



Department of the Environment

Collection of Mercury Switches and Mercury Switch Assemblies from Vehicles

July 1, 2016 – June 30, 2017

Prepared by:

Land and Materials Administration

Prepared for:

The Maryland General Assembly

October 1, 2017



MARYLAND DEPARTMENT OF THE ENVIRONMENT
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Background

In the 2009 session, the Maryland General Assembly passed House Bill 1263 – Maryland’s Mercury Switch Removal from Vehicles Act (the “Act”), Chapter 713. The bill amended Environment Article, Annotated Code of Maryland, Sections 6-904 and 6-905.

The impetus for the Act was that processing scrap metal from motor vehicles was causing releases of mercury to the environment from mercury-containing switches. The Act requires removal of mercury-containing switches from end-of-life vehicles by vehicle recyclers and by scrap processing facilities. Manufacturers of vehicles with mercury switches are required to develop and implement a “mercury minimization plan” that will assist entities required to remove mercury-containing switches from vehicles.

Section 6-905.5(j) of the Environment Article, Annotated Code of Maryland, requires the Maryland Department of the Environment (“the Department”) to submit a report on the implementation of the Act to the General Assembly by October 1 of each year. The report is required to include information on:

1. The number of mercury switches and mercury switch assemblies recovered from vehicles;
2. The capture rate of switch recovery achieved;
3. The number of switches projected to be recovered;
4. The amount and use of funds paid into the State Recycling Trust Fund for the administration of this Act; and
5. Any recommendations to improve the provisions of this Act or to increase the capture rate of mercury switches from vehicles.

This document is submitted in fulfillment of the requirement under Environment Article, 6-905.5(j), Annotated Code of Maryland. **This report covers the period from July 1, 2016 through June 30, 2017.** This is the last full-year report as the law requiring the report sunsets on December 31, 2017.

Overview of Mercury Switch Collection Program

Under the Act, vehicle manufacturers that sold vehicles containing mercury switches in Maryland must develop a mercury minimization plan. The plan ensures that manufacturers will be responsible for removal and collection of mercury switches from end-of-life vehicles before the vehicles are processed at vehicle recycling and scrap processing facilities. Processing includes intentionally flattening, crushing, bailing, or shredding of vehicles. The plan is required to include information on the location of mercury-containing switches in vehicles by make, model, and model year; information on the safe and environmentally responsible removal and handling of mercury-containing switches; a plan for implementing and financing the removal, collection, and recovery of mercury-containing switches; payments to vehicle recyclers for each mercury-containing switch collected in accordance with the mercury minimization plan; and maintenance of appropriate record-keeping systems associated with implementation of the plan.

Vehicle manufacturers that installed mercury-containing switches have established a nationwide collection program for automotive mercury switches. This program is being

implemented by the End of Life Vehicle Solutions Corporation (ELVS), an entity created by a consortium of motor vehicle manufacturers. The ELVS website (www.elvsolutions.org) states that ELVS was created by the automotive industry to promote the industry's "environmental efforts in recyclability, education and outreach, and the proper management of substances of concern."

Automobile manufacturers are relying on the ELVS mercury switch collection program to serve as the core of the Maryland approved "mercury minimization plan" that the manufacturers were required to develop and implement under the Act. Under the program, ELVS provides vehicle recyclers and scrap processing facilities with specially designed containers for collection, temporary storage, and shipping of mercury switches removed from end-of-life vehicles. Pre-paid shipping is included with containers that are provided to program participants.

ELVS has developed educational materials that identify which vehicles have mercury switches, where the switches are located on the vehicles, and how the switches should be removed. These educational materials are provided to program participants, and are also made available on the ELVS website (www.elvsolutions.org).

Maryland participants are eligible for bounty payments from ELVS of \$4 per mercury light switch or mercury light switch assembly and \$6 per mercury-containing antilock braking system (ABS) unit, provided the switches are delivered to ELVS in accordance with requirements specified in the program plan. The plan also provides for a payment from ELVS to the Department of \$1 for each mercury switch delivered to ELVS in accordance with the plan.

ELVS submitted its mercury minimization plan for review by the Department on September 27, 2009. On October 27, 2009, ELVS submitted a revised plan that addressed issues arising from the General Motors bankruptcy and reorganization. The Department reviewed the plan and provided ELVS with written comments on October 30, 2009. ELVS provided the Department with a revised plan on November 23, 2009 and the Department approved the plan on January 25, 2010.

As of June 30, 2017, 150 of 150¹ active facilities from Maryland have registered in the ELVS collection program. Due to the upcoming sunset of the law, all departmental activities relating to the state's National Vehicle Mercury Switch Removal Program ended. Therefore, no new facilities are expected to register in the ELVS program.

¹ This may differ slightly from the registered number shown in the January 31, 2017 ELVS Manufacturer's Annual Implementation Report (Appendix A) due to the existence of out-of-business and duplicate facilities in the ELVS database.

Report of Required Information

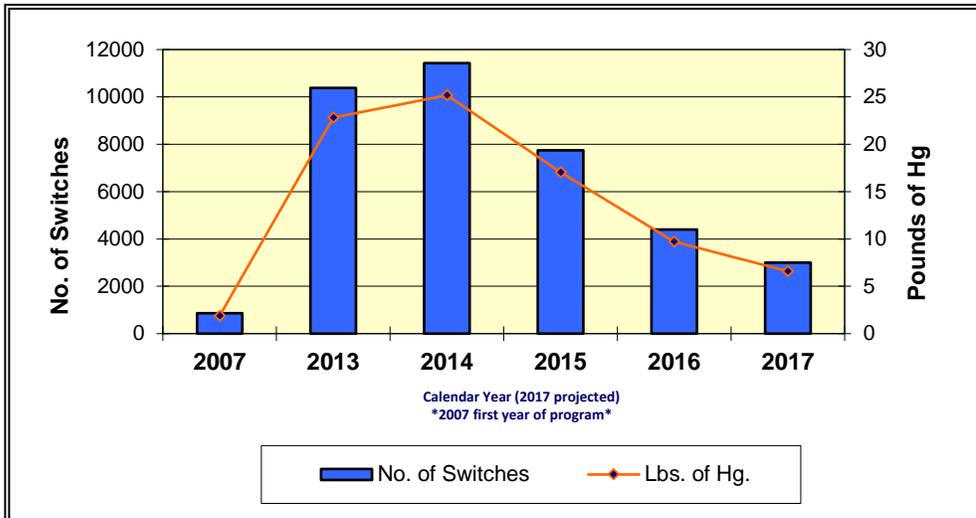
This section of the report presents information required to be reported to the General Assembly under Environment Article, 6-905.5(j), Annotated Code of Maryland. The information is presented in the order it is listed in Section 6-905.5(j).

- Number of mercury switches and mercury switch assemblies recovered from vehicles:

From July 1, 2016 through June 30, 2017, the period covered by this report, the ELVS recycling contractor received 3,500 mercury switches (yielding 7.7 pounds of mercury) from Maryland vehicle recyclers and scrap processing facilities. This is a decrease of 52.45% compared to the 7,360 mercury switches collected during the previous twelve months. Month-by-month data on the number of switches returned to ELVS from July 1, 2016 through June 30, 2017, are shown in the following table:

Month-Year	Number of Switches
Jul-2016	205
Aug-2016	298
Sept-2016	198
Oct-2016	102
Nov-2016	1,041
Dec-2016	157
Jan-2017	557
Feb-2017	54
Mar-2017	54
Apr-2017	176
May-2017	613
Jun-2017	45
TOTAL	3,500

From January 1, 2017 to June 30, 2017, 1,499 mercury switches, yielding 3.3 pounds of mercury, were returned to the ELVS recycling contractor from Maryland. Data from CY 2007 – 2017 (projected) is presented in the following chart and table:



Calendar Year	Number of Switches Collected	Pounds of Mercury Collected **
2017 [^] (projected)	2,998	6.60
2017*	1,499	3.30
2016	4,393	9.70
2015	7,745	17.04
2014	11,653	25.64
2013	10,376	22.83
2012	12,151	26.73
2011	11,011	24.22
2010	5,509	12.12
2009	10,052	22.11
2008	4,625	10.23
2007	860	1.89
TOTAL **	79,874	175.81

[^] 2017 projected switches equal to $(1,499 \div 6) \times 12$.

* For period January 1, 2017 through June 30, 2017, period ending date covered by report.

** Per ELVS, 454.54 switches = 1 pound of mercury.

** Actual total through June 30, 2017. 2017 projected **not** included in Total.

Appendix A contains the 2017 ELVS Manufacturers' Implementation Report which is required to be submitted by the vehicle manufacturers. The report details collection activities for the previous CY of 2016. Note that there is a lag between the time that participants remove switches from vehicles and the time that the switches are delivered to ELVS because it takes time to accumulate enough switches to fill the collection/shipping container. During each Department inspection, the facility is made aware that the mercury switch collection/shipping container cannot be kept on site for more than one year from the date the first switch is placed in the container. This is required to remain in compliance with hazardous waste regulations, Code of Maryland Regulations (COMAR)

26.13.10.17B(1), which references the “Universal Waste Rule” with respect to the storage of hazardous waste

- Number of switches projected to be available for recovery:

The National Vehicle Mercury Switch Recovery Program (NVMSRP) Switch Retirement Model, available on the ELVS web page at http://elvsolutions.org/?page_id=1298, provides the following estimates for the number of end-of-life vehicle mercury switches available in Maryland through 2017:

Year	Estimated No. Switches Available from Vehicles Scrapped in Maryland
2007	61,000
2008	51,000
2009	51,000
2010	51,000
2011	48,000
2012	44,000
2013	41,000
2014	38,000
2015	34,000
2016	31,000
2017	27,000
Total	477,000

- Capture rate of switch recovery achieved:

ELVS uses the Switch Retirement Model developed by the NVMSRP Measurement Committee to identify switch populations and estimate mercury switch retirement rates through 2017. The NVMSRP was developed through a collaborative effort involving the U.S. Environmental Protection Agency, states, environmental organizations, and several industry sectors. More information on the NVMSRP is available at http://elvsolutions.org/?page_id=8.

The Switch Retirement Model uses historic information on vehicle sales by state, estimates of vehicle scrappage rates as a function of vehicle age, and information on the average number of mercury switches per vehicle to estimate the number of switches expected to be in vehicles scrapped each year, by state.

The model estimates the total number of mercury switches installed in vehicles manufactured before automobile model year 2003 and sold in the United States to be 169,185,000. The 2002 model year was the last year that mercury switches were installed in vehicles. Most of the vehicles manufactured prior to 2003 containing these switches

have already been taken out of service. The model estimates that 11,797,000 mercury switches nationally will be taken out of service from 2013 through 2017. The number of mercury switches available for collection from vehicles taken out of service in Maryland from 2013 through 2017 is estimated at 171,000. The model estimates that 27,000 mercury switches were available for collection from vehicles taken out of service in Maryland in calendar year 2017, and 31,000 mercury switches in calendar year 2016.

The Maryland Mercury Switch Model table on pages 7 and 8 is an approximation indicating the number of mercury switches available for recovery, by year, as estimated by the Switch Retirement Model.

To determine the capture rate (CR) in Maryland for the reporting period July 1, 2016 through June 30, 2017, the number of mercury switches available during this period was calculated as follows:

July 1 through December 31, 2016, the number of mercury switches available was 31,000 x (6/12) = 15,500.

January 1 through June 30, 2017, the number of mercury switches available was 27,000 x (6/12) = 13,500.

Therefore, the Capture Rate from July 1, 2016 through June 30, 2017 was:

$$\frac{\text{Number of Switches Returned}}{\text{Total Number of Switches Available}} = \text{Capture Rate} \therefore \frac{3,500}{29,000} = 0.1206 \text{ or } 12\%$$

As mentioned before, there can be a significant lag time before a switch that has been removed is returned for recycling. Also, economic concerns related to the recession may have reduced the number of switches available as vehicle owners kept vehicles in operation longer. There may be some uncertainty in the model's estimate of the number of switches available because the model assumes that a vehicle that was purchased in Maryland will be scrapped in Maryland. That does not take into account vehicles being taken out of State by persons who relocate, and trade-in vehicles being sent out of State by new car dealers. However, this could be happening in other states as well, resulting in vehicles originally purchased elsewhere being scrapped in Maryland.

- Amount and use of funds paid into the State Recycling Trust Fund:

For FY 2017 (*i.e.*, July 1, 2016 through June 30, 2017), the Department was paid \$3,355 by ELVS. As stated in the manufacturers' mercury minimization plan, ELVS pays the State the \$1.00 required under the Act only upon receiving proper documents from program participants. The switch recovery plan the Department approved includes the statement "ELVS will further authorize the payment of \$1 for each *form verified* (emphasis added) mercury convenience light switch or mercury containing ABS assembly to the Maryland Department of the Environment." The amount of money the State received from ELVS (\$3,355) vs. the number of switches received by ELVS (3,500) from vehicle recyclers and processing facilities reflects the challenges related to the submission of the proper documents. Also, once switches are shipped by a State participant in the program,

the delay within ELVS for payment of costs to the State may take between 60 and 90 days. This delay may result in mercury switches counted during the fiscal year coming from switches collected during the previous year.

In FY 2017, the Department expended \$0.00 for mercury switch recovery program activities. Details on program costs are provided in the financial statement on Page 9 of this report.

Maryland Mercury Switch Model

<u>Year Model</u>	<u>Scrappage Rate</u>	<u>No. Switches in Operation as of 7/06</u>	<u>No. Scrapped 2007</u>	<u>2007 Switches In Operation</u>	<u>2008 No. Scrapped</u>	<u>2008 Switches In Operation</u>	<u>2009 No. Scrapped</u>	<u>2009 Switches In Operation</u>	<u>2010 No. Scrapped</u>	<u>2010 Switches In Operation</u>	<u>2011 No. Scrapped</u>	<u>2011 Switches In Operation</u>
1973 & Older	20.2	21,818	4,407	17,411								
1974	20.2	2,485	502	1,983	3,918	15,476						
1975	20.2	2,328	470	1,858	375	1,482	3,426	13,533				
1976	20.2	3,541	715	2,826	571	2,255	455	1,799	3,097	12,235		
1977	20.2	5,058	1,022	4,036	815	3,221	651	2,570	519	2,051	2,886	11,400
1978	19.3	6,318	1,219	5,098	1,030	4,068	822	3,247	656	2,591	523	2,067
1979	18.5	7,687	1,422	6,265	1,209	5,056	1,021	4,034	815	3,219	650	2,569
1980	17.7	4,186	741	3,445	637	2,807	542	2,266	458	1,808	365	1,443
1981	16.9	4,465	755	3,711	657	3,054	565	2,489	480	2,009	406	1,603
1982	16.1	5,205	838	4,367	738	3,629	642	2,987	553	2,434	470	1,964
1983	15.2	8,546	1,299	7,247	1,167	6,080	1,028	5,052	894	4,158	769	3,389
1984	14.5	15,242	2,210	13,032	1,981	11,051	1,779	9,272	1,567	7,705	1,364	6,341
1985	13.6	20,847	2,835	18,012	2,612	15,400	2,341	13,059	2,103	10,957	1,852	9,105
1986	12.9	34,873	4,499	30,375	4,131	26,244	3,805	22,438	3,411	19,028	3,063	15,964
1987	12.1	32,462	3,928	28,534	3,681	24,853	3,380	21,473	3,114	18,359	2,791	15,569
1988	11.4	41,449	4,725	36,724	4,444	32,280	4,164	28,116	3,824	24,292	3,522	20,770
1989	10.6	56,526	5,992	50,534	5,761	44,773	5,418	39,356	5,077	34,279	4,662	29,617
1990	9.9	46,336	4,587	41,749	4,425	37,323	4,255	33,069	4,001	29,067	3,750	25,318
1991	9.2	48,654	4,476	44,177	4,374	39,804	4,219	35,585	4,057	31,528	3,815	27,713
1992	8.5	42,356	3,600	38,756	3,566	35,190	3,484	31,706	3,361	28,345	3,231	25,114
1993	7.8	53,606	4,181	49,425	4,201	45,224	4,161	41,063	4,065	36,998	3,922	33,076
1994	7.3	66,074	4,823	61,250	4,778	56,473	4,800	51,672	4,754	46,919	4,645	42,274
1995	5.6	47,409	2,655	44,754	3,267	41,487	3,236	38,251	3,251	35,000	3,220	31,780
1996	4.6	38,912	1,790	37,122	2,079	35,044	2,558	32,485	2,534	29,952	2,546	27,406
1997	3.4	13,580	462	13,118	603	12,514	701	11,814	862	10,951	854	10,097
1998	3.1	14,115	438	13,678	465	13,213	608	12,605	706	11,899	869	11,031
1999	2.5	22,655	566	22,089	685	21,404	728	20,676	951	19,725	1,105	18,620
2000	2.3	8,317	191	8,125	203	7,922	246	7,677	261	7,416	341	7,075
2001	1.8	9,551	172	9,379	216	9,163	229	8,934	277	8,657	294	8,363
2002	1.7	29,114	495	28,619	515	28,104	646	27,458	686	26,771	830	25,942
	Total*	713,713	66,016	647,697	63,102	584,595	59,909	524,687	56,333	468,354	52,745	415,609
			Switches Newly Available in MD for Collection:		61,000	51,000	51,000	51,000	51,000	48,000		

Note: Switches available for collection estimated by subtracting inaccessible switches due to vehicle damage, end of life vehicle exports, and lost or stolen vehicles which do not enter the recycling stream from total switches, Sheet.

*Totals may not add up due to rounding.

<u>Year Model</u>	<u>Scrappage Rate</u>	<u>2012 No. Scrapped</u>	<u>2012 Switches In Operation</u>	<u>2013 No. Scrapped</u>	<u>2013 Switches In Operation</u>	<u>2014 No. Scrapped</u>	<u>2014 Switches In Operation</u>	<u>2015 No. Scrapped</u>	<u>2015 Switches In Operation</u>	<u>2016 No. Scrapped</u>	<u>2016 Switches In Operation</u>	<u>2017 No. Scrapped</u>	<u>2017 Switches In Operation</u>
1973 & OLDER	20.2												
1974	20.2												
1975	20.2												
1976	20.2												
1977	20.2												
1978	19.3	2,721	10,747										
1979	18.5	519	2,050	2,585	10,212								
1980	17.7	291	1,151	233	919	2,249	8,883						
1981	16.9	324	1,279	258	1,021	206	815	1,959	7,738				
1982	16.1	397	1,568	317	1,251	253	998	202	797	1,724	6,811		
1983	15.2	654	2,735	552	2,182	441	1,742	352	1,390	281	1,109	1,600	6,320
1984	14.5	1,173	5,168	997	4,170	842	3,328	672	2,656	536	2,119	428	1,691
1985	13.6	1,612	7,494	1,386	6,107	1,179	4,929	996	3,933	794	3,139	634	2,505
1986	12.9	2,698	13,266	2,348	10,918	2,020	8,898	1,717	7,181	1,451	5,730	1,158	4,573
1987	12.1	2,507	13,062	2,208	10,855	1,921	8,933	1,653	7,281	1,405	5,876	1,187	4,689
1988	11.4	3,157	17,613	2,836	14,777	2,497	12,280	2,174	10,106	1,870	8,237	1,590	6,647
1989	10.6	4,294	25,323	3,849	21,473	3,457	18,016	3,045	14,972	2,650	12,322	2,279	10,042
1990	9.9	3,443	21,874	3,172	18,703	2,843	15,860	2,553	13,306	2,249	11,058	1,957	9,100
1991	9.2	3,575	24,138	3,283	20,855	3,024	17,831	2,710	15,121	2,434	12,686	2,144	10,542
1992	8.5	3,039	22,075	2,848	19,227	2,615	16,613	2,409	14,204	2,159	12,045	1,939	10,106
1993	7.8	3,771	29,305	3,546	25,759	3,323	22,436	3,051	19,385	2,811	16,574	2,519	14,055
1994	7.3	4,481	37,793	4,308	33,484	4,052	29,433	3,797	25,636	3,486	22,149	3,212	18,938
1995	5.6	3,146	28,634	3,035	25,598	2,918	22,680	2,744	19,936	2,572	17,364	2,362	15,003
1996	4.6	2,521	24,884	2,464	22,421	2,377	20,044	2,285	17,759	2,149	15,610	2,014	13,597
1997	3.4	858	9,239	850	8,389	830	7,558	801	6,757	770	5,987	724	5,262
1998	3.1	860	10,170	864	9,306	856	8,450	837	7,613	807	6,806	776	6,030
1999	2.5	1,359	17,261	1,346	15,915	1,353	14,562	1,340	13,222	1,309	11,913	1,263	10,651
2000	2.3	396	6,678	488	6,191	483	5,708	485	5,223	481	4,742	469	4,273
2001	1.8	385	7,978	447	7,532	550	6,982	545	6,437	547	5,890	542	5,348
2002	1.7	882	25,060	1,153	23,907	1,339	22,568	1,647	20,921	1,632	19,289	1,640	17,649
	Total*	49,063	366,546	45,372	321,173	41,627	279,546	37,973	241,573	34,117	207,456	30,436	177,020

*Totals may not add up due to rounding.

Switches Newly Available in MD for Collection:

44,000

41,000

38,000

34,000

31,000

27,000

**RECYCLING TRUST FUND
MERCURY AUTO SWITCH ACTIVITY**

July 1, 2016 to June 30, 2017

A. Beginning Balance 7/01/16 \$0.00

B. FY 2017 Receipts

Mercury Vehicle Switch Payments from ELVS \$3,355.00

C. Total Receipts Available FY 2017 (A+B) **\$3,355.00**

FY 2017 Expenditures

D.

Salaries and Wages	0
Technical and Special Fees	0
Communications	0
Travel	0
Utilities	0
Motor Vehicle Operations and Maintenance	0
Contractual Services	0
Supplies and Materials	0
Equipment	0
Grants	0
Fixed Charges	0
Subtotal	0
Indirect Costs (26.29% + Fringe)	0
*Total Expenditures	\$0.00

* Total Expenditure reflects the total sum of Mercury Auto Switch Activity for FY 2017, broken down by funding of \$0.00 from State General Funds and \$0.00 from Federal Funds.

E. Balance for Mercury Switch Activities June 30, 2017 \$3,355.00

Highlights of Department Activities

On July 1, 2016, all departmental activities relating to the state’s National Vehicle Mercury Switch Removal Program ended due to the forthcoming sunset of the law. Therefore, during the period covered by this report, the Department did not perform any inspections or perform outreach activities related to the program. However, during this same period, mercury switches continued to be removed and collected from end-of life vehicles by recyclers and scrap processing facilities.

Implementation Challenges

Payment to the State by vehicle manufacturers of \$1.00 per switch recovered, as mandated in the Act, is a concern because the manufacturers are only making payments for switches accompanied by complete and accurate documents required by ELVS. As a result, the State received \$3,355 in payments in FY 2017, reflecting a decrease from the \$6,479 received in FY 2016. The discrepancy between the money received and switches returned can be attributed to the return of switches without proper documentation, and a delay from the time switches are received by ELVS and the processing of the switches. Participants may intentionally omit the proper documentation because they believe the burden of filling out the ELVS documents exceeds the value of the \$4 or \$6 per switch bounty. In addition, some participants do not want to deal with the tax implications of receiving the reimbursement.

The reduction in the number of switches returned by vehicle recyclers and scrap processing facilities may be attributed to a reduced number of vehicles received that contain mercury switches, and the practice of participants to delay the return of switches collected.

Future Activities

Facilities that fall under the scope of Maryland’s mercury switch recovery program are required to remove mercury switches from end-of-life vehicles in compliance with the requirements of the Maryland Mercury Switch Law.

As noted in the End-of-Life Vehicle Solutions Corporation (ELVS) “Manufacturer’s Annual Implementation Report dated January 31, 2017 (Appendix A), the NVMSRP is being extended until December 31, 2021. However, payments for mercury switches only occurs in states with mercury switch legislation. The Maryland Mercury Switch Law sunsets on December 31, 2017.

Appendix A



P.O. BOX 3282
Farmington Hills, MI. 48333-3292

January 31, 2017

Mr. David Mrgich, Chief
Waste Diversion Division
Maryland Department of the Environment
LMA/Waste Diversion & Utilization Program
1800 Washington Boulevard, Suite 610
Baltimore, MD 21230-1719

Subject: End-of-Life Vehicle Solutions Corporation "Manufacturer's Annual
Implementation Report"

Dear Mr. Mrgich,

The Annotated Code of Maryland Section 6-905.5(G) Mercury Switch Removal from Vehicles, Chapter 713 requires vehicle manufacturers to report annually to the Maryland Department of the Environment on the progress of their mercury minimization plan including:

- the number of mercury switches collected
- a description of the capture rate achieved
- a description of actions that may be implemented to improve the plan if a capture rate of at least 90% for the previous calendar year is not achieved
- the number of end-of-life vehicles containing mercury switches
- a description of how the mercury switches were managed
- a description of the costs of implementing the program

This report is provided by End of Life Vehicle Solutions Corporation on behalf of its member automotive companies. The participating members of ELVS are: FCA US LLC (formerly Chrysler Group LLC); Ford Motor Company; Mack Trucks Inc; Mercedes-Benz USA, LLC; Mitsubishi Motors North America, Inc; Navistar, Inc.; Nissan North America, Inc; PACCAR, Inc; Porsche Cars North America Inc.; Subaru of America, Inc; Toyota Motor Sales USA, Inc.; Volkswagen Group of America, Inc; Volvo Cars of North America; and Volvo Trucks North America. This report also includes switches from the former MLC (old GM).

Mercury Switches Collected

A total of 4,393 mercury switches were delivered to the ELVS recycling contractor from Maryland dismantlers during calendar year 2016, yielding 9.7 pounds of recovered mercury. There were 165 registered dismantlers, 46 of which submitted switches.

Mercury Switch Capture Rate

The estimated number of switches available for recovery in Maryland during 2016 was 31,000. The number of switches collected (4,393) yields an annual capture rate of 14% (23% for 2015).

Vehicle / Switch Estimates

ELVS uses the National Vehicle Mercury Switch Recovery Program (NVMSRP) Switch Retirement Model (www.elvsolutions.org/model.html) approved by the U.S. EPA and program partners to estimate mercury switch populations. The model was developed to identify switch populations and estimate mercury switch retirement rates through 2017. Therefore, the model focuses on mercury switch counts rather than vehicle counts.

The model estimates that the national total number of mercury switches historically manufactured in vehicles to be 169,185,000. Most of the vehicles containing these switches have already been scrapped, with an estimated 1,859,000 switches remaining in today's national fleet for collection (CY 2017). Maryland's portion of switches remaining for collection (CY 2017) is estimated to be 27,000.

For reference and according to the model, the number of mercury switches that were available nationally for recovery in 2016 was estimated to be 2,098,000 units. In Maryland 31,000 switches were available for recovery in 2016.

For your convenience, regularly updated collection information is available through our contractor's (US Ecology) website, <http://www.eqonline.com/services/ELVS-Mercury-Switch-Recovery-Program/annual-report.asp?year=all>, portions of which are now downloadable into Excel. This web-based data tracking system is part of ELVS' commitment to data accessibility, and will be available at least until 2017.

Processing of Vehicles

ELVS does not have data on the actual number of end of life vehicles processed. Our estimate is based on data from the latest Ward's Motor Vehicle Facts & Figures. According to Wards, the number of vehicles retired from use nationally in 2014 (the latest year given) is 11,047,000. The total registrations for Maryland for 2014 (again, the latest year given) are 3,936,290 out of 252,301,882 registered nationally. We estimate approximately 172,350 end of life vehicles were processed in Maryland in 2015 ($11,047,000 * (3,936,290 / 252,301,882)$). This does not include end of life vehicle imports or exports from the state or the effect of recessions. We realize that the number of vehicles retired annually varies year to year depending on many conditions. Our estimate is therefore based on the best available data.

Improvement Actions

- In 2016 ELVS participated in a number of regional and national automotive recycling events, some of which were attended by Maryland recyclers. In 2017, ELVS will continue to attend major events to encourage recycler participation and mercury switch collection.

- Based on a mutual desire to maintain nationwide recovery of automotive mercury switches, auto and steel manufacturers have signed an agreement to continue the ELVS program past the current expiration of the National Vehicle Mercury Switch Recovery Program on December 31, 2017. The ELVS program extension will be from January 1, 2018 through December 31, 2021. The services and program support currently provided by ELVS will continue during the extension of the program.

Mercury Switch Management

Mercury switches received by ELVS are generally managed as follows:

- Dismantlers remove the switch assemblies and place them in the collection bucket, or extract and place the mercury pellets in the collection buckets. ABS assemblies with multiple pellets are returned as units.
- Once the buckets are full, the dismantler contacts US Ecology which pays for the shipping of the buckets to its facility in Michigan.
- US Ecology records the number of pellets and enters them into its database. The pellets are then sent to a retorting facility where the mercury is recycled.

Program Costs

The total implementation cost for the program including bounties, bucket charges, and program maintenance was \$30,152 for calendar year 2016.

If you have any questions or comments regarding this report, please contact me at brelvs@yahoo.com.

Sincerely,



Brian Rippon
End-of-Life Vehicle Solutions
Project Manager