

Division of Public Health, Section of Epidemiology

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## Mercury, Gold Mining, and Health

### Introduction

Mercury is an element that occurs naturally in varying forms and concentrations throughout the earth. Elemental mercury (also known as metallic mercury) — the shiny, silver colored, liquid metal at room temperature — is one form of mercury that gold miners may come across in historical mining areas where it was used to recover gold. Some modern miners still use mercury to recover placer gold.

Some mercury that was used in the past can still be found in the environment today. Mercury attaches itself to gold in different amounts; often it's present but not visible. Heating gold concentrate that may contain small amounts of mercury can produce mercury vapors that can harm your health and pollute the environment.

*If you're a gold seeker, please read the following information to protect your health, the health of those around you, and the environment.*

### How is mercury used in small-scale gold mining?

The most common practice used in small-scale mining to separate gold from ore is mercury amalgamation. This process involves combining mercury with silt that contains pieces of gold. The mercury binds to the flakes of gold and forms a solid mercury-gold amalgam. The amalgam is then heated to vaporize and capture the mercury in an enclosed retort oven, leaving the gold behind.



Gold pan with tiny beads of mercury and gold flakes



Jar with metallic mercury

### How can mercury get into the body from gold mining?

When gold concentrate containing mercury or mercury-gold amalgam is heated, mercury vapors are released into the air, which — if not properly contained — can be breathed in by miners and those nearby. When you breathe in mercury vapors, about 80 to 85 percent of the mercury enters your bloodstream directly from your lungs, and then rapidly goes to other parts of your body, including the brain and kidneys. Once in your body, metallic mercury can stay for weeks or months. Mercury in the blood of pregnant women can pass through to her developing child.

Direct skin contact with elemental mercury is less of a health concern because it cannot readily go through intact skin. However, if proper safety procedures are not followed, you can easily spread mercury contamination to anything you touch (e.g., clothes, food, other parts of your body) and to others. For this reason, you should never handle mercury with your bare hands.

### **How can mercury harm my health?**

High exposure to mercury vapor is very dangerous, and can cause permanent brain, kidney, and lung damage. Unborn babies and young children are especially sensitive to the toxic effects of mercury because of their developing brain and nervous systems. Short-term exposure to high levels of mercury vapors can cause lung damage, nausea, vomiting, diarrhea, increased blood pressure and heart rate, skin rashes, and eye irritation. Long-term exposure to lower levels can cause health effects that develop gradually, such as tremors, headaches, sleeping problems, memory loss, irritability, poor coordination, and changes in vision and hearing.

Children and pregnant women should stay far away from mercury-related activities to minimize their exposure.

### **How does the use of mercury in gold mining harm the environment?**

Mercury used in gold amalgamation, if improperly used, can be released into the environment as a liquid or a vapor. Mercury remains in the environment for a long time as it cycles through air, water, sediment, and living things.

Mercury vapors released into the air can travel long distances before settling into waterways and soils. Bacteria in the environment can convert this mercury into an even more toxic form called methylmercury, which can bioaccumulate (build up) in the food chain and get into fish and animals, and people who eat those fish and animals.

### **Recommendations for small-scale gold miners**

1. Avoid direct contact with mercury. If you cannot avoid direct contact with mercury, wear gloves at all times.
2. Avoid using mercury to separate gold from ore.
3. Avoid exposure to mercury vapors.
4. Miners who choose to heat gold concentrate or mercury-gold amalgam should:
  - Never heat it indoors or in an enclosed space such as a tent; doing so may result in dangerously high levels and contaminate the surroundings.
  - Never heat it around pregnant women or children.
  - Properly use a retort to greatly reduce exposure to mercury vapors.
5. Miners who have any contact with mercury should shower/bathe thoroughly and change their clothes before coming in contact with other people, especially pregnant women and children.
6. Avoid washing mercury-contaminated clothing in a washing machine because it can contaminate other clothes and the septic system, and release mercury into the air.
7. Place all mercury and mercury waste, such as paper towels, newspapers, and gloves in a sealed container like a jar inside of a plastic bag.
8. Properly dispose of mercury-contaminated clothing, towels, and other items. See <http://www.epa.gov/mercury/spills/> for more information.

### **Contacts**

For health-related questions and concerns, contact:

Alaska Division of Public Health, Environmental Public Health Program, (907) 269-8000.