



# Mercury P2 2011 Status Report

Below is a summary of the various mercury P2 efforts worked on by the OEA, DEQ, during the 2011 calendar year. Acronyms used are listed at the bottom of the document.

## SUMMARY

<b>Program</b>	<b>Notes</b>
Auto Switches	23,529 switches = 51 lbs mercury
Clean Sweep, HHW	3,387 mercury items & 315.2 lbs bulk elemental mercury
Dental Amalgam	784 Separators installed, removing 379 lbs of mercury
EPA GLRI Grant	\$856,046 awarded Oct. 1, 2010
Gold Mining	See discussion below
IMERC	Membership began Oct. 1, 2010
Legislation & Rules	Act 503 Dental amalgam separator rules pending SB764 2011 – Bill analysis on regulating toxics in toys
National Mercury Efforts	Partnership efforts with QSC States & EPA
Outreach Efforts	See discussion below
Schools	Spills continue - Outreach planned
Spills	Spills reported to MDCH & PEAS
Thermostats	15,939 units = 131.7 lbs mercury
TRI	2,492 lbs mercury recycled by two manufacturers
Web site Efforts	limited

## PROGRAM DETAILS



**Auto Switches** 23,529 switches collected = 50.8 lbs mercury  
Michigan has had auto switch collections since the DEQ pilot program in the 1990's. The state has participated in the NVMSRP since it began in 2006. Below is a listing of the auto switches recycled by year. In 2011, Michigan had 290 auto switch recyclers registered in the recycling program, but only 55 had recycled switches during 2010 and 2011. (Only 85 had ever recycled any switches.) Several sites (122) registered during the 2009 federal Cash for Clunker program, but never recycled any auto switches.

Year	# Switches*	Hg Lbs	Year	# Switches	Hg Lbs
2006	45,890	100.1	2012		
2007	39,445	86.8	2013		
2008	45,266	99.6	2014		
2009	31,094	68.4	2015		
2010	34,830	76.6	2016		
2011	23,529	51.8	2017	Program ends	

\*Data provided by the ELVS Web site & Bucket collection reports

2010 Began salvage yard committee

2012 Letters sent to yards encouraging recycling

A brochure was developed to encourage salvage yards to recycle switches and participate in the ELVS program. Two letters were drafted to send to the registered ELVS sites with a copy of the brochure. One letter thanked sites that had recycled switches since January 1, 2009, for recycling. The second letter sent to the non-recycling sites encouraged recycling and

participation in ELVS. The letters were initially tabled when QSC notified the states that ELVS intended to do a similar mailing. When ELVS had not issued their letters by the end of 2011, the states were instructed to proceed. The DEQ letters were mailed March 13, 2012.



**Clean Sweep** 3,387 mercury items and 315.2 pounds elemental mercury. About 20 sites (including satellite locations) participate in Clean Sweep and mercury collections. Bulk mercury is typically from residents in all types of containers from paint cans to glass jars, etc. Note that the bulk mercury collections typically far exceeded the mercury collected in devices. Without this program, bulk mercury would have likely ended up in either landfills or sewers. But just as significantly, the mercury equipment would likely have been burned and emitted into the air. (The program does not accept fluorescent lamps, CFLs, or debris.)

Funding for mercury recycling under the Clean Sweep Program has been through the Community P2 Grant program for several years. The MOU with the Department of Agriculture was extended to September 1, 2012. The program pays for collection of most mercury items and bulk items. Collection sites are encouraged to recycle thermostats through the TRC program and auto switches through the ELVS program. These do not obtain funding from the state. In addition, this program does not fund collection of mercury lamps, of any kind. The cost for disposal of lamps would have wiped out the grant rapidly. In addition, the amount of mercury in lamps is miniscule compared to other equipment and the large amount of elemental mercury collected by the sites.

Schools, farms, hospitals, small businesses, and the public are provided the opportunity to drop off liquid elemental mercury and mercury-containing devices 'free of charge' at any of Michigan's fifteen (20 including satellite locations) Clean Sweep sites. Thousands of mercury-containing devices and pounds of bulk mercury have been recovered over the years. This mercury was successfully removed from small businesses, industry store rooms, classrooms, basements, attics, closets, and storage sheds. Several of the bulk collections were found by families when cleaning homes as part of estate efforts. Countless accidents, dumping, and accidental spill incidents have been prevented due to this recovery effort.

### Collection Totals

Mercury Device	2010	2011	2011	
	# of Devices	# of Devices	Contains Grams Hg	Total Lbs. Hg
Auto Switches (hood and trunk)	369	19	1.0	0.13
Barometers	2	3	500.0	14.33
Esophageal Dilators (Maloney or Hurst)	1	41	1,361.0	9.00
Gas Flow Regulators	1	11	100.0	0.00
Hydrometer	20	0	453.6	0.00
Industrial Flow Meters	0	3	4,989.5	33.00
Manometers	7	7	500.0	1.10
Mercury Maze Game	1	1	5.0	0.00
Mercury Vapor Lamps (not fluorescent)	48	38	250.0	20.39
Sphygmomanometers (blood pressure)	130	45	200.0	14.11
Switches (electrical, appliance, etc.)	103	133	2.0	0.59
Switches (industrial)	127	592	200.0	242.51
Flame sensors	0	36	3.0	0.00

<b>Thermometers</b> (household fever)	1,556	1,223	0.8	1.75
<b>Thermometers</b> (laboratory + school)	290	195	4.0	1.79
<b>Thermostats</b>	571	683	3.0	3.10
<b>Other</b> (Hg in lab chemicals)	0	34		0.00
<b>Other</b>	0	114		0.00
<b>Other</b>	2	3		1.00
<b>Other</b>	0	0		0.00
<b>Other</b> Dental amalgam capsules	51	206		2.00
<b>Hg Devices –Total No.</b>	<b>3,279</b>	<b>3,387</b>		
<b>Hg Devices -Total Mercury</b>		<b>219.5</b>	<b>(in pounds)</b>	
<b>Liquid Elemental Mercury, (lbs)</b>	<b>368.2</b>	<b>315.2</b>	<b>(in pounds)</b>	
<b>2011 Total Mercury Recovered:</b>		<b>535</b>	<b>(in pounds)</b>	

State funding does not fund the collection of CFLs as they are very costly and do not contain significant amounts of mercury. Each CFL contains about 4 mg of mercury. To collect 1 lb (454 g) of mercury requires recycling 113,000 CFLs. Collecting 535 lbs of mercury in bulk and equipment is equivalent to recycling over 60 million CFLs and has a larger potential for protecting the environment, and is more cost effective.

From 2001-2010, Clean Sweep collected over 108,130 mercury devices and 4,955 pounds of pure elemental mercury. The program cost less than \$5,000 per year for 2009 and 2010 collections.



#### **Dental Amalgam**

- State Act 503 rules were drafted in 2010, but they have not been public noticed.
- Dental separator grants issued in partnership with MDA
- see also National Efforts

#### Michigan Dental Act 503, PA 2008

The Act assigns responsibility for implementation to MDCH, which was moved to DLARA. The OEA and WRD staff of the DEQ assisted MDCH in developing the draft rules and in committee revisions. They were not public noticed as of March, 2012.

#### Dental Separator Grants

To increase compliance with the Act's requirement for dental amalgam separators, the DEQ obtained an EPA GLRI grant to provide \$270,000 towards the purchases of dental amalgam separators. The MDA agreed to manage the grant payments to dentists statewide and included non-members as well as members. During 2011, the project awarded 784 separator grants, which removed a total of 379 lbs of mercury. The funds were nearly exhausted and OEA was evaluating a shift of more funds to this project. The mercury removal for 2011 is calculated below.

Installed Quarter	# Separators	Lbs Hg* removed/yr	# Months** /12	Total Mercury Removed (lbs)
Jan-Mar 2011	58	1	11 = .917	53.2
Apr-June 2011	312	1	8 = .667	208.1
July-Sept 2011	196	1	5 = .417	81.7
Oct-Dec 2011	218	1	2 = .167	36.4
Total	784			379.4

### Separator Mercury Calculation

\*Solmetex estimated the average amalgam removal per separator per year was 2 lbs. As mercury averages 50 percent of amalgam this is equivalent to 1 lb of mercury per separator per year.

\*\*Months Operating– As all units are required to be installed and working prior to application, the calculation is based on the first of the second month of the quarter installed as the average for all separators to begin operation. From that month to the end of the year is the total number of months operating. Divide by 12 to get the percent. As each separator is estimated to collect 1 lb of mercury a year, take this percent, times the number of separators = the number of pounds of mercury removed.

### Rural Discharges

Act 503 only requires separators and best management practices. It does not provide authority for any measures to address rural dental discharges. Separators alone only remove solids and do not remove dissolved mercury. This has been discussed extensively within DEQ. State laws clearly require rural Michigan dentists to either eliminate the discharge by installing a holding tank that captures the waste that is then solidified and landfilled, obtain a groundwater permit, or do extensive and costly sampling to prove a permit is not required. The State also requires several set back distances on the discharge that include the property lines and other issues. An issue with the holding tanks is the storage. Dental industry representatives believed the holding tanks were expensive disposal unless they could be used for up to 180 days, but medical waste requirements allow a maximum of 90 day storage. No agreement was reached. As the Act did not require nor authorize holding tanks to be addressed, the holding tank language in the draft rules was removed.

### **EPA GLRI Grant - \$856,046**

The state was awarded an EPA grant for mercury collection and recycling under the GLRI grants effective October 1, 2010. The total grant was for \$856,046. A variety of projects funded included \$270,000 for dental amalgam separators, about \$200,000 for staff, \$20,000 for IMERC membership, and nearly \$400,000 for outreach, collections, and incentives for a wide selection of mercury items and sources. Outreach funding included a funding printing of burn ban brochures and MDCH development of mercury PSAs that can be used on YouTube, TV, or cable channels. The goal of the PSAs was to increase awareness and recycling of mercury items as well as reducing new purchases containing mercury. The collections contractor had not been selected so some program elements remained under development.

Note: The MOU with Air Quality for staff assistance was withdrawn.

## **IMERC Membership**

Michigan's membership in the IMERC was funded for two years under the EPA GLRI grant, for October, 2010 – September, 2012. (IMERC was formed in 2001 to provide member states with technical and programmatic assistance on mercury education and legislation.)



### **Legislation & Rules**

#### Introduced Legislation –SB764, 2011

The DEQ did not initiate any new mercury legislation, but did do an analysis of SB764 that regulated toxics, including mercury in toys. The last action on the bill was the transfer to the Committee on Governmental Operations on October 20, 2011.

#### Act 503, PA2008 Rules

The Act requires installation of dental amalgam separators by Michigan dentists by December 31, 2013. The OEA and WB drafted the rules that were then presented, modified, and accepted by the rules committee, in 2010. Licensing & Regulatory Affairs was then responsible for the public noticing and issuance. The rules had not been not public noticed as of March, 2012.

To increase compliance with the act, the DEQ obtained a GLRI grant for \$270,000 to be provided as grants to dentists for the purchases of dental amalgam separators. The MDA agreed to manage the grant payments to dentists statewide and include non-members as well as members. A grant agreement was signed and effective January 13, 2011.

One unresolved issue was how to bring rural dentists into environmental compliance. See the discussion under Dental Amalgam.



### **Outreach Efforts**

#### MDCH

The MDCH held two spill workshops in 2011 where information was also provided on identification and free recycling. The MDCH developed the publications listed below and is establishing a contract with MSU for the development of several public service announcements (PSAs) on mercury.

#### Presentations -Workshops

Mercury recycling information was presented or shared at the following events.

Date	Topic
11/02/11	MDCH Mercury Spill workshop -Gaylord
12/01/11	MDCH Mercury Spill workshop –Saginaw
09/28/11	MWEA annual conference, Lansing

#### Publications

- Mercury and Renovation/Energy Upgrades
- Mercury & Plumbing
- Mercury & HVAC Systems
- Mercury & Electrical

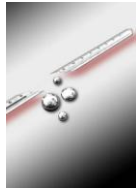


### **Schools** -Spills continue -Outreach planned

Background: Schools were sent mercury information in 1998 and 2002. The mercury CD was sent to 11,000 school libraries and 500 school superintendents in 2002. Mercury was banned in schools by law as of December, 2004. In 2005 and 2006, Community P2 grants were issued to 20 schools to properly dispose of chemicals and develop chemical management systems resulted in the proper disposal of 2,492 pounds of mercury and 99 mercury containing devices such as thermometers. Even so, there continue to be spills at schools. Three occurred within weeks in 2012. Two were due to school owned equipment. One was a lab thermometer that was broken by a student when shaken and the second was a blood pressure cuff that was dropped and broken. The third spill involved a vial of mercury brought to school by a student. It was unknown where he got the mercury. On March 2, 2012, a mercury-in-schools conference call was held between Maggie Fields (DEQ), Chris Rose Bush (MDCH mercury coordinator), and Sue Manente (MDCH health educator). The discussion centered on what to propose to the MDE for outreach to schools on mercury. It was agreed to propose a mailing to school superintendents that would include packets of information targeting three areas: maintenance; laboratory; and medical.



**Spills** - There were 36 mercury calls made to the MDCH hotline. Some were not spills such as requests on how to recycle a container or other mercury items. The spills included broken thermostats, a broken humidity psychrometer used by a window installer, several broken fever thermometers, including two that broke in people mouths and two cooking thermometers that broke in hot food.



### **Thermometers** Exchanges

Thermometer Exchanges began in 1999. As of 2002, the state funded program recovered over 29,000 mercury thermometers through 44 exchange 'events'. Some counties, such as Monroe County, continue to do exchanges through the support of local pharmacies. There is no data on these exchanges.

### Legislation

Michigan legislation prohibits all thermometers, not just fever. This has caused problems for hospitals, laboratories, and research facilities. There is an exemption for federal test methods that require the use of a mercury thermometer. By 2010, mercury free data loggers for autoclaves were available and the EPA had begun revising test methods to allow the use of mercury-free thermometers. There is confusion on whether a mercury thermometer qualifies under the exemption due to the fact that there is no EPA list of which test methods have been changed to allow for mercury free alternatives. There are estimated to be over 6,000 tests methods being revised.



**Thermostats** - 15,939 units = 131.7 lbs mercury  
See also – QSC & National Mercury Efforts

Thermostat collections continue to increase in Michigan due to the outreach efforts of MEO [www.michiganenergyoptions.org](http://www.michiganenergyoptions.org) under a Community P2 Grant. For recyclers, the program pays the \$25 recycling bin deposit charged by the TRC. For several years, Michigan collections averaged only 3,000 thermostats per year. In 2010, the first year of the outreach program, Michigan exceeded 12,000 thermostats. During 2011, Michigan collected 15,939 thermostats.



The MEO distributed over 2,000 brochures with follow-up phone calls to HVAC contractors and utility energy efficiency programs. The MEO also created a Web site of the registered collection sites to help residents and small contractors locate thermostat recycling sites. The TRC has advised that Michigan has had the largest growth in the thermostat recycling program in the nation. In addition, Michigan's collections were unique as the typical collection sites nationally have been wholesalers. In Michigan, it is the contractors themselves.

Additional outreach efforts are being considered to increase the collections. (1) MEO is developing outreach posters and materials for distributing information through retailers. The idea is the DIY would replace their thermostat and recycle the old one. (2) PSAs are being developed to promote thermostat collection.

On April 28, 2011, Michigan was one of three states asked to represent the national Environmental Council of States in a national meeting on thermostat recycling. The EPA hosted the meeting in Washington DC that included representatives from the states, EPA, energy contractors, the Thermostat Recycling Corporation, and the National Demolition Association. In May, 2011, Michigan helped EPA, Region 5 develop a factsheet on mercury and demolition projects called: "Before You Tear it Down, Get the Mercury Out"

[www.epa.gov/mercury/pdfs/EPA-905-F-11-008.pdf](http://www.epa.gov/mercury/pdfs/EPA-905-F-11-008.pdf). Since then, the National Demolition Association has posted that information on their Web site!

[www.demolitionassociation.com/ENVIRONMENT/RecyclingInformation/MercuryContainingThermostats/SafeHandlingDisposal/tabid/248/Default.aspx](http://www.demolitionassociation.com/ENVIRONMENT/RecyclingInformation/MercuryContainingThermostats/SafeHandlingDisposal/tabid/248/Default.aspx)

This should help increase awareness within the industry and increase proper handling.



#### **TRI – 2010 Mercury Recycling** \*2011 data is not available yet

For many Michigan companies on EPA's TRI, mercury was an unavoidable contaminant, such as coal fired power plants. There were only two companies that clearly utilized mercury in their processes; Kerr and Mercury Displacement Industries.

Kerr manufactures dental amalgam and reported recycling 1,764 lbs of mercury. Mercury Displacement Industries manufactures electrical relays or switches and reported recycling 728 pounds of mercury. A summary of the TRI reports is below.

<u>Type of Facility</u>	<u>Recycled (in pounds)</u>	<u>Total Mercury* (in pounds)</u>
Cement & stone	0	389
Disposal	1,546	133
Mercury Manuf	2,492	2,689
Paper	0	53
Steel	34	171
Utility power	291	3,921
Total -all facilities	4,415	9,825

\*Total Mercury includes: emissions, recycling, and disposal.



### **Web site Efforts**

Work was done to simplify access to mercury recycling resources and organize information by category. Work to update broken links and post new publications is pending.



### **National and Multi-State Mercury Efforts**

#### Great Lake States

The Great Lakes Mercury Product Phasedown Report includes information on what all the states have done to control the use and discharge of mercury in products.

During 2011, the states worked on updating the detailed but outdated information. The updates have been compiled and will be sent to the states for approval to reissue the document in early 2012.

#### QSC – Quick Silver Caucus committee of ECOS

The OEA participates in about four monthly QSC calls and submits written comments as requested for the main committee and the following sub-committees.

- Automotive switches
- Dental amalgam
- Mercury export ban
- National Compendium of state mercury efforts
- Thermostats

Specific topics are discussed separately below. The DEQ and states worked on updating the 2005 Environmental Council of States, Quick Silver Caucus State Compendium. It contains a summary of all mercury activities in the states. In addition, the DEQ reviewed and commented on the QSC resolutions 06-7 on product stewardship and 09-2 on vehicle switches for an update. QSC leadership reauthorized them without considering the reviews due to time limits. These comments should be kept on file until the resolutions are re-evaluated again.

#### Dental Amalgam

For several years EPA refused to regulate dental amalgam as the program operates under a voluntary MOU with the national American Dental Association. Several states demonstrated that the voluntary compliance program was not working and environmental impacts needed to be addressed. The EPA initially planned to issue wastewater categorical regulations by early 2012 that would not specify limits, but would require compliance with some best management practices. Even when released, typically new categorical regulations include a three year delay in implementation to allow for outreach and compliance. The work on these rules has been tabled.

Note: Rural Dentists - these regulations will not apply to dentists discharging to a septic tank. QSC is researching how to address the groundwater contamination from rural dentists.

#### EPA Mercury Export Ban & DOE Storage Facility

There has not been any action on this since the 2010 conference calls.

#### Gas Meter Regulators

In 2010, Region 5 EPA worked with HUD to develop a partnership with utilities to take back gas meter regulators containing mercury removed during demolition and deconstruction by community blight projects. No status is available.



Thermometers

Several states prohibit the use of mercury thermometers. This has caused problems for hospitals, laboratories, and research facilities. The common issue is about the problem finding mercury-free alternatives that satisfy certification requirements for equipment such as autoclaves and meeting EPA analytical method requirements for mercury thermometers. The EPA has issued guidance and proposed rules to recognize mercury-free thermometers for specified applications.

Thermostats

See thermostats above. The EPA has advised they will not be able to take an active role on this issue after the April 28, 2011, meeting.

**ACRONYMS**

CFL	Compact Fluorescent Lamp (light bulb)
DEQ	Department of Environmental Quality
DIY	Do It Yourself (home repair)
DLARA	Department of Labor and Regulatory Affairs
DOE	Department of Energy
ECOS	Environmental Council of States
ELVS	End of Life Vehicle Solutions Corporation
EPA	US Environmental Protection Agency
GLRI	Great Lakes Restoration Initiative <a href="http://www.epa.gov/glnpo/glri">www.epa.gov/glnpo/glri</a>
HHW	Household Hazardous Waste
HUD	Housing & Urban Development
HVAC	Heating, Ventilation & Air conditioning
IMERC	Interstate Mercury Education & Reduction Clearinghouse
MDA	Michigan Dental Association
MDCH	Michigan Department of Community Health
MDE	Michigan Department of Education
MEO	Michigan Energy Options
MOU	Memorandum of Understanding
MSU	Michigan State University
MWEA	Michigan Water Environment Association
NVMSRP	National Vehicle Mercury Switch Recycling Program
OEA	Office of Environmental Quality
P2	Pollution Prevention
PEAS	Pollution Emergency Alerting System
PSA	Public Service Announcement
QSC	Quick Silver Caucus
TRC	Thermostat Recycling Corporation <a href="http://www.thermostat-recycle.org">www.thermostat-recycle.org</a>
TRI	Toxics Release Inventory <a href="http://www.epa.gov/tri">www.epa.gov/tri</a>
WRD	Water Resources Division