

GET THE MERCURY OUT

A campaign to increase public investment in restoring California's watersheds

**By reclaiming legacy mines, California will:
maintain reservoir capacity, protect public health and
reduce mercury contamination of the San Francisco Bay-Delta.**

More than 96% of the total mercury loading to the Bay-Delta comes from the streams and rivers of the Sierra Nevada and the Inner Coast Range (Wood et al., 2010).

As part of the “rush for gold in California” 150 years ago, huge machines tore apart mountains looking for gold. These disturbed and polluted mountain remnants tumbled down from the Sierra Nevada as a thick wall of mud flooding the valleys and the San Francisco Bay-Delta. Mercury was used extensively during the Gold Rush in the Sierra Nevada in both hard rock and hydraulic mining (Alpers et al., 2005). Mercury was mined in the Coast Range (cinnabar deposits), transported to the Sierra and used as quicksilver to extract gold.

Mercury-contaminated sediment reduces reservoir storage capacity.

Millions of gallons of mercury were poured into mining sluices and tunnels and lost to the streams and rivers. As a result, mercury-contaminated sediment continues to move downstream with every storm event (Alpers et al., 2010).

For about 200 reservoirs in California, estimated sediment deposition of 2.1 billion cubic meters (1.7 million acre feet) has cut their storage capacity in half (Minear and Kondolf, 2009).

Public Health Is Threatened by Mercury from Legacy Mines:

When the price of gold fell, mines were abandoned without any effort to clean them up. A century later, toxic mercury is still leaking into the state's water system. Public health officials in California are increasingly concerned about the amount of mercury in the fish of the state and the danger posed by eating fish caught in the San Francisco Bay-Delta and in rivers and reservoirs in the Sierra Nevada and Inner Coast Range. The World Health Organization has stated that there is no safe level of exposure to mercury. Mercury exposure, especially during pregnancy or as a young child, can cause devastating and permanent health effects.

Methylmercury is the highest priority toxic bioaccumulative contaminant in California (Davis, 2012).

The Solution: There are several approaches for remediation where mercury can be remediated, removed or encapsulated. Pilot projects now underway are providing lessons that can be applied widely to upland sources at legacy mine sites and to numerous reservoirs that accumulate mercury contaminated sediment.

- 1. Reservoirs, built downstream of legacy mines, where mercury laden sediments accumulate.** The Nevada Irrigation District's pilot project at Combie Reservoir, in collaboration with US Geological Survey and others, is the first effort ever undertaken to determine if removing mercury-contaminated sediment as part of dredging to maintain reservoir capacity can reduce the amount of mercury in reservoir

releases. This project promotes water supply reliability and sustainability by maintaining reservoir capacity.

2. **Upland sources, such as legacy gold mines.** Upland sources need to be identified, assessed, prioritized and cleaned up. The Sierra Fund is pioneering methods of assessment and remediation of legacy mercury pollution at Malakoff Diggins State Historic Park aimed at understanding how to clean up or divert water around these kinds of sources to minimize mercury transport and bioaccumulation downstream. This collaborative project is conducted with State Parks and other state and federal agencies, with seed funding provided by the Sierra Nevada Conservancy,
3. **Upland sources, such as legacy mercury mines.** Unlike legacy gold mines that can be cleaned up, mercury mines require continuous treatment because the mercury deposit is on site. These mines need to be identified, assessed, prioritized, and cleaned up. Tuleyome's project to remediate legacy mercury mines in Napa County is an example that demonstrates an effective role for non-profit organizations. Other recent examples of this type of cleanup are the Abbott-Turkey Run Mine in Lake County, and the BLM Rathburn-Petray Mine in Colusa County.
4. **Soil erosion, adding mercury to streams and rivers.** Projects that focus on reducing soil erosion into Cache Creek, Putah Creek, and other Inner Coast Range water bodies can abate the mercury release as well as sediment contamination downstream.

Put it in the Water Bond: Funding to assess, design and implement these sorts of pilot projects must be included in the next water bond. Proposed language for inclusion in a new water bond:

Delta Sustainability : *Funding for pilot projects that reduce discharge of mercury into the Delta from upstream legacy gold and mercury mines.*

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