Upper American River Project
Asset Overview

- 11 Reservoirs
- 8 Power Houses
- 17 Dams
- 9 Switchyards
- 21 miles of tunnels
- 177 miles transmission lines
- 73 roads
2015-2017 Water Year Rainfall Patterns
Fresh Pond Rain Gauge (cumulative inches)
El Dorado County
2017 Presidential Disaster Declarations

- FEMA-4301-DR-CA (January 3 through 12)
- FEMA-4305-DR-CA (January 18 through 23)
- FEMA-4308-DR-CA (February 1 through 23)
Damaged UARP Facilities
Several Road Segments and Powerhouse
Examples of Damage
Types of UARP Road Damages

- Slumps and Drops
- Slow Moving Slides
- Road Washouts
- Downed Trees
Examples of Damage
Examples of Damage
Examples of Damage
Examples of Damage
Examples of Damage
Examples of Damage
Examples of Damage
History of Landslides and Fires

• Major landslides and road damage in 1964, 1986, 1997

• Major fires in UARP areas
  – 1992 Cleveland Fire (22,000 acres)
  – 2004 Freds Fire (7,600 acres)
  – 2014 King Fire (98,000 acres)
Working with Federal Agencies

Lessons Learned

• FEMA and insurance carriers
  – Importance of damage assessment and repair estimates
  – FEMA.gov, FP-104-09-2 Public Assistance Program & Policy Guide
  – Need for documentation throughout entire process
  – Multiple events or single event

• US Forest Service
  – Make sure you have a road maintenance agreement in place if possible
  – Road Use Permits, Environmental Assessments
  – Special status species concerns (e.g., spotted owl)
Contacting Repair Work Issues

- Do you have the time to go through normal in-house contracting procedures?
- Contracts must align with FEMA guidelines.
- Schedule contractor work to not conflict with normal O&M schedules.
Road Repair/Hazard Mitigation Measures

- Mechanically stabilized earth (MSE) walls
- Hydro seeding and Erosion control blankets
- Inclinometers, wells, horizontal drains
- Asphalt ditches
- Culvert upgrades
Examples of Repairs
Examples of Repairs
Examples of Repairs
Examples of Repairs
Dealing with Changing Field Conditions

- Continuing runoff and flows
- On-going weather while making repairs
- Landslides that continue to move while you are working
- Must be adaptable – Form a good team
Storms During Construction
Storms During Construction
Brush Creek Road
Before
Brush Creek Road

After
Forebay Road
Before
Forebay Road
After
Jaybird Canyon Road

Before
Jaybird Canyon Road

After
Questions