



EPA

LAVA CAP MINE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY • REGION IX • SEPTEMBER 2000

Studies Indicate Arsenic is Primary Concern at Lava Cap Mine Superfund Site

This fact sheet summarizes the EPA's (U.S. Environmental Protection Agency's) initial findings of investigations at the Lava Cap Mine Superfund site in Nevada County, California (see Figure 1). The purpose of the investigations (called the Superfund Remedial Investigation, or RI) is to collect information to define the type and location of contamination at a Superfund site. Three sampling phases have been completed and the EPA will be conducting data evaluation and site characterization activities for the next few months. Now that the initial data collection component of the RI field program is nearing completion, the EPA will also initiate preparation of human health and ecological risk assessments for the site. The only contaminant consistently found at elevated concentrations at and associated with the Lava Cap Mine site is arsenic, although there are isolated areas with other constituents present above the EPA's screening levels.

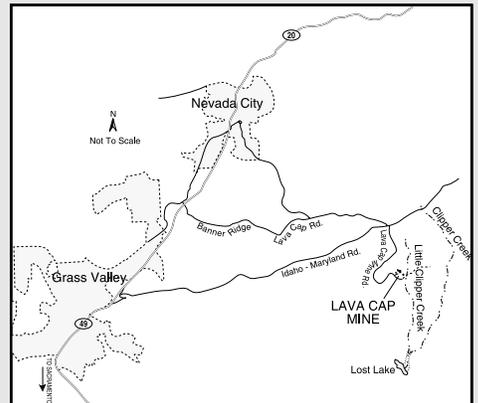


Figure 1: Lava Cap Mine Superfund site, Nevada County, California.

Summary of the Remedial Investigation Field Program and Preliminary Findings

Three sampling phases of the RI fieldwork have been completed since the Lava Cap Mine site was formally listed as a Superfund site. The first phase occurred in October and November 1999, the second in January 2000, and the third in May 2000. The EPA has not completed the evaluation and review of all the data generated during the three phases of RI fieldwork. This fact sheet presents preliminary findings for the first two sampling phases and some of the data from the third phase. The only contaminant consistently found

above the EPA's screening levels is arsenic, although there are some areas with other contaminants present above screening levels. The EPA uses screening levels as an initial indication of areas that may need to be addressed in developing cleanup alternatives for a site. The samples collected were all analyzed for a full range of metals and, except in limited instances, cyanide. Water

samples, except the residential wells, were also analyzed for hardness, anions, total dissolved solids, and alkalinity.

The 10 sampling areas referred to in the following section are shown on Figure 2. Table 1 presents a summary of the preliminary analytical results for arsenic from the fieldwork program.

The EPA will hold a community meeting in November, 2000 to provide more detailed information to residents on the RI findings.

Topics addressed in this fact sheet include:

- Summary of the Remedial Investigation Field Program and Preliminary Findings
- Site Background
- Technical Assistance Grant (TAG) Program Update
- Superfund Process
- Information on Arsenic

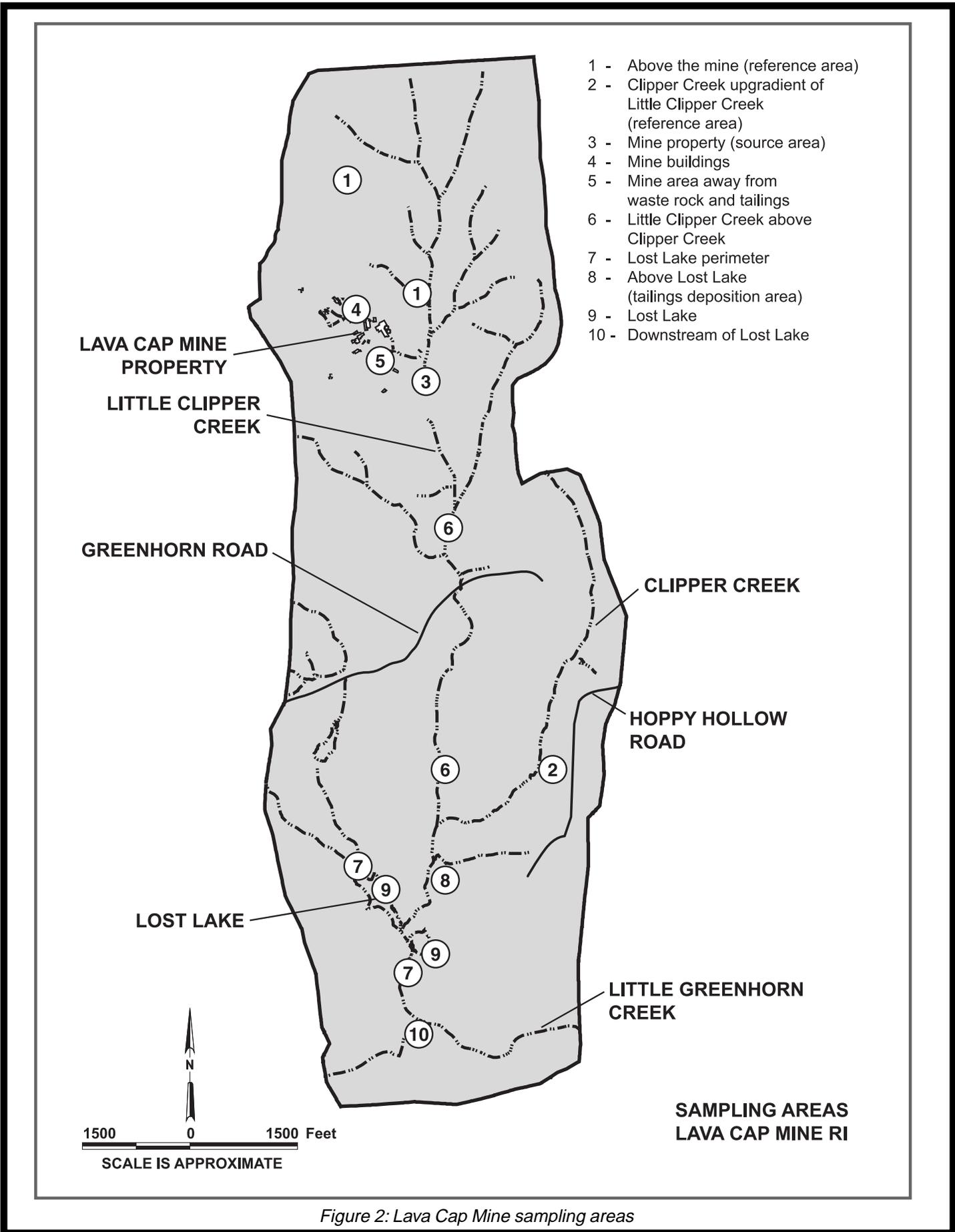


Figure 2: Lava Cap Mine sampling areas

Soil and Sediment

What EPA did: Surface soil was collected at locations upgradient of the mine and upgradient along Clipper Creek to characterize background conditions in the area. Background conditions are defined as the natural conditions in the area, and are used as a baseline for comparison with other sampling results. Surface soil was collected in the source areas (mine tailings and waste rock) at the mine, in and around the mine buildings, around the mine in areas away from the sources, along Little Clipper Creek, in the tailings deposition area above Lost Lake, around Lost Lake and along Clipper Creek downgradient of Lost Lake. Subsurface, or below ground, soil samples were collected upgradient of the mine to characterize background conditions, and at source areas at the mine and in the tailings deposition area above Lost Lake. Sediment samples were collected upgradient of the mine in Little Clipper Creek,

upgradient along Clipper Creek, and in Little Greenhorn Creek above its confluence with Clipper Creek, to characterize background conditions.

What was found? The highest concentrations of arsenic in soil are found in and around the old buildings on the mine property. Other metals, including antimony, cadmium, lead, manganese, and nickel, were also detected at concentrations higher than the EPA's screening levels in these areas. Arsenic concentrations in subsurface soil samples in the tailings deposition area and the tailings pile at the mine are elevated, with concentrations typically exceeding what is found at the ground surface. In the tailings deposition area, tailings are present from the ground surface down to the underlying bedrock (between 20-30 feet below ground). Nearly all of the surface soil samples from the source areas and vicinity at the mine property, down the Little Clipper Creek/Clipper Creek drainage below the mine prop-

ARSENIC CONCENTRATIONS [AVERAGE (MAXIMUM)]					
LOCATION	Surface soil/ parts per million	Subsurface soil/ parts per million	Sediment/ parts per million	Surface water/ parts per billion	Groundwater parts per billion
1) Above the mine [background]	20.7 (95.3)	1.6 (4.6)	25.8 (44.3)	<0.5 (0.5)	23.6 (36.7)
2) Clipper Creek upgradient of Little Clipper Creek [background]	13.1 (20)		13.2 (16)	<0.3 (1.1)	
3) Mine property source areas	1336 (2070)	857 (5360)	7856 (34000)	203 (567)	256 (567)
4) Mine buildings	6598 (31200)			2880 (14300)	
5) Mine area away from waste rock and tailings	350 (1750)				
6) Little Clipper Creek above Clipper Creek	599 (908)		669 (1150)	131.7 (285)	
7) Lost Lake perimeter	287 (848)				
8) Above Los Lake [tailings deposition]	446 (913)	1425 (2480)	616 (892)	245 (1160)	1175 (2410)
9) Lost Lake			976 (1140)	28.4 (70.6)	
10) Downstream of Lost Lake	471 (673)		660 (2110)	33.9 (72.3)	

Table 1: Summary of the preliminary analytical results for arsenic from the fieldwork program

erty, in the tailings deposition area above Lost Lake, around Lost Lake and downstream of Lost Lake, contain concentrations of arsenic above the EPA's screening levels. The arsenic concentrations in soil quickly drop off to background levels moving up slope from the surface waters and the Lost Lake shoreline. Sediment samples collected within the creek channels downstream of the mine and Lost Lake all contain concentrations of arsenic above the EPA's screening levels.

Groundwater

What EPA did: Seven groundwater monitoring wells (one upgradient, four at the mine site, and two in the tailings deposition area above Lost Lake) were installed and sampled. Four of the wells have been sampled three times since November 1999. Samples were also collected from residential wells at the mine site, and from selected residents' wells along the Little Clipper Creek drainage downstream of the mine and around Lost Lake. The residential wells were sampled in Fall 1999 and Spring 2000.

What was found? Groundwater from shallow monitoring wells beneath the tailings pile at the mine contains high concentrations of arsenic, over 400 parts per billion (ppb). The current federal drinking water standard is 50 ppb and the EPA has recently proposed lowering this standard to 5 ppb. The upgradient monitoring well contains arsenic, at concentrations of approximately 30 ppb. Arsenic concentrations of up to 2,000 ppb were detected in groundwater from the two monitoring wells installed in the tailings deposition area. Groundwater samples from these wells were taken above the bedrock in the tailings-impacted soils. One residential well below the mine contained arsenic at a concentration of approximately 30 ppb. All other residential wells sampled below the mine are within the federal drinking water standard for arsenic (i.e. arsenic was either not detected or detected at levels of less than 2 ppb).

Surface Water

What EPA did: Surface water samples were collected at background (upstream) locations above the mine in Little Clipper Creek and upgradient along Clipper Creek. At the mine, samples were collected from the mine adit (the horizontal passage from the ground surface into the old mine shaft) discharge, tailings pile seeps,

and water ponded in various locations, including within the mine buildings. Surface water samples were collected from Little Clipper Creek adjacent to and downstream of the mine, from Clipper Creek upstream and downstream from Lost Lake, from ponds in the tailings deposition area above Lost Lake, from Lost Lake, and from Little Greenhorn Creek near its confluence with Clipper Creek. If water was present, the surface water locations were sampled in all three sampling phases.

What was found? Background surface water does not contain elevated levels of arsenic. Ponded water from inside the mine buildings had the highest concentrations of arsenic and other metals (up to 14,300 ppb for arsenic). Arsenic concentrations in the discharge from the mine adit are in the 500 ppb range. Arsenic is present in Little Clipper Creek between the mine and Lost Lake at elevated concentrations. Concentrations are higher near the mine property and during the dry season and lower near Lost Lake and during the rainy season. Arsenic concentrations in ponds in the tailings deposition area above Lost Lake vary. The highest concentrations (over 1,000 ppb) are found in the permanent pond near the confluence of Little Clipper and Clipper Creeks. Arsenic concentrations just below the Lost Lake dam are similar to those found in Lost Lake and decline moving downstream. None of the samples collected downstream from the base of the Lost Lake dam have exceeded 50 ppb. Arsenic is present in Lost Lake, although the concentrations are lower than in the creeks and are generally below the current drinking water standard of 50 ppb.

Air

What EPA did: Air samples were collected to characterize potential exposure to contaminants from dust transport and to assess potential impacts from dust during possible cleanup action activities. Air samples were collected in Fall 1999 and Spring 2000 adjacent to a residence at the mine, in the source areas at the mine, in the mine buildings, in the tailings deposition area above Lost Lake, and adjacent to Lost Lake.

What was found? Arsenic was detected in one of the air samples collected in Fall 1999 at the mine property. Data evaluation is not yet complete for the additional air samples collected in May and June 2000.

Ecological

What EPA did: An ecological investigation was conducted to characterize contaminant concentrations in water (aquatic) and land (terrestrial) species. Samples were collected of insects, plants, fish, small mammals and frogs. Samples were collected from the following areas: background locations upgradient of the mine and upgradient along Clipper Creek, source areas at the mine, in and around the mine buildings, in and adjacent to Little Clipper Creek downstream of the mine, in the tailings deposition area, in and adjacent to Clipper Creek upstream and downstream of Lost Lake, and in Lost Lake. All ecological sampling was performed during the May 2000 sampling phase. Samples of surface water, sediment, and soil samples were collected for testing using various species to assess the potency of chemicals present in background and impacted areas in the Lava Cap Mine vicinity.

What was found? Analytical data from the ecological sampling have not yet been evaluated.

Technical Assistance Program (TAG) Update

In March 2000, the EPA received a Technical Assistance Grant (TAG) application from the Lava Cap Mine Superfund Coalition, which is comprised of three local organizations: the South Yuba River Citizens League, the Greenhorn Road Association, and the Banner Mountain Home Owners Association. A TAG helps a community become involved in the Superfund cleanup process and the selection of a final cleanup remedy. The grant provides funding to hire an independent technical advisor to examine and explain technical issues about the site, and to support the grantee's community outreach efforts. The EPA anticipates awarding the TAG to the Lava Cap Mine Superfund Coalition by the end of September 2000.

For additional information about the Lava Cap Mine Superfund Coalition, please contact Shawn Garvey, South Yuba River Citizens League at 530-265-5961; Email: syrcl@syrcl.org

For additional information about the TAG program, please contact Don Hodge at 415-744-2427 or 800-231-3075; Email: hodge.don@epa.gov.

Information about the TAG program is available at the Nevada County and Grass Valley libraries and on the Internet at: <http://www.epa.gov/superfund/tools/tag/index.htm>.

Superfund Process

After the EPA has listed a site on the NPL, the next phase of activity is to complete the RI and Feasibility Study (FS), collectively known as the RI/FS. If necessary, the EPA may also conduct removal actions concurrent with the ongoing RI/FS process. At the Lava Cap Mine site, the EPA is currently completing the RI. The overall goals of the RI at the Lava Cap Mine site are to characterize site conditions, collect sufficient data to determine the nature and extent of contamination, and support informed risk management decisions regarding human health and the environment. Following evaluation of the information gathered during the RI, potential remedial alternatives will be addressed in the FS. The FS will develop, screen, and provide detailed evaluations of alternative remedial actions. During the RI/FS process, the EPA concurrently performs enforcement activities and implements community involvement activities. The RI/FS process at the Lava Cap Mine site will lead to a Record of Decision (ROD) that will select the environmental cleanup actions necessary to mitigate risks to human health and the environment from contamination at the Lava Cap Mine site.

Information on Arsenic

What is arsenic? Arsenic is an element found in nature at low levels. It is found mostly in compounds with oxygen, chlorine, and sulfur. These are called inorganic arsenic compounds. Arsenic in plants and animals combines with carbon and hydrogen, and is called organic arsenic. Organic arsenic is usually less harmful than inorganic arsenic. Most arsenic compounds can dissolve in water. Arsenic doesn't break down, but can change from one form to another. Fish and shellfish build up organic arsenic in their tissues, but most of the arsenic in fish is not toxic.

What are the health effects of being exposed to arsenic? The effects of exposure to any substance depend on the amount you are exposed to, how long you are exposed, how you are exposed, personal traits and habits, and whether other chemicals are present.

In general, inorganic arsenic is a human poison; organic arsenic is less harmful. High levels of inorganic arsenic (60 parts per million, or ppm) in food or water can be fatal. Arsenic can damage many tissues including nerves, stomach, intestines, and skin. Lower levels of arsenic exposure may cause nausea, blood vessel damage, and a “pins and needles” sensation in hands and feet. Long term exposure to inorganic arsenic may lead to a darkening of the skin and the appearance of small corns or warts on the palms, soles, and torso. The Department of Health and Human Services has determined that arsenic is a known carcinogen. Breathing inorganic arsenic increases the risk of lung cancer and ingesting inorganic arsenic increases the risk of skin cancer and tumors of the bladder, kidney, liver, and lungs.

How much arsenic is too much? The EPA sets limits on the amount of arsenic that industrial sources can release, and has restricted or canceled many uses of arsenic in pesticides and may restrict more. The EPA’s current limit for arsenic in drinking water is 50 ppb, but a lower standard of 5 ppb has been proposed.

Where can I find more information? The Agency for Toxic Substances & Disease Registry has produced a fact sheet on arsenic. Copies are available in the information repositories listed below or on the Internet at: www.atsdr.cdc.gov/tfacts2.html.

SITE BACKGROUND

The Lava Cap Mine occupies approximately 30 acres in a rural residential area of California’s Sierra Nevada foothills. The mine is bordered on the north, south, east, and west by forests and low-density residential housing. There are several structures on the mine property including a former mill, former cyanide treatment facility, miscellaneous old mine buildings, and several residences.

Gold and silver mining activities were initiated at the site in 1861.

The Lava Cap Mine was largely inactive from 1918 to 1933, at which time mining activities were resumed and an on-site flotation plant was built to process the ore and recover the concentrates which were shipped offsite for smelting. In 1940, a cyanide plant was built and used to recover mine middlings and tailings. On-site operations continued until 1943.

During a major winter storm in January 1997, the upper portion of the on-site log dam collapsed, releasing over 10,000 cubic yards of tailings into Little Clipper Creek. Extensive deposits of tailings were observed in and along Little Clipper Creek, in Clipper Creek below its confluence with Little Clipper Creek, and around Lost Lake.

During October and November 1997, the EPA removed tailings from just upstream of the damaged log dam and stockpiled them on the waste rock pile immediately to the north of the tailings pile. The slopes of the tailings pile immediately behind the dam were graded, the entire tailings pile was covered with waste rock, and stream diversions were created around the tailings pile. In February 1998, the EPA conducted additional work at the mine to address another tailings release and improve drainage.

In February 1999, the EPA formally added the site to the National Priorities List (NPL) in February 1999. The NPL is the list of hazardous waste sites identified for further investigation and possible cleanup response using money from the Trust Fund established under the Superfund law. The purpose of the investigation activities, called the Superfund Remedial Investigation, or RI, is to collect information to define the type and the extent of contamination at a Superfund site.

Information Repositories

The EPA will place copies of pertinent documents related to the Lava Cap Mine Superfund site RI/FS at the locations listed below. The documents at the information repositories are part of the Administrative Record for the Lava Cap Mine Superfund site.

Superfund Records Center

(the most extensive collection of documents)

95 Hawthorne Street, Suite 403S

San Francisco, CA 94105

Telephone: 415-536-2000

Nevada County Library

980 Helling Way

Nevada City, CA 95959

Telephone: 530-265-7050

Grass Valley Public Library

206 Mill Street

Grass Valley, CA 95945

Telephone: 530-273-4117

New site team members

Dave Seter will be transitioning onto the Lava Cap Mine site team over the next few months as the new Project Manager, replacing Michelle Schutz. As of August 2000, Don Hodge is the new Community Involvement Coordinator for the Lava Cap Mine site, replacing Catherine McCracken. Contact information for EPA staff is on the back page of this fact sheet.

Additional information is available on the Internet:

EPA Region 9 Solid & Hazardous Waste Programs:
www.epa.gov/region09/waste

EPA Region 9:
www.epa.gov/region09

EPA Superfund Program:
www.epa.gov/superfund

EPA Superfund Program/Information for Communities:
www.epa.gov/superfund/citizens/index.htm

EPA Headquarters:
www.epa.gov

The Nevada County Department of Environmental Health Home Page has a link set up to connect you to information about the Lava Cap Mine Superfund site. You will find the link on their Home Page at: www.co.nevada.ca.us/ehealth/welcome.htm under the "Federal Activities in Nevada County" section.



MAILING LIST COUPON

If you did not receive this fact sheet in the mail and would like to be included on the mailing list to receive future EPA mailings about the Lava Cap Mine Superfund site, please fill out the coupon and return to the address below.



**Don Hodge, Community Involvement Coordinator, U.S. Environmental Protection Agency, Region 9,
75 Hawthorne Street (SFD-3), San Francisco, CA 94105**

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or via fax: 415/744-1796

FOR ADDITIONAL COPIES OF THIS FACT SHEET OR FOR OTHER INFORMATION ON THE
LAVA CAP MINE SUPERFUND SITE, PLEASE CONTACT:

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Email: seter.david@epa.gov

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Community Involvement Coordinator

Telephone: 415-744-2427

Fax: 415-744-1796

Email: hodge.don@epa.gov

U.S. Environmental Protection Agency, Region 9,
75 Hawthorne Street (SFD-3), San Francisco, CA 94105-1309.

Or, you may leave a message on the EPA's Office of Community Involvement toll-free line at
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