

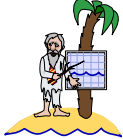
Municipal Mercury Pollution Prevention




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Discussion Topics

- I. Mercury Facts and Sources
- II. Universal Waste Regulations
- III. Mercury-Containing Products Typically Used by Municipalities
- IV. Managing Municipal Products
- V. Conclusion



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I. Mercury Facts and Sources




80	200.59
357	1.5
Hg	
-38.72	
[Xe]4f ¹⁴ 5d ¹⁰ 6s ²	
13.6	1.2



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Mercury Facts


- Silver-colored liquid metal at room temperature.
- Easily vaporizes to the atmosphere.
- Does not break down in the environment.
- Nerve toxin that can impair sight, hearing and speech.
- Used in household and commercial products and industrial processes.

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Mercury Facts


- Mercury deposited in lakes or waterways is converted to methyl mercury by bacteria.
- Methyl mercury contaminates food chain by building up in fish and consumers of fish.
- Two-thirds of atmospheric mercury is from coal burning power plants and incinerators.
- Remaining mercury comes from natural sources (e.g., oceans, rocks and soils).




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Mercury Facts

- Mercury was used in the gold extraction process during California's Gold Rush.
 - Most was washed into San Francisco Bay.
- About 1,220 kilograms of mercury enter San Francisco Bay each year.
 - Bed Erosion- 460 kg/yr
 - Urban Stormwater Runoff- 160 kg/yr
 - Guadalupe River Watershed- 92 kg/yr- mercury mines



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Mercury Facts

- South San Francisco Bay and the Guadalupe River Watershed have been listed as “impaired” under Section 303(d) of the Clean Water Act.
- Water Board staff is considering adopting a Total Maximum Daily Load (TMDL) to resolve mercury impairment.
- TMDLs are actions to restore clean water.

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Major Sources of Mercury Contributing to Urban Runoff



- Municipal and public agency buildings/activities
- Incinerators
- Some manufacturing plants
- Hospitals
- Dental offices
- Schools
- Households

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II. Universal Waste Regulations



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What is a Universal Waste?

- A hazardous waste that is more common and poses a lower risk to people and the environment than other hazardous wastes.
- Federal and State regulations were adopted to simplify how universal wastes are managed.
- California Department of Toxic Substances Control adopted the California Universal Waste Rule.

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Mercury-Containing Universal Wastes

- Mercury thermostats
- Electric lamps (e.g., fluorescent, HIDs, etc.)
- Mercury switches
 - Motor vehicle light switches
 - Non-automotive



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Mercury-Containing Universal Wastes

- Rubber Flooring (e.g., older gymnasium floors)
- Mercury thermometers
- Pressure or vacuum gages
- Dilators and weighted tubing
- Mercury-added novelties



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Mercury-Containing Universal Wastes

- Mercury gas flow regulators
- Dental amalgam wastes
- Counterweights and dampers





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Universal Waste Regulations

- Since February 9, 2006, if you do not recycle a universal waste, it must be managed as a hazardous waste in accordance with DTSC regulations.

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Universal Waste Regulations

- The following mercury-containing products are listed as hazardous unless recycled:
 - Mercury-added novelties
 - Thermostats
 - Thermometers
 - Dental amalgam




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Universal Waste Regulations

- Pressure or vacuum gauges
- Dilators and weighted tubing
- Counterweights and dampers
- Gas flow regulators
- Rubber flooring




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Universal Waste Regulations


- All discarded fluorescent lamps (including low mercury lamps) and mercury-containing thermostats are listed as hazardous unless recycled.
- Other products (non-automotive) that contain mercury switches are listed as hazardous until the mercury switches are removed.
 - (Note: HHW collection agencies recommend that consumers should NOT remove mercury switches from products).

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Universal Waste Regulations

- Vehicles that contain mercury switches are hazardous waste until the mercury switches are removed.




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Universal Waste Regulations

- Households and Conditionally Exempt Small Quantity Generators prohibited from disposing fluorescent lamps, mercury batteries and mercury thermostats in trash.
- Other requirements relating to total volumes generated apply.

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III. Mercury-Containing Products



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Activities and Locations

Mercury-containing products may be found/used in:

- Construction/demolition activities
- Custodial/janitorial activities
- General maintenance
- Vehicle fleet/service



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Activities and Locations

Mercury-containing products may be found/used in:

- Laboratories
- Offices
- Industrial facilities
- Households





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Mercury-Containing Products

Municipalities typically use the following mercury-containing products:

- Lamps
- Switches and relays
- Thermostat probes
- Thermoelectric devices





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Mercury-Containing Products

Municipalities typically use the following mercury-containing products:

- Thermometers
- Paints and glues
- Old pesticides
- Pressure or vacuum gauges



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Lamps

- Fluorescent, mercury vapor, high intensity discharge (HID) electric lamps contain mercury and must be managed as a universal waste.
- Other examples of common universal waste electric lamps include, but are not limited to, metal halide, high-pressure sodium and neon lamps.



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Lamps

- By volume, most likely the largest mercury-containing waste generated by municipalities.
- One hundred fluorescent lamps contain about 4 grams of mercury.



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Switches and Relays

Mercury switches are found in:

- Building security systems
- "Silent" wall switches
- Airflow/fan limit controls
- Fire alarm box switches
- Temperature controls
- Pressure controls



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Switches and Relays

- Float controls (sump and bilge pumps)
- Tilt switches in or under washing machine and chest freezer lids
- Motion/position sensitive safety switches in clothes irons and space heaters
- Automobile trunk and hood light switches
- Welding
- Wetted reed relay



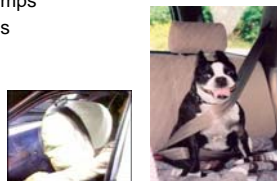
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Switches and Relays

Relays that include mercury switches control:

- Some automatically adjusting suspension systems
- Power to heaters or pumps
- Some seat belt systems
- Anti-lock brakes
- Airbags



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Switches and Relays

- One mercury switch contains about 3.5 grams of mercury.
- Mercury switches may be found in some agricultural equipment, mass transit vehicles and fire hook and ladder equipment.




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Thermostat Probes

Mercury-containing thermostat probes (e.g. flame sensors or gas safety valves) may be found in the following gas-fired appliances that have pilot lights:

- Ranges
- Ovens
- Clothes dryers
- Water heaters
- Furnaces
- Space heaters





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Thermoelectric Devices

Mercury-containing thermoelectric devices include:

- Portable refrigeration units
- Small food coolers/warmers that plug into cigarette lighters of automobiles
- Small-scale applications with small cooling demands (e.g., cooling electronic components)





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Thermometers

Mercury thermometers are used to measure air and water temperature in:

- Outdoor recreation activities (recreational anglers)
- Businesses/Institutions
- Medical facilities
- Laboratories
- Households





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Paints and Glues


Mercury maybe a constituent of:

- Gold porcelain paint
- Corrugated cardboard glue
- High heat orange paint
- Check Material Safety Data Sheets




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Old Pesticides




- Certain pesticides manufactured before 1995 are known to contain mercury.
- Check Material Safety Data Sheets


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Pressure or Vacuum Gauges

Mercury-containing instruments include:

- Blood pressure gauges
- Barometers
- Hydrometers
- Manometers
- Pyrometers



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IV. Managing Municipal Products



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Suggested Practices and Control Measures

Guidelines/Methods:

- Continue to implement the Program's *Guidelines for Mercury-Containing Products Reduction and Management*.
- Adopt a Mercury Virtual Elimination policy, procedure or ordinance in accordance with the Mercury Plan.

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Suggested Practices and Control Measures

Guidelines/Methods:

- Determine the high priority mercury-containing products to address within your agency.
- Identify management options available for virtual elimination of the prioritized products.
- Prioritization should be based on the potential to provide a source of mercury to urban runoff, likelihood of municipal use and controllability.

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Suggested Practices and Control Measures

Mercury-containing Product Purchasing and Use

- Substitute mercury-containing products with reduced-mercury and/or mercury-free products.
- Educate municipal staff about mercury-containing products and processes.
- Purchase only what is needed for use in the near future.



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Suggested Practices and Control Measures

Mercury-containing Product Storage & Maintenance

- Provide mercury spill kits and store kits near mercury-containing products.
- Educate employees on the use of mercury spill kits.
- Minimize quantities of mercury-containing products stored on-site.



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Suggested Practices and Control Measures

Mercury-containing Product Storage & Maintenance

- Store fragile mercury-containing products in a way that will prevent them from breaking (e.g., boxes).
- If stored products are accidentally broken, store them in a sealed container.
- Clearly mark boxes and the storage area.



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Suggested Practices and Control Measures

Mercury-containing Product Recycling

- Recycle unwanted mercury-containing products in accordance with DTSC guidelines.
- Remove mercury-containing components from appliances and vehicles and store properly.
- Do not remove switches from thermostats.



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Suggested Practices and Control Measures

Mercury-containing Product Recycling

- Contact wholesalers and ask if they offer a take-back program to collect used mercury-containing products.
- Save invoices that track the recycling of mercury-containing products and operate in accordance with DTSC regulations.

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Suggested Practices and Control Measures

Mercury-containing Product Disposal

- Dispose of mercury-containing products as hazardous waste in accordance with DTSC regulations
- Save invoices that track the proper disposal (in accordance with DTSC regulations) of your mercury-containing products.
- Recycling mercury-containing products reduces your regulatory burden!

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Mercury Outreach Materials

- "Keep Your Business Safe from Mercury"- Fluorescent tube/bulb recycling for businesses. (http://watershedwatch.net/Mercury_business.htm)
- "Keep Your Family and Water Safe from Mercury"- Fluorescent tube/bulb recycling for residents. (<http://watershedwatch.net/Mercury.asp>)
- Preventing Mercury Pollution- Information for Small Businesses"- City of Sunnyvale.
- "Tailgate Safety Topic-Mercury"-Information Sheet

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V. Conclusion

- Mercury-containing products are hazardous waste unless recycled.
- Properly store mercury-containing products destined for recycling.
- Identify management options available for virtual elimination of mercury-containing products.
- Minimize mercury releases from all controllable sources.



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