



# Leviathan Mine Superfund Site National Priorities List

September 19, 2023

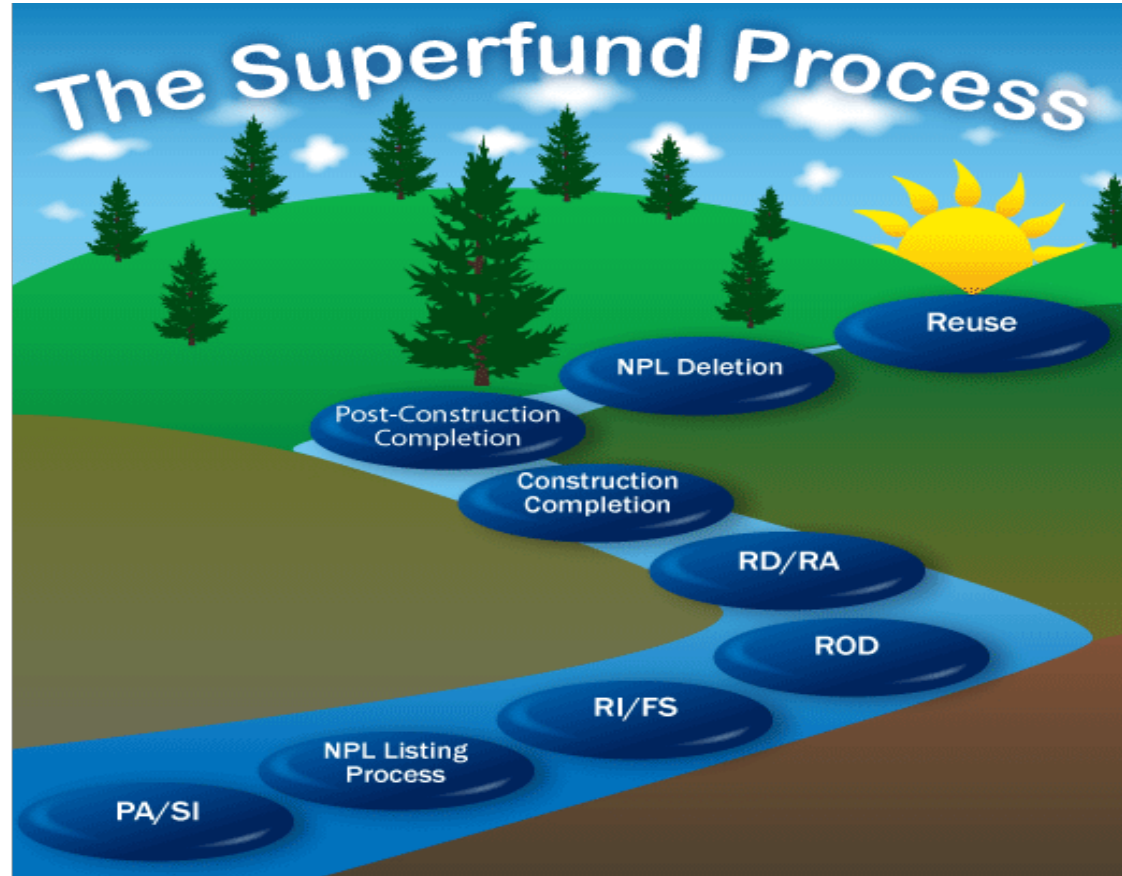
**Freyja Knapp, Ph.D.**  
**75 Hawthorne Street, SFD 7-2**  
**San Francisco, CA 94105**

**(415) 972-3025**  
**[knapp.freyja@epa.gov](mailto:knapp.freyja@epa.gov)**

# Topics

- CERCLA (Superfund) Authority for Action: Remedial & Removal
- National Priority List (Remedial)
- Leviathan NPL Highlights
- Leviathan Superfund Path – both Remedial and Removal Authorities

# Superfund (Remedial) Process



# SUPERFUND REMOVAL PROCESSES

## TIME-CRITICAL REMOVAL - SIX-MONTH PLANNING PERIOD AVAILABLE

### Assessment



Discovery/  
Notification of  
Contamination



Removal  
Site  
Evaluation



Removal Action  
Determination

### Removal



Action  
Memorandum



Removal  
Planning



Removal  
Action

### Post-Removal



Post-Removal  
Site Control  
(if needed)



Additional  
Site Evaluation  
(if needed)

## NON-TIME-CRITICAL REMOVAL - GREATER THAN SIX-MONTH PLANNING PERIOD AVAILABLE

### Assessment



Discovery/  
Notification of  
Contamination



Site  
Evaluation



Removal Action  
Determination

### Removal



Engineering  
Evaluation/  
Cost Analysis



Action  
Memorandum



Removal  
Planning



Removal  
Action

### Post-Removal



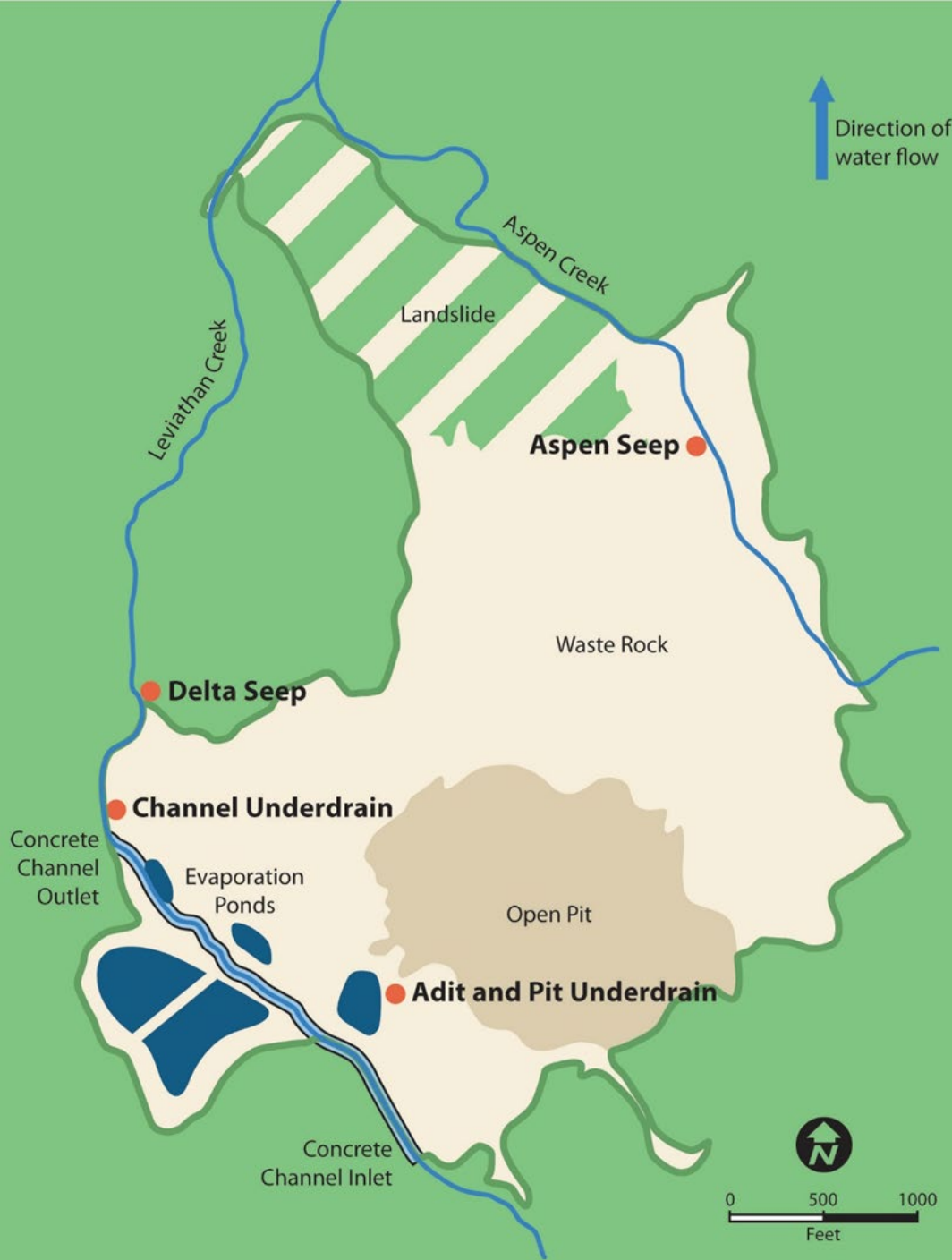
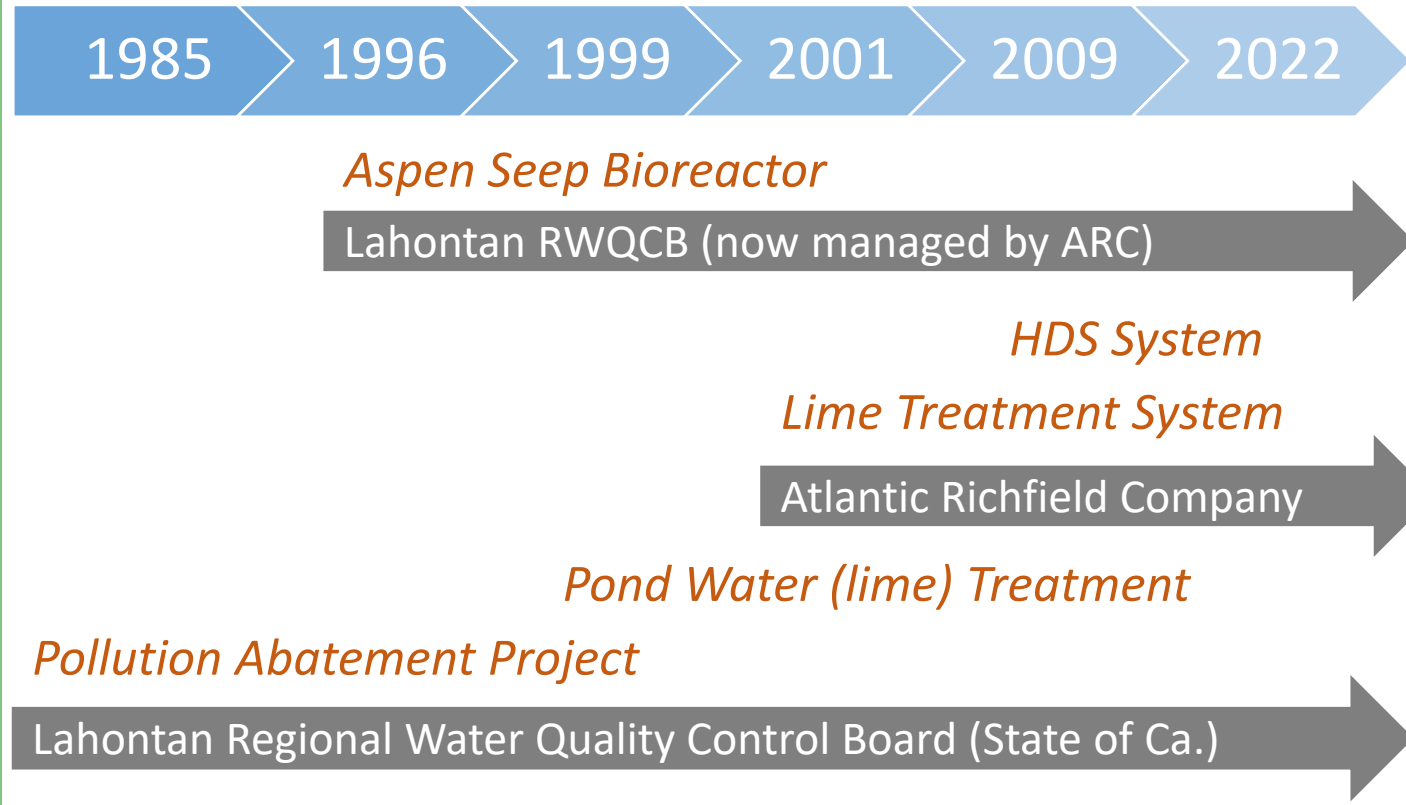
Post-Removal  
Site Control  
(if needed)



Additional  
Site Evaluation  
(if needed)

*Community involvement is integral to the entire process*

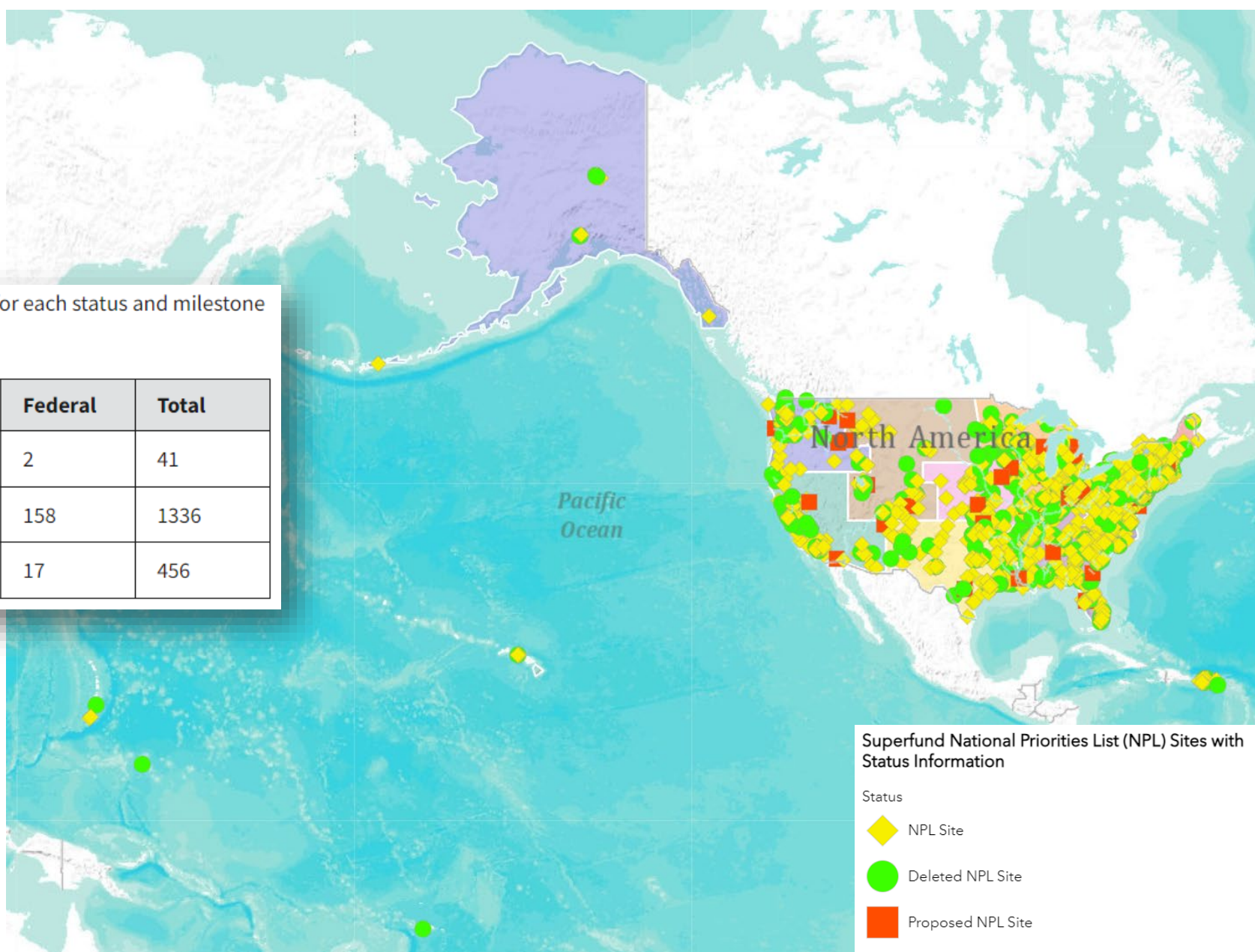
# Ongoing Early Response Actions Superfund **REMOVALS**



# National Priorities List (NPL)

- A list of national priorities among the known or threatened releases of hazardous substances throughout the United States
- Required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) – the “Superfund” law
- Intended primarily to guide EPA in determining which sites warrant further investigation
- Placement of a site on the National Priorities List makes the site eligible for federal funding for possible site remediation

# NPL Sites



The following table shows the number of Federal and general sites for each status and milestone as of September 07, 2023:

Status	Non-Federal (General)	Federal	Total
<a href="#">Proposed NPL Sites</a>	39	2	41
<a href="#">NPL Sites</a>	1178	158	1336
<a href="#">Deleted NPL Sites</a>	439	17	456

# Superfund Cleanup Approaches

EPA's Superfund program has three options for Superfund sites that need long-term (remedial) clean ups:

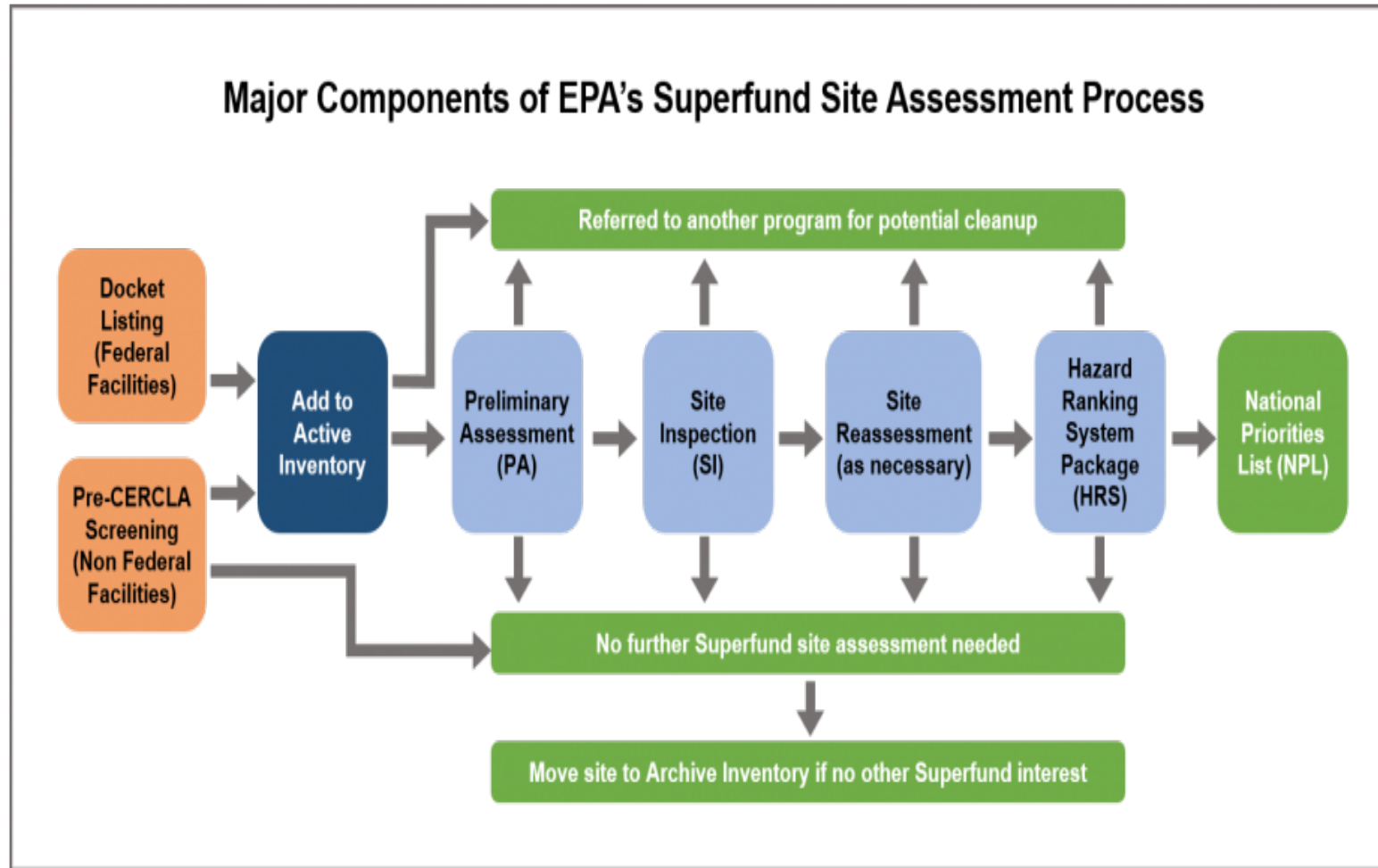
- Listing the site on the National Priorities List (NPL), which makes the site eligible for federal remedial cleanup funds
- Addressing the site using other cleanup options (e.g. other federal or state programs)
- Using the Superfund Alternative approach, funded by a Potentially Responsible Party (not eligible for federal remedial cleanup funds)



# Three ways to determine eligibility for NPL

- A Hazard Ranking System (HRS) site score of 28.50 or greater
  - The role of the Hazard Ranking System is as an initial screening tool. ***It is not a site specific risk assessment.***
- Each state and territory may designate one site to be added to the NPL
- The Agency for Toxic Substances and Disease Registry (ATSDR) issues a public health advisory, plus additional requirements

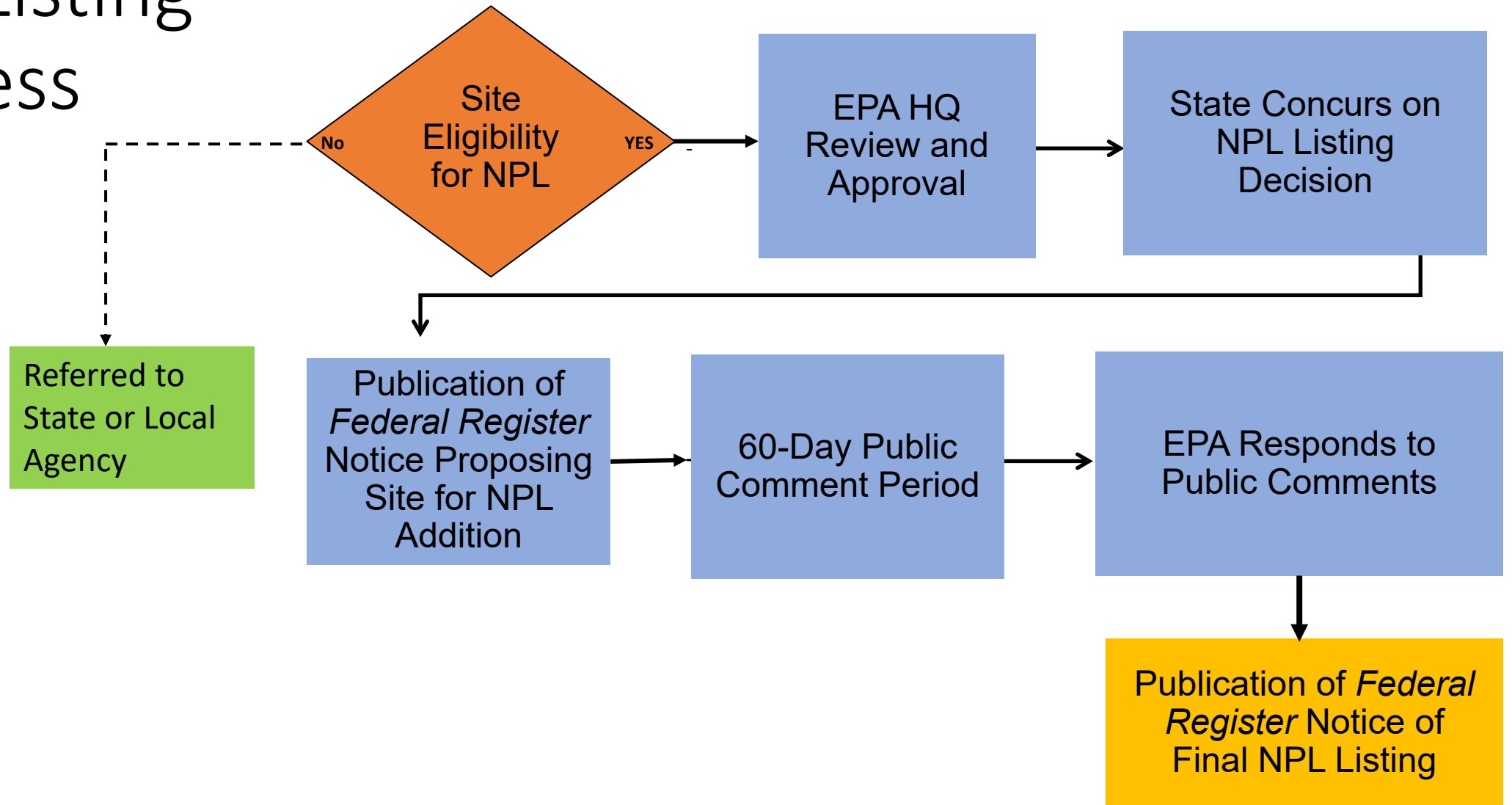
# Site Assessment (Pre-Listing)



# Hazard Ranking System

- A mathematical model that evaluates 4 different pathways: groundwater, surface water, soil exposure, air
- Used as a screening tool
  - At the Preliminary Assessment stage (and beyond), a HRS score is generated before field activities begin, to help prioritize resources used for sampling events
  - Sites with a score of 28.50 or greater qualify for further assessment under CERCLA
  - Max score 100

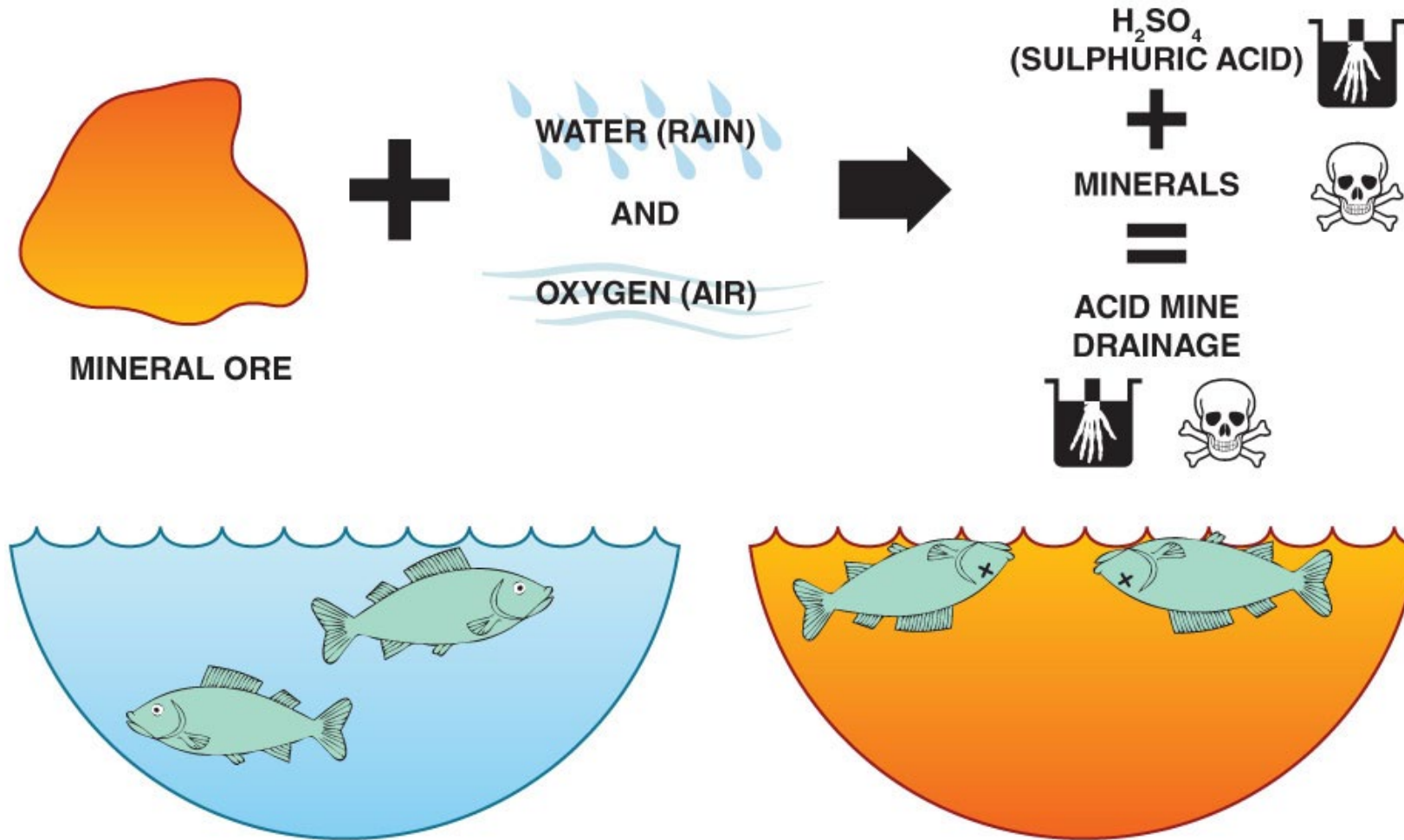
# NPL Listing Process



# Leviathan Mine NPL Listing

- Leviathan Mine is an abandoned, open-pit sulfur mine located on the eastern slope of the Sierra Nevada mountain range, in remote portion of northeast Alpine County, CA
- The acid mine drainage (AMD) from Leviathan Mine has historically contaminated a nine-mile stretch of the Leviathan-Bryant Creek watershed, impacting Leviathan, Aspen, and Bryant Creeks, as well as the East Fork Carson River
- Sulfuric acid, created when rainwater, snowmelt, and subsurface water interacts with rocks containing sulfur-bearing minerals

# Acid Mine Drainage



# Pre-Listing Highlights

- 1983**
  - The [California Regional Water Quality Control Board \(RWQCB\)](#), in 1983, approved Pollution Abatement Project to reduce surface water infiltration, collect and evaporate AMD, and isolate Leviathan Creek from overburden piles.
  - There was ongoing insufficient capacity in the ponds to hold AMD in the wet season.
- 1990**
  - EPA R9 Water Division listed the Leviathan Mine as a point source of As and Ni under the *Clean Water Act* section 304(I), requiring an *Individual Control Strategy* by the [RWQCB](#).
  - EPA conducted a Preliminary Assessment and calculated a HRS resulting in a not-eligible score
- 1995**
  - In 1995, the [RWQCB](#) developed the “Leviathan Mine 5-Year Workplan” with EPA and Washoe tribal participation.
- 1997**
  - The [Washoe Tribe of Nevada and California](#), in May 1997 petitioned EPA to investigate ongoing concerns.
  - EPA determined a need to re-assess the site based on new information.

# Pre-Listing Highlights

- 1997** • In the fall of 1997, EPA attempted to install an active treatment system (“Time-Critical Removal Action”). EPA also re-evaluated the site under Superfund site assessment.
- 1998** • In 1998, EPA R9 Superfund Program negotiated Administrative Order on Consent with [Atlantic Richfield Company](#), and oversaw its efforts to prevent pond overflow.
  - In 1998, EPA and the [Natural Resource Trustees](#) (including the Washoe tribe) entered into a Memorandum of Agreement to define roles.
- 1999** • In 1999, the [RWQCB](#) initiated a treatability study for pond water using a biphasic approach.
- 2000** • In early 2000, EPA conducted an additional Removal Action to increase pond capacity.



# Listing

## Why EPA Got Involved

In 1997, the Washoe Tribe of Nevada and California requested help from EPA because of particular concern over the effects from the overflow of the evaporation ponds. (Washoe tribal lands include areas directly downstream from the mine.) Besides concern over potential human health impacts from mine contamination, the Washoe Tribe's desire to protect their cultural and natural resources prompted them to pursue federal assistance. EPA's Region IX office in San

Francisco responded by attempting to treat enough pond water during the summer and fall so the ponds would not overflow the following spring. This treatment, based on raising the pH and reducing the dissolved concentrations of metals through lime neutralization, was not successful due to technical difficulties and time constraints. A berm, however, was constructed around the lowermost pond to increase its holding capacity.

## Additional Recent Actions

Two additional attempts to control pond overflow have been made in the past two years. In 1998, ARCO agreed to create more storage capacity for the ponds, but could provide only three million gallons more before the winter began. During Spring 1999, approximately eight million gallons of acid mine drainage overflowed from the ponds. Following that, the Regional Board received funding to treat the pond water with an innovative method that would reduce the volume of waste solids needing special handling. From August through October of this year, the Regional Board successfully treated 4.5 million gallons. With evaporation, more than eight million gallons of capacity are ready for this winter.



# LEVIATHAN MINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY • REGION IX • SAN FRANCISCO, CA • NOVEMBER 1999

## EPA PROPOSES LEVIATHAN MINE FOR SUPERFUND LIST

### ALPINE COUNTY, CALIFORNIA

The U.S. Environmental Protection Agency (EPA) has proposed the Leviathan Mine near Markleeville, CA for the federal Superfund list of the Nation's most environmentally critical hazardous waste sites. This proposal that the site be listed on the National Priorities List (NPL) was made because of the environmental impacts caused by acid mine drainage coming from the mine site. Inclusion on the NPL would give the site and all releases coming from the site priority status for federal cleanup under the Superfund program and ensure the availability of adequate resources to address all contamination associated with Leviathan Mine.

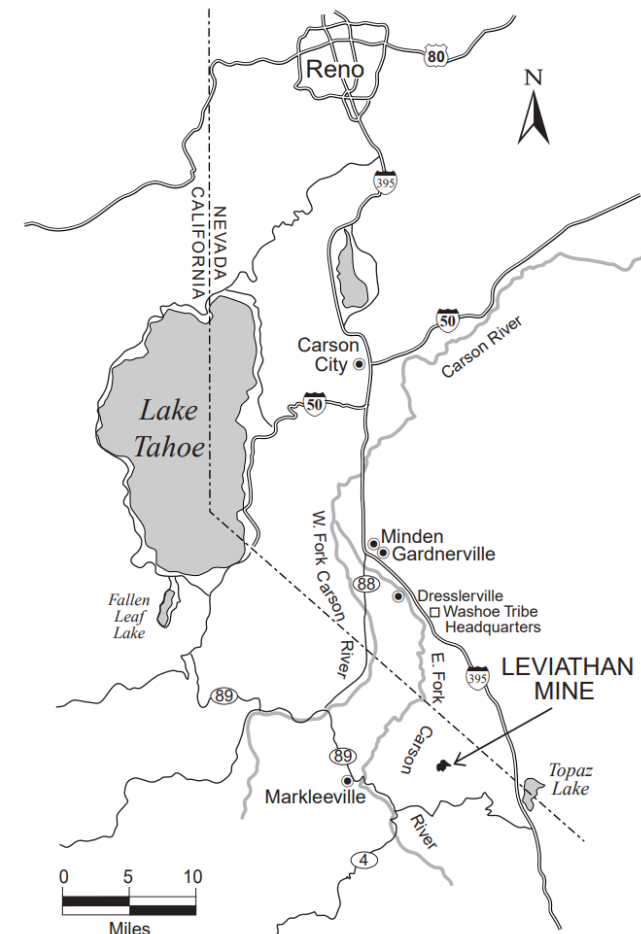
### Comments Welcome

A public comment period on the proposed listing ends on December 21, 1999.

All comments must be received by that date.

Comments may be sent to:

**Carolyn Douglas**  
U.S. Environmental Protection Agency  
75 Hawthorne St. (SFD-5)  
San Francisco, CA 94105



Site map of Leviathan Mine and surrounding areas

11/17/99

## Listing

## Alpine officials back Leviathan Mine Superfund listing

by **Andy Bouelle**  
Special to the R-C

Joining Douglas County and the Washoe Tribe of Nevada and California, Alpine County Tuesday agreed to support the U.S. Environmental Protection Agency's plans to list the polluted Leviathan Mine on its Superfund National Priorities List.

"I think anything we can do to help the cleanup of this thing we should," said Chris Gansberg, member of the Alpine County Board of Supervisors.

The Leviathan Mine, located in Alpine County 25 miles south of Gardnerville near the California and Nevada line, is an inactive sulfur mine now contaminating a nearby creek with acid mine drainage — acidic water containing dissolved toxic metals such as iron, copper, aluminum, nickel and arsenic.

The proposed listing, which had been expected for months, hap-

pened last month and began a 60-day public-comment period, which ends Dec. 21. Actual designation as a Superfund site could happen sometime after that.

At the Alpine County meeting Tuesday, Kevin Mayer, Superfund project manager for EPA, said the federal agency has received no formal comment from California. Nevada has commented but didn't support or oppose the listing.

The Leviathan Mine, which has been closed for 37 years, now looks like a several-hundred-acre white scar in the otherwise green mountains of Alpine County. Leviathan Creek, which runs through the site, is discolored and unable to support aquatic life.

The water eventually runs into the East Fork of the Carson River.

The Leviathan Mine was first mined in 1863.

Early mining activities did not harm the water quality of the region. However, a mining business called Anaconda, Co. pur-

chased it in the 1950s and used it as a sulfur mine. The company excavated hundreds of acres of land, creating an open pit mine — a type of operation known for causing water quality problems.

Water runoff going through the mining site mixes with sulfur, which lowers the water's pH level, making it acidic.

After Anaconda sold the site in 1963, Leviathan Creek flowed directly through the disturbed area.

Acid mine drainage flowed into the creek.

Lahontan bought the mine in the 1980s, and officials estimate the state has taken care of 70 percent of the problem. Lahontan officials this past summer built a \$1 million-plus system for treating a long-running problem there. EPA supports those cleanup efforts. However, federal and Lahontan officials agree there are other problems and the stream will still be contaminated. EPA offi-

cial think the Superfund status will help create more of a long-term cleanup approach.

"Despite what I think is a really commendable effort by the regional board, when they have the funds, the waste from the mine is continuing to impact the watershed there," Mayer said.

The Superfund listing likely could bring a more focused approach to the cleanup, according to EPA. And it could hold ARCO, which has purchased Anaconda, and Lahontan, for currently owning the property, financially responsible for the cleanup.

The Washoe Tribe has long supported the listing. Douglas County commissioners voted to support it last month.

Although Alpine County took action this week, a public workshop has been scheduled for later this month to educate residents of the county about the situation. Representatives of Lahontan and EPA are expected to be there.

# Listing

United States  
Environmental Protection  
Agency

Regional Administrator  
75 Hawthorne Street  
San Francisco, CA 94105-3901

Region 9  
Arizona, California,  
Hawaii, Nevada  
Pacific Islands



**For Immediate Release:** May 10, 2000  
**Contact:** Leo Kay, Press Office, 415/744-2201

## **EPA FINALIZES LEVIATHAN MINE AS SUPERFUND SITE**

SAN FRANCISCO – The U.S. Environmental Protection Agency announced today that it has listed the Leviathan Mine in Alpine County as a federal Superfund site, a move that will help facilitate the cleanup of the inactive sulfur mine located on the eastern slope of the Sierra.

“This action will provide us with the formal regulatory authority necessary to clean up a very complex site that continues to endanger an otherwise pristine environment,” said Keith Takata, director of the EPA’s Superfund division in San Francisco. “Now we can roll up our sleeves and focus entirely on stemming the flow of contamination into nearby creeks and watersheds.”

The EPA will continue working with ARCO and the Lahontan Regional Water Quality Control Board to address some of the site’s immediate issues, such as treating the 15 million gallons of acidic waste currently stored in the ponds to prevent overflows next winter, and intercepting and treating contamination from sources separate from the ponds. In the meantime, the EPA, ARCO and the water board will work to devise a long-term cleanup plan for the site.

# Remedial Kickoff

## EPA meets with public about Leviathan

### Estimated \$25 million for Superfund project

By Jim Scripps  
Tribune News Service

CARSON CITY — Plans for a Superfund project to clean up the poisonous Leviathan Mine took a small step closer to fruition during a public meeting Wednesday evening.

Officials from the Environmental Protection Agency met with concerned community members at the Carson Valley Middle School library to lay the framework for the project, which promises to span several years.

A video presentation and question-and-answer session outlined the route that waste from the acid mine takes before entering the East Fork of the Carson River. Scientists also talked about the hazards to plants and animals that have been discovered during water testing.

"We can look at this river and see that there's an effect," said EPA biologist Ned Black. "We know from the outset that there's an ecological effect."

"No bugs or bunnies; no organism that we are interested in — including cutthroat trout — are going to survive this."

Remedial Project Manager Kevin Mayer characterized the site, located on the east slope of the

Sierra near Markleeville as an ecological disaster.

"It's a lovely walk into that canyon, but the water is orange," he said, describing the Leviathan and Bryant creeks. The creeks serve as a repository for seepage from the 250-acre mine site.

He said tests of the water pH levels indicate a fluctuating acidity, a sign that metals from mine slag and overflowing holding ponds are creating concentrated bursts of contamination. The next step is to investigate where the contamination is coming from and look deeper into its ecological effect.

The mine was in use, mostly for sulfur extraction, from the 1860s until 1962. To date, more than \$7.5 million dollars has been spent to undo the contamination.

Those cleanup efforts, though significant, have not totally contained the waste, which has become a visible part of the ecosystem.

Mayer illustrated the level of contamination, comparing wildlife where the creeks meet with other bodies of water. On the contaminated side, a rock will have only slime and, an "arm's reach away," there will be caddis fly larvae in the riverbed.

"For quite a number of miles down Bryant Creek, it's just dead," he said.

Although preliminary discussion

touched on the possibility of an acid-neutralizing filtration system, environmental testing and cost analysis need to be done before work starts, Mayer said.

Some of the first efforts at a cleanup were put forth by the Washoe Tribe and Alpine and Douglas county officials. Senator Richard Bryan, D-Nev., in conjunction with the Lahontan Regional Water Quality Control Board, headed the effort to bring in the promised funding and manpower of Superfund status.

The mine's former owner, Arco, will pick up some of the cost, Mayer promised. "It's still an order and we expect Arco to comply with that order."

At present, Arco has shown initiative in the cleanup. The company has been doing its own testing at the site, providing information and

agreeing to further efforts. Nevada agreed to settle with the company for \$2.3 million and freedom from future liability. The EPA said that during the Superfund project — which has been estimated at \$25 million — the company will have to kick in, regardless of the settlement.

"They've given us pretty clear signals to say they are interested in getting started at least," Mayer said.

Trout Unlimited, a nonprofit environmental powerhouse, has expressed interest in the cleanup.

Nevada branch Executive Director Matt Holford said the organization has experience in pushing for similar operations.

"This is a grass-roots effort," he said. "We can help by educating people to the problems for clean water and native species."

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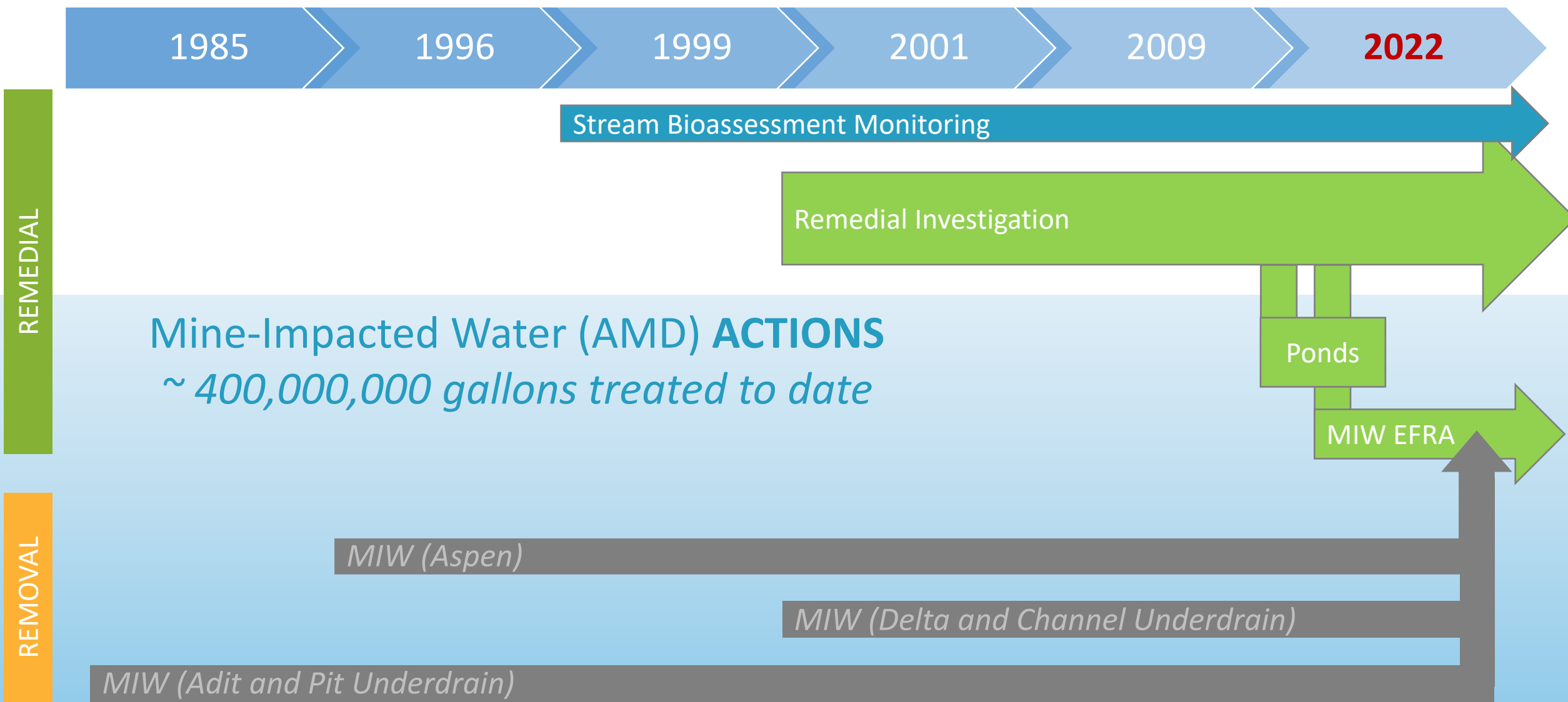
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# Remedial Path & Removal Actions in Parallel





# Thank You

Freyja Knapp

~ US EPA Project Manager for Leviathan Mine ~

US EPA Region 9

(415) 972-3025

[Knapp.Freyja@epa.gov](mailto:Knapp.Freyja@epa.gov)