

Iron Mountain Mine Superfund Site



Site History, Cleanup, and Current Status

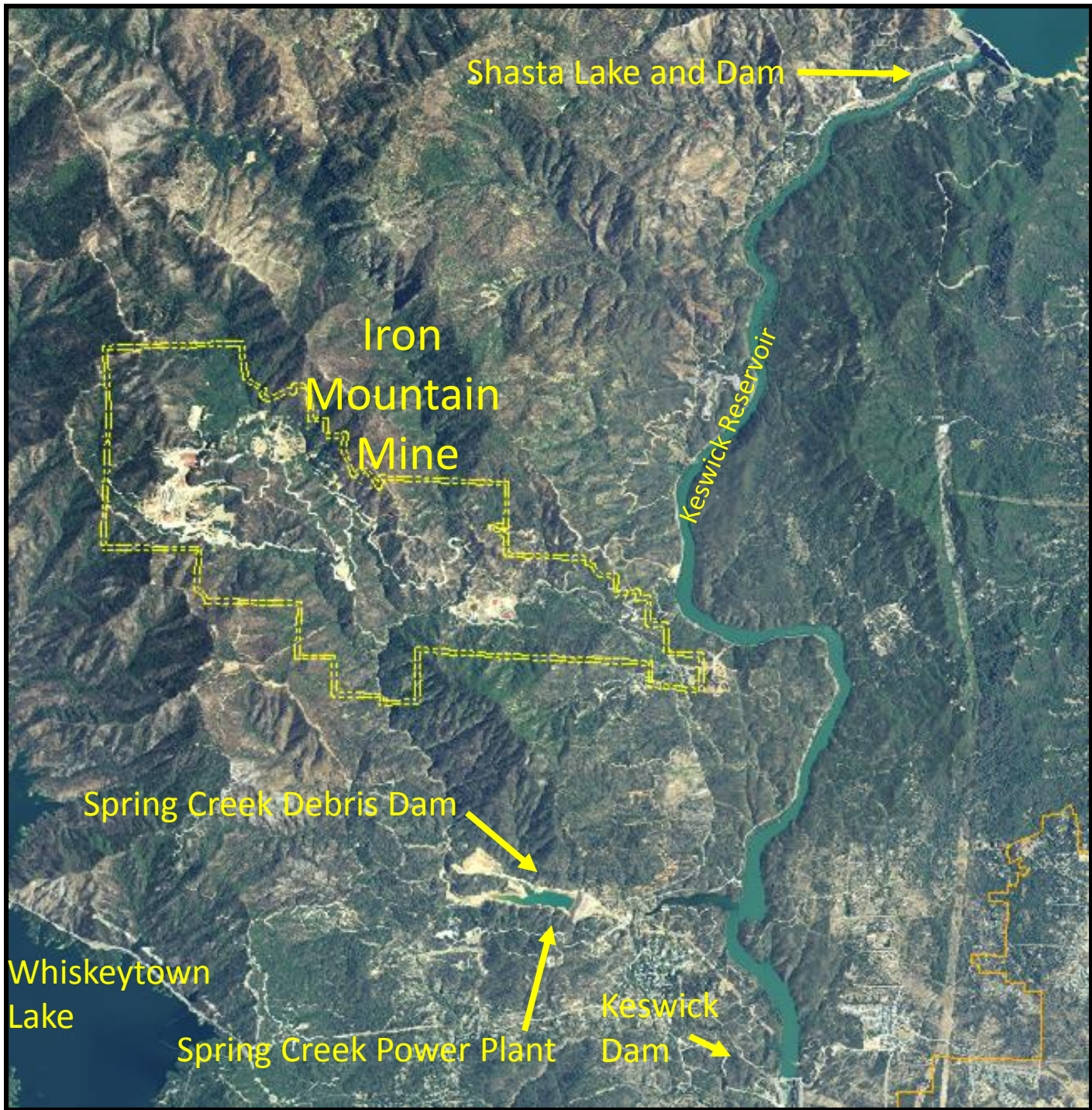
October 2015

Agenda

- Location
- Site Overview
- History and Mining Impacts
- Cleanup History
- Preparing for the Future



Location

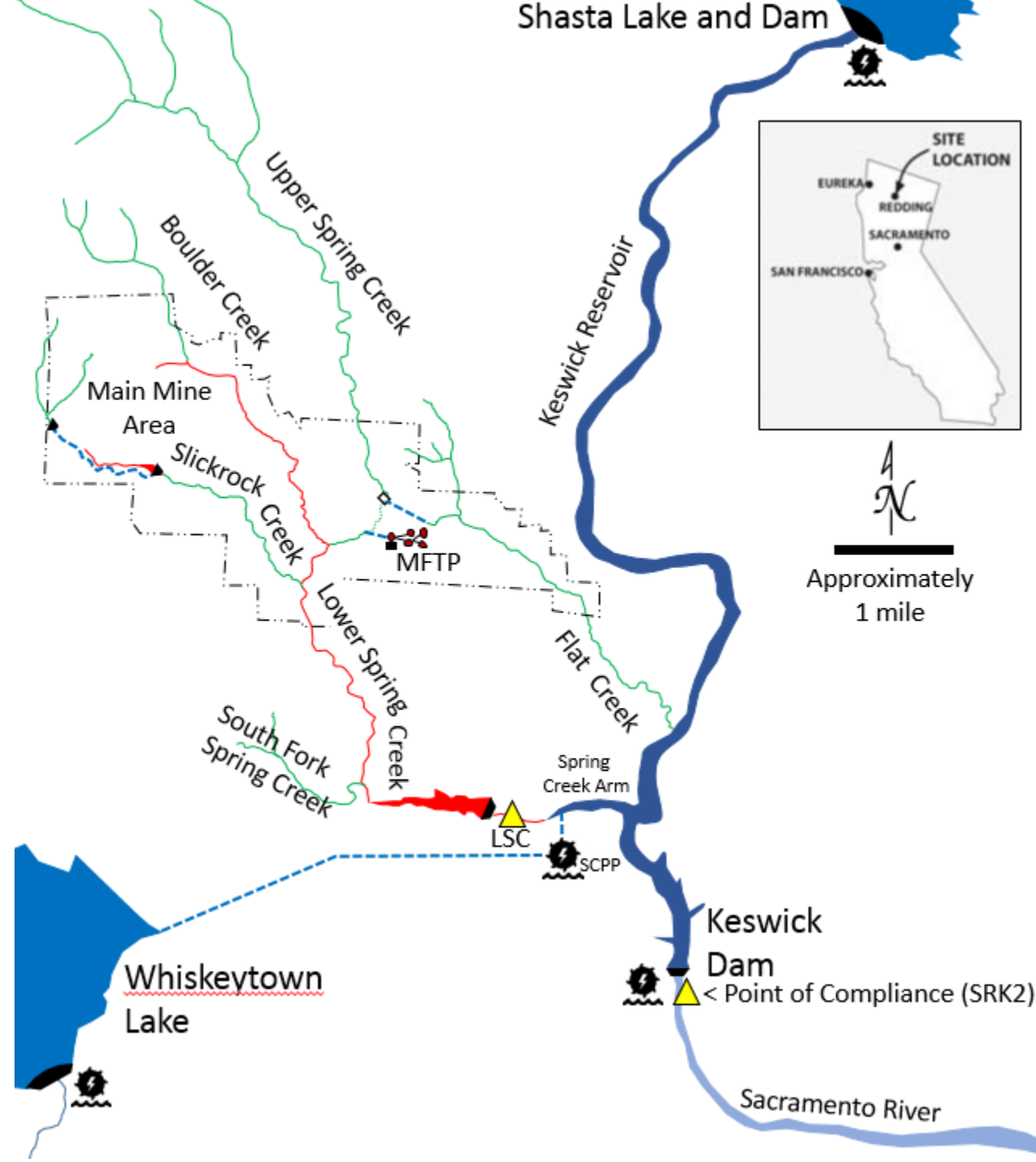


City of Redding



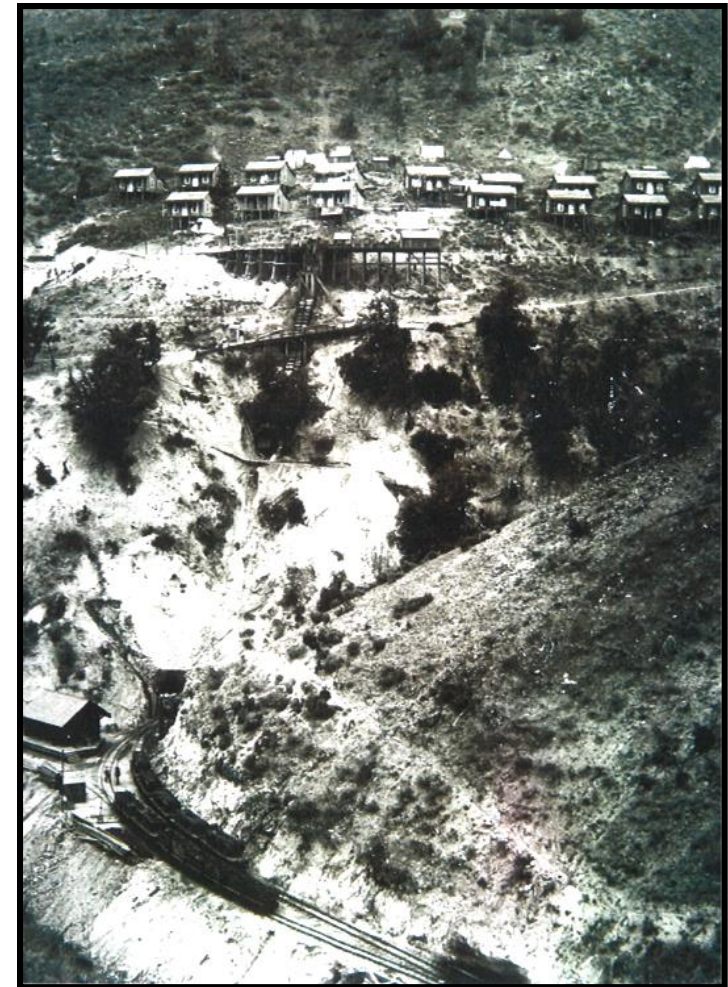
Site Overview

- 4,400 acre property
- Mined 1890-1963 for copper, zinc, gold, silver, and pyrite
- Spring Creek flows into the Sacramento River
 - Most critical spawning habitat for salmon in CA
 - 19% of California's water supply
 - Major source of hydroelectric power

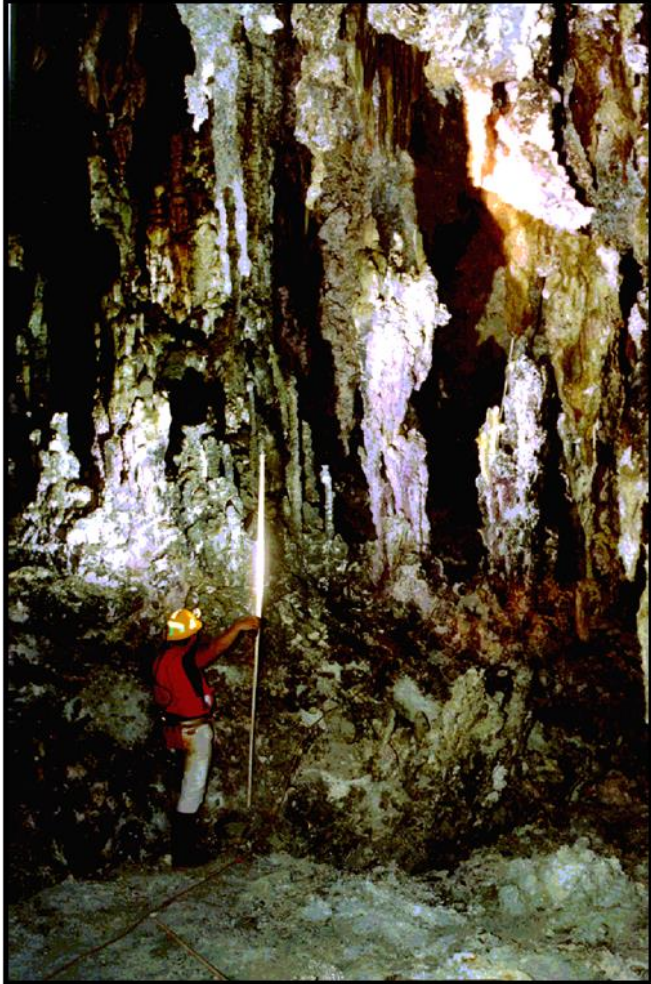


History

- 1860's Ore found
- 1880's Mining started at a large scale
- 1898 - 1904 Hillside denuding from smelters became a legal issue
- 1905 Keswick smelter shut down
- 1929-1942 Gossan open pit mining
- 1930's Copper cementation plant built
- 1945 Shasta Dam completed
- 1950 Keswick Dam completed
- 1955-1962 Brick Flat Pit open pit mining
- 1963 All mining stopped
- 1963 Spring Creek Debris Dam completed
- 1964 Spring Creek Power Plant starts
- 1976 Water Board issues order abate SW pollution
- 1983 IMM on Superfund List
- 1989 AMD collection, treatment started, onsite capping, adit rehab, tailings removed
- 1994 Minnesota Flats Treatment Plant started
SCDD Sizing Study completed
- 2004 Slickrock Creek Retention Reservoir online
- 2009 IMM Surface Water Quality Model updated
- 2010 SCAKR Dredging Project completed



Acid Mine Drainage (AMD)



Richmond Ore Body



Impacts to Spring Creek
(pH = 3)

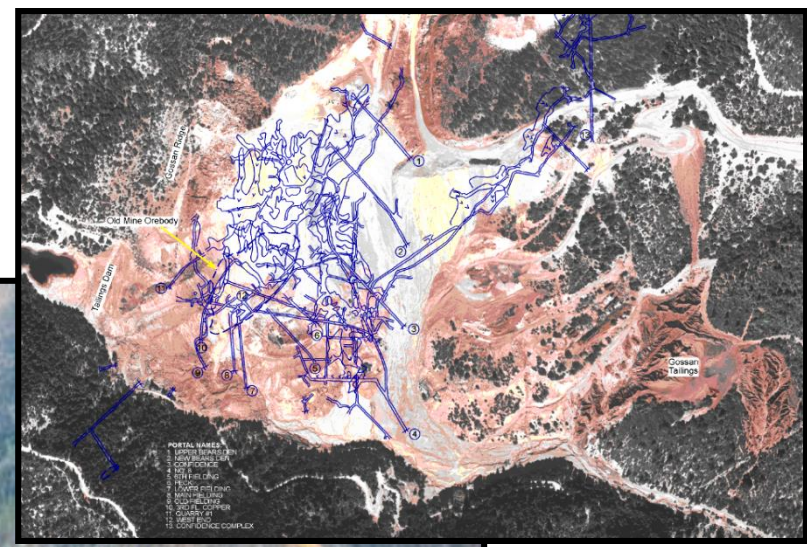
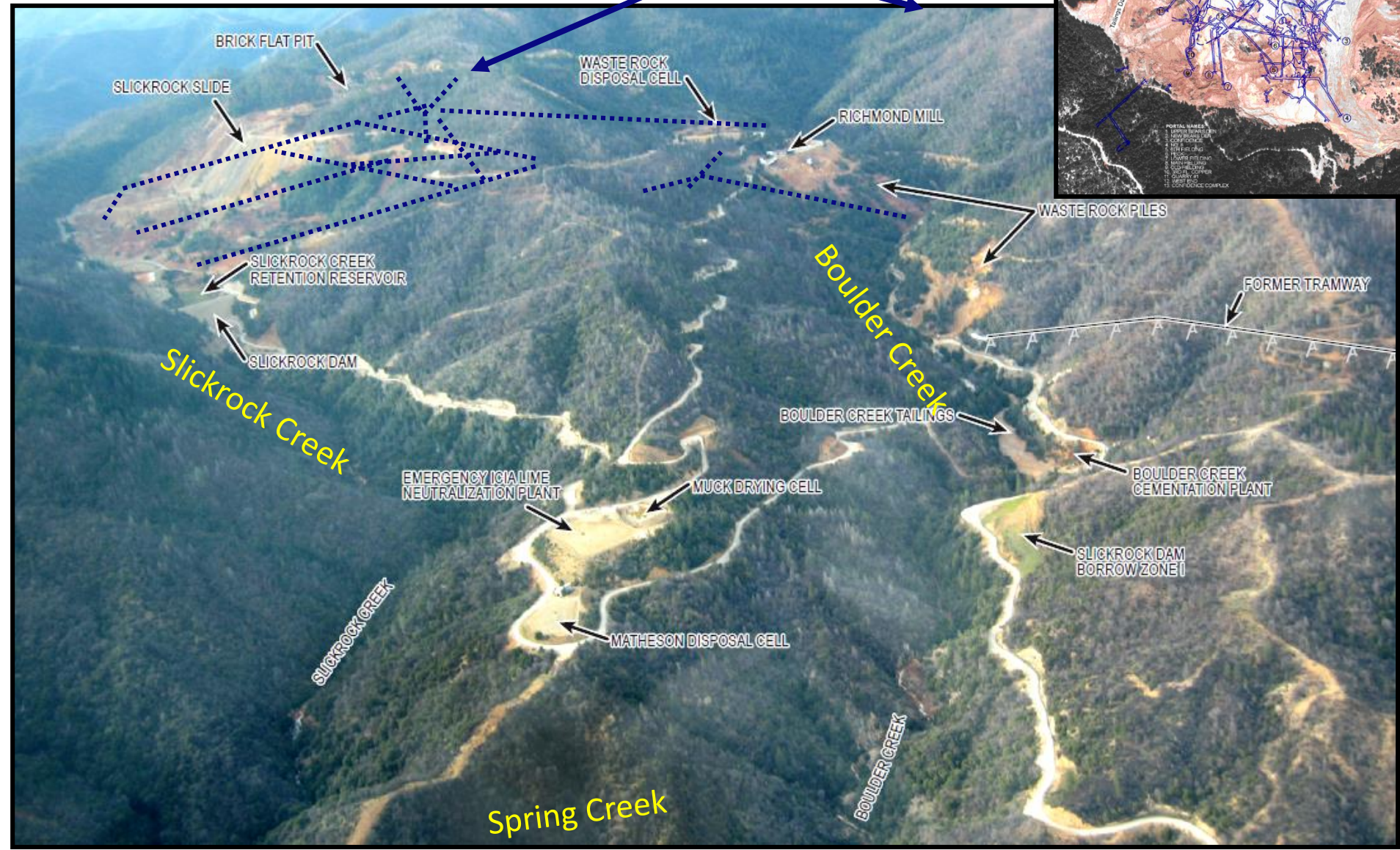
Impact on the Environment

- Largest source of surface water pollution in US. Historic discharges into Sacramento River:
 - 10,000 lbs/day iron
 - 650 lbs/day copper
 - 1,800 lbs/day zinc
- 30 documented large-scale fish kills
 - Habitat for steelhead and four runs of Chinook Salmon (including endangered Winter Run Chinook Salmon)
- Site listed on National Priorities List (Superfund) in 1983 to address ecological risk



Main Mine Area of Iron Mountain Mine

Adits in the mine workings



Adit Rehab and AMD Collection



AMD Collection

2004 Slickrock Creek
Retention Reservoir

AMD

Photo:
EPA Superfund
25th
Anniversary
Winner

Project:
2006 Grand
Award Winner
American
Council of
Engineering
Companies



Minnesota Flats Treatment Plant
Iron Mountain Mine
Superfund 25th Anniversary Photo Project

AMD Treatment and Disposal

Minnesota Flats Treatment Plant



Sludge Drying Ponds

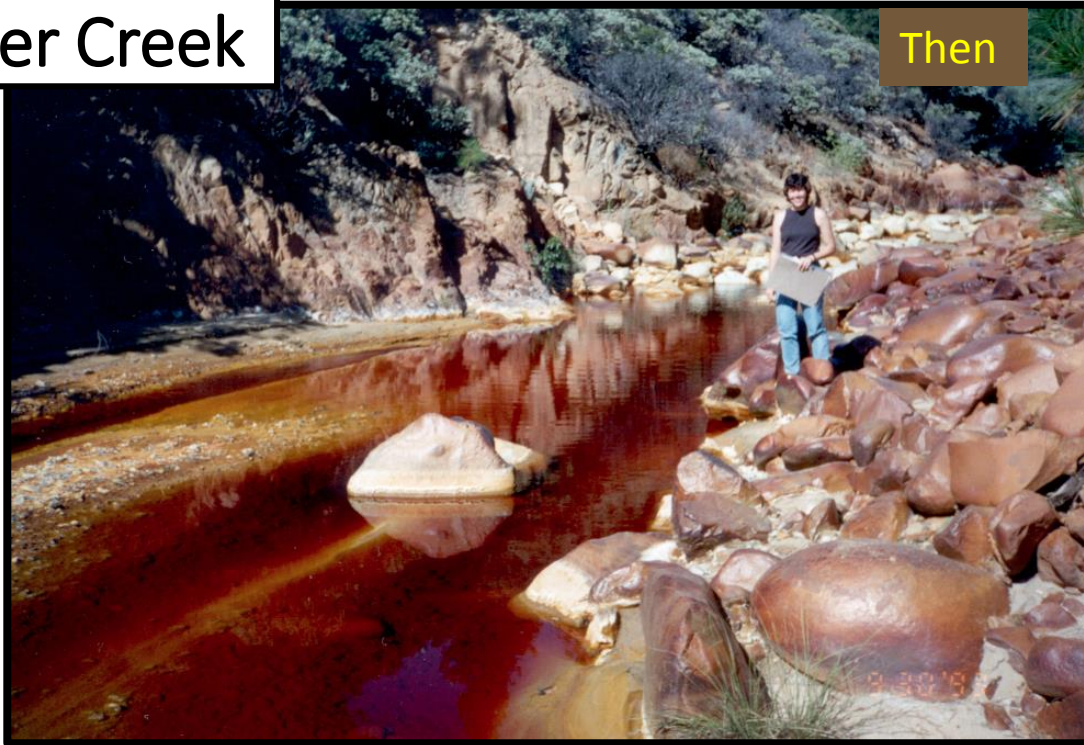


Brick Flat Pit



Boulder Creek

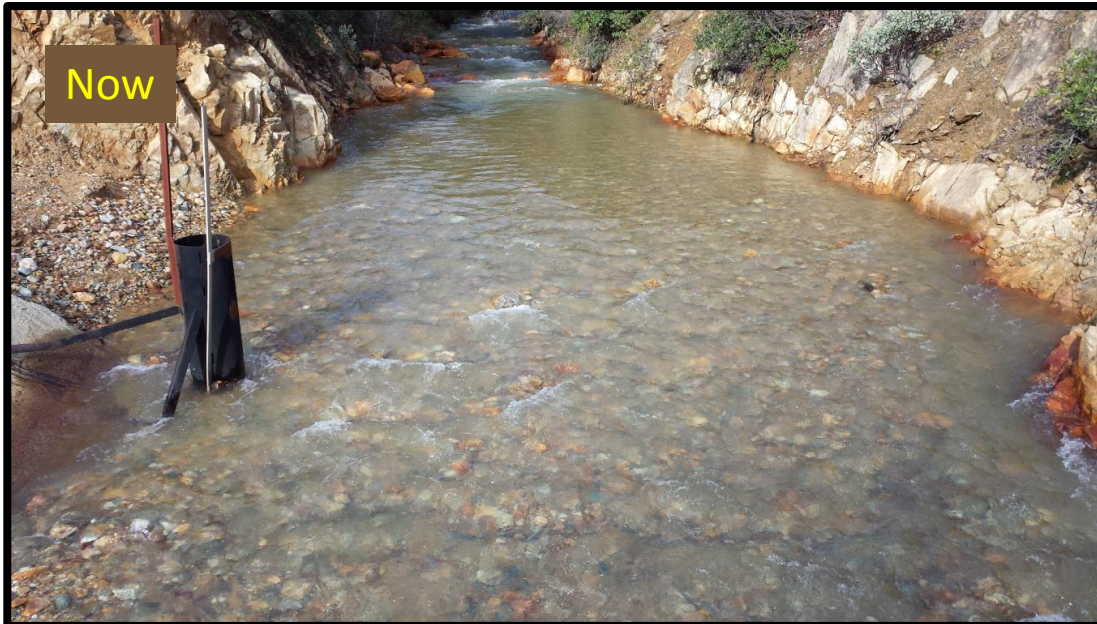
Then



Now

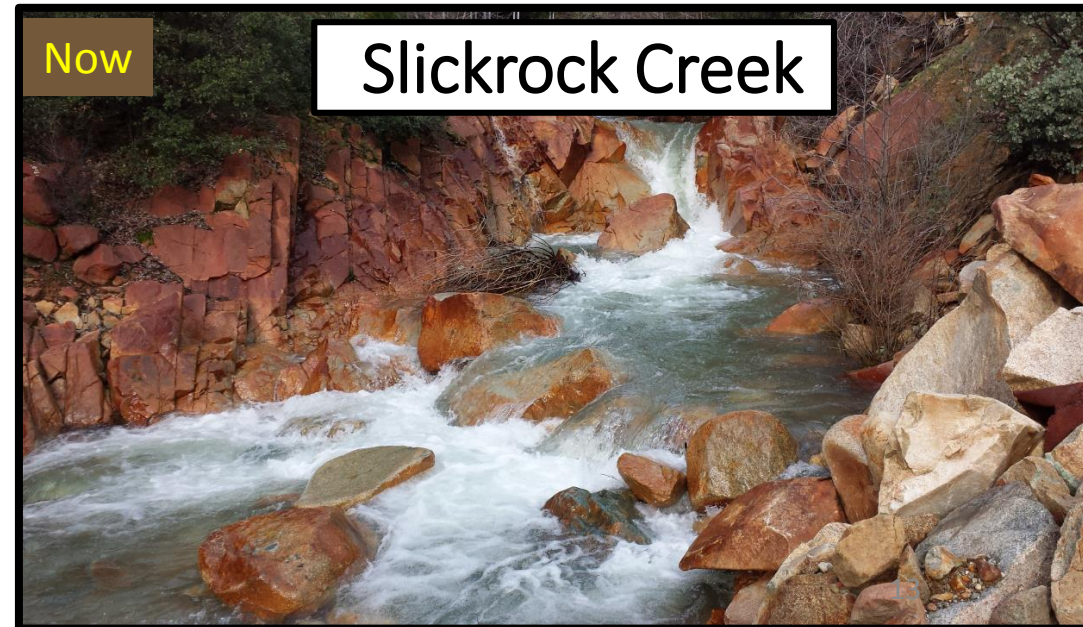


Now



Now

Slickrock Creek



Spring Creek Arm of Keswick Reservoir Dredging Project

2014 AAEES
Grand Prize
Award
Winner



Interim Compliance Point: Sacramento River Below Keswick Dam



Results of Cleanup Activities

- 97% reduction of metals
- Current version of remedy: no exceedances of compliance point
- Over \$500M work completed, primarily through enforcement
- Site operation requires high investment/resources
- Remedial actions performed to date:
 - Acid Mine Drainage conveyance and treatment
 - Minnesota Flats Treatment Plant for lime neutralization treatment plant
 - Clean water diversions
 - Upper Spring Creek Diversion pipeline
 - Slickrock Creek Retention Reservoir
 - Waste pile and tailings consolidation, capping, and removals
 - Spring Creek Arm of Keswick Reservoir
 - Contaminated sediment dredging and storage

Preparing for the Future

- Final Cleanup Decision
 - Focuses on Boulder Creek drainage
 - Tramway and railroad areas
 - Extensive Water Quality Modeling
 - Changing conditions: drought, raising of Shasta Dam, etc.
- EPA Takeover of Site
 - Site operator will run site until 2030
 - Unique legal settlement provides for 100 years of treatment post-2030
- Collaborating with partners
 - Continued work with our Federal, State, and Local partners
- Considering innovative technologies
 - Potential to shrink footprint of site
 - Solar/hydroelectric power

Conclusion



Lily Tavassoli
Remedial Project Manager
(415) 972-3146
Tavassoli.Lily@epa.gov