

November 19, 2009

Honorable Congressman Jim Costa, Chairman  
Subcommittee on Energy and Mineral Resources  
House of Representatives  
United States Congress  
Washington, D.C. 20515

Re: Field Hearing, *Abandoned Mines and Mercury in California*  
November 23, 2009

Dear Mr. Costa,

My name is Elizabeth "Izzy" Martin, Chief Executive Officer of The Sierra Fund. I am honored to be asked to participate in your Committee's field oversight hearing about the topic of "Abandoned Mines and Mercury in California." The Sierra Fund's Mining's Toxic Legacy Initiative has developed a strategic approach to identifying the problems associated with legacy mining in California. We have worked with a broad range of stakeholders to build consensus around the policy directions needed to assess and remediate the impacts of the "gold rush" on the Sierra Nevada, in the headwaters of California.

### **Summary**

It is time to address the ongoing impacts of legacy mining in California. We urge your consideration of the following recommendations:

#### **1. Increase Collaboration**

- Support development of a Mining Toxins Working group that supports collaboration between tribal, federal, state and local governments and community members in addressing legacy mining issues.

#### **2. Fund Strategic Research**

- Support development of pilot research projects that explore methods for reducing methylmercury in the Sierra Nevada watershed.
- Support research into health impacts on Sierra residents of exposure to mining toxins.

#### **3. Outreach and Education on Human Health**

- Support regional medical education and outreach on the impacts of legacy mining toxins on public health, including mercury.

#### **4. Direct and Fund Federal Programs**

- Inventory, assess, and prioritize for remediation abandoned mines on all lands owned or managed by the federal government.
- Assess water projects, wetlands, reservoirs and other federal projects and put programs into place that ensure best management practices and appropriate technologies to minimize mercury methylation.
- Reform the Federal 1872 Mining Act needs to require meaningful mitigation of cultural and environmental impacts from historic mining, and reform "Good Samaritan" laws to provide incentives for cleanup.
- Support implementation of Phase 2 of the CALFED Mercury Strategy.

## **The Sierra Fund's Mining's Initiative**

The Sierra Fund's Mining's Toxic Legacy Initiative is rooted in our mission "to increase and organize public and private investment in the people and places of the Sierra Nevada." Launched in 2006, this Initiative focuses on the impacts of historical gold mining activities. Working with partners from state, federal, and tribal governments as well as from the academic, health, and environmental communities, The Sierra Fund's report "Mining's Toxic Legacy," published in 2008, is the first comprehensive evaluation of what happened during the Gold Rush, including: the cultural, health, and environmental impacts of this era; the obstacles in the way of addressing these impacts; and a strategic plan for taking action on the longest neglected environmental problem in the Golden State of California.

## **Mining in the Sierra Nevada**

The Gold Rush changed California demographics as indigenous people were dislocated and mining towns appeared and disappeared across the Sierra Nevada range. A less recognized consequence of the Gold Rush was the massive environmental destruction that took place, which plagues the Sierra to this day. Ever since gold was discovered in the Sierra Nevada in 1848, mining activities to extract gold, copper, asbestos, lead and other minerals from California's rich deposits have had an impact on the state's human and environmental health.

While it has slowed down dramatically since the days of the Gold Rush, mining has left a lasting legacy of toxic contamination that threatens the health of humans and wildlife throughout California: in the rural areas of the Sierra where gold mining occurred; in the coastal mountain ranges where mercury was mined; and in downstream communities whose water comes from the rivers and streams of the mined region. Rebecca Solnit illustrates the magnitude of this impact in her article "Winged Mercury and the Golden Calf" (Orion Magazine, September 2006)

*The California Gold Rush clawed out of the foothills of the Sierra Nevada considerable gold—93 tons or 2.7 million troy ounces in the peak year of 1853 alone... In the course of doing so, everything in the region and much downstream was ravaged. Wildlife was decimated. Trees were cut down to burn for domestic and industrial purposes and to build the huge mining infrastructure that was firmly in place by the 1870s. ...The earth was dug into desolation and later hosed out so that some landscapes—notably the Malakoff Diggings and San Juan Ridge near Nevada City—are still erosive badlands of mostly bare earth.*

*But most of all, the streams and rivers were devastated. The myriad waterways of the Sierra Nevada were turned into so much plumbing, to be detoured, dammed, redirected into sluices high above the landscape, filled with debris and toxins. Water as an industrial agent was paramount, and water as a source of life for fish, riparian creatures, downstream drinkers, farmers, and future generations was ignored.*

**Environmental Impacts:** The Sierra Nevada is the headwaters for more than 60% of the developed drinking water for the state of California. Using placer, hard rock, and hydraulic mining techniques, millions of ounces of gold were extracted from the Sierra Nevada "Mother Lode" during the 19th century. Mercury, arsenic,

lead, acid mine drainage, and other kinds of contamination left behind from mining threaten the water, plants, and people of the entire state.

According to the most recent state estimate, there are 47,000 abandoned mines in California. Abandoned mines have left behind toxic pits and acid mine drainage. Naturally occurring minerals including arsenic, lead, chromium and asbestos were disturbed, crushed, and distributed throughout the region as gravel for road construction. Much of the land impacted by these activities is now publicly owned by the federal government.

Mining practices used substantial amounts of mercury, millions of gallons of which still pollute the Sierra landscape. Mercury was mined in the coast range, and brought to the Sierra Nevada in the form of "quicksilver" specifically for use in gold mining. Gold was extracted through a process that mixed elemental mercury with mined gravel, and mercury has since been found in nearly every stream in Sierra gold country. Mercury also occurs in mill tailings along with other heavy metals.

This mercury is routinely reactivated into the water through development, resource extraction and human activity, and reaches dangerously high concentrations in fish caught in the San Francisco Bay-Delta region and in low-elevation Sierra reservoirs and streams (C.N. Alpers et al, "Mercury Contamination from Historical Gold Mining in California," USGS Fact Sheet 2005-3014, April 2005.) Although the presence of mercury in the Bay and Delta is a significant issue, the impact of exposure on Sierra watersheds is currently unknown, for lack of studies. This year, the Lakes Report from the State Water Resources Control Board Surface Water Ambient Monitoring Program, published May 2009, found mercury to be the most commonly found contaminant of fish in the state's lakes.

**Health impacts:** Since most towns in the Sierra Nevada were founded around productive mine workings, downtown areas, parks, and school sites contain mine waste. Common mining toxins such as mercury, arsenic, lead and asbestos are known to cause severe human health problems with continued exposure.

*Mercury* is a neurotoxin that accumulates over time in the flesh of fish and the humans and wildlife that eat them. Mercury contamination of fish has caused the State to issue warnings about fish consumption in Sierra water bodies that have been tested. There have been few studies of the impact of eating mercury-contaminated fish from this region, but recent research suggests the presence of observable health impacts in those who eat a lot of fish.

*Arsenic, lead and asbestos*, naturally occurring in toxic materials crushed during the Gold Rush and left in massive tailings piles, have been found in dangerously high levels throughout the region and can be inhaled as dust particles when working or recreating in these areas. Exposure to arsenic, asbestos and lead in dust from crushed mine waste is a significant and largely unknown hazard for people living in the Sierra. Inhalation of dust is the primary way residents are exposed to toxins in the mine waste. Sensitive populations include people who work and recreate outdoors, especially young children.

Despite the extensive evidence of potential exposure to these many toxins, human health studies have never been conducted in the Sierra Nevada to learn if there are health impacts resulting from this exposure. A survey of thirteen health clinics throughout the Gold Country documented that none of these clinics currently collect environmental health histories from their patients or provide information about mercury contamination of fish as part of their maternal health program, even though many serve areas where there are recently adopted advisories to limit fish consumption.

**Cultural Impacts:** The Gold Rush devastated the Native Peoples in the region. Forced relocation, disease, and outright murder shattered their villages and tribes. Toxic materials that remain from this era sever Native Californians from their traditional ceremonial activities such as fishing and collection of ceremonial plants, perpetuating the devastation begun over a century ago.

### **Obstacles to Solving the Problems**

A patchwork of government agencies and regulations on the local, state, and federal levels relate to mining toxin problems on both public and private property.

The government is the largest landowner in the Sierra Nevada, and many of the lands affected are owned by public agencies, however, the state and federal governments have not established a clear and consistent plan for assessing and addressing the many problems associated with the impact of gold mining on public land. Public land managers such as regional Forest Service offices and BLM field offices are faced with costly environmental cleanup actions on severely limited budgets. Meanwhile, there are no incentives for voluntary private lands cleanup, and regulations regarding cleanup are not always consistent or understandable.

There are some specific challenges that need to be better understood:

- Mercury contamination behind federally owned on-stream impoundments in mining regions, such the Shasta Dam (Bureau of Reclamation, Central Valley Project) and Englebright Dam (Army Corps of Engineers), requires thoughtfully designed reservoir management practices to decrease methylation, mercury mobility, and reactivity. Accumulation of sediment contaminated with mercury behind some reservoirs requires dredging out this excess material to maintain water storage capacity. Dangers associated with this procedure include re-suspending and re-mobilizing toxins, and increasing mercury methylation.
- Flooding wetlands with mercury contaminated water can have a dramatic impact on mercury methylation. The design, construction, and management of wetlands to reduce methylation needs to be studied.
- Mine tailings and materials left over from dredging are not tested for arsenic or other heavy metals before being sold for aggregate. Though many of the materials dredged from reservoirs or left over from mining are known to be contaminated, the use of local aggregate fill is not effectively regulated for arsenic, mercury and other contaminants.

## **Recommendations for Action**

A strategic alignment among indigenous tribes, scientists, local landowners, businesses, government representatives, philanthropic, health and conservation organizations, and the community in the Sierra Nevada, based on mutual need and desire to find solutions, is the key to solving this vast problem. The Sierra Fund is calling for a new, strategic investment in research, education, and cleanup. State, federal, business and private philanthropic funding must be directed to the Sierra Nevada mining problem over the next several decades.

The Initiative's Gold Ribbon Panel of tribal leaders, watershed scientists, medical professionals, and community members has identified four activities to begin to address mining toxin issues (see list, attached). Effective implementation of these recommendations requires new institutional relationships and funding. Our Gold Ribbon Panel recommended the following objectives:

### **1. Increase Collaboration**

Improving collaboration among key governmental, academic, and medical institutions to stimulate the implementation of this Initiative is crucial.

**Action Recommended:** Support formation of a Mining Toxins Working Group including researchers: at the University of California and California State University; state and federal government land managers, regulators and scientists; tribal and local government; community leaders and others to ensure effective information exchange on these issues.

**2. Fund Strategic Research:** More information is needed on a number of issues in order to inform policy and develop best practices.

**Actions Recommended:** The federal government should develop grant programs to fund scientific inquiry by government, university and non-profit organizations, into the following topics:

1. To identify the most effective methods for assessing and cleaning up the pollution distributed throughout the region, including better deployment of existing technologies and development of new technologies and best management practices. This should include development of pilot research projects that explore methods for reducing methylmercury in the Sierra Nevada watershed, such as the project proposed by the Nevada Irrigation District to test new technology for removal of legacy "quicksilver" mercury from on-stream impoundments in the region. Pilot projects that include careful monitoring of wetlands restoration are needed to learn about what works on the ground.
2. To study exposure and the human health impacts resulting from exposure to mining toxins and naturally occurring toxic minerals disturbed during the Gold Rush. There needs to be a much better understanding of what, if any, epidemiological impacts this exposure is having on the residents of the Gold Country. Community monitoring of mining toxins using high-quality scientific

tools needs to be supported. The public needs access to all testing data in order to effectively participate in decisions about mine remediation.

### **3. Improve Outreach and Education on Human Health**

Awareness of the potential human health hazards associated with mining toxins needs to be increased dramatically.

**Action Recommended:** The federal government needs to improve regional medical education and outreach on the impacts of legacy mining toxins on public health, including mercury.

### **4. Reform, Enforce and Fund Government Programs**

The complexity of the mining toxin problem requires evaluation of scientific information and policy solutions among a number of agencies. The federal government should assess their publicly owned land for mining toxins and develop plans to clean up or contain these wastes from contaminating the land and water of the state. Additional funding is critically needed to clean up legacy mining contamination.

Solutions to the obstacles to cleanup of private lands must be developed and funding mechanisms for these identified. Legal mechanisms need to be explored to look for ways for downstream urban users to help pay for cleanup upstream in the Gold Country.

**Actions Recommended:** The following steps need to begin immediately:

1. Inventory, assess, and prioritize for remediation abandoned mines on all federally owned assets including those managed by the US Forest Service and Bureau of Land management. Funding for remediation in the area needs to be increased. Hazardous materials recovered from cleanups need to be carefully disposed. This process needs to work closely with stakeholders to ensure cultural sensitivity and community engagement.
2. Assess water projects, wetlands, reservoirs and other projects of the Bureau of Reclamation, Army Corps of Engineers and other federal agencies, and put programs in place that ensure best management practices and appropriate technologies that address mercury methylation concerns.
3. The Federal 1872 Mining Act needs to be reformed to require meaningful mitigation of cultural and environmental impacts from historic mining. Good Samaritan laws must be reformed to provide incentives for private land cleanup.
4. Support implementation of Phase 2 of the CALFED Mercury Strategy. The CALFED Mercury Strategy Phase I provided useful information, but the strategy has yet to be fully implemented. Follow-up is needed, including convening another panel of experts to revisit the Strategy, and to take a look at scientific and policy lessons learned.

## **In Conclusion**

California gold helped maintain the Union in the Civil War, sustained the nation during the banking “panics” of the late 19<sup>th</sup> century, and helped fight World Wars I and II. The Gold Rush brought immigrants to this country from all over the world with their strengths and dreams, and the attendant gifts of a culturally rich and diverse state.

This enormous contribution of wealth to the nation should be recognized, as well as the costs that this intensive extraction left in its wake. The nation owes the gold fields of California, the people displaced from them, and the people who live on the pollution left behind its support in cleaning up mining’s toxic legacy.

Thank you for this opportunity to tell you about our concerns about mining’s toxic legacy in California.

Sincerely,

A handwritten signature in black ink that reads "Elizabeth J. Martin". The signature is written in a cursive, flowing style.

Elizabeth “Izzy” Martin  
CEO  
The Sierra Fund

## Attachments:

1. Disclosure Requirement
2. TSF Mining Project Advisors
3. Abandoned Mines in California (Map)
4. *Mining’s Toxics Legacy* (Report, PDF)