

# Report for Congress

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## **Mercury in Products and Waste: Legislative and Regulatory Activities to Control Mercury**

**May 12, 2003**

Linda G. Luther  
Environmental Policy Analyst  
Resources, Science, and Industry Division

# Mercury in Products and Waste: Legislative and Regulatory Activities to Control Mercury

## Summary

Mercury is a highly volatile, naturally-occurring element. It is a potent neurotoxin that can cause brain, lung, and kidney damage. Mercury also has properties that make it useful in a variety of household, medical, and industrial products and processes. It is a component in such products as thermometers, fluorescent lamps, electrical switches, dental fillings, and batteries. This report discusses the health effects of mercury, how it is released into the environment, and current federal and state activities and recent legislative activity in Congress to control mercury releases into the environment.

Human-related activities have significantly changed the natural distribution of mercury in the environment. For example, mercury is released during manufacturing processes or when mercury-containing products are ultimately discarded as waste. Significant sources of mercury include coal-burning power plants, cement manufacturing operations, and the incineration of municipal, hazardous, and medical wastes. (For a discussion of air emissions of mercury, see CRS Report RL31881.)

After mercury vapors enter the air, they are ultimately converted to the highly toxic methylmercury. Exposure to methylmercury can cause a wide array of health problems, including damage to the brain and central nervous system. Potential sources of human exposure to mercury include eating fish or shellfish contaminated with methylmercury, breathing mercury vapor from spills or a contaminated workplace, or absorbing mercury through dental work.

Both federal and state regulations govern the use of mercury in products and manufacturing processes. Federal regulation is done under the authority of several statutes and multiple agencies. Regulations are intended to control releases of mercury to the environment, reduce or eliminate the use of mercury in products, or specify disposal requirements. Also, the U.S. Environmental Protection Agency (EPA) has established voluntary efforts and education outreach programs aimed at reducing the use of mercury in products and manufacturing processes and at better managing mercury-containing wastes.

Recent legislative activity by states has gone beyond the health-based criteria associated with the use or disposal of particular products. Instead, many states are trying to reduce the problems associated with mercury by restricting its use altogether. For example, some states have banned mercury use or required warning labels on certain mercury-containing products. Some states have also implemented recycling or disposal requirements for certain types of mercury-containing products.

Recent legislative activity at the federal level has mirrored activities undertaken by many states. Bills introduced in the 108<sup>th</sup> Congress seek to reduce the use of mercury in such products as thermometers, lighting products, and dental fillings, and to provide warning labels on mercury-containing products. Legislation has also been proposed requiring that mercury-containing waste be removed from the waste stream before incineration. This report will be updated as events warrant.

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# Mercury in Products and Waste: Legislative and Regulatory Activities to Control Mercury

## Background

Mercury is a highly volatile, naturally-occurring element. It is a potent neurotoxin that can cause brain, lung, and kidney damage. Mercury exists in three forms: elemental (metallic), organic, and inorganic. All forms of mercury are toxic, but the degree to which it is toxic to humans depends on the form it takes. This report discusses the health effects of mercury, how it is released into the environment, and current federal and state activities and recent legislative activity in Congress to control mercury releases into the environment.

Elemental mercury is distributed throughout the environment naturally by such processes as volcanic activity, movement of rivers, lakes, and streams, and biological processes. Since the industrial revolution, the distribution of mercury has changed significantly due to human-related (anthropogenic) activities. For example, elemental mercury is used in manufacturing processes, such as the production of chlorine gas and caustic soda (known as chlor-alkali production). It may also be an added ingredient in detonating devices, cosmetics, pharmaceuticals, blood pressure devices, electrical switches, thermometers, fluorescent lights, dental fillings, and batteries. During such processes, the use or accidental spill of mercury allows it to vaporize. Once it is released into the atmosphere, elemental mercury may undergo a photochemical reaction that transforms it into inorganic mercury.

Inorganic mercury vapors are introduced to the environment through additional anthropogenic sources, such as, coal-burning power plants, mining operations, cement manufacturing operations, and the incineration of municipal, hazardous, and medical wastes. Inorganic mercury may also migrate to water or soil after mercury-containing wastes are disposed of on land.

When airborne, inorganic mercury is eventually deposited on land or into water, where it may be transformed into the highly toxic *organic* form, methylmercury. This process, which is not completely understood, is known as methylation. Methylation is a microbial process controlled by certain bacteria and enhanced by chemical and environmental variables, such as the presence of organic matter and oxygen.<sup>1</sup> Methylmercury poses a particular risk because it concentrates in animal tissue as it moves up the food chain, a process known as bioaccumulation.

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<sup>1</sup> Mark E. Brigham, David P. Krabbenhoft, and Pixie A. Hamilton, "Mercury in Stream Ecosystems-New Studies Initiated by the U.S. Geological Survey," U.S. Department of the Interior, U.S. Geological Survey, March 2003.

**Health Effects of Mercury.** The health effects of mercury on humans depend on the form of mercury and the intensity and length of time of exposure.<sup>2</sup> Humans may be exposed to mercury by breathing its vapors, through ingestion, or by absorption through the skin. The nervous system is sensitive to all forms of mercury. Exposure to elemental mercury vapors and to methylmercury is more harmful than others because the mercury in these forms is capable of reaching the brain and potentially causing permanent damage.<sup>3</sup> Selected health effects of mercury, specific to each form, are summarized in **Table 1**.

**Table 1. Selected Health Effects of Mercury**

<b>Mercury Type</b>	<b>Primary Exposure Route</b>	<b>Health Impacts</b>
Elemental	Vapor inhalation and absorption through the lungs; readily enters the bloodstream and crosses the blood-brain barrier	Short-term exposure to high levels can damage the lungs, long-term exposure to low levels can cause neurological damage.
Inorganic	Ingestion and absorption through the gastrointestinal tract	Potentially toxic to the kidneys; neurological and behavioral disorders possible.
Organic (Methylmercury)	Ingestion and rapid and extensive absorption through the gastrointestinal tract; readily enters the bloodstream and crosses the blood-brain barrier	Highly toxic and potentially damaging to the nervous system, especially in the developing nervous system of a fetus or child under six.

**Source:** Table prepared by the Congressional Research Service (CRS) based on data from the U.S. Health and Human Services, Agency for Toxic Substances and Disease Registry and Centers for Disease Control and Prevention and from the U.S. Environmental Protection Agency (EPA), December 1997 “Mercury Study Report to Congress.”

Human exposure to mercury would likely come from one or more of the following sources:

- Eating fish or shellfish contaminated with methylmercury;
- Breathing vapor from mercury spills (e.g., from broken fever thermometers) or contaminated workplace air (e.g., dental or health services industries that use mercury-containing devices or chlor-alkali plants); and
- Absorbing mercury through dental work or medical treatments.

<sup>2</sup> “Second National Report on Human Exposure to Environmental Chemicals,” U.S. Health and Human Services, Centers for Disease Control and Prevention, January 2003, available online at [<http://www.cdc.gov/exposurereport/metals/index.htm>].

<sup>3</sup> U.S. Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry “ToxFAQs” on Mercury, April 1999.

**Mercury in Products and Waste.** Mercury conducts electricity, is liquid at room temperature, combines easily with other metals, and expands and contracts evenly with temperature changes. These properties make mercury useful in a variety of household, medical, and industrial products and processes. For example, mercury is an added component in electrical switches, thermostats, cosmetics, pharmaceuticals, dental amalgams, scientific instruments, thermometers, and mercury vapor lamps (e.g., fluorescent or high intensity discharge lamps). In 2001, manufacturers within the United States used between 200 and 300 metric tons of mercury as part of their manufacturing processes or to create products that rely on mercury's properties.<sup>4</sup>

While coal-fired power plants are the greatest *single* source of air emissions of mercury, significant mercury releases to air, land, and water are also attributed to the use of mercury in products and manufacturing processes. In such cases, mercury is released during manufacturing, either from processes where the mercury is exposed to air or when mercury-containing products are broken while in use. Mercury releases also occur when mercury-containing products are ultimately discarded as waste, either through land disposal or incineration. (For a discussion of air emissions of mercury, see CRS Report RL31881, "Mercury Emissions to the Air: Background and Legislative Proposals.")

Currently there are limited choices for the management of mercury-containing wastes. Essentially, it can be incinerated, disposed of or stored long-term on land, or recycled. Each option ultimately returns the mercury to the environment. As an element, it does not degrade and cannot be eliminated from the waste cycle once it is introduced. It can only change forms.

## **Federal and State Regulation of Mercury**

Both federal and state regulations govern the use of mercury in products and manufacturing processes. Those requirements regulate mercury either directly or indirectly.<sup>5</sup> Regulations with a "direct" impact on mercury involve restrictions or requirements related to the use or release of mercury in products or manufacturing processes. For example, the regulations promulgated under the Resource Conservation and Recovery Act (RCRA, 42 U.S.C. 321) established handling and disposal requirements for mercury-containing wastes.

The "indirect" regulation of mercury is achieved through setting health and risk-based environmental standards. Environmental standards specify maximum acceptable mercury concentration limits for certain media. Mercury limits that have been established include those for groundwater and drinking water, fish tissue, and mercury-containing waste disposed of in landfills. Standards indirectly regulate mercury because they do not specify *how* a certain limit must be achieved. For

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<sup>4</sup> U.S. EPA's "2002 Great Lakes Binational Toxics Strategy -Annual Progress Report 2002," released in March 2003.

<sup>5</sup> This delineation of regulatory categories is discussed by EPA in its report "Background Information on Mercury Sources and Regulations," available online at [<http://www.epa.gov/grtlakes/bnsdocs/mercsrce/mercreg.html>], undated.

example, the maximum contaminant level for mercury in drinking water, established under the Safe Drinking Water Act (42 U.S.C. 300f), is .002 milligrams per liter.<sup>6</sup> It is left up to public water systems to determine how they will reduce mercury concentrations if they are above this level.

**Federal Regulation of Mercury.** Federal regulation of mercury is done under the authority of several statutes. Regulations to control releases of mercury to the environment are generally centered around health-based criteria. Regulations may also serve to reduce or eliminate the use of mercury in products or to specify disposal requirements. For example, RCRA and the Clean Air Act (42 U.S.C. 7401) have provisions intended to reduce or control releases of hazardous constituents to the environment, including mercury. Also, limitations on mercury-added products have been specified in regulations promulgated under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA, 7 U.S.C. 135) and the Federal Food, Drug, and Cosmetic Act (FFDCA, 21 U.S.C. 301).

The regulation of mercury also falls under more than one agency's jurisdiction. For example, EPA regulates mercury in pesticides, and mercury releases to air, water, and land. The Food and Drug Administration (FDA) regulates mercury in drugs, cosmetics, food, and dental products. The Occupational Safety and Health Administration (OSHA) regulates mercury air exposures in the workplace. Federal requirements regulating mercury are summarized in **Table 2**.

**Table 2. Federal Regulation of Mercury**

<b>Statutory Authority</b>	<b>Requirements Regarding the Use or Release of Mercury Pursuant to Attendant Regulations</b>
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) 7 U.S.C. 135 (1972)	Banned or phased out the use of mercury in paints and certain pesticides.
Federal Food, Drug, and Cosmetic Act (FFDCA) 21 U.S.C. 301	<ul style="list-style-type: none"> <li>• Limits the use of mercury as an antimicrobial or preservative in cosmetics.</li> <li>• Regulates the use of mercury in dental amalgams.</li> </ul>
Food and Drug Administration Modernization Act of 1997 (FDAMA) Amended 21 U.S.C. 301	Required FDA to compile a list of drugs and foods that contain intentionally introduced mercury compounds, and provide a quantitative and qualitative analysis of the mercury compounds in the list.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund) 42 U.S.C. 9601 (1980)	Requires that mercury spills of one or more pounds be reported to the National Response Center.

<sup>6</sup> 40 CFR 141.62

Clean Water Act 33 U.S.C. 1251 (1977)	Requires a permit system to regulate industrial discharges to surface water. Permits may assign a facility a specific mercury discharge limit or require them to monitor and report on mercury discharges.
Emergency Planning and Community Right-to-Know Act (EPCRA, Title III of Superfund Amendments and Reauthorization Act) 42 U.S.C.9601 (1986)	<ul style="list-style-type: none"> <li>• Establishes reporting requirements for accidental and intentional releases.</li> <li>• Establishes requirements to report inventory information to state and local authorities.</li> <li>• Requires facilities to submit a report to the Toxics Release Inventory when they manufacture, process, or otherwise use 10 pounds or more of mercury.</li> </ul>
Resource Conservation and Recovery Act (RCRA) 42 U.S.C. 321 (1976)	<ul style="list-style-type: none"> <li>• Establishes disposal requirements for wastes that contain mercury (e.g., thermometers, medical &amp; dental wastes, and mercury switches).</li> <li>• Allows states to adopt less stringent “Universal Waste Rules” if certain often-used, mercury-containing wastes are recycled (i.e., thermostats, fluorescent and high-intensity discharge lamps, and batteries).</li> </ul>
Mercury-Containing Rechargeable Battery Management Act (Battery Act) 42 U.S.C 14301 (1996)	Phased out the use of mercury in batteries; established labeling, collection and recycling, and disposal requirements for certain regulated batteries.
Occupational Safety and Health Act 29 U.S.C. 651 (1970)	Sets permissible exposure levels for mercury in workplace settings.
Clean Air Act 42 U.S.C. 7401 (1970)	Establishes emission limits for selected sources of mercury emissions, such as medical waste and solid waste incinerators, hazardous waste combustors, and chlor-alkali plants (chlorine/caustic soda manufacturers). Emission limits are also required for electric utilities, but have not yet been established.
<b>Statutory Authority</b>	<b>Indirect Regulation: Environmental Standards</b>
FFDCA	Establishes an FDA action level for methylmercury in fish at 1 part per million.
Clean Water Act	Requires EPA to issue water quality criteria that may be used by states, territories, and tribes as the basis for their own enforceable water quality standards; if water quality criteria are exceeded, fish consumption advisories may be issued by states.



Safe Drinking Water Act 42 U.S.C. 300f (1974)	Sets a maximum contaminant level for mercury in drinking water at 0.002 mg/l.
RCRA	Establishes land disposal restriction levels for mercury waste.

**Source:** Table prepared by the Congressional Research Service (CRS) based on a review of current environmental regulations and EPA report “Background Information on Mercury Sources and Regulations,” available online at [<http://www.epa.gov/grtlakes/bnsdocs/mercsrce/mercreg.html>], undated.

***Voluntary Activities Initiated or Funded by EPA.*** In addition to regulatory requirements, EPA is pursuing a number of voluntary initiatives to reduce or eliminate the industrial uses of mercury. EPA is also participating in a variety of outreach programs aimed at educating sectors of the population that either manufacture or use mercury-containing products. Following is a sample of voluntary mercury-reduction and educational/outreach activities initiated by EPA:

- EPA identified mercury as one of the persistent, bioaccumulative, toxic (PBT) chemicals being targeted as a “priority PBT.” As such, EPA has issued a draft “National Action Plan for Mercury,” aimed at reducing the intentional introduction of mercury into all environmental media (i.e., air, water, land).<sup>7</sup> A draft strategy to monitor PBTs is anticipated by the end of 2003.
- On September 9, 2002, EPA identified 30 “priority chemicals,” including mercury, that are commonly found in hazardous wastes. EPA is working with manufacturers to either voluntarily reduce the use of those chemicals by 50% or to eliminate them from production processes altogether.
- The United States, through EPA, and Canada have been working jointly since 1997 to reduce certain target pollutants, including mercury. In March 2003, the “Great Lakes Binational Toxics Strategy 2002” was released to report on the progress in achieving the pollution reduction goals established under the joint strategy.<sup>8</sup> The U.S. goal of a 50% reduction in national mercury emissions by 2006 was nearly met at 40%. The U.S. goal of reducing the national use of mercury by 50% was exceeded.<sup>9</sup>
- In 1999, with funding from EPA’s Great Lakes National Program Office, the University of Wisconsin Extension’s Solid and Hazardous Waste Education Center developed a “mercury in schools” educational outreach project. Key project activities included: creating and maintaining a basin-wide clearinghouse for information on reducing mercury usage, increasing mercury recycling and improving mercury management in schools, and educating students and teachers about eliminating mercury. In 2001, funding was provided by EPA to extend the mercury in schools education and outreach program nationwide.

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<sup>7</sup> The draft plan is accessible online at [<http://www.epa.gov/pbt/hgaction.htm>].

<sup>8</sup> The report is accessible online at [<http://binational.net/bns/2002/index.html>].

<sup>9</sup> In setting national goals, the Strategy evaluated total nationwide reduction in the use and emissions of mercury from all sources. Goals did not set specific reduction percentages for individual sources.

- On June 24, 1998, EPA and the American Hospital Association (AHA) signed a memorandum of understanding to advance pollution prevention efforts in U.S. health care facilities. One goal of the agreement was the virtual elimination of mercury-containing waste from health care facilities' waste streams by 2005. The agreement also led to the creation of Hospitals for a Healthy Environment whose aim is to educate health care professionals about pollution prevention opportunities in hospitals and health care systems.<sup>10</sup>

**State Actions to Control Mercury.** Due to the method in which mercury is transported through the environment, it is deposited in some areas of the U.S. in greater concentrations than others. This makes potential mercury contamination a local or regional issue. According to EPA's 1997 Mercury Study Report to Congress, the following geographical areas were determined to have the highest annual rate of deposition of mercury:

- The southern Great Lakes and Ohio River Valley;
- The Northeast and southern New England; and
- Scattered areas in the South with the most elevated deposition occurring in the Miami and Tampa areas.

The potential for regional impacts is one reason many states have enacted their own legislation aimed at controlling mercury. Recently, several states have moved beyond the health-based criteria associated with the use or disposal of particular products. Instead, they are looking to reduce waste disposal problems by restricting mercury use altogether. For example, Great Lakes states, such as Minnesota, are banning or limiting the sale of certain mercury-containing products and imposing recycling requirements and disposal restrictions on others. **Table 3** summarizes the types of legislation enacted in selected states or activities undertaken by state organizations to control mercury.

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<sup>10</sup> For more information about Hospitals for a Healthy Environment (H2E), see [<http://www.h2e-online.org>].

**Table 3. Summary of Selected State Actions to Control Mercury**

<b>States/ Organization</b>	<b>Legislation/Activity</b>
CA, IL, IN, MN, NH, NY, OH, OR, PA, VT	<b>Labeling/Notification Requirements:</b> Mercury-containing products, such as dental amalgams, pharmaceuticals, thermostats or fluorescent bulbs, must be labeled or notification provided directly to users regarding the mercury content in products, dangers posed by mercury, and/or safe disposal practices.
CA, CT, IL, IN, IA, ME, MD, MI, MN, NH, NY, OR, RI	<b>Restrictions on Product Sale or Usage:</b> Limits or prohibits the use or sale of certain products such as dental amalgams, mercury vapor lighting, fever thermometers, electronic equipment, medical equipment, mercury switches (particularly in automobiles).
IA, MI, MN, OR	<b>Special Disposal/Recycling Requirements:</b> Directs state agencies or manufacturers to accept mercury-containing products for recycling, such as cathode ray tubes or other electronic devices, or to dispose of mercury-containing products, such as dental amalgams, in an environmentally appropriate manner.
IA, ME, MN	<b>Mercury Recovery Requirements:</b> Identifies a responsible party to recover mercury from a class of products before disposal. For example, auto makers are being required to remove mercury switches from automobiles before being scrapped.
Interstate Mercury Education and Reduction Clearinghouse	<b>Regional Cooperative Agreement:</b> Environmental agencies in eight northeastern states (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont ) created the Clearinghouse as an umbrella group to assist the states in implementing mercury reduction laws and programs aimed at getting mercury out of consumer products, the waste stream, and the environment. The clearinghouse will coordinate regional mercury reduction efforts and assist state environmental agencies in developing and implementing specific legislation and programs for notification, labeling, collection, and eventual phase-out of products that contain mercury.
The Quicksilver Caucus	<b>Coalition of State Environmental Organizations:</b> The Quicksilver Caucus is an EPA/state workgroup formed in May 2001 to develop a joint approach to controlling mercury. The Caucus is a forum for state environmental associations (e.g., the Association of State and Territorial Solid Waste Management Officials), the Environmental Council of the States, and the National Governors' Association to coordinate their mercury initiatives. EPA is currently working with the Caucus to resolve two issues: 1) how to meet mercury reduction goals for specific water bodies where mercury water pollution is caused primarily by air deposition; and 2) how to ensure safe stewardship of mercury supplies and wastes. Reports on each topic are available online at [ <a href="http://www.sso.org/ecos/">http://www.sso.org/ecos/</a> ].

**Source:** Table prepared by the Congressional Research Service (CRS) based on a review of current state laws and legislative activity and the California Department of Toxic Substances Control draft report on mercury, Appendix A-Summary of Nationwide Mercury Efforts.

## Recent Legislative Action

A variety of legislative proposals have been introduced in Congress to minimize or eliminate the use of mercury. Generally, the legislation is aimed at protecting children from exposure to mercury or at reducing mercury in products or waste.<sup>11</sup> Recently introduced legislation related to mercury is summarized below.<sup>12</sup>

**Legislation Aimed at Protecting Children.** The Leave No Child Behind Act of 2003 (H.R. 936 and S. 448) introduced on February 26, 2003, by Representative George Miller and Senator Christopher Dodd, proposes to amend Section 313(f) of the Emergency Planning and Community Right-to-Know Act (EPCRA, 42 U.S.C. 11023(f)). These bills would require the EPA Administrator to establish reporting thresholds for releases of specific toxic chemicals, including mercury, that the Administrator determines may present a significant risk to children's health or the environment, depending upon the persistent use or existence of that chemical in the environment.

There has been legislative activity in both the 107<sup>th</sup> and 108<sup>th</sup> Congress related to the use of mercury in childhood vaccines, particularly the presence of the mercury-containing preservative thimerosal. A provision added to the Homeland Security Act (P.L. 107-296), which revised the Public Health Service Act (42 U.S.C. 300), was interpreted as protecting vaccine manufacturers from potential financial liability related to the use of thimerosal. The preservative is added to formulations for influenza, diphtheria-tetanus, tetanus, hepatitis B, and rabies.<sup>13</sup> Opponents of the provision argued that it would effectively end lawsuits for injuries caused to children after multiple mercury exposures from thimerosal in infant vaccines. On January 10, 2003, Senators Olympia Snowe, Susan Collins, and Lincoln Chafee announced an agreement with Senate leadership to address concerns that arose from the addition of the vaccine-related language. The language in P.L. 107-296 was subsequently removed in the Consolidated Appropriations Resolution for 2003 (P.L. 108-7).

On March 19, 2003, Representative Dan Burton introduced the National Vaccine Injury Compensation Program Improvement Act of 2003 (H.R. 1349). The bill would amend the Public Health Service Act (42 U.S.C. 300) with respect to the National Vaccine Injury Compensation Program (VICP), by extending the statute of

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<sup>11</sup> Legislative activity regarding air emissions is discussed in CRS Report RL31881.

<sup>12</sup> Several bills introduced in the 107th Congress have not been reintroduced in the 108th. The bills dealt with mercury storage and disposal, and the reevaluation of safe levels of mercury in seafood. Those bills were the Mercury Storage and Safe Disposal Act of 2001 (H.R. 2266), The Seafood Safety and Mercury Screening Act of 2002 (H.R. 3885) and the Mercury-Safe Seafood Act of 2001 (S. 555).

<sup>13</sup> The amount of mercury in an individual vaccine is small. However, the FDA announced in June 1999 that infants given multiple thimerosal-preserved vaccines were exposed to mercury levels that exceeded EPA safety guidelines. The FDA, National Institutes of Health (NIH), Centers for Disease Control and Prevention (CDC), and the American Academy of Pediatrics have urged vaccine manufacturers to reduce or eliminate thimerosal in vaccines as soon as possible (no deadline has been specified). For more information, see the FDA's report "Thimerosal in Vaccines," at [<http://www.fda.gov/cber/vaccine/thimerosal.htm>].

limitations on filing claims for vaccine-related injuries, and increasing the base amount of funding available to those injured. While the bill does not refer to concerns about thimerosal specifically, Representative Burton has discussed, in hearings and publications, the connection between the exposure to the mercury-containing preservative and neurological developmental disorders of autism, and speech and language delays.<sup>14</sup>

**Legislation Aimed at Reducing Mercury in Products or Waste.** The Omnibus Mercury Emissions Reduction Act (S. 484), introduced on February 27, 2003 by Senators Patrick Leahy and Olympia Snowe, proposes to amend Section 3002 of the Solid Waste Disposal Act (42 U.S.C. 6922). The bill intends to reduce releases of mercury from all major sources of air emissions, including solid waste incinerators. To do so, the bill requires the EPA Administrator to identify mercury-containing materials that must be separated from the waste stream before incineration. The list must include mercury-containing items such as fluorescent light bulbs and tubes, batteries, pharmaceuticals, laboratory chemicals and reagents, electrical devices such as thermostats, relays and switches, and medical and scientific instruments. To facilitate separation, the bill requires mercury-containing materials to be labeled to indicate mercury content. Further, the bill requires the phase-out of mercury in consumer products within three years, allowing for the possibility of exceptions for essential uses. The legislation also includes a provision prohibiting the Defense Department from selling mercury currently in the National Defense Stockpile.

The Mercury Reduction Act of 2003 (S. 616), introduced on March 13, 2003 by Senator Susan Collins, proposes to amend the Solid Waste Disposal Act. The bill calls for a nationwide ban on the sale of mercury fever thermometers. It would also provide grants for exchange programs to help consumers exchange mercury thermometers for digital thermometers. The bill directs EPA to ensure that the mercury is properly collected and stored, as opposed to recycled and reintroduced in commerce, in order to keep it out of the environment. The bill would also create a multi-agency “Task Force on Mercury” to address the issue of long-term management of surplus mercury from such sources as thermometers, stores held by the Departments of Defense and Energy, and other medical, commercial or industrial sources. The bill was approved by the Senate Environment and Public Works Committee by voice vote on April 9, 2003. Similar legislation (S. 351) was passed by the Senate in the 107th Congress, but was not considered by the House.

The Next Generation Lighting Initiative (S. 167), introduced on January 15, 2003 by Senator Jeff Bingaman, has the objective of developing, by 2012, “advanced solid-state lighting technologies” based on white-light-emitting diodes. Such lighting would be required to meet certain illumination criteria and not contain harmful pollutants, such as mercury, found in current lighting products (e.g., fluorescent lamps). Research to develop lighting that meets the bill’s objectives would be carried out by a consortium of private firms, trade associations and institutions of higher education chosen by the Secretary of Energy. A similar component is in the Energy

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<sup>14</sup> See Representative Burton’s “Dear Colleague” letter regarding “facts and fiction about thimerosal in vaccines,” printed on the Autism Society of Washington web page at [<http://www.autismsocietyofwa.org/News/Congress.htm>].

Policy Act of 2003 (H.R. 6), as passed by the House on April 11, 2003. While the bill deals with a broad range of energy-related issues, Part 2, Section 21111 proposes the same “next generation lighting” requirements as those delineated in S. 167.

The Mercury in Dental Filling Disclosure and Prohibition Act (H.R.1680), introduced on April 8, 2003, by Representative Diane Watson, would amend Section 501 of the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 351). The bill proposes to prohibit the introduction into interstate commerce of mercury intended for use in dental fillings after January 1, 2008. Effective December 31, 2004, the bill also would require mercury-containing dental amalgams to be labeled with information regarding the health effects related to mercury.

## **Conclusion**

Mercury is a potent neurotoxin that can be harmful both to humans and the environment. The primary route by which humans are exposed to mercury is from eating fish contaminated with methylmercury. Humans may also be exposed to elemental mercury vapor in either the workplace or through the use of mercury-containing consumer products (e.g. in dental amalgams or broken fluorescent bulbs or fever thermometers). Once mercury is introduced into the environment, it cannot be removed. However, it can transform into more toxic forms, such as methylmercury, particularly when it is introduced into the environment through anthropogenic means.

Both federal and state authorities have taken action to *control* the introduction of mercury into the environment that originates from the use of mercury in products and manufacturing processes. The current trend, in many federal and state legislative actions, is to reduce mercury releases by *eliminating* it altogether, either from its use in manufacturing processes or as an added component to products. Many states have passed such legislation; few federal initiatives have been enacted into law.