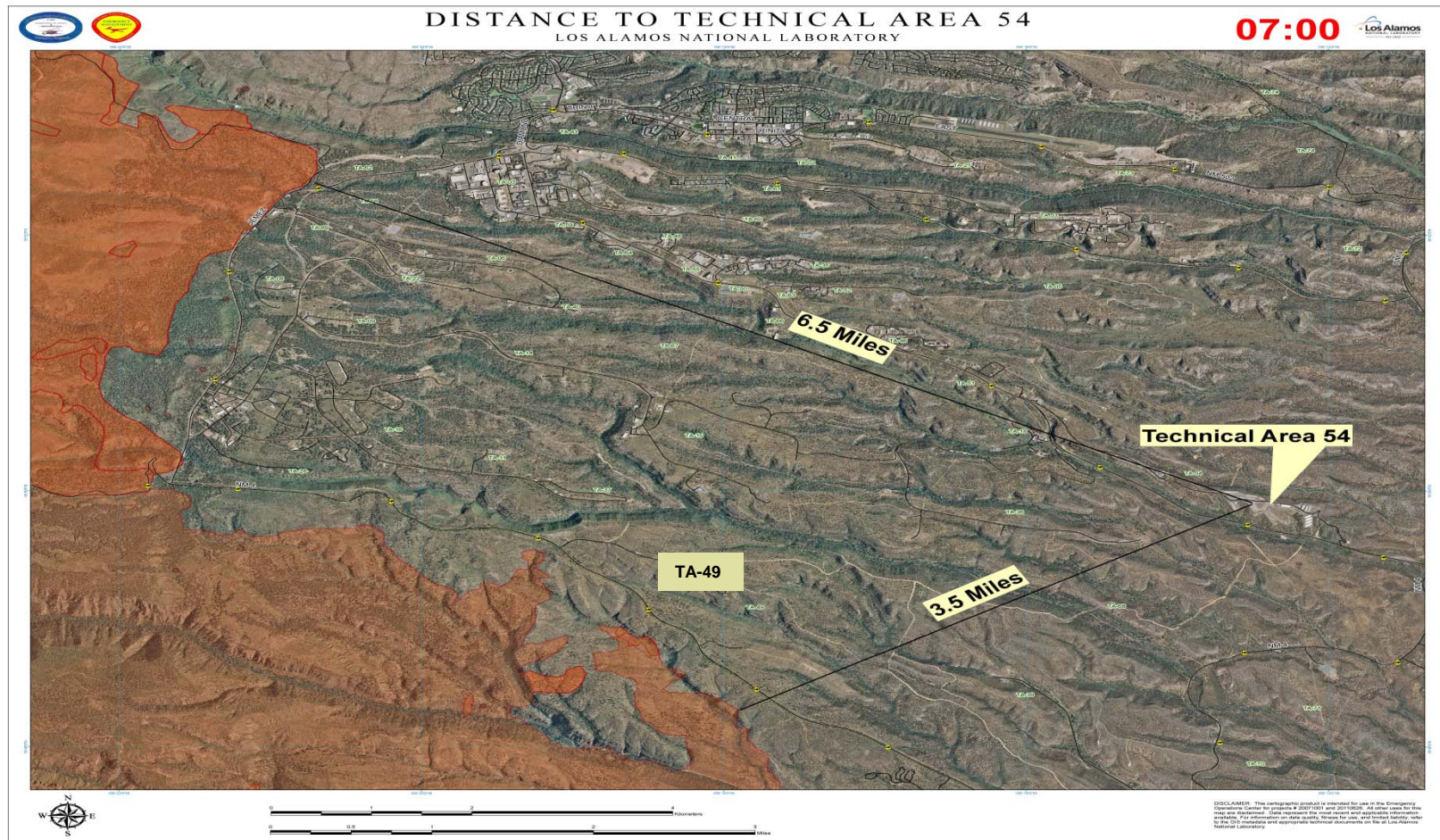
- With a few exceptions, our facilities escaped damage
  - one-acre fire at TA-49 near Water Canyon extinguished within an hour
- Basic services are in place and employees have returned to work
- Lab declared normal operations on July 15

# Interagency cooperation at the federal, state and local level was stellar

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- **State activated its Emergency Operations Center (EOC) in Santa Fe five hours after the fire began**
- **Early involvement by all agencies/parties**
- **Decision makers were at State of New Mexico EOC – decisions were made quickly**
- **Special thanks to New Mexico Environment Department, Department of Homeland Security, and United States Environmental Protection Agency**

# Area G (Technical Area 54) – No Fire Nearby



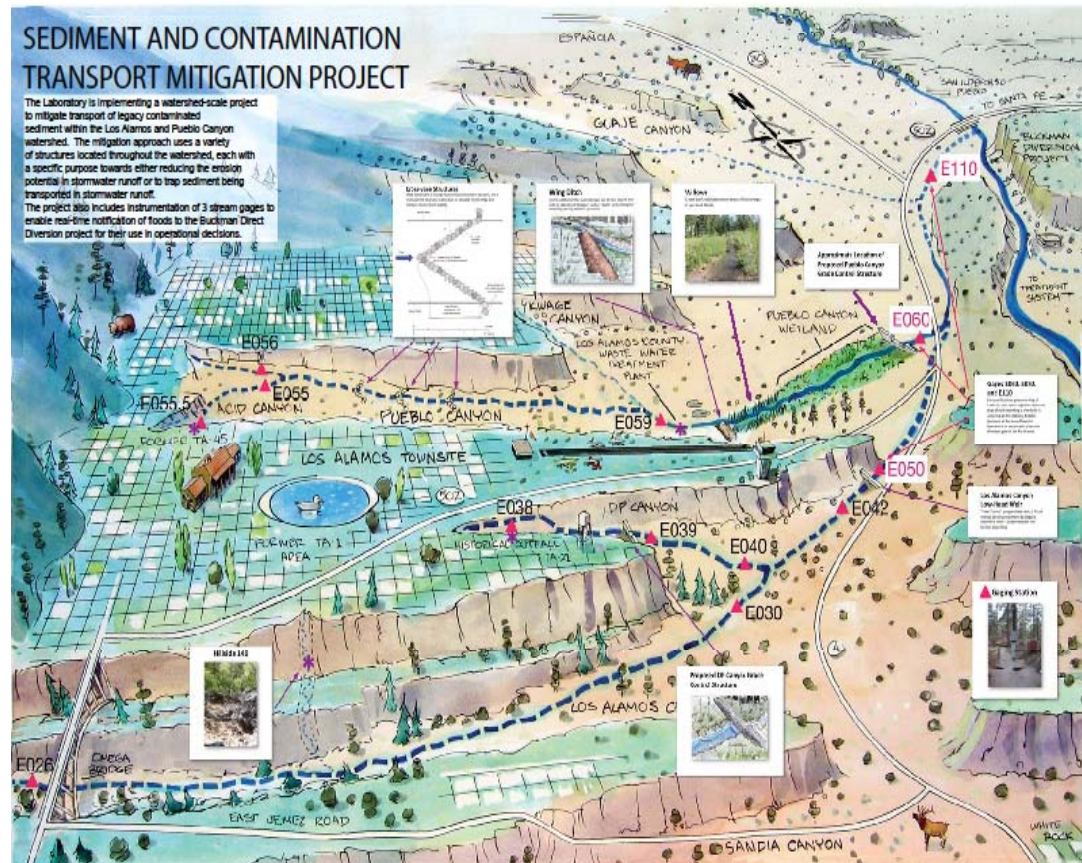
# Air sampling during the fire showed no Lab contaminants

- Samples taken by Lab, EPA, NMED
- LANL produced quick-turnaround results
- Constituents found were typical for any New Mexico wild land fire
- Results now posted to RACER



# Impacts assessed as the Laboratory reopens and restarts

- **No canyons on LANL property burned**
  - One-acre fire near Water Canyon extinguished within an hour
- **Areas up canyon still inaccessible due to ongoing fire and flood hazard**
- **All three Buckman storm water early notification gauges were confirmed operational**
- **All baseline controls per the storm water Individual Permit are complete and largely unaffected by flood potential**
- **Storm water runoff effects are a top priority**



## Cerro Grande Fire – by comparison

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- **Fire began May 5, 2000**
- **Over 47,000 acres burned**
- **Over 400 families in Los Alamos lost homes**
- **Impacts to LANL**
  - 7,500 acres burned
  - 112 minor laboratory structures burned
  - no buildings containing nuclear materials or high explosives were burned (in some cases the fire came every close)
- **\$1 billion in property damage**



## Cerro Grande Lessons Paid Off

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- **Post Cerro Grande fire mitigations are effective**
- **Cerro Grande fire management lessons learned have been practiced for 10 years**

IFRAT (interagency fire risk assessment team) concluded **no additional risk to the public from Cerro Grande fire**

Las Conchas burned less than an acre on LANL property

## Fire Management Actions Since 2000

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- **Trees thinned, ground fuels removed**
- **Fire breaks and roads installed**
- **Interagency fire center and helicopter fire base built**
- **Emergency Operations Center built**
- **Purchased new fire trucks, service vehicles, and heavy equipment**
- **Improved storm water runoff and erosion controls**
- **Enacted interagency agreements and training with the U.S. Forest Service, National Park Service, Los Alamos County, and the state of New Mexico**

# During the fire, several watersheds experienced moderate burn intensities over 90% of their area

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- **Five adjacent watersheds sustained significant fire damage, generally up-canyon of the Lab**
  - Los Alamos Canyon
  - Pajarito/Two-mile
  - Water Canyon/Canon de Valle
  - Frijoles
  - Guaje

# Hydrophobic Soils

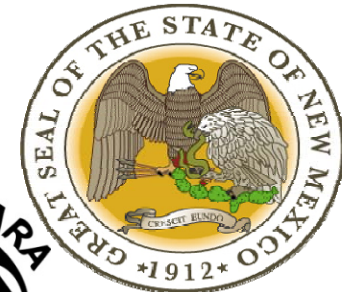
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- **Intense heat of wildfires cause soils to be hydrophobic**
  - Increases water repellency
  - Yields nearly 100% surface runoff
  - Erosion in post-burn sites



# Formation of Burned Area Emergency Response (BAER) Team

- Formed while fire is still burning to immediately respond to possibility of extreme storm runoff and flash flooding
- Team members:
  - United States Forest Service
  - Department of Energy
  - State of New Mexico
  - Santa Clara Pueblo
  - San Ildefonso Pueblo
  - Cochiti Pueblo
  - National Park Service



# BAER Program

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- **Address emergency situations through its key goals of protecting life, property, and critical natural and cultural resources**
- **Rapidly evaluate the burned area and prescribe emergency stabilization treatments**
- **Assessment usually begins before the wildfire has been fully contained**
- **Staffed by specially trained professionals**
  - Hydrologists
  - Soil Scientists
  - Engineers
  - Biologists
  - Vegetation Specialists
  - Archeologists

# LANL Top 5 Priorities

- **Installed barriers to protect infrastructure**
- **Removed barriers within canyons and cleaning of culverts**
- **Removed material/debris drums from canyon bottoms**
- **Alert System**
  - Installation of additional erosion control and upstream rain gauge warning systems are ongoing
- **Water quality testing is ongoing**
  - Interagency and pueblo coordination on monitoring approach



# Los Alamos Canyon Weir

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# LANL Erosion/Flood Mitigation Efforts

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- **Flood mitigation prioritized and underway**
  - Removal of sediments and investigatory waste from Canyon systems
  - Protection of infrastructure
    - Armoring
    - Well-head protection of monitoring wells
    - Increasing holding capacities of flood retention structures
  
- **Surface water monitoring systems**
  - Inspected, operational status verified
  - Additional locations on western boundary
  - Focused analytes
  - 11 identified for quick-turnaround analysis
  
- **Information Management**
  - Press releases, media tours
  - Signage restricting access to trail systems

# LANL continues to collaborate with surrounding neighbors

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- **Collaborating with: neighboring tribal governments, Los Alamos County, City and County of Santa Fe, State of New Mexico, and Federal Agencies**
- **Data will be posted to public website (RACER)**
- **Expect to measure fire products similar to any western forest fire**
  - Elevated metals
  - Fallout constituents from plant uptake released into ash and cyanide
  - Dioxins and furans from burning
  - Runoff will contain higher levels of substances in ash

# Buckman Direct Diversion

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- **Thanks to San Ildefonso for placing Early Notification System (ENS) on tribal land**
- **Camera at E109.9; will confirm flows within the E109.9 flume**
  - Still Image collection every 5 minutes of staff gage within gage station flume
- **ENS comprised of three gage stations**
  - Provides real-time stream flow data (5-350 cfs) to the Buckman Water Treatment Plant Operations Office
  - Put through the test in August 2010; three storm events (peak flow at 780 cfs)
    - ENS signals sent during each three events (provided station had flow greater than 1 cfs)

# Summary

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- **Minimal to no direct impact to LANL**
- **Storm water runoff evaluation/mitigation activities coordinated and underway**
- **Cooperation with other agencies**