Appendix A: Intrastate Mercury Sources

Top Three Anthropogenic Intrastate Sources of Mercury Releases Reported by the States

State	Coal-Fired Electric Power Plants	Electric Arc Furnaces	Industrial Boilers	Steel Recycling Facilities	Sewage Sludge Incinerators	Wastewater Treatment	Chlor-alkali Plants	Hazardous Waste	Municipal Solid Waste Incinerators	Medical Waste Incinerators	Mining	Cement Kilns	Broken Mercury-Containing Products & Spills	Others	Comments
Alaska	1				3						2				
Arizona	2										1	3			
California	2		1											3	3 = petroleum manufacturing
Colorado	2	3									1				
Connecticut	3				2				1*						1 = municipal waste combustors
Delaware	2		3				1								
Florida	2								1	3					
Hawaii			1						2					3	3 = refineries
Illinois	1		2									3			
Indiana	1	3										2			
Kansas	1					3						2			
Kentucky	1						3					2			
Louisiana	2	3					1								
Maine	1*								3				2		* = and residential combustion

State	Coal-Fired Electric Power Plants	Electric Arc Furnaces	Industrial Boilers	Steel Recycling Facilities	Sewage Sludge Incinerators	Wastewater Treatment	Chlor-alkali Plants	Hazardous Waste	Municipal Solid Waste Incinerators	Medical Waste Incinerators	Mining	Cement Kilns	Broken Mercury-Containing Products & Spills	Others	Comments
Maryland	1								3		2				
Massachusetts					3*	3*			1					2	2 = residential /commercial boilers; 3*=wastewater treatment including sewagesludge incinerators
Michigan	1													2,3	2=volatilization during solid waste collection and processing; 3=steel manufacturing
Minnesota	1	3									2				
Missouri	1											2		3	3 = lead smelters
Montana	1										2			3	3 = petroleum refineries
Nebraska	1	3										2			
Nevada	2										1	3			
New Hampshire	3		1						2						
New Jersey	2													1,3	1 = iron and steel manufacturing; 3 = use and disposal of various products
New York	1				3				2						
North Carolina	1	2												3	3 = other coal burning industries
North Dakota	1													2,3	2 = petroleum refinery; 3 = other manufacturing
Oklahoma	1													2	2 = petroleum refining

Appendix A: Intrastate Mercury Sources

State	Coal-Fired Electric Power Plants	Electric Arc Furnaces	Industrial Boilers	Steel Recycling Facilities	Sewage Sludge Incinerators	Wastewater Treatment	Chlor-alkali Plants	Hazardous Waste	Municipal Solid Waste Incinerators	Medical Waste Incinerators	Mining	Cement Kilns	Broken Mercury-Containing Products & Spills	Others	Comments
Oregon	2										1				
Pennsylvania	1								3			2			
Rhode Island					1	2							3		
South Carolina	1		3									2			
South Dakota	1		3									2			
Tennessee	1						2	3							
Texas	1	3*											2	2	2 = alumina production; 3 = steel works, blast furnaces, and rolling mills
Utah	3										1			2	2 = metal manufacturing
Vermont			3											1,2	1 = on-road mobile sources; 2 = residential heating
Virginia	1	2	3												
Washington	2					3							1		
West Virginia	1		3				2								
Wisconsin	1												3	2	2 = dental amalgam
Wyoming	1		3								2				

Appendix B: States Regulating Mercury From Coal-Fired Power Plants[1]

State	Coal-Fired Power Plant Law
Connecticut	In 2003, the Connecticut General Assembly passed legislation that requires each coal-burning power plant to reduce its mercury air pollution by 90% by 2008. Under the law, if a plant installs and properly maintains the best available control technology and still fails to meet the new emissions rate, it can request an alternative emissions rate from the Department of Environmental Protection.[2]
Illinois	Multi-pollutant legislation adopted in 2001 required the Illinois Environmental Protection Agency to release a report in September 2004 proposing multi-pollutant reduction targets and compliance timelines.[3]
Massachusetts	In 2004, the Massachusetts Department of Environmental Protection finalized a rule that requires coal-burning power plants to capture 85 percent of their mercury air pollution by 2008 and 95% by 2012.[4]
Minnesota	In 1999, the Minnesota Legislature passed a law requiring the Minnesota Pollution Control Agency to solicit voluntary reduction agreements from sources that emit more than 50 pounds of mercury annually.[5] The law sets a state goal of reducing releases of mercury into the air and water by 70% from 1990 levels by 2006. A 2002 progress report found that virtually no reductions in mercury pollution occurred under the voluntary initiative.[6] Progress under the law is due to be assessed again in October 2005. Xcel Energy's MERP project will upgrade a coal-fired plant with technology to reduce mercury emissions.
New Hampshire	Pursuant to the 2002 Clean Power Act, New Hampshire's Department of Environmental Services must implement an integrated, multi-pollutant strategy to reduce air emissions from coal-fired power plants.[7] A bill that would establish an initial emissions cap of 50 pounds/year by 2009 (62% reduction), and a Phase II cap of 24 pounds/year by 2013 (82% reduction) has passed the Senate and is under consideration by the New Hampshire House of Representatives.[8]

[1] Information for this appendix provided by National Wildlife Federation
[2] CT Public Act 03-72. Available at: http://www.cga.ct.gov/2003/act/Pa/2003PA-00072-R00HB-06048-PA.htm
[3] 415 ILCS 5/9.10 Available at: http://www.ilga.gov/legislation/ilcs/documents/041500050k9.10.htm
[4] Massachusetts Emissions Standards for Power Plants, 310 CMR 7.29. Available at: www.mass.gov/dep/bwp/daqc/files/regs/hgreg.pdf
[5] Minn. Stat. § 116.915 (1999). Available at: http://ww2.revisor.leg.state.mn.us:8181/SEARCH/BASIS/mnstat/public/www/DDD/116.915/116915
[6] Minnesota Pollution Control Agency, 2002. "Evaluating Voluntary Agreements" from Mercury Reduction Program Progress to the Minnesota Legislature.
[7] N.H. Rev. Stat. Ann. Ch. 125-O (2002). Available at: http://gencourt.state.nh.us/legislation/2002/HB0284.html
[8] SB128 http://www.gencourt.state.nh.us/legislation/2005/sb0128.html

Appendix B: States Regulating Mercury From Coal-Fired Power Plants[1]

State	Coal-Fired Power Plant Law
New Jersey	In 2004, the New Jersey Department of Environmental Protection adopted a rule requiring coal-burning power plants to reduce 90% of their mercury air pollution by the end of 2007. The rules allow for some flexibility, giving plants the option of meeting the new emission standards in 2012 if they also make major reductions in their emissions of sulfur dioxide, nitrogen oxides, and fine particulates.[9]
North Carolina	In 2002, North Carolina adopted the Clean Smokestacks Act, which imposes nitrogen oxides (NO_x) and sulfur dioxide (SO_2) limits on coal-burning power plants. A 55% reduction in mercury emissions is estimated to result as a co-benefit. The North Carolina State Department of Environmental & Natural Resources is required to submit a report to the legislature in 2005 on whether mercury-specific controls should be adopted after full implementation of NO_x and SO_2 controls.[10]
Pennsylvania	In January 2005, the Pennsylvania Environmental Quality Board voted to accept for internal review, a citizen petition requesting that the state regulate mercury emissions from coal-burning power plants, requiring the Department of Environmental Protection (DEP) to complete a report evaluating the petition.[11] On May 18, 2005, DEP released a report recommending that state regulations be established.
Wisconsin	In 2004, the Wisconsin legislature gave final approval to a rule that requires in-state coal-burning power plants to reduce their mercury air pollution by 40% by 2010 and 75% by 2015. Under the rule, the Wisconsin Department of Natural Resources (DNR) may enter into a multi-pollutant reduction agreement with a major electric utility as an alternative to complying with the initial 40% reduction level. The rule also required DNR to revise the state's rule within 18 months of a federal standard so that the state's standard is no stricter than the federal standard.[12]

[9] N.J.A.C. 7:27 Available at: www.nj.gov/dep/rules/adoptions/mercury_rule7-27.pdf

[10] See http://daq.state.nc.us/news/leg/cleanstacks.shtml

[11] See http://www.dep.state.pa.us/dep/subject/eqb/Mercury%20Emissions/Mercury_Ltr_Petition1.pdf

[12] Wisconsin Natural Resources Board, 2004. Authorizing Statutes ss. 227.11(2) (a) and 285.11 (9). Available at: http://dnr.wi.gov/org/aw/air/reg/mercury/AM-27-01signed.pdf.

Appendix C: States Reducing Chlor-Alkali Plants' Mercury Pollution[1]

The U.S. chlor-alkali industry consumes significantly more mercury than it reports having released. In 2000, the nine chlor-alkali plants reported consuming 79 tons of mercury and releasing 14 tons of mercury. It is not uncommon for elemental mercury to vaporize and escape from within chlor-alkali plants during routine operations through unmonitored ventilation systems and other leaks. In 2000, these unmonitored releases, known as fugitive emissions, totaled approximately 59 tons of mercury.

In April 2005, the Delaware Department of Natural Resources and Environmental Control and the U.S. EPA signed an agreement with Occidental Chemical Corporation (OxyChem) in which the company will voluntarily measure and reduce fugitive mercury emissions at its Delaware City plant.

In Ohio, in lieu of making the facility pay fines for violating its wastewater discharge permit, the Ohio Environmental Protection Agency negotiated an agreement under which the Ashta Chemicals chlor-alkali plant will install pollution controls, which are estimated to remove 148,475 grams of mercury from the air. The agreement also requires the plant to collect and treat storm water runoff from the site, preventing the discharge of 30 grams of mercury into the water annually.

Aside from assessing and preventing mercury releases, ensuring the safe disposal of mercury when chlor-alkali plants convert to mercury-free manufacturing processes or when they shut down has emerged as an issue of concern for states. Until recently, owners of retiring chlor-alkali plants expected to sell their mercury. However, recognizing the need to prevent unhealthy re-releases of mercury into the environment, states are beginning to look at alternative solutions. In Maine, when the HoltraChem chlor-alkali plant closed its doors, the state government, private industry, and environmental organizations worked collaboratively to craft a memorandum of understanding to ensure that the plant's 80 metric tons of mercury be safely stored for at least 5 years, rather than re-enter commerce.

Developing incentives for chlor-alkali plants to convert to mercury-free manufacturing processes is critical to addressing the problems posed by these toxic facilities.

[1] Information for this appendix provided by National Wildlife Federation.

Appendix D: ECOS Resolutions and QSC Publications

ECOS Resolutions

United States Mercury Stockpile Sales. Resolution 96-2. Opposes future U. S. mercury stockpile sales and calls for a permanent halt to sales. Available at: http://www.ecos.org/files/1607_file_Resolution_96_2.pdf.

Need for Articulation of a National Vision for Mercury. Resolution 01-01. Requests that the federal government articulate a national vision of substantially reducing discharges of mercury into the environment and that EPA work with the States and others to develop strategies and initiatives to achieve this goal. Available at: http://www.ecos.org/files/565_file_Resolution_01_1_REV_4_7_04.pdf.

Mercury Retirement and Stockpiling. Resolution 01-03. Recognizes that long-term storage of mercury is a federal responsibility, asks the federal government to create and implement a plan to manage long-term mercury storage, and requests that large consumers of mercury be included in the development of the plan. Available at: http://www.ecos.org/files/568_file_Copy_of_Resolution_01_3.pdf.

Mercury Stewardship. Resolution 03-03. Endorses the four Quicksilver Caucus Stewardship Workgroup documents and encourages the EPA and other federal agencies to utilize the information in the documents. Available at: http://www.ecos.org/files/579_file_Resolution_03_3.pdf.

The Need for a National Mercury Reduction Strategy as an Option for Atmospheric Mercury Total Maximum Daily Loads (TMDLs). Resolution 03-07. Calls upon EPA to create a national mercury reduction strategy and recommends that EPA develop an implementation plan for the strategy that may be used in lieu of a TMDL. Available at: http://www.ecos.org/files/583_file_Resolution_03_7.pdf.

Regarding a Mercury Emissions Rule. Resolution 04-2. Urges EPA to modify its existing proposed mercury emissions rule to require the most aggressive mercury reductions achievable, in as early a timeframe possible in concert with the earliest of other air pollutant emission reduction schedules, and in such a way that would preclude the creation of localized, adverse health or environmental impacts. Available at: http://www.ecos.org/files/573_file_Resolution_04_2.pdf.

Need for Nationwide Mercury Switch Removal Strategy that Provides Flexibility to the States. Resolution 04-7. Encourages EPA to develop a national switch removal program that provides flexibility for States to maintain and to continue to develop, and implement their own switch removal strategies or programs. Available at: http://www.ecos.org/files/1117_file_Copy_of_Resolution_04_7.pdf.

Need for State EPA Approach for Reducing Mercury on the Environment. Resolution 05-3. Requests that US EPA form a workgroup co-chaired by the EPA and Quicksilver Caucus, to discuss and recommend an implementation strategy and action plan for reducing mercury nationally. Available at: http://www.ecos.org/files/1450_file_Copy_of_Resolution_05_3.pdf.

QSC Documents

Mercury Stewardship—Best Management Practices provides practical guidelines for those engaged in interim or longer term storage of elemental mercury.

Mercury Stewardship—Storage of Mercury describes and evaluates a range of elemental mercury interim storage options that could be used until a permanent treatment or storage solution is identified.

Mercury Stewardship—Market Commodity Review summarizes economic, supply and demand data to provide a picture of the mercury commodity market.

Mercury Stewardship—Market Policy Options summarizes data on domestic and global supply and demand, identifies areas of uncertainty, and where able to do so, provides qualitative conclusions about the impacts of alternate scenarios for the storage or sale of the U.S. mercury stockpile.

Removing Mercury Switches from Vehicles—A Pollution Prevention Opportunity for States provides information on possible solutions for the problem of mercury in vehicles by describing approaches states have taken to address the issue.

Appendix E: Voluntary Manufacturer Take-Back Program[1]

Because manufacturers do not include the costs of contamination or disposal in their production costs, there is limited incentive for them to eliminate the use of mercury-containing products. To date, the only industry that has set up a national mercury-product take-back program is the thermostat-manufacturing industry. Honeywell, General Electric, and White-Rodgers established the Thermostat Recycling Corporation to organize the collection of all brands of used, wall-mounted mercury-switch thermostats so that the mercury can be purified for re-use. The program, which focuses on collecting thermostats from HVAC contractors, has experienced limited success. In 2001, this voluntary program resulted in the collection of 48,215 thermostats and processed 402 pounds of mercury. To put the success of this program into perspective, trade data indicate that approximately 9 million residential replacement thermostats were sold in 2002. A stakeholder process is currently underway to improve this program, based on voluntary initiatives undertaken by the manufacturers.

[1] Information for this appendix provided by National Wildlife Federation.

Appendix F: State Dental Amalgam Laws[1]

Dentists are the third largest user of mercury in the United States, consuming more than 40 metric tons of mercury in 2001 alone.[2] Dental offices are the largest single contributor of mercury in wastewater.[3] Mercury dental amalgam is frequently rinsed down the drain, usually to a municipal wastewater system (or septic system), deposited in biomedical waste containers destined for waste incineration, or placed in trash disposed in a municipal waste landfill or incinerator, and ultimately released into the environment.

Although dental uses and releases remain largely unregulated, several state and local governments recently adopted laws or formal legal agreements requiring dental mercury-release reduction.

State	Mercury Dental Amalgam Law
California	Proposition 65 requires that dentists provide patients with notice about the potential harmful effects of mercury dental amalgam. The City of San Francisco requires that all dental offices install dental amalgam separators.
Connecticut	State law prohibits the sale of products containing more than 250 parts per million of mercury. CT DEP developed best-management practices for dentists which require amalgam separator installation and patient notification.
Maine	State law requires mandatory pollution prevention plans and amalgam separator installation for dental offices. The law also requires dentists using mercury or a mercury amalgam in any dental procedure to display a poster adopted by the Department of Human Services Bureau of Health in the public waiting area of that dentist's office and to provide each patient with a copy of the brochure adopted by the bureau. Dentists are also required to maintain records on waste mercury amalgam for at least 3 years.
Massachusetts	In collaboration with the Massachusetts Dental Society, MA DEP is implementing a voluntary program to encourage the early installation of mercury amalgam separators in dental offices prior to finalization of regulations requiring mandatory installation that DEP will be adopting in 2006. Over the past 12 months, 74% of Massachusetts dentists who generate mercury amalgam wastes have joined in this effort, reducing mercury inputs into wastewater by several hundred pounds.
New Hampshire	State law requires dentists and the New Hampshire Department of Health and Human Services to provide information on restorative dental materials. NH Department of Environmental Services established regulations that require dentists to utilize amalgam separators.
Minnesota	A Memorandum of Agreement between the Metropolitan Council Environmental Services (MCES-POTW) and the Minnesota Dental Association encourages the installation and maintenance of dental amalgam separators in dental offices in the MCES service area and statewide.
New York	State law prohibits dentists from using or possessing elemental mercury unless it is contained in appropriate pre-encapsulated capsules specifically designed for the mixing of dental amalgam. The law also requires all dentists to recycle any elemental mercury, including any pre-encapsulated mercury capsule waste, and dental amalgam waste generated in their dental practices in accordance with rules and regulations established by the commissioner.
Vermont	Vermont law requires dentists to install amalgam separators and follow best management practices.

1. Information for this appendix provided by National Wildlife Federation.
2. Bender, Michael T. *Dentist the Menace? The Uncontrolled Release of Dental Mercury* (June 2002).
3. *Ibid.*