Pollution Prevention Fact Sheet
Mercury
Utah Department of Environmental Quality
Promoting a Healthy Environment

INTRODUCTION TO MERCURY

Mercury, known as quicksilver, or Hg (for hydrargyrum, the Latin name for the element), is a heavy, silver, metallic liquid at room temperature. While it is a naturally occurring element that is present throughout the environment, its concentration in surface water bodies has increased in recent decades. For years, mercury was mined from the earth in the solid form as the ore cinnabar (HgS), and was converted to metallic mercury by roasting or heating it in the presence of air or lime. In the United States, coal-fired power plants are the biggest source of mercury emissions to the air. Today, mercury is supplied domestically from secondary suppliers, with over 400 tons being produced and sold back into the marketplace annually, according to the U.S. Geological Survey, Mineral Commodity Summaries (1997). The toxicity of mercury makes it necessary to keep it contained and controlled from releases and spills, but the properties of mercury make it useful worldwide, as evidenced by many different applications in hospitals, schools, laboratories, industry and the home.

EFFECTS OF MERCURY ON HEALTH AND THE ENVIRONMENT

Mercury is toxic by ingestion, inhalation and skin absorption with acute and chronic exposure effects including central nervous system and kidney damage. Acute exposure includes nausea, blurred vision, painful breathing, excessive salivation and pneumonitis, while chronic or longer-term exposure includes memory disturbance, hypertension, vision problems, hallucinations, tremors and personality changes. Because mercury can cross the blood-brain barrier, and because it can affect brain development, its effects are of special concern to pregnant or lactating women and young children. For this reason, many states, as well as the Environmental Protection Agency (EPA), have issued fish consumption advisories. Many of these advisories are directed towards pregnant or lactating women and young children, or are more strict for these populations, due to concerns over developmental disabilities in infants from mercury exposure.

MERCURY IN HOUSEHOLDS

Mercury can be found in a variety of household items. When liquid mercury is spilled, it forms droplets that can accumulate in the tiniest places; these droplets can emit vapors into the air that we cannot see or smell. Mercury vapor in the air can be very toxic. Families have been poisoned from mercury spills in the home which have been improperly cleaned up. Children are at highest risk. The small amount of mercury in fever thermometers, thermostats and fluorescent bulbs is not

likely to cause serious health problems, but it should be cleaned up.

Mercury Containing Devices In The Home	Pollution Prevention and Recycling Options
Mercury Thermostats	Replace with electronic thermostats. Recycle old thermostats.
Mercury Thermometers	Replace with digital thermometers or alcohol (red bulb) thermometers. Recycle old thermometers.
Mercury-Containing Switches	Replace with mechanical or electric switches such as motion sensors. Recycle old switches.
Batteries	Replace with mercury-free batteries. Recycle old batteries.

MERCURY IN SCHOOLS

Schools do not constitute one of the largest sources of mercury to the environment. However, they are places where mercury and children may come together, and where appropriate health and environmental protection behaviors should be modeled. Schools can also be catalysts for reducing mercury in homes of their students (and staff). Most high schools and middle schools have had one or more mercury spills involving elemental mercury, thermometers, sphygmomanometers or barometers.

GOVERNMENT MERCURY REDUCTION PROJECTS

Interested in having a mercury reduction program in your area? You can do many things to help decrease the amount of mercury entering the environment in your area. The most common programs are mercury thermometer exchange programs, mercury collection days, public education about mercury issues, and mercury reduction pledges for businesses and organizations.

MERCURY AND FISH CONSUMPTION

When mercury enters water bodies from the air through dry deposition or when washed down in rainfall, biological processes transform it into a highly toxic form that builds up in fish and animals that eat fish, called methylmercury. This process of building up in fish is known as bioaccumulation. Fish ingest mercury in their food sources or absorb it from their surroundings, but their systems are unable to flush it out of their bodies as fast as it is taken in. The result is a steady increase of mercury over time in the edible tissue of the fish, to potentially toxic levels. Most states issue a mercury advisory for fish from lakes and streams with excessive mercury levels. Fish from these water bodies should be consumed with caution. Marine fish, such as shark, swordfish and other predatory species should also be consumed with caution.

FLUORESCENT LIGHTS AND MERCURY

Mercury is an essential ingredient for most energy-efficient lamps. Fluorescent lamps and high intensity discharge (HID) lamps are the two most common types of lamps that utilize mercury. Fluorescent lamps provide lighting for most schools, office buildings and stores. HID lamps, which include mercury-vapor, metal halide and high-pressure sodium lamps, are used for street lights, floodlights and industrial lighting. A typical fluorescent lamp is composed of a phosphor-coated glass tube with electrodes located at either end. The tube contains mercury, of which only a very small amount is in vapor form. When a voltage is applied, the electrodes energize the mercury vapor, causing it to emit ultraviolet (UV) energy. The phosphor coating absorbs the UV energy, causing the phosphor to fluoresce and emit visible light. Without the mercury vapor to produce UV energy, there would be no light. A four-foot fluorescent lamp has an average rated life of at least 20,000 hours. To achieve this long life, lamps must contain a specific quantity of mercury. The amount of mercury required is very small, typically measured in milligrams, and varies by lamp type, date of manufacture, manufacturing plant and manufacturer.

Fluorescent lamps are an excellent lighting choice because they use up to 50% less energy than other lamps. This reduces the amount of mercury produced at the power plant, where mercury is given off by coal and oil combustion. Thus, even though incandescent bulbs contain no mercury, their inefficient energy use results in more mercury being released to the environment. However, it is essential that fluorescent lamps are disposed of properly, so as not to allow the mercury to enter the environment. The best disposal method is recycling.

A new type of long-life fluorescent lamp has been developed which contains such a small amount of mercury that it is no longer considered a hazardous waste. The typical fluorescent lamp has a lot of "extra" mercury in it because mercury loses its effectiveness over time due to physical and chemical reactions. This new lamp has a buffering system that blocks these physical and chemical reactions so that the lamp contains less than 10 mg. of mercury. These lamps should still be recycled.

Caution should be taken to avoid lamp breakage. Breakage may result in mercury released into the environment. Lamp recyclers also generally require that the lamps arrive unbroken. The best way to protect them is putting old lamps into the boxes the new lamps came in or boxes from a lamp recycler.

WHAT TO DO IF A MERCURY SPILL OCCURS

When liquid mercury spills, it breaks into small drops. Any disturbance causes the mercury to break into even smaller droplets. As the droplets become smaller, the mercury vaporizes and can be easily inhaled. Even a very small quantity of mercury spilled in a room will produce vapor concentrations that are dangerous to human health. Small amounts of mercury - a broken thermometer, for example - may pose only a nominal hazard and be relatively simple to clean up safely. Any spill beyond 1.0 kg. or 2.2 lbs. must be reported to the EPA. Follow these guidelines for safe disposal:

In case of a very small spill (such as breakage of a fever thermometer):

Try to ventilate the room to outside air and close the room off from the rest of the house. Promptly turn off central heating or cooling systems. Be sure to seal the heating and air-conditioning ducts. If available use fans for a minimum of one hour to help ventilate the room. Pick up the mercury with an eye dropper or scoop up beads with a piece of paper and place it in a sealable plastic zipper bag, a plastic or glass jar or bottle and tightly close the lid. Use any non-metallic material to clean up scattered mercury beads - a suitable scraper and dustpan can be constructed from a plastic soda bottle or similar container. Leave the recovered mercury in the room where the spill occurred. Then, call your local health department for the nearest approved mercury disposal location. If the disposal location is not available, wrap the mercury and broken glass in plastic or newspaper and dispose of it with other household solid waste.

When cleaning up a very small mercury spill:

DO NOT use household products to clean up the spill - particularly Windex®, Formula 409®, bleach or similar cleansers containing ammonia or chlorine. They will react violently with mercury, releasing toxic gases.

DO NOT attempt to clean up the mercury by sweeping or by using a vacuum cleaner. Never use a household vacuum cleaner because it causes the metallic mercury to vaporize in the air, creating greater health risks. And, you may have to dispose of the vacuum cleaner later.

DO NOT place contaminated garments in a washing machine or clothes dryer or combine with other clothing. Instead, place contaminated garments in a plastic bag and then seal the bag before ensuring proper disposal.

DO NOT wash mercury into drains.

If the spill is more than a few drops:

Immediately evacuate everyone from the room where the spill occurred and close the doors. Do not touch the spilled mercury, or breathe mercury vapors. Stop or contain the spilled material if it is possible without risking contact with skin or clothing. Promptly turn off central heating or cooling systems. Do not allow people into the room. It is recommended that you retain a professional environmental cleanup firm with the training and equipment to safely accomplish the removal. If the spill is one pound or more, you are required by law to report the incident to the EPA National Response Center, 1-800-424-8802. Report all mercury releases to your local Utah Department of Health office and if more than 1 kilogram (2.2 lbs.) the Department of Environmental Quality, 1-800-458-0145. Contact your health and safety personnel if the spill occurs at work or school. Call your local county health department or poison control center for professional help and answers to health questions. Mercury absorbent kits may be available with the local health departments.

DISPOSAL OF MERCURY AND MERCURY CONTAINING PRODUCTS

For most small quantities of mercury found in households, disposal is best accomplished by

contacting your local health department for information on household hazardous waste programs in your area. These programs accept all forms of household hazardous waste including mercury. Your local landfill may also have a household hazardous waste facility in the county where you reside.

The disposal of large quantities of mercury and mercury containing materials is best achieved by contacting one of the commercial recycling companies listed at the website: http:// www.deq.state.mi.us/ead/p2sect/mercury.

For More Information, Contact:

Division of Solid & Hazardous Waste- (801) 538-6170.
Environmental Hotline (800) 458-0145
Pollution Prevention Coordinator (801) 536-4477

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