



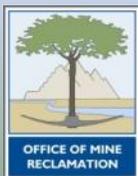
# **THE ABANDONED MINE LANDS UNIT (AMLU) PARTNERSHIP PROCESS**

## **Coordinating Physical Hazard Remediation on California's Abandoned Mine Lands**

**Fix A Shaft Today! Campaign Workshop  
Barstow, California  
November 6, 2008**

Cy R. Oggins, AMLU Manager  
Sarah Reeves, Engineering Geologist  
Jon Mistchenko, Engineering Geologist

Office of Mine Reclamation, California Department of Conservation





# Presentation Outline

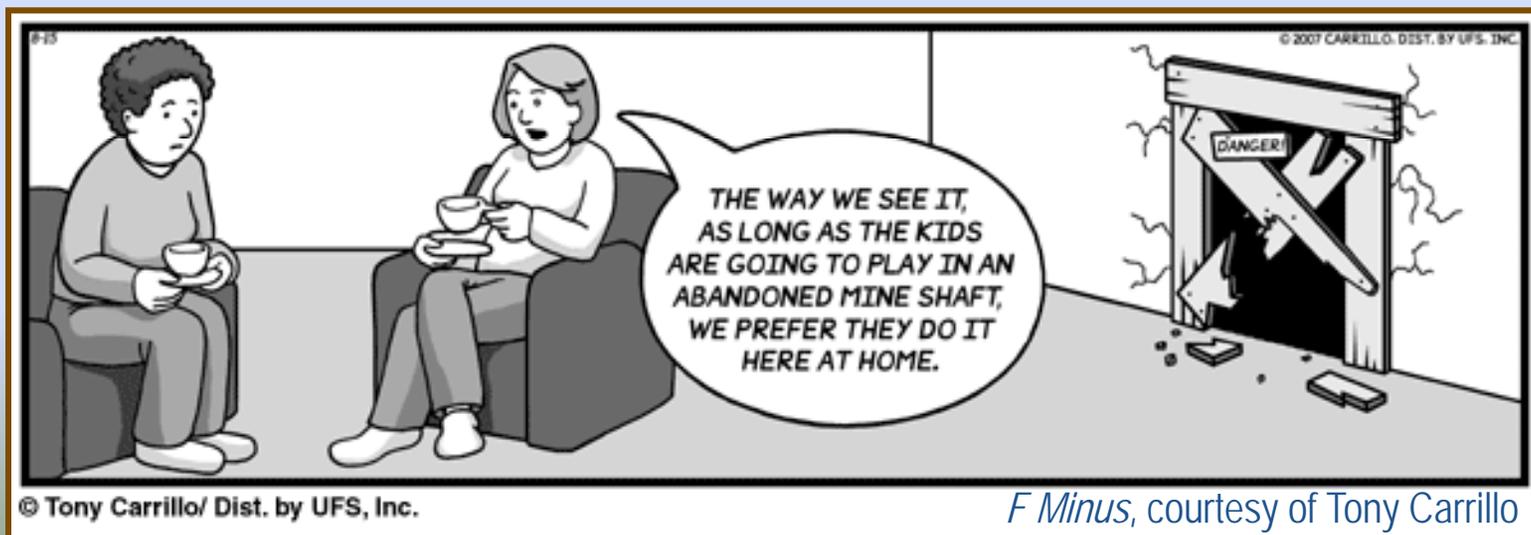
- **Why Remediate?**
- **AMLU's Background.**
- **Partnership Process** (project criteria & 6 steps for program success).
  1. Determine ownership early on.
  2. Conduct site visit & define the project.
  3. Obtain necessary clearances.
  4. Determine who will do the project and coordinate with your contractor.
  5. Use detailed project specifications.
  6. Promote CA's AML programs.
- **Summary: Accomplishments & Key Challenges.**





# Presentation Outline

- **Focus of Talk = Physical Hazard Remediation.**
  - Includes: wire fences, backfills, polyurethane foam (PUF) closures, bat gates, culvert gates, cupolas, debris removal.
  - Today's FAST! talk doesn't address chemical remediation, "**Stay Out, Stay Alive!**" education, calling the AMLU Hotline (**1-877-OLD-MINE**), or people who seek to enter mines.





# Why Remediate?

Man Who Fell Down Shaft Dies (*Desert Dispatch*)

Searchers Find Body in Abandoned Mine (*Fresno Bee*)

Boy Survives 200 Foot Fall Into Mine (*High Desert News*)

Motorcycle Rider Escapes Serious Injury After Tumble Down Mine Shaft (*The Daily Independent*)

Bike Rider, 11, Survives 40-foot Plunge into Unfenced Mine Shaft (*Los Angeles Daily News*)

4 Youths Killed in Old Eastbay Mine (*Oakland Tribune*)

Another Man Falls Down Abandoned Mine Shaft (*Victorville Daily Press*)

9-Year-Old Boy Who Fell Down Abandoned Mine Shaft Rescued (*The Bakersfield Californian*)

Fix Unmarked Mine Shafts Before Someone Else Dies (*Del Norte TriPLICATE*)

Death Spurs Mines Alert (*Riverside Press Enterprise*)

Brothers Die While Diving in Old Mine (*Los Angeles Times*)

**DANGER  
KEEP OUT**

2 Killed By Fumes in Abandoned El Dorado Mine (*CBS 13 News*)





# Why Remediate?



Homepage > VIDEO



KCRA 3 EXCLUSIVE

Courtesy: Tuolumne County Sheriff's Dept.



### Man Rescued After 2 Nights in Mine Shaft

A man rescued from an abandoned gold mine after tumbling more than 100 feet and spending two nights at the bottom of the dark shaft said his experience was "the worst thi..



## Man Rescued After 2 Nights in Mine Shaft (August 17, 2008)

May 20, 2008 Central Valley's News Station: Fresno-Visalia



- News Weather Sports Traffic Features YouNewsTV Programming Community Contes
- Local News US & World Business Health KSEE Sunrise Politics Entertainment Technolog

## UPDATE: 3 MEN DIED OF CARBON MONOXIDE POISONING IN GOLD MINE

### MINE ACCIDENT

KSEE 24 NEWS



DAVID ALISON



MATTHEW ALISON



BRANNON SCHARF

#### TOOLS

- SAVE
- E-MAIL
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- MOST POPULAR
- RSS FEED
- DIGG
- DELICIOUS

## 3 Men Died ... in Gold Mine (May 20, 2008)



# Why Remediate?

DailyBulletin.com

Article Launched: 07/13/2006 12:00:00 AM PDT

## Claims filed in Calico mine shaft

By Andrew Edwards, Staff Writer

CALICO - The family of a man who fell to his death in an abandoned mine shaft near Calico Ghost Town has filed about **\$11.5 million** in claims against the county, alleging officials failed to warn park-goers of the hazard.

Feb. 29, 2008 Copyright © Las Vegas Review-Journal

## Claim lodged in Arizona mine death

By DAVE HAWKINS SPECIAL TO THE REVIEW-JOURNAL KINGMAN, Ariz. –

A Las Vegas attorney has filed a near **\$14 million** claim alleging that the state of Arizona is liable in the death of a teenager and the injury of her sister in their 120-foot plunge into an abandoned mine in September.





# Why Remediate?

## Bats, Other Wildlife, & Mines



**California leaf-nosed bat**

(© Merlin D. Tuttle, Bat Conservation International)



**Townsend's big-eared bat**

(Pat Brown, Brown-Berry Consulting)

*Bats use abandoned mine workings because mines are analogous to caves, with their openings and underground passages that can provide temperatures and humidity levels appropriate for roosting bats, as well as dens for other wildlife like bobcats, owls, snakes, and tortoises.... It is frequently possible...to fence off mine areas or install gates on mine openings that are safety hazards. The gates prevent human access, but still allow bats and other wildlife to pass in and out of the opening.*

– From "Living With Bats" by Betsy Bolster, California Department of Fish and Game

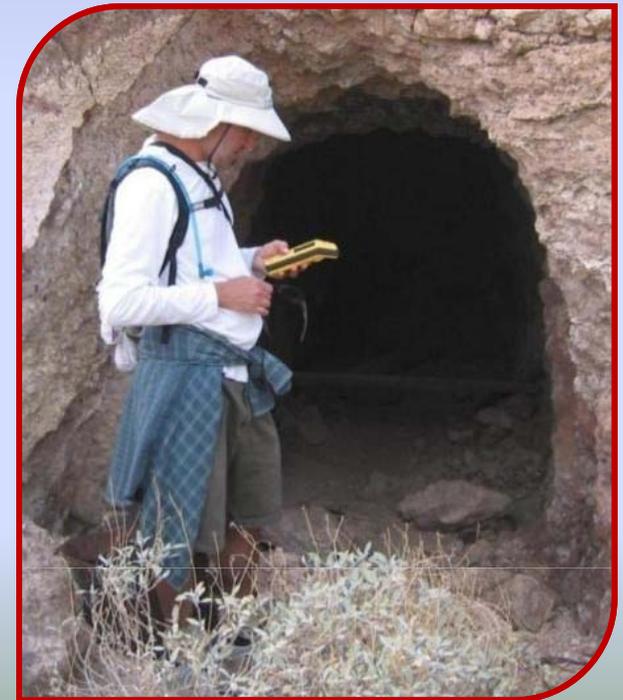




# AMLU Background

## Program created in 1997 with the objectives of:

- Evaluate existing AML datasets (not good!).
- Inventory as many abandoned mines as possible on public land and, with written permission from landowner, private land (the Department of Conservation doesn't own land).
- Compile inventory data into a statewide database.
- Prepare report for Legislature on the "Magnitude and Scope" of AML issues in California (published June 2000).





# Background (2000 Report)

California has an estimated **47,000** historic abandoned mines (based on digitizing mine symbols from USGS 7.5 minute topographic maps and field inventories).

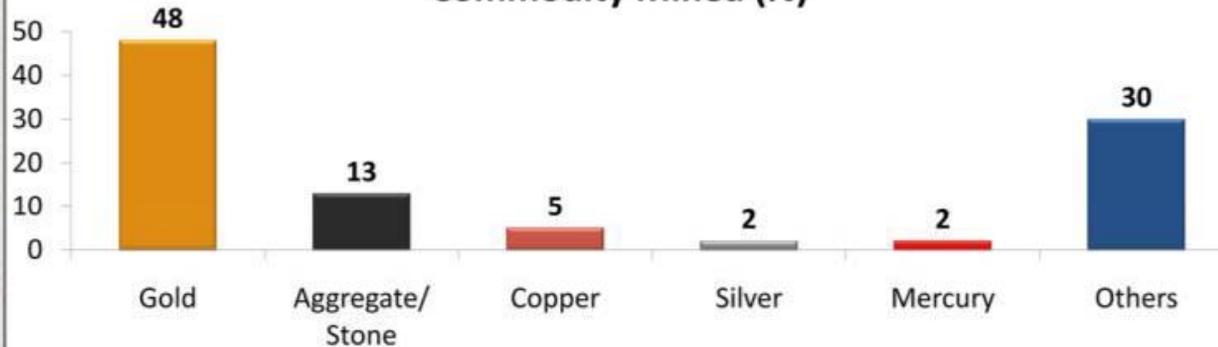
- ~ **39,000 (84%)** are physical hazards.
- ~ **5,200 (11%)** are environmental hazards.
- ~ **67%** lie on federal lands.



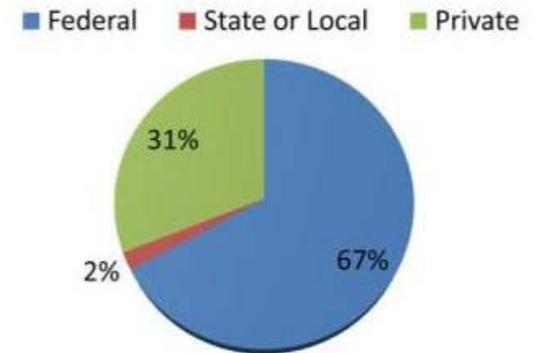


# Background (2000 Report)

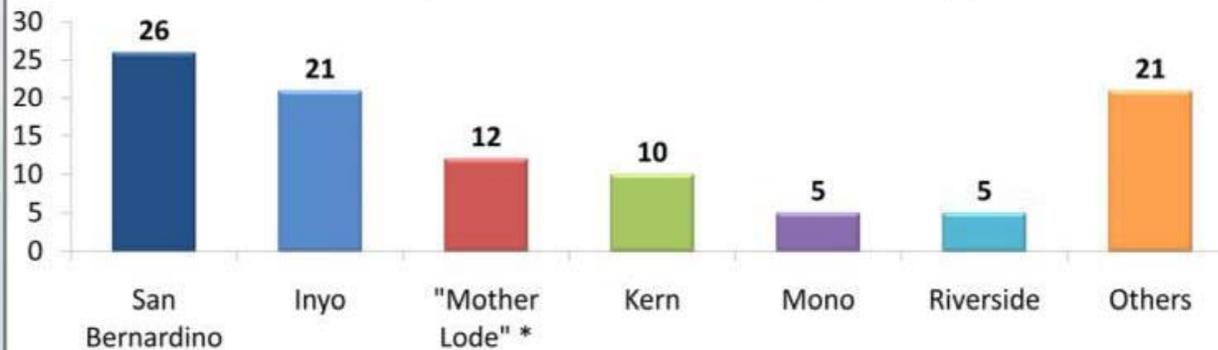
### Commodity Mined (%)



### Ownership by Agency

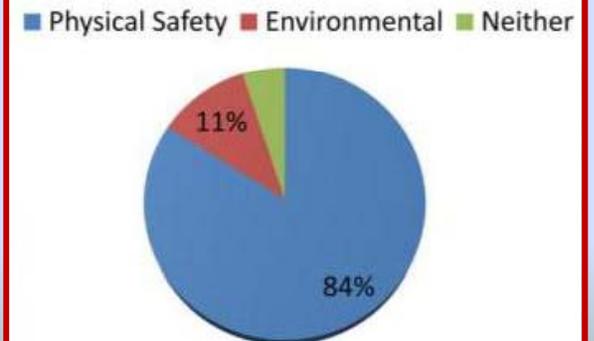


### Location (% Abandoned Mines by County)



\* Sierra, Nevada, Placer, El Dorado, Amador, Calaveras, Tuolumne, Mariposa, Plumas, and Madera counties.

### Types of Hazards





## Background (Remediation)

### Shifting Gears: Physical Hazard Remediation

- In FY 2002-2003, Legislature directed the AMLU to spend ½ its budget (\$125,000) on physical hazard remediation.
- In January 2006, the AMLU began remediating hazardous AML features using fees collected on gold and silver mined in California (\$5/ounce of gold & 10¢/ounce of silver; [Kuehl, Chapter 794, Statutes 2003]).
- Since 2002, the AMLU has partnered on **158** projects to remediate **511** hazardous mine features statewide, including **348** features with gold and silver fees.



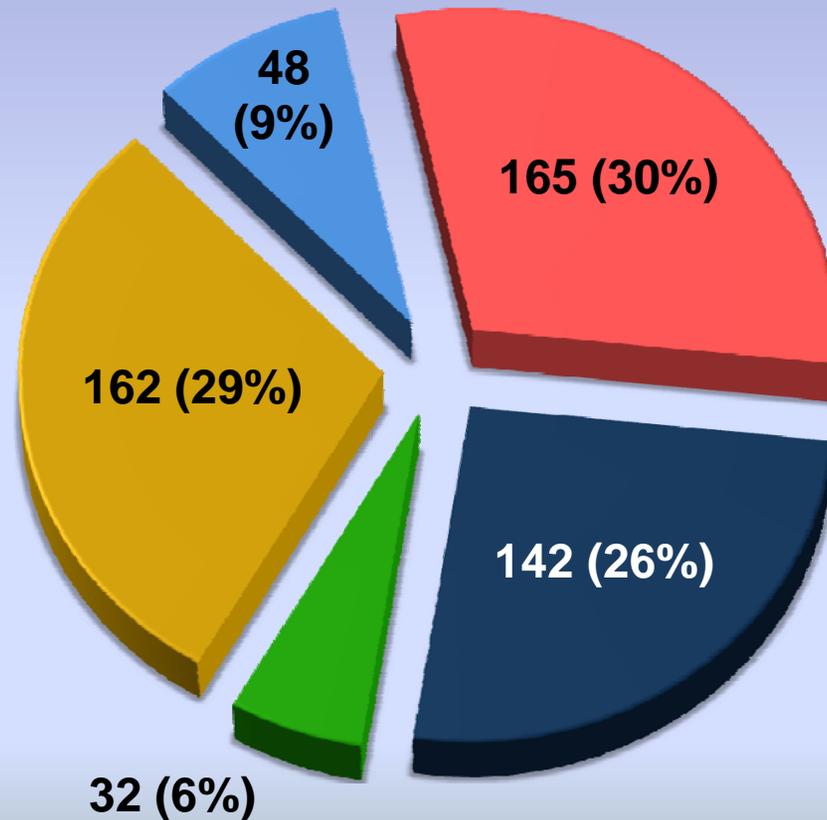


# Background (Remediation)

## Hazardous Features Remediated (2002-08)



- Bat Gate, Culvert Gate, & Cupola
- PUF
- Backfill
- Fence
- Other (cap, debris removal, etc.)



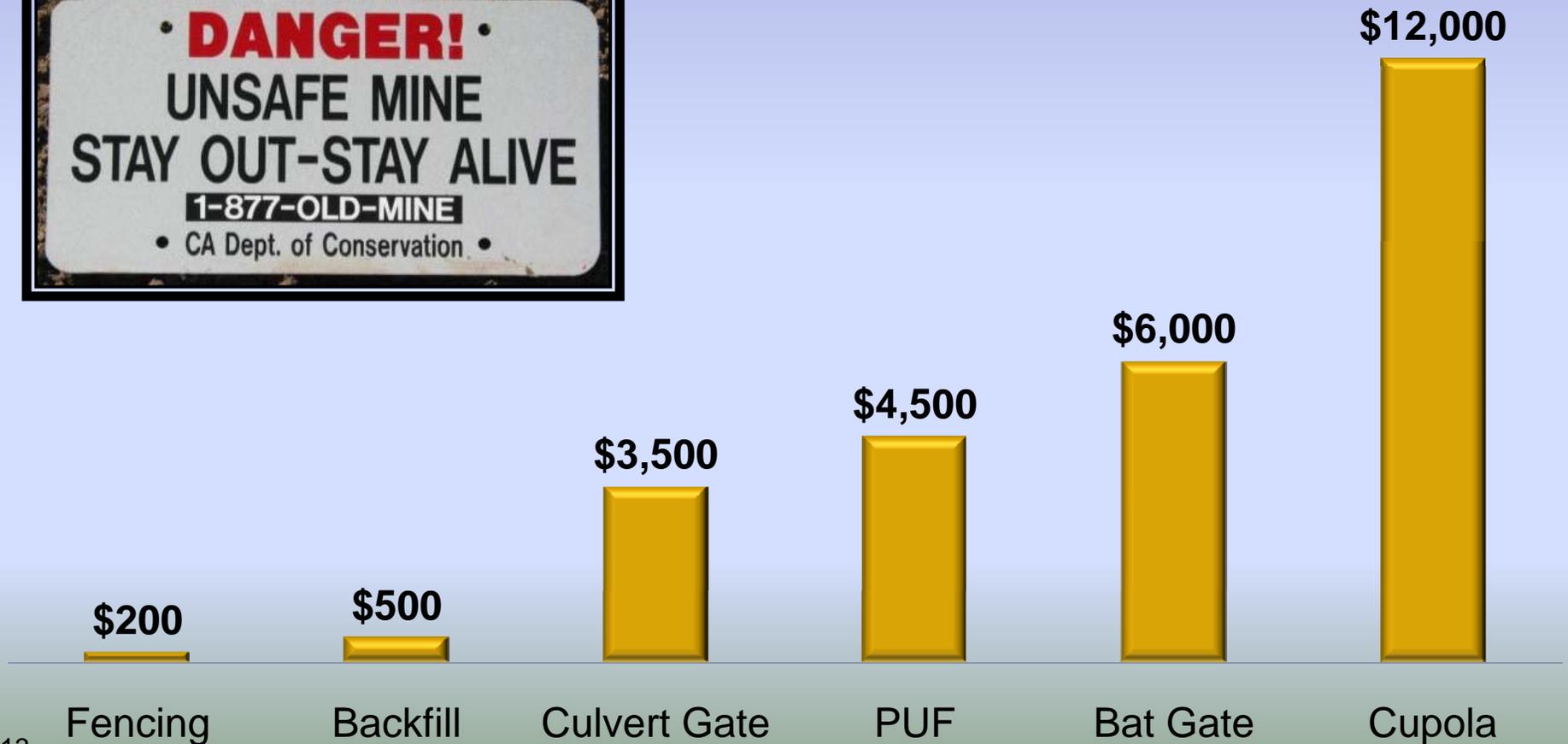
Total 2002-08 (as of 10/08): **158** projects with **511** features remediated.





# Background (Remediation)

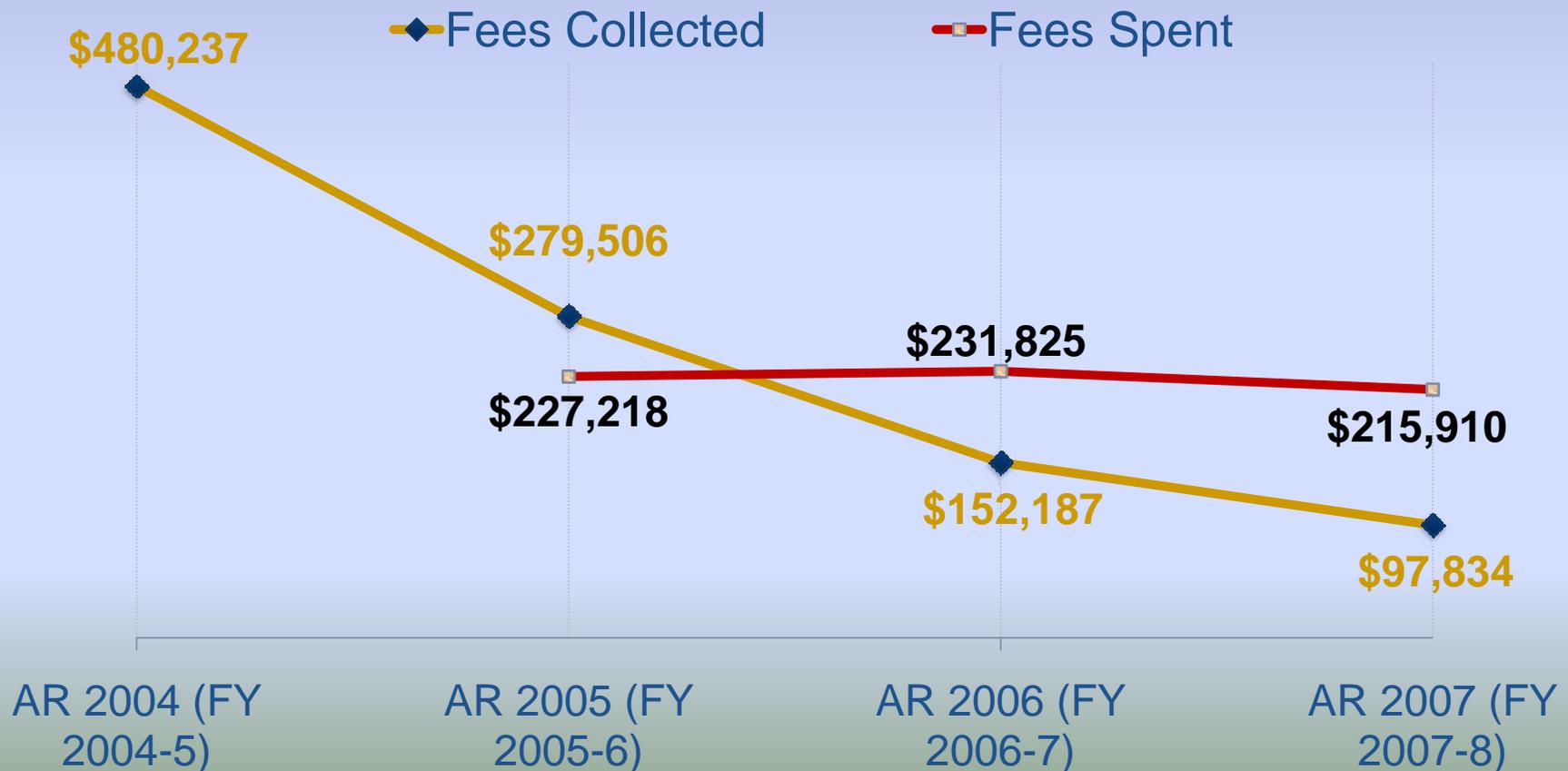
## Average Cost by Remediation Type





# Background (Remediation \$)

## Gold & Silver Fees Collected & Spent (rounded to nearest \$; excludes interest)





# Background (Partners) \*

## STATE

\* As of 11/08

- California Conservation Corps
- California Department of Fish and Game
- California Department of Transportation
- California State Lands Commission
- California State Parks
  - Auburn State Recreation Area
  - Bodie State Historic Park
  - Carnegie-Tesla State Vehicular Recreation Area
  - Salton Sea State Recreation Area
  - Office of Historic Preservation

## FEDERAL

- Bureau of Land Management (California State Office & Bakersfield, Barstow, Bishop, El Centro, Folsom, Lake Havasu [BLM Arizona], Needles, Palm Springs, and Ridgecrest Field Offices)
- Bureau of Reclamation (Mid-Pacific Region)
- National Park Service (Joshua Tree National Park & Mohave National Preserve)
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service (California and Nevada Operations)
- U.S. Forest Service (Eldorado, Humboldt-Toiyabe, Inyo, Klamath, Los Padres, Plumas, San Bernardino, Sequoia, Shasta-Trinity, Six Rivers, and Tahoe National Forests)

## LOCAL AGENCIES, NONPROFITS, AND PRIVATE PARTNERS

- Bat Conservation International, El Dorado Co. Search and Rescue, City of Vallejo, Paradise Irrigation District, Solano Land Trust, Teichert, Western States Trail Foundation.





## Partnering (Project Criteria)

- Abandoned mine sites located on public lands or nonprofit lands that have or will have a public use.
- High level of public interaction with physical hazards (close to roads, campgrounds, recreation areas, schools, etc.).
- Environmental documentation (NEPA or CEQA) completed before work begins.
- Wildlife, habitat, and cultural resources protected, if present.
- A variety of remediation methods explored; best method chosen by landowner in coordination with AMLU.
- Higher priority sites have preference; consideration given for “readiness” (NEPA/CEQA completed) and “bang for the buck” (as many features as can remediate for money).

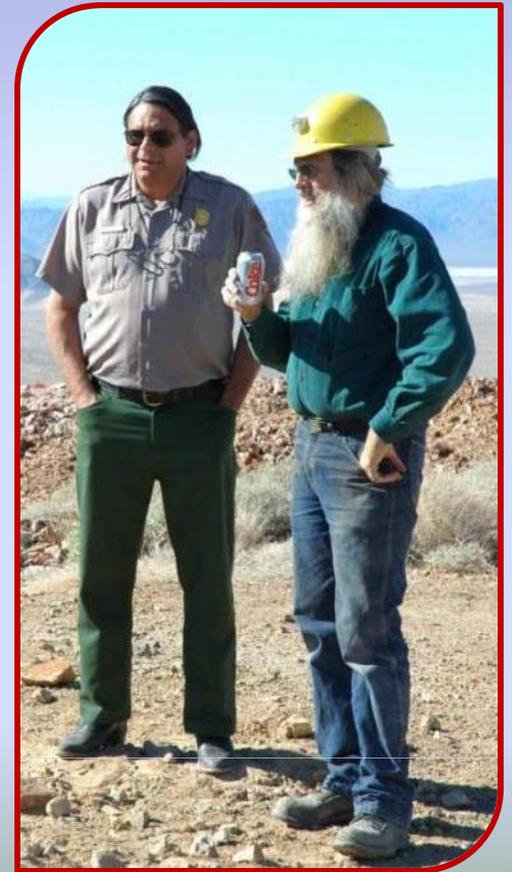




# Partnering STEP #1

## Starting a Project: Identify the Landowner.

- Private citizens/claimants (can't assist).
- Federal agencies: Bureau of Land Management, Bureau of Reclamation, National Park Service, U.S. Forest Service, etc.
- State agencies: Department of Parks and Recreation, State Lands Commission, Department of Fish and Game, etc.
- Local government: City and County lands, Park Districts, Utility Districts, etc.





# Partnering STEP #2

## Conduct Site Visit & Define the Project.

- Schedule visit to site with all invested parties.
- Discuss project basics: e.g., closure options; any needed surveys (bats, other wildlife, cultural); approximate timeline.
- Obtain consensus on the project basics.
- Include contractor or agency maintenance staff on site visit if possible.

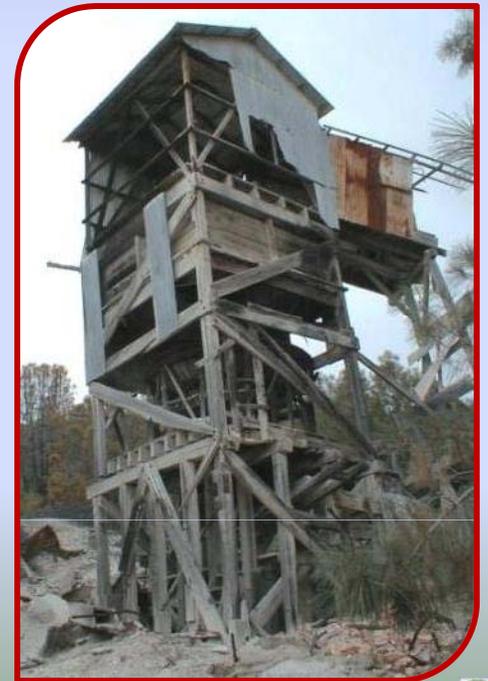




# Partnering STEP #3

## Obtain Proper Clearances.

- Allow partners leeway to conduct the necessary surveys.
- Obtain copies of NEPA/CEQA documents for files.
- Biological/Historical:
  - Protect bats and other wildlife and cultural resources before (by choosing proper design) and during closures.
  - Building only gates may lessen environmental review time, but can be costly.
  - Balance public safety and preservation.





# Partnering STEP #4a

## Determine Who Will Do the Construction.

### Specialized Contractor

#### Pros:

- Usually has more experience.
- Can engineer challenging closures.
- Per AMLU contract, must have insurance & MSHA certification.
- Can subcontract for specialized services (e.g., helicopter, mule team).

#### Cons:

- Can be costly for simpler projects (e.g., fences and backfills).
- Contracting and scheduling can be complex and take time/effort.
- Some agencies resist outside help.

### Agency Maintenance Staff

#### Pros:

- Less expensive for simpler jobs.
- No contract needed if project conducted by land management agency that owns abandoned mine.
- Schedule likely more flexible than contractor working under contract.

#### Cons:

- May lack abandoned mine closure experience/specialized knowledge.
- Potentially greater liability for agency should accident occur at mine site or should closure fail.





# Partnering STEP #4b

## Coordinate with Contractor.

- Understand and discuss potential limiting factors – seasonal, biological, maintenance, any media events – in advance of construction date.
- Obtain all approvals before mobilization begins.
- “Expect the unexpected” and anticipate that site and other conditions may result in materials changes, unexpected delays, and unplanned expenses.
- Lay the groundwork for prompt payment.

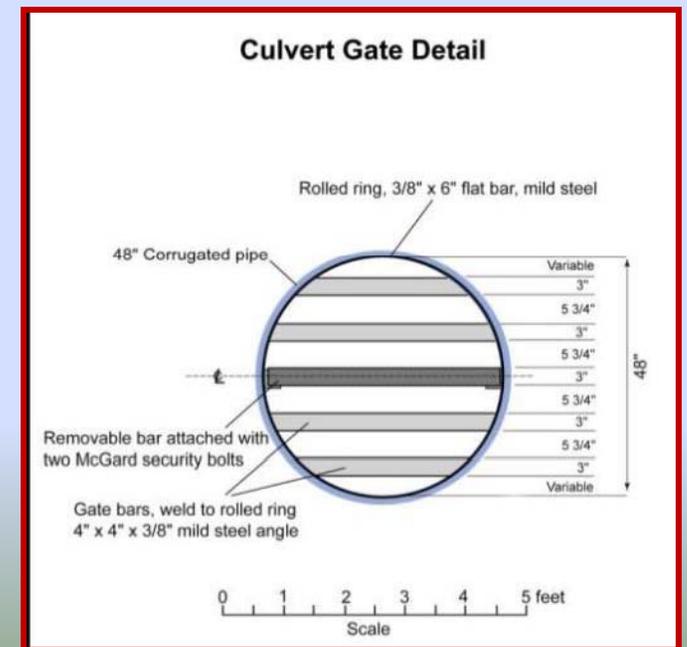




# Partnering STEP #5a

## Use Appropriate Detailed Design Specifications.

- **Sample Culvert Gating Project** (contact AMLU staff for specs).
  - Bar spacing per American Cave Conservation Association.
  - Culvert: 48" diameter & 8' long (dimensions are site-specific).
  - Rolled ring: 3/8" x 6" flat bar of mild steel to be placed in culvert.
  - Bars: 4" by 4" angle iron, 3/8" thick, & welded to rolled ring.
  - Culvert will be foamed in place with 2 yards of PUF, then covered by a layer of dirt and rock.

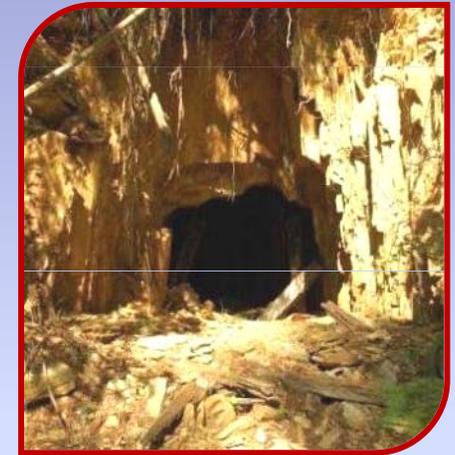




# Project Example: Culvert Gate

## Otter Creek Adit.

- Located in Eldorado National Forest, ½-mile from an elementary school.
- USFS conducted surveys and prepared NEPA document.
- AMLU contracted with Dolver Co. to install a culvert gate and seal culvert with loose rock.



*"It's a good thing [the adit was sealed], since this is so close to the school. Safety's always an issue. I'm not sure whether any of our students were aware of the mine, but if they had found it, well, kids are naturally curious."*

– Darcy Knight, Vice President, Black Oak Mine Unified School District

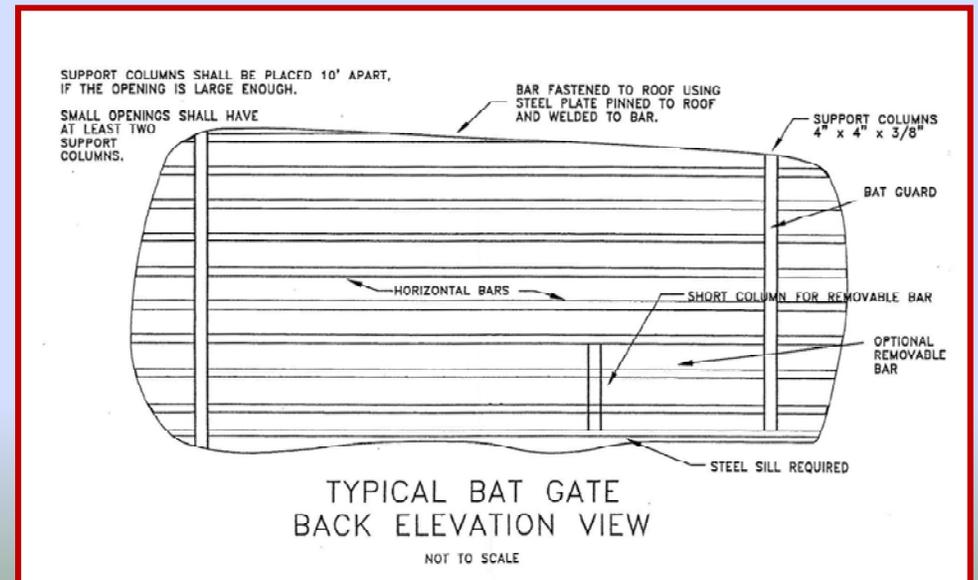




# Partnering STEP #5b

## Use Appropriate Detailed Design Specifications.

- **Sample Bat Gating Project** (contact AMLU staff for specs).
  - Build to American Cave Conservation Association specs.
  - Sill: Reinforced concrete with steel plates to support attachment of columns.
  - Uprights: 4" by 4" tubing, 3/8" thick.
  - Bars: 4" by 4" angle iron, 3/8" thick.
  - Bat guards: 4" plate, 1/4" thick.
  - Pins: #8 rebar.

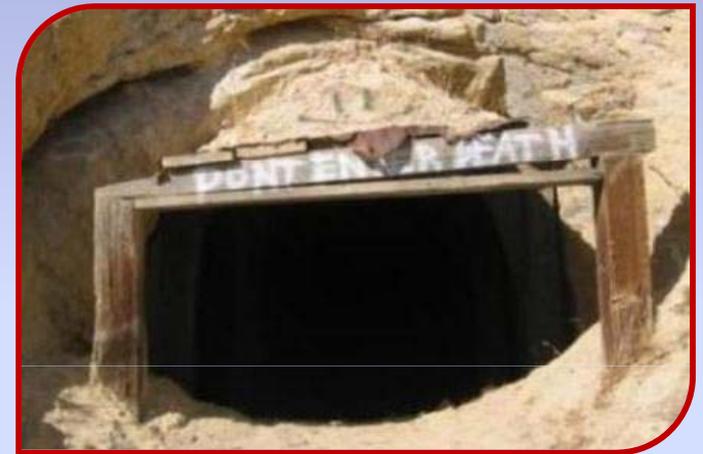




# Project Example: Bat Gate

**Tesla** (part of Carnegie State Vehicular Recreational Area).

- One of many features in historic coal, sand, and clay mining area.
- Adit heavily visited: timbers burned; extensive graffiti. Townsend's big-eared bats present (bats have returned since gate installed).
- State Parks conducted surveys & prepared CEQA documents.
- AMLU contracted with Sweetwater Construction to build bat gate. Additional work, co-funded by Office of Surface Mining, is pending.





## Project Example: Bat Gate

### California Mine Adit.

- Near “Parker Strip” (recreation area).
- Maternity roost for Cave Myotis, California Leaf-Nosed bats.
- Previous gate vandalized.
- Man fell and was injured inside mine; successfully sued BLM.
- BLM conducted surveys and prepared NEPA documents.
- AMLU contracted with Frontier Environmental Solutions to install a bat gate with “hard-facing.”

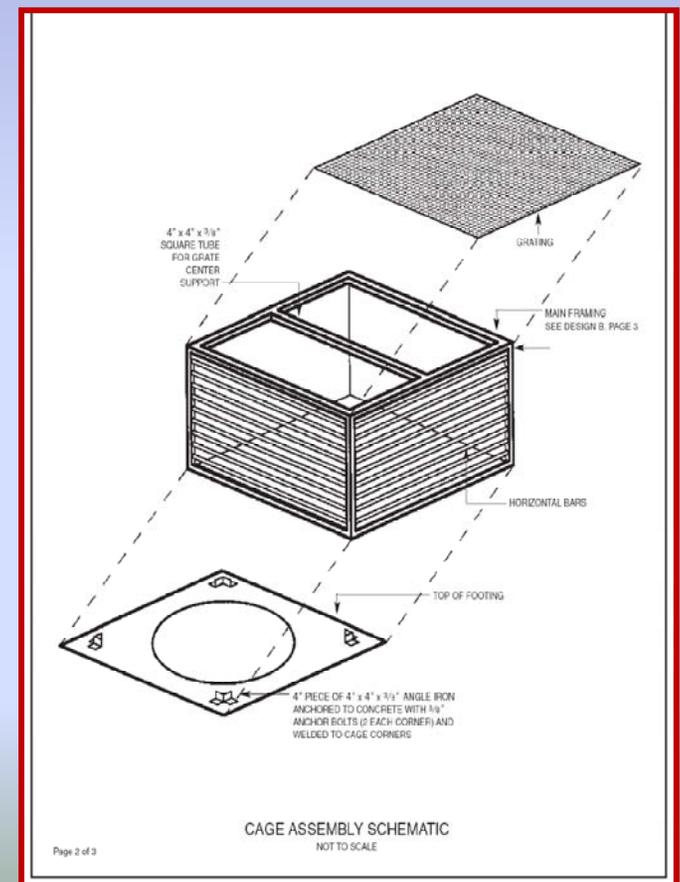
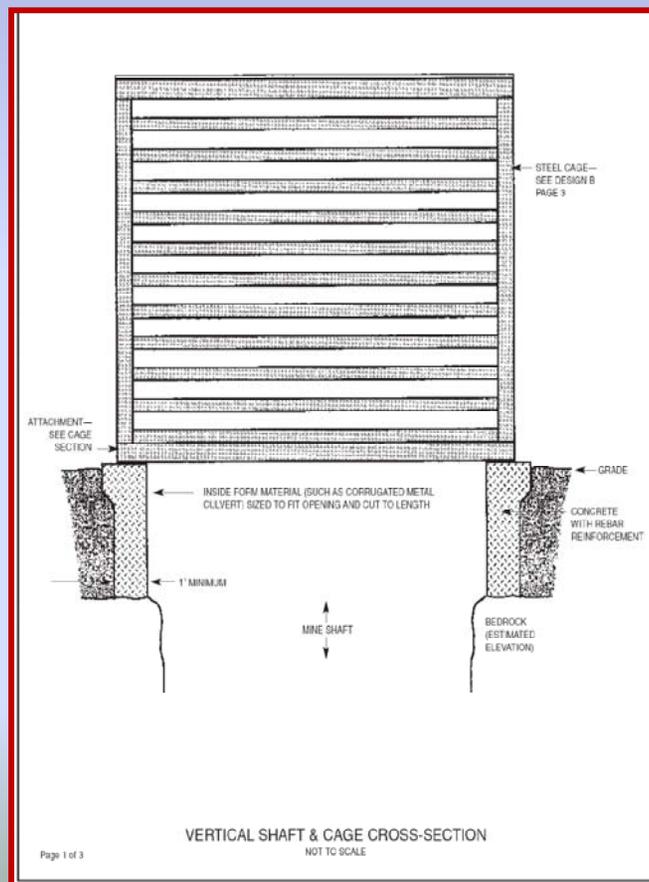




# Partnering STEP #5c

## Use Appropriate Detailed Design Specifications.

- **Sample Bat Cupola Project**  
 (note: materials are similar to those used to construct bat gates; contact AMLU staff for specs).





# Project Examples: Bat & Owl Cupola

## Kelly Mine, aka Highway 395 shaft.

- 1,600' deep shaft located adjacent to Highway 395, one of hundreds in the Red Mountain area of Kern County.
- BLM conducted surveys and prepared NEPA documents.
- AMLU contracted with Frontier Environmental Solutions to build bat & owl compatible cupola.



Owl  
access





# Project Example: Bat Cupola

## Pacific Fluorite shaft.

- State Lands Commission parcel within Mojave National Preserve.
- 10' Shaft, turns into 45° decline into stope (over 100' deep).
- High use area for hunters.
- Internal survey found evidence of Townsend's and Myotis.
- AMLU contracted with Frontier Environmental Solutions to install modified cupola inside shaft.

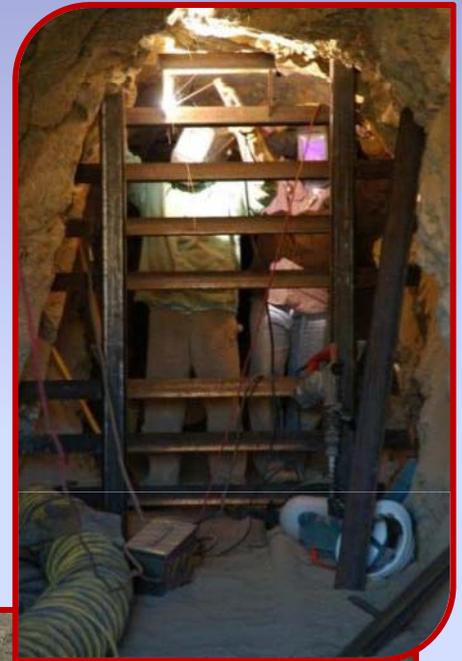




## Project Example: Gate & Cupolas

### Paymaster Mine Gating/Workshop.

- Collaboration with and funded by AMLU, Bat Conservation International (BCI), Mojave National Preserve, & U.S. Army Corps of Engineers.
- One of three workshops in last five years.
- “Students” helped build one gate and two cupolas. Frontier Environmental Solutions responsible for instruction and construction.
- Four bat species observed, including Townsend’s & Pallid.



# Other Project Examples: PUF



## “Dewie the Dog” shaft.

- Site of abandoned mine accident and rescue involving a pet dog. Located along popular trail in city of Auburn.
- Bureau of Reclamation conducted surveys and prepared NEPA document.
- AMLU assisted State Parks’ maintenance staff in PUF closure.



# Other Project Examples: Backfill



## Rosamond shaft.

- Site of a “near miss” after car carrying family nearly backed off a road into the abandoned mine shaft.
- SLC expedited surveys and obtained CEQA exemption; internal survey performed.
- Media coverage during closure benefits both SLC and AMLU programs.





# Other Project Examples: Fences

**Trade Rat shaft fence then backfill (SLC/AMLU).**



**Mojave National Preserve fences (NPS/AMLU).**





# Partnering STEP #6

## News/Media Coverage.

- **PBS's *California Connected*** (AMLU), April 2004.
- **Rosamond backfill.** (SLC/AMLU), April, 2005.
- **Otter Creek culvert gate.** (USFS/AMLU), June 2006.
- **Tesla bat gate.** (State Parks/AMLU), January 2008.
- **"Dewie the Dog" PUF closure.** (State Parks/AMLU), March 2008.
- ***Dirty Jobs*** (Discovery Channel). (AMLU/State Parks), air date in late 2008.





# Summary & Conclusions

## Some Partnering Accomplishments.

- The AMLU and partner agencies have jointly remediated 511 hazardous abandoned mine features since 2002.
- To date (since 2002), the AMLU has provided over \$750,000 in remediation funding for three dozen public partners.

## Continued Key Challenges.

- **Public Health & Safety.** The public continues to move into and recreate in and around historic, heavily mined areas.
- **Remediations.** There is a shortage of experienced staff and qualified contractors for physical hazard remediation and wildlife surveys (especially internal mine surveys).
- **Funding & Need To Prioritize.** There are few dedicated funding sources to address all of California's AML sites.





# Contacts & Questions?

Cy Oggins: [Cy.Oggins@conservation.ca.gov](mailto:Cy.Oggins@conservation.ca.gov)

Sarah Reeves: [Sarah.Reeves@conservation.ca.gov](mailto:Sarah.Reeves@conservation.ca.gov)

Jon Mistchenko: [jonathan.mistchenko@conservation.ca.gov](mailto:jonathan.mistchenko@conservation.ca.gov)

