



Steve Mason, EPA Region 6  
E-Mail: mason.steve@epa.gov

Angie Rothen, Weston Solutions  
E-Mail: angie.rothen@westonsolutions.com

From Angie and Steve:

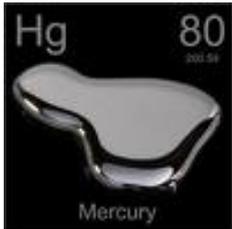
We have expanded our e-mailing list for those receiving our Update. If you receive this Update from a secondary source, and would like to receive it directly from us, please send me an email:

mason.steve@epa.gov

I hope you find the articles in each Update useful for your work in the LEPC / EPCRA arena.

## In this Issue:

- Mercury: What is it, where does it come from, am I exposed and how do I get rid of it?, Pages 2-4
- How do I clean up a small mercury spill?, Pages 4-7
- Mercury Specific Laws, Page11
- What are the states in EPA Region 6 doing with their mercury? , Page11



### *Mercury: What is it, where does it come from, am I exposed, and how do I get rid of it?*

**Forms of mercury.** Mercury is a naturally occurring element that is found in air, water and soil. It exists in several forms: elemental or metallic mercury, inorganic mercury compounds, and organic mercury compounds.

Elemental or metallic mercury is a shiny, silver-white metal and is liquid at room temperature. It is used in thermometers, fluorescent light bulbs and some electrical switches. When dropped, elemental mercury breaks into smaller droplets which can go through small cracks or become strongly attached to certain materials.

At room temperature, exposed elemental mercury can evaporate to become an invisible, odorless toxic vapor. People can be exposed to elemental mercury vapor when products that contain mercury break and expose mercury to the air, particularly in poorly-ventilated spaces.

Organic mercury compounds, such as methylmercury, are formed when mercury combines with carbon.

Microscopic organisms convert inorganic mercury into methylmercury, which is the most common organic mercury compound found in the environment. Methylmercury accumulates up the food chain.

Inorganic mercury compounds take the form of mercury salts and are generally white powder or crystals, with the exception of mercuric sulfide (cinnabar) which is red.



Inorganic mercury compounds have been included in products such as fungicides, antiseptics or disinfectants. Some skin lightening and freckle creams, as well as some traditional medicines, can contain mercury compounds.



**Sources of mercury.** Mercury is an element in the earth's crust. Humans cannot create or destroy mercury.

Pure mercury is a liquid metal, sometimes referred to as quicksilver that volatilizes readily. It has traditionally been used to make products like thermometers, switches, and some light bulbs.

Mercury is found in many rocks including coal. When coal is burned, mercury is released into the environment. Coal-burning power plants are the largest human-caused source of mercury emissions to the air in the United States, accounting for over 40 percent of all domestic human-caused mercury emissions.

EPA has estimated that about one quarter of U.S. emissions from coal-burning power plants are deposited within the contiguous U.S. and the remainder enters the global cycle.



Burning hazardous wastes, producing chlorine, breaking mercury products, and spilling mercury, as well as the improper treatment and disposal of products or wastes containing mercury, can also release it into the environment.

Current estimates are that less than half of all mercury deposition within the U.S. comes from U.S. sources.

**Exposure to mercury.** Mercury in the air eventually settles into water or onto land where it can be washed into water. Once deposited, certain microorganisms can change it into methylmercury, a highly toxic form that builds up in fish, shellfish and animals that eat fish. Fish and shellfish are the main sources of methylmercury exposure to humans.

Methylmercury builds up more in some types of fish and shellfish than others. The levels of methylmercury in fish and shellfish depend on what they eat, how long they live and how high they are in the food chain.



### Methylmercury exposure

For fetuses, infants, and children, the primary health effect of methylmercury is impaired neurological development.

Methylmercury exposure in the womb, which can result from a mother's consumption of fish and shellfish that contain methylmercury, can adversely affect a baby's growing brain and nervous system. Impacts on cognitive thinking, memory, attention, language, and fine motor and visual spatial skills have been seen in children exposed to methylmercury in the womb.

Recent human biological monitoring by the Centers for Disease Control and Prevention in 1999 and 2000 (PDF) shows that most people have blood mercury levels below a level associated with possible health effects. More recent data from the CDC support this general finding.

In addition to the subtle impairments noted above, symptoms of methylmercury poisoning may include; impairment of the peripheral vision; disturbances in sensations ("pins and needles" feelings, usually in the hands, feet, and around the mouth); lack of coordination of movements; impairment of speech, hearing, walking; and muscle weakness.

People concerned about their exposure to methylmercury should consult their physician.

### Elemental mercury exposure

When elemental mercury is spilled or a device containing mercury breaks, the exposed elemental mercury can evaporate and become an invisible, odorless toxic vapor.



This is especially true in warm or poorly-ventilated rooms or spaces. Sources of potential exposure to elemental mercury are described below.

Elemental or metallic mercury is the liquid metal used in thermometers, barometers, and thermostats and other electrical switches. Metallic mercury is often found in school laboratories as well as in thermometers, barometers, switches, thermostats, and other devices found in school science labs.



It is not uncommon for children to break fever thermometers in their mouths. Mercury that is swallowed in such cases poses low risk compared to the risk of breathing mercury vapor.

There are some necklaces imported from Mexico that contain a glass pendant that contains mercury. The mercury-containing pendants can come in various shapes such as hearts, bottles, balls, saber teeth, and chili peppers. If broken, they release metallic mercury to the environment.

Mercury is used in dentistry in dental amalgam. Dental amalgam is a direct filling material used in restoring teeth. It is made up of approximately 40-50% mercury, 25% silver and 25-35% a mixture of copper, zinc and tin.



Amalgam use is declining because the incidence of dental decay is decreasing and because improved substitute materials are now available for certain applications.

The Centers for Disease Control and Prevention (CDC) reports that, at present, there is scant evidence that the health of the vast majority of people with dental amalgam is compromised, nor that removing amalgam fillings has a beneficial effect on health.

More information is available at: <http://www.cdc.gov/OralHealth/publications/factsheets/amalgam.htm>

## Inorganic and organic mercury compound exposure

High exposures to inorganic mercury may result in damage to the gastrointestinal tract, the nervous system, and the kidneys. Both inorganic and organic mercury compounds are absorbed through the gastrointestinal tract and affect other systems via this route. However, organic mercury compounds are more readily absorbed via ingestion than inorganic mercury compounds.

Symptoms of high exposures to inorganic mercury include: skin rashes and dermatitis; mood swings; memory loss; mental disturbances; and muscle weakness. People concerned about their exposure to inorganic mercury should consult their physician.

**Ritual Use of Mercury** - Persons who use metallic mercury in ethnic folk medicine and for religious practices may be at risk of exposure to mercury. Metallic mercury is sold under the name "azogue" in stores (sometimes called botanicas), which specialize in religious items used in Esperitismo (a spiritual belief system native to Puerto Rico), Santeria (a Cuban-based religion that venerates both African deities and Catholic saints), and voodoo.

The use of azogue in religious practices is recommended in some Hispanic communities by family members, spiritualists, card readers, and santeros. Typically, azogue is carried on one's person in a sealed pouch prepared by a spiritual leader or sprinkled in the home or automobile.

## Spills, Disposal and Site Cleanup

Humans use mercury in a variety of manufacturing processes and products such as thermometers and fluorescent bulbs. If you improperly dispose of products with mercury in them, they may break and release mercury vapors which are harmful to human and ecological health.



- Dispose of used mercury-containing items properly.
- Clean up mercury spills properly and report them to the proper authorities when necessary.

## What Never to Do with a Mercury Spill

- Never use a vacuum cleaner to clean up mercury (but see the "What to Do if a Fluorescent Light Bulb Breaks" section below for more specific instructions about vacuuming broken fluorescent light bulbs).

The vacuum will put mercury into the air and increase exposure.



- Never use a broom to clean up mercury. It will break the mercury into smaller droplets and spread them.
- Never pour mercury down a drain. It may lodge in the plumbing and cause future problems during plumbing repairs. If discharged, it can cause pollution of the septic tank or sewage treatment plant.



- Never wash clothing or other items that have come in direct contact with mercury in a washing machine, because mercury may contaminate the machine and/or pollute sewage. Clothing that has come into direct contact with mercury should be discarded. By "direct contact," we mean that mercury was (or has been) spilled directly on the clothing. For example:



- if you broke a mercury thermometer and some of elemental mercury beads came in contact with your clothing, or
- if you broke a compact fluorescent bulb (CFL) so that broken glass and other material from the bulb, including mercury-containing powder, came into contact with your clothing.

- You can, however, wash clothing or other materials that have been exposed to the mercury vapor from a broken CFL, like the clothing you happened to be wearing when you cleaned up the broken CFL, as long as that clothing has not come into direct contact with the materials from the broken bulb.



- Never walk around if your shoes might be contaminated with mercury. Contaminated clothing can also spread mercury around.

### Mercury: What to if a Fluorescent Light Bulb Breaks

Compact fluorescent lights (CFLs) are lighting more homes than ever before, and EPA is encouraging Americans to use and recycle them safely.

Carefully recycling CFLs prevents the release of mercury into the environment and allows for the reuse of glass, metals and other materials that make up fluorescent lights.



#### Before Clean-up: Ventilate the Room

1. Have people and pets leave the room, and don't let anyone walk through the breakage area on their way out.
2. Open a window and leave the room for 15 minutes or more.
3. Shut off the central forced-air heating/air conditioning system, if you have one.

## Clean-Up Steps for Hard Surfaces

- Carefully scoop up glass fragments and powder using stiff paper or cardboard and place them in a glass jar with metal lid (such as a canning jar) or in a sealed plastic bag.
- Use sticky tape, such as duct tape, to pick up any remaining small glass fragments and powder.
- Wipe the area clean with damp paper towels or disposable wet wipes and place them in the glass jar or plastic bag.



Do not use a vacuum or broom to clean up the broken bulb on hard surfaces.

## Clean-up Steps for Carpeting or Rug



- Carefully pick up glass fragments and place them in a glass jar with metal lid (such as a canning jar) or in a sealed plastic bag.
- Use sticky tape, such as duct tape, to pick up any remaining small glass fragments and powder.
- If vacuuming is needed after all visible materials are removed, vacuum the area where the bulb was broken.

Remove the vacuum bag (or empty and wipe the canister), and put the bag or vacuum debris in a sealed plastic bag.

## Disposal of Clean-up Materials

- Immediately place all cleanup materials outside the building in a trash container or outdoor protected area for the next normal trash.
- Wash your hands after disposing of the jars or plastic bags containing clean-up materials.
- Check with your local or state government about disposal requirements in your specific area. Some states prohibit such trash disposal and require that broken and unbroken mercury-containing bulbs be taken to a local recycling center.



## Future Cleaning of Carpeting or Rug: Ventilate the Room During and After Vacuuming



- The next several times you vacuum, shut off the central forced-air heating/air conditioning system and open a window prior to vacuuming.
- Keep the central heating/air conditioning system shut off and the window open for at least 15 minutes after vacuuming is completed.

## Mercury, What to Do if a Mercury Thermometer Breaks

*NOTE: these instructions also apply to spills from other sources, if the amount spilled is less than or similar to the amount in a thermometer (see [specific information above about how to clean up broken fluorescent bulbs](#))*

- Have everyone else leave the area; don't let anyone walk through the mercury on their way out. Make sure all pets are removed from the area. Open all windows and doors to the outside; shut all doors to other parts of the house.
- DO NOT allow children to help you clean up the spill.
- Mercury can be cleaned up easily from the following surfaces: wood, linoleum, tile and any similarly smooth surfaces.
- If a spill occurs on carpet, curtains, upholstery or other absorbent surfaces, these contaminated items should be thrown away in accordance with the disposal means outlined below. Only cut and remove the affected portion of the contaminated carpet for disposal.

### Items needed to clean up a small mercury spill:

1. 4-5 ziplock-type bags
2. trash bags (2 to 6 mm thick)
3. rubber, nitrile or latex gloves
4. paper towels
5. cardboard or squeegee
6. eyedropper
7. duct tape, or shaving cream and small paint brush
8. flashlight
9. powdered sulfur (optional)

### Cleanup Instructions

1. Put on rubber, nitrile or latex gloves.
2. If there are any broken pieces of glass or sharp objects, pick them up with care. Place all broken objects on a paper towel. Fold the paper towel and place in a zip lock bag. Secure the bag and label it as directed by your local health or fire department.



3. Locate visible mercury beads. Use a squeegee or cardboard to gather mercury beads. Use slow sweeping motions to keep mercury from becoming uncontrollable.
4. Take a flashlight, hold it at a low angle close to the floor in a darkened room and look for additional glistening beads of mercury that may be sticking to the surface or in small cracked areas of the surface. Note: Mercury can move surprising distances on hard-flat surfaces, so be sure to inspect the entire room when "searching."
5. Use the eyedropper to collect or draw up the mercury beads. Slowly and carefully squeeze mercury onto a damp paper towel.
6. Place the paper towel in a zip lock bag and secure. Make sure to label the bag as directed by your local health or fire department.



7. After you remove larger beads, put shaving cream on top of small paint brush and gently "dot" the affected area to pick up smaller hard-to-see beads. Alternatively, use duct tape to collect smaller hard-to-see beads. Place the paint brush or duct tape in a zip lock bag and secure.
8. Make sure to label the bag as directed by your local health or fire department.



9. OPTIONAL STEP: It is OPTIONAL to use commercially available powdered sulfur to absorb the beads that are too small to see. The sulfur does two things:
  - it makes mercury easier to see since there may be a color change from yellow to brown and
  - it binds mercury so that it can be easily removed and suppresses vapors of missing mercury.



Where to get commercialized sulfur? It may be supplied as mercury vapor absorbent in mercury spill kits, which can be purchased from laboratory, chemical supply and hazardous materials response supply manufacturers.

**Note:** Powdered sulfur may stain fabrics a dark color. When using powdered sulfur, do not breathe in the powder as it can be moderately toxic. Additionally, users should read and understand product information before use.

10. If you choose not to use this option, you may want to request the services of a contractor who has monitoring equipment to screen for mercury vapors. Consult your local environmental or health agency to inquire about contractors in your area.
11. Place all materials used with the cleanup, including gloves, in a trash bag. Place all mercury beads and objects into the trash bag. Secure trash bag and label it as directed by your local health or fire department.
12. Contact your local health department, municipal waste authority or your local fire department for proper disposal in accordance with local, state and federal laws.

- Remember to keep the area well ventilated to the outside (i.e., windows open and fans in exterior windows running) for at least 24 hours after your successful cleanup. Continue to keep pets and children out of cleanup area. If sickness occurs, seek medical attention immediately.
- For additional information on health effects, the Agency for Toxic Substances and Disease Registry (ATSDR) provides a Mercury Fact Sheet that also presents information on health effects related to exposures to vapors from metallic mercury.



**Recommendation:** If there are young children or pregnant women in the house, seek additional advice from your local or state health or state environmental agency.

### Spills of More than the Amount in a Thermometer, but Less Than or Similar to Two Tablespoons (One Pound)

#### Cleanup Instructions

- Have everyone else leave the area; don't let anyone walk through the mercury on their way out.
- Open all windows and doors to the outside.
- Turn down the temperature.
- Shut all doors to other parts of the house, and leave the area.

*Don't vacuum !!*

- Call your local or state health or environmental agency.

### Spills of More than Two Tablespoons (One Pound)

Any time one pound or more of mercury is released to the environment, it is mandatory to call the National Response Center (NRC). The NRC hotline operates 24 hours a day, 7 days a week.

Call (800) 424-8802.

Note that because mercury is heavy, only two tablespoons of mercury weigh about one pound.

### Storing, Transporting and Disposing of Mercury



#### What to Do if You Have Mercury in Your Home

Many people have containers of elemental mercury in their homes left over from science projects or other sources. If you have elemental mercury in your home, you need to exercise extreme caution with it and package it to prevent any leaks or spills.

See the next two sections of this page to find how to package, transport and dispose of mercury.

#### Packaging Mercury for Storage and Transportation

- All mercury-containing products or containers of mercury should be placed inside a larger container with a tight fitting lid.
- Kitty litter or oil-absorbent matter should be placed around the product to protect it from breaking or sudden shocks.



- Clearly label storage container as "Mercury - DO NOT OPEN."
- If you must wait for a hazardous waste collection day, store products safely in their original containers with the labels intact, and keep them out of reach of children and pets.
- Transport container to a household hazardous collection center in a cardboard box. Secure them so that they do not tip over. This will minimize shifting or sliding during sudden stops or turns.
- Transport containers in the back of a pick-up truck or in a car trunk. If you must transport in the passenger compartment, make sure there is adequate ventilation.



## Disposal

Many states and local agencies have developed collection/exchange programs for mercury-containing devices, such as thermometers, manometers, and thermostats, and recycling programs for fluorescent light bulbs.

Some counties and cities also have household hazardous waste collection programs. For information about these programs, contact your local officials to find out when and where a collection will be held in your area. Earth911 also provides information about local collection programs.

Households are generally exempt from Resource Conservation and Recovery Act (RCRA) regulations that govern the transportation, storage and disposal of hazardous wastes that contain mercury, but small and large businesses and industries are not exempt.

Their mercury wastes are governed under EPA's Land Disposal Restrictions (LDR) Program. EPA has designated some widely generated hazardous wastes, including certain spent batteries, pesticides, mercury-containing equipment and light bulbs, as "universal wastes".

The regulations that govern universal wastes include special management provisions intended to facilitate the recycling of such materials.

Note that some states and local jurisdictions have elected to pass regulations that are more stringent than the federal hazardous waste regulations. Several states and municipalities do not recognize the exemption for households; others regulate all fluorescent bulbs as hazardous, regardless of their mercury content.

For example, Vermont bans all mercury-containing waste from landfills, including mercury-containing waste generated by households. For more information specific to your state, contact your state or local environmental regulatory agency.

## Hazardous Waste Site Cleanup

### Cleaning Up Superfund and Other Hazardous Waste Sites Where Mercury is Present

At site cleanups of active facilities or abandoned hazardous waste sites, mercury presents significant environmental challenges because it is difficult to treat, exists in many different forms, is volatile, and can be difficult to analyze. Some mercury contamination sites are also contaminated with oils, radioactive materials and organic compounds that present technical challenges.

Cleaning up mercury contamination at active facilities or at abandoned hazardous waste sites and preparing the land for redevelopment or redeployment happens in a variety of EPA programs.

EPA is improving the coordination, speed, and effectiveness of cleanups at the nation's contaminated sites through the One Cleanup Program.

This Program is EPA's vision for how different cleanup programs at all levels of government can work together to meet that goal – and ensure that resources, activities, and results are effectively coordinated and communicated to the public.



EPA accomplishes this work in partnership with state, local and tribal governments and responsible parties.

For more information about the various cleanup programs managed by EPA, click on the following links:

### EPA Cleanup and Redevelopment Programs

- Superfund is the Federal government's program to clean up the nation's uncontrolled hazardous waste sites.
- RCRA Corrective Action is the program responsible for the cleanup of hazardous waste contamination that may occur as a result of accidents or other activities at active facilities managing hazardous wastes. Most states are authorized to implement the Corrective Action Program, and they use it as a tool to address the cleanup and revitalization of our nation's hazardous waste sites.
- EPA's Federal Facilities Restoration and Reuse Office facilitates cleanups at federal facilities, such as Department of Defense and Department of Energy properties.
- EPA's Brownfields program facilitates assessment and cleanup of abandoned or under-utilized sites where actual or potential contamination and liability may be impeding development.
- EPA's Technology Innovation Office advocates more effective, less costly approaches (i.e. "smarter solutions") by government and industry to assess and clean up contaminated waste sites, soil, and groundwater.
- EPA's Office of Emergency Management implements portions of The Emergency Planning and Community Right-to-Know Act (EPCRA). EPCRA establishes requirements for federal, state and local governments, Indian tribes and industry regarding emergency planning and "Community Right-to-Know" reporting on hazardous and toxic chemicals.

### Mercury Response Guidebook (for Emergency Responders)

The *Mercury Response Guidebook*, by EPA's Emergency Response Team and EPA Region 5, is designed to assist emergency and remedial professionals coordinate and clean up indoor mercury spills. The principles in this guidebook can also be used at other mercury-contaminated sites.

<http://www.epa.gov/mercury/spills/index.htm>

### State mercury programs in Region 6



Arkansas - The Arkansas Department of Environmental Quality has a Mercury Switch Removal Program, which can be found at:

[www.adeq.state.ar.us/solwaste/branch\\_programs/wt\\_mercury\\_switch\\_program.htm](http://www.adeq.state.ar.us/solwaste/branch_programs/wt_mercury_switch_program.htm)

They also have a general guidance document at:

[www.adeq.state.ar.us/ftp/ftproot/Pub/pa/Brochures\\_Online/05\\_Hazardous%20Waste/What%20You%20Need%20to%20Know%20about%20Mercury%20Brochure.pdf](http://www.adeq.state.ar.us/ftp/ftproot/Pub/pa/Brochures_Online/05_Hazardous%20Waste/What%20You%20Need%20to%20Know%20about%20Mercury%20Brochure.pdf)

Louisiana - The Louisiana Department of Environmental Quality (LDEQ) has developed a website for their mercury initiative program:



[www.deq.louisiana.gov/portal/Default.aspx?tabid=287](http://www.deq.louisiana.gov/portal/Default.aspx?tabid=287)

Included in this site is awareness information, their mercury risk reduction plan, educational presentations, a list of mercury recyclers, and advisories.



New Mexico - The New Mexico Environment Department has several white papers, fish consumption advisories, their mercury reduction plan, and mercury regulations, for this information go to their website at

[www.nmenv.state.nm.us/](http://www.nmenv.state.nm.us/)

and search for mercury in their search engine.

Oklahoma - Oklahoma Department of Environmental Quality has a number of general guidance documents on mercury



These can be viewed at:

[www.deq.state.ok.us/factsheets/](http://www.deq.state.ok.us/factsheets/)



Texas - The Texas Commission on Environmental Quality has mercury guidance for Texas residents on their website

This guidance is located at:

<http://www.tceq.state.tx.us/assistance/hhw/mercury.html>

## Region 6 LEPC Coordinators

Arkansas	Kenny Harmon	501-683-6700	<a href="mailto:kenny.harmon@adem.arkansas.gov">kenny.harmon@adem.arkansas.gov</a>
Louisiana	Gene Dunegan	225-925-6113	<a href="mailto:gene.dunegan@dps.la.gov">gene.dunegan@dps.la.gov</a>
New Mexico		505-476-9681	
Oklahoma	Tom Bergman	405-702-1013	<a href="mailto:tom.bergman@deqmail.state.ok.us">tom.bergman@deqmail.state.ok.us</a>
Texas	Paula McKinney Jim Ogden	800-452-2791 512-424-5677	<a href="mailto:paula.mckinney@dshs.state.tx.us">paula.mckinney@dshs.state.tx.us</a> <a href="mailto:jim.ogden@txdps.state.tx.us">jim.ogden@txdps.state.tx.us</a>

## Emergency Numbers for Spill Reporting in Region 6

Arkansas Dept. of Emergency Management	800-322-4012
Louisiana State Police	877-925-6595
New Mexico State Police	505-827-9126
Oklahoma Dept. of Environmental Quality	800-522-0206
Texas Environmental Hotline	800-832-8224
*****	
National Response Center	800-424-8802
EPA Region 6	877-372-7745
CHEMTREC	800-424-9300