

ADVISORY COMMITTEE ON MERCURY POLLUTION



2007 ANNUAL REPORT

to the Governor, General Assembly
and Citizens of the State of Vermont
January 2007

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	Gary Gulka	Vermont Agency of Natural Resources
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EXECUTIVE SUMMARY

This is the ninth annual report of the Advisory Committee on Mercury Pollution, which was established in 1998 by the Vermont Legislature to address and report on mercury contamination in the environment, health risks posed, and to review programs and methods to reduce contamination and health risks of mercury to Vermonters (10 V.S.A. §7113).

The report reviews the status of recent mercury education and reduction efforts in Vermont; mercury environmental and health update; and Committee recommendations to the Legislature on reducing mercury exposure and risk.

Committee Recommendations

Dental Mercury

- In efforts to virtually eliminate the release of anthropogenic mercury in Vermont, the Committee supports an eventual phase-out of mercury-containing dental amalgam and recommends that the Legislature consider this.
- Dental clinics should provide information to patients about the advantages and disadvantages to human health and the environment from using dental amalgam and other filling materials, and this information should be developed by the Vermont Department of Health in consultation with the Vermont State Dental Society and the Advisory Committee on Mercury Pollution. In addition, the Committee recommends that the Legislature consider legislation to not allow placement of dental amalgams in pregnant women and children under 18 years of age.

Thimerosal in Vaccines

- Vermont should prohibit the use of thimerosal, a mercury-containing preservative, in vaccines administered to children under 18 years of age and in pregnant women, except in the case of an emergency or a temporary shortage.

Fish Mercury Monitoring Program

- The Committee supports the recommendations for a proposed fish mercury monitoring program for Vermont's freshwaters in the 2006 legislative report of the Vermont Departments of Environmental Conservation, Fish and Wildlife, and Health. The proposed fish mercury monitoring program would enable the Vermont Fish Contaminant Monitoring Committee (consisting of the three above-mentioned departments) to document the occurrence of and trends in mercury contamination in fresh water fishes in Vermont's lakes and rivers and relate trends to mercury reduction management actions. This monitoring program is essential to understanding and managing the risk of mercury contamination from fresh water fish consumption. The cost of an ongoing fish mercury monitoring program is slightly more than \$35,000 per year. Vermont's efforts to monitor fish mercury from inland waters presently lag behind those of every New England state except for Rhode Island, but this can easily be changed. Adequate funding should be available to the Departments of Environmental Conservation and Fish and Wildlife to perform this important and necessary task.

Mercury-Thermostats

- The Committee supports legislation similar to that recently adopted in Maine, requiring thermostat manufacturers to provide convenient collection and recycling programs for out-of-service mercury thermostats from all sources; including residential, commercial and institutional; and provide meaningful financial incentives to significantly increase the collection rate of mercury thermostats. Legislation should also require performance standards on manufacturers to ensure high capture rates of mercury thermostats and annual reports to the Agency from manufacturers on thermostat collection amounts.

National Management of Surplus Mercury

- The Advisory Committee recommends that the Legislature adopt a resolution requesting the U.S. Congress to enact legislation that: (1) prohibits the sale or transfer to any entity of the large quantities of stockpiled elemental mercury held by the Department of Defense and the Department of Energy; (2) prohibits the export of elemental mercury from the U.S. from all sources; and (3) establishes federal storage capacity sufficient to safely store federal stocks of surplus mercury and also store non-federal stocks that are in excess of quantities necessary for domestic consumption.

INTRODUCTION

This is the ninth annual report of the Advisory Committee on Mercury Pollution, which was established in 1998 by the Vermont Legislature to address and report on mercury contamination in the environment, health risks posed, and to review programs and methods to reduce contamination and health risk of mercury to Vermonters (10 V.S.A. §7113).

The Committee met five times in the past year. Since 1998 the Committee has met 71 times.

This report is divided into the following sections:

- I. **Background for This Year's Report**
- II. **Mercury – Environmental and Health Update and Highlights**
- III. **Recent Mercury Education and Reduction Efforts**
- IV. **Committee Recommendations**
- V. **Committee Work Plan for 2005**

I. **Background for This Year's Report**

Fish Consumption: A Major Route of Methylmercury Exposure

The health and environmental effects of mercury pollution have been detailed by the Advisory Committee in previous reports (this can be accessed at www.mercvt.org). The main route of exposure of the general public to methylmercury is through the consumption of fresh water and marine fish and shellfish. The Food and Drug Administration (FDA) has issued stringent advisories for pregnant women and children to limit consumption of all fish to twelve ounces per week and canned white albacore tuna to six ounces per week. The federal Center for Disease Control and Prevention found that one in six, or 16 percent of American women of childbearing age had amounts of mercury in their blood above levels considered safe. The Vermont Department of Health has issued fish consumption advisories for freshwater fish that are caught in Vermont waters.

Mercury Sources

The Northeast States for Coordinated Air Use Management (NESCAUM) has finalized a new mercury emissions inventory for the Northeast region. As compared to a similar inventory developed in 1998, mercury emissions from the Northeast have been reduced from 15,900 kg to 4,700 kg; a 71% reduction. The New England Governors and Eastern Canadian Premiers have set a goal of virtual elimination of mercury releases and have an interim goal of 75% reduction by 2010. Point emission sources of mercury comprise 76% of the current total emissions. This includes municipal waste combustors, sewage sludge incinerators, electrical utility boilers, and steel and cement manufacturing as major point sources of mercury. Area sources comprise the remainder of mercury releases and include releases from products and fluorescent bulbs, home heating, dental discharges, and crematoria. Presently, out-of-region emission sources comprise 85% of the deposited to the Northeast, and in-region sources comprise 15%.

Mercury Legislation in Vermont

In 2005, comprehensive mercury legislation was passed to reduce the amount of mercury released to the environment through the discard of mercury-added products. This law bans the sale of certain mercury-added products such as thermostats, fever thermometers, and dairy manometers and restricts the sale of numerous other measuring devices containing mercury and mercury-added switch and relay components in thousands of products. The law further prohibits the use of mercury in schools, requires reduction in mercury releases from dental clinics, and requires mercury reduction plans from hospitals. The law clarifies the product labeling requirements for mercury-added products and bans the discard of mercury-added products in landfills and municipal waste incinerators.

In 2006, further mercury legislation was passed that requires the removal of mercury-added auto switches (trunk and hood convenience light switches and anti-lock brake mercury switches) from junk or end-of-life vehicles prior to crushing and scrap metal processing. The legislation also required the Agency of Natural Resources to report to the Legislature on recommendations to increase the recycling rate of mercury wall thermostats that are still in use in residential, commercial, and institutional settings.

Advisory Committee Recommendations

The 2006 report of the Advisory Committee also recommended that retail grocery stores selling fish in Vermont display fish consumption guidelines for mercury in fish. The Vermont Grocers' Association has supported the voluntary display of such information and has disseminated information materials to all its members in 2006.

The recommendations in this year's report focus on and further develop some of the recommendations in last year's report and include the use of mercury-containing dental amalgam; the use of mercury-containing preservatives in vaccines; mercury thermostats; and establishment of a fish mercury monitoring program. A new recommendation not previously addressed by the Committee concerns the ever-growing national and international problem of excess mercury in commerce as a result of reduced use in products and processes in this country and increased recycling of mercury from discarded products and other sources.

II. Mercury – Environmental and Health Update and Highlights

The following is an update of noteworthy environmental and health issues regarding mercury that is of relevance to the Advisory Committee and its charge.

U.S. Environmental Protection Agency

Roadmap for Mercury: During 2006, the U.S. Environmental Protection Agency (EPA) published its Roadmap for Mercury – a six-part action plan establishing an approach to reducing mercury pollution nationally and internationally. The document addresses six aspects of mercury pollution: mercury releases to the environment; mercury uses in products and processes; managing the mercury stockpile; communicating risks to the public; international mercury sources; and mercury research and monitoring. The Roadmap is a new action plan that follows the 1998 EPA Draft Mercury Action Plan. It establishes priorities for EPA that compliment priorities of many states for mercury risk reduction, and is the first acknowledgement by EPA that managing mercury supplies and excess commodity-grade mercury is a national and international problem.

Implementation of the Clean Air Mercury Rule: During 2006, EPA completed its reconsideration of the Clean Air Mercury Rule (CAMR). This regulation, in concert with the Clean Air Interstate Rule, is designed to cap mercury emissions at 31% of 2005 levels using a combination of sulfur emission controls and the so-called “cap and trade” approach. Under “cap and trade”, coal-fired generating units that exceed target reductions can release credits against these overages to the open marketplace. Many scientists question the suitability of “cap and trade” for mercury, as emissions may continue unabated at certain plants (that achieve their mandated reductions by purchasing credits), leading to the maintenance or exacerbation of land-based mercury pollution hotspots. As of December 2006, all Northeastern states have submitted their required State Implementation Plans under CAMR. Having no coal-fired generating units within its borders, Vermont is exempt from the requirement to develop a State Implementation Plan. However, as it presently stands, no Northeastern state is choosing to permit credit trading as part of its plan, which bodes well for reducing mercury in Vermont’s environment.

Forthcoming important synthesis studies by Hubbard Brook Research Foundation

The Hubbard Brook Research Foundation’s ScienceLinks team has completed two important journal articles that stand as statements on the overall footprint of the mercury problem in the Northeast. The first study describes the mechanisms by which mercury moves from emissions source to Northeastern biota. The second study identifies the locations and causes of biological mercury hotspots on the landscape, two of which occur in Vermont. The second study also identifies changes in biota mercury levels that resulted from recent reductions in regional air mercury emissions from waste combustion. The release date for the publications, and an accompanying interpretive report entitled *Mercury Matters*, is January 9, 2007.

National Mercury Monitoring Program

Both of the Hubbard Brook journal articles speak to the need for a National Mercury Monitoring Program, to consistently track changes in mercury contamination over time, across a suite of selected locations. A bill has been drafted by US Senators Snowe and Collins (both of Maine) that would establish the program. In the past two years, Northeastern Senators have been approached to dedicate funds to establish pilot National Monitoring Program studies in Vermont, New Hampshire, and Maine. At present, an earmark has been dedicated to the Hubbard Brook Research Foundation to pilot the program at the Hubbard Brook Research Forest in New Hampshire.

State of Massachusetts Fish Mercury Monitoring Program

The State of Massachusetts developed a monitoring program to track changes in fish mercury given the considerable mercury reductions achieved in that state. In the first evaluation of the fish mercury results, Massachusetts observed a decline in fish mercury in certain indicator waters that was temporally consistent with reductions in mercury releases from waste combustion sources. The results, while preliminary, further show that biological mercury levels will respond to reductions in emissions over relatively short periods of time.

New measurements of dry deposition at the Underhill mercury monitoring station

Using new monitoring techniques, Dr. Eric Miller (Ecosystems Research Group, Norwich, VT) has been making wet and dry mercury deposition measurements at the Underhill monitoring station. He has developed stronger evidence than ever before that certain mercury deposition events measured at Underhill are directly attributable to mercury emissions from Midwestern areas where many coal-fired power plants are located. He has further compared measured mercury deposition to EPA’s modeling studies. EPA has used its modeling studies to conclude that the improvement in mercury deposition to the Northeast that is attributable to the Clean Air Mercury Rule will be modest at best. Dr. Miller’s measurements contradict the EPA conclusions,

suggesting that meaningful reductions in mercury emissions from coal-fired power plants will result in an important reduction in mercury deposition to Vermont.

Continuation of the Lake Champlain Modeling Project

This long-standing project has been funded for another one to three-year cycle, and is now being led by Dr. Miller. The project will be substantially augmented during 2007. The project has been redesigned to link measurements of reactive gaseous mercury deposition (measured dry deposition) to mercury in water, then to methylmercury, and in turn to the biota that accumulate methylmercury. In this way, the project team will be able to track deposition events of mercury from known sources into the aquatic food web in Lake Champlain.

Continuation of mercury monitoring by USGS

During 2006, mercury sampling by the U.S. Geological Survey (USGS) in Lake Champlain tributaries was curtailed in favor of an investigation of so-called “new generation” contaminants. Monitoring continued at a baseline level in the Sleepers River watershed in eastern Vermont. During 2007, USGS plans to monitor mercury loss from a stormwater-impaired urban watershed. Specifically, they are interested in the potential for the simultaneous effects of reduced total mercury discharge but increased methylmercury production, due to the placement of stormwater control ponds in the Englesby Ravine in South Burlington. Also during 2007, USGS will continue to participate in the Lake Champlain Modeling Project.

Loon Recovery Project

Abandoned loon eggs and feathers from Vermont lakes continue to be analyzed for mercury in conjunction with the Loon Recovery Project, in partnership with the Biodiversity Research Institute in Maine.

Vermont Fish Contaminant Monitoring Committee

This committee oversees collection and analysis of fish contaminants throughout Vermont. In 2006, the Committee delivered a report to the General Assembly, in response to 10 V.S.A. §7114, outlining elements of a desirable indicator-based mercury monitoring initiative for Vermont. This plan is similar to that implemented by Massachusetts as described above. The plan has seen no action as of this writing. Fish samples collected during 2003-2004 have now been completely analyzed and are available for risk assessment.

III. Recent Mercury Education and Reduction Efforts

Implementation of Recent Mercury Product Legislation

The Department of Environmental Conservation (DEC) is implementing the provisions of the 2005 mercury product legislation, much of which has already taken effect. These provisions deal with mercury product manufacturer notification and labeling, mercury product sales bans (dairy manometers, novelties, thermostats, fever thermometers), bans on use of mercury in schools, disposal ban on mercury-added products, and requirements on hospitals and dental offices to reduce mercury use and release.

Mercury Product Manufacturer Requirements: Notification was sent to nearly 500 known and potential mercury-added product manufacturers advising them of the new requirements related to product bans, labeling, and notification requirements in Vermont. Manufacturers were required to submit updated or new plans for labeling by October 1, 2006 and implement these labeling plans for products sold into the state by July 1, 2007.

Restrictions on Sale of Certain Mercury Added Products: Effective July 1, 2006, mercury thermostats, fever thermometers, novelties and dairy manometers were banned from sale. Mercury added neon signs, measuring devices, mercury switches, mercury thermometers (other than fever), blood pressure devices, and other instruments will be restricted from sale starting January 1, 2007 if an exemption has not been granted. Outreach letters were mailed to retailers, neon sign manufacturers, marinas and product manufacturers to inform them of mercury-added products that are restricted from sale. In addition, there is ongoing outreach to notify other potentially affected sectors about sales bans.

Dental Mercury: DEC has issued Dental Best Management Practices (BMPs) and is requiring all dental practices to self-certify to compliance with these BMPs by January 31, 2007. These BMPs also address the requirement to install amalgam separators on the wastewater discharge system by January 1, 2007 as well as proper handling of dental amalgam wastes and other hazardous wastes. The amalgam separator requirement will lead to a significant decrease in mercury releases to municipal wastewater treatment plants and systems. Self-certification is required every two years. The Committee acknowledges that for more than a decade, Vermont's dental community and the Vermont State Dental Society have advocated and implemented best management practices to significantly reduce the amount of mercury released to the environment. These efforts have included nationally recognized educational materials, elemental mercury collection programs for dentists, a pilot program for amalgam separators, and collaboration with DEC on dentist surveys, and development of a self-certification program for dental best management practices.

Mercury Auto Switches: DEC is implementing a mandatory mercury auto switch removal program for auto salvage yards and other handlers of junk or end-of-life vehicles that passed in the 2006 legislative session. Under the law, mercury-added trunk and hood convenience light switches and anti-lock brake system switches must be removed and recycled prior to crushing. A switch collection program is required to be provided by automobile manufacturers. The *National Vehicle Mercury Switch Recycling Program* (NVMSRP) was formed in August 2006 by associations and individuals representing dismantlers, automakers, automotive steel and scrap industries, environmental groups, and state/federal environmental agencies. A four million dollar fund has been established as a financial incentive and to compensate auto dismantlers/recyclers on a first-come, first-serve basis for their efforts by paying one dollar per switch received. Vermont dismantlers and recyclers are eligible for this incentive. Automakers have formed *End-of-Life Vehicle Solutions Corporation* (ELVS) to implement a mercury switch education, collection, and recycling program. ELVS has been mailing all participating facilities collection buckets, instructions, and other program materials to all auto salvage operations identified by DEC. DEC will report to the Legislature in 2008 on the progress of the program.

Hospital Mercury Reduction Plans: DEC is finalizing guidance for Vermont hospitals that are required by legislation, passed in 2005, to develop mercury reduction plans for mercury use in all patient care sites. Plans will be due July 1, 2007. Many Vermont hospitals have virtually eliminated the use of mercury in measuring devices, equipment and laboratory chemicals. The plans will help in quantifying and documenting mercury reduction efforts that have been undertaken as well as encourage further reductions in mercury use.

Mercury in Schools: After July 1, 2006, no primary or secondary non-vocational school in Vermont may use or purchase elemental mercury, chemicals containing mercury, mercury compounds, or any mercury-added measuring device. Information was sent to schools to inform them of the requirement and Vermont Solid Waste Districts offered assistance to the schools to help them in low or no-cost recycling of the discarded chemicals and devices.

15 Mile Falls (Hydroelectric Dam) Mercury Reduction Fund

DEC received \$150,000 for mercury reduction projects from a settlement agreement with TransCanada, the owner/operator of the 15 Mile Falls hydroelectric facility. These funds will be used over the next few years to implement various projects to reduce mercury release in Vermont.

Dairy Manometer Removal and Replacement Project

A project was implemented in conjunction with the Agency of Agriculture, Food, and Markets to remove mercury-added dairy manometers on active and inactive farms and replace them with a mercury-free manometer at no cost to the farm. Previously, there were 80 manometers removed and replaced utilizing funds from the Lake Champlain Basin Program targeted at farms in the Lake Champlain Basin. The current project is targeted to remove the remaining manometers from active and inactive farms across the state. To date there have been an additional 30 manometers removed and replaced with the program still ongoing. The goal of the project is to have all mercury-added dairy manometers removed and replaced by the close of 2007. The sale of mercury-added manometers is banned in Vermont after July of 2006. These manometers contain a half-pound or more of mercury each.

Maple Sugar Thermometer Exchange Project

After January 1, 2007 mercury thermometers used by maple sugarhouses will not be available for sale. After the first of the year, DEC is partnering with the Agency of Agriculture, Food, and Markets and the Maple Sugar Association to implement a no-cost maple sugar thermometer exchange program with Vermont maple sugarhouses. Current efforts are being made to locate a viable alternative.

Outreach to Sensitive Populations on Mercury in Fish

Distribution of Mercury-In-Fish Materials

- Over 20,000 mercury-in-fish posters and brochures were distributed in 2006 throughout the year primarily through healthcare providers to educate Vermonters about making informed choices regarding consumption of both fish caught in Vermont waters and commercial fish purchased in stores.
- DEC together with the Vermont Department of Health and the Vermont Grocers' Association conducted a direct mailing to all grocers in the state with information that could be made available to post at the store fish counters or to be made available at the service counter. A follow up was provided to the stores through the Vermont Grocers' Association and approximately 1,100 posters were distributed with a statewide newsletter.
- A new mercury in fish poster was developed and placed on bulletin boards at Fish & Wildlife fishing access areas throughout the state. The new poster provides pictures of fish caught in Vermont waters as well as commercial fish purchased in stores. The posters were placed with the assistance of Town Health Officers.

Survey of parents of newborns: A two-year survey is being conducted by DEC of parents of newborn babies to be completed in September of 2007. This survey identifies whether a mother, during her pregnancy, knew about fish advisories, safe eating guidelines and also identifies types and quantities of fish consumed and potential changes in behavior due to knowledge of Vermont's fish consumption advisories. VDH has been supplying the data for identifying random survey participants and will evaluate the final data. DEC will release a final report on the project by the end of 2007.

Mission Mercury (video and game): A 20-minute animated mercury video for eighth grade students was developed by DEC in collaboration with Champlain College. Teacher materials are being developed and the video (available in VHS and DVD) together with companion video games will be distributed in 2007. The video and games will also be available on www.mercvt.org for web-based access. EPA Region 7 is modifying the Vermont version to include a shorter version of the video and also a closed-captioned version for the hearing impaired. This video will be made available to schools in Iowa, Kansas, Missouri, Nebraska and nine tribal nations. The video will be distributed in these states along with instructional materials on mercury spills.

Button Cell Battery Pilot Project

A pilot project to collect mercury-added button cell batteries was initiated in 2006 in nearly 100 pharmacies across the state as well as over 20 nursing homes. The project was implemented through and administered by the Vermont Nursing Home Association. The program goals are to expand the program in the upcoming year to include placement of collection containers in Audiologists’ offices across the state. The program allows for free disposal for the customer or nursing home resident. The pharmacy collects and sends the batteries in for recycling through a mail-back program to a recycler. Funds for the project have been provided through the settlement of an enforcement case in DEC.

Fluorescent Lamp Recycling

Lamp Recycling Grant: Two major media campaigns were conducted in 2006 to promote residential and business recycling of spent fluorescent lamps containing mercury through funding provided by EPA. Newspaper and radio ads promoted proper recycling of spent lamps. DEC is monitoring recycling of Vermont’s lamps through several specialized lamp recycling facilities that process and recycle mercury from lamps. A direct mailing identifying recycling options was disseminated to nearly 20,000 Vermont businesses. Since 2004 lamp recycling has increased by 18% for linear fluorescent bulbs and 7% for compact fluorescent bulbs.

True Value and ACE Hardware Pilot Project: Forty True Value hardware stores completed the first year of a pilot project throughout Vermont to serve as collection points for spent fluorescent bulbs from households and small businesses. The program allows for up to six mercury-added lamps to be brought per visit to the store by a customer, at no cost. At the end of the first year, 24 ACE hardware stores were also added to the program. The goal of the project is to increase lamp recycling and provide a convenient, no-cost option for recycling. The following chart shows the results of the program for the first year.

True Value/ACE Collection Program	
Lineal feet collected	Misc. bulbs CFL, circular, U-tubes, HID
66,409	1163

Stores that are participating in the program surveyed their customers to see if they would be willing to pay 50 cents for this same service once the funding for the program had ended. Approximately 75% of those surveyed stated that they would be willing to pay for the convenience of the recycling service. Of those who participated in the program about 76% of the

customers were households, 21% were businesses and the remainder were from municipalities. About 55% of the customers heard about the program primarily through in-store materials or store advertisements. Funds for the project have been provided through the settlement of an enforcement case in DEC.

Municipal Collection of Mercury–Containing Wastes

The table below shows the amount of mercury collected through municipal household hazardous waste programs over the last seven calendar years from households and businesses. Municipal solid waste districts and other municipal entities continue to play a significant role in the proper management of mercury-containing wastes. Wastes typically collected include thermometers, thermostats, mercury switches and mercury spill clean-up debris. Due to recent outreach to encourage fluorescent lamp recycling, it is anticipated that lamp collection will continue to increase, although some lamps will be diverted to the True Value and ACE hardware store pilot collection program and will not be counted in municipal collection programs. DEC believes that decreases in elemental mercury collected may reflect the decreasing amounts of mercury stockpiled over time as well as solid waste districts not tracking elemental mercury separately from mercury products and debris after 2004, when statewide school clean outs and mercury collection programs for dentists ended.

Mercury Collection in Municipal Programs							
Type of Mercury Waste	2000	2001	2002	2003	2004	2005	2006
Mercury Products/Debris* (thermometers, measuring devices, switches)	972 lbs	1675 lbs	1740 lbs	1740 lbs	2049 lbs	1696 lbs	2511 lbs
Elemental Mercury **	25 lbs	161 lbs	168 lbs	204 lbs	234 lbs	35 lbs	17 lbs
Mercury-added Lamps ** (fluorescent and HID)	0.8 lbs (141,000 linear ft)	1.4 lbs (248,200 linear ft)	1.9 lbs (339,000 linear ft)	2.1 lbs (378,000 linear ft)	2.3 lbs (411,711 linear ft)	2.5 lbs (446,455 linear ft)	2.5 lbs (449,148 linear ft)

*** Includes the weight of mercury and non-mercury containing components**

**** Represents actual weight of mercury collected**

IV. Committee Recommendations

The Advisory Committee on Mercury Pollution's recommendations to the Legislature for reducing mercury risk and exposure are divided into two categories: mercury exposure reduction and mercury release reduction recommendations.

MERCURY EXPOSURE REDUCTION RECOMMENDATIONS

Dental Mercury

- In efforts to virtually eliminate the release of anthropogenic mercury in Vermont, the Committee supports an eventual phase-out of mercury-containing dental amalgam and recommends that the Legislature consider this.
- Dental clinics should provide information to patients about the advantages and disadvantages to human health and the environment from using dental amalgam and other filling materials, and this information should be developed by the Vermont Department of Health in consultation with the Vermont State Dental Society and the Advisory Committee on Mercury Pollution. In addition, the Committee recommends that the Legislature consider legislation to not allow placement of dental amalgams in pregnant women and children under 18 years of age.

Rationale: Dental amalgams are approximately 50 percent mercury and constitute the largest sources of mercury use in products. Although amalgam use has declined significantly in the U.S. in favor of other alternatives, such as composite resins, dental mercury is the largest contributor of mercury to wastewater discharges. Mercury air emissions from crematoria contain vaporized mercury from so-called "silver fillings". This constitutes a significant mercury emission source in Vermont, and for that reason, the Vermont Air Pollution Control Division recently encouraged the Advisory Committee "... to recommend that the use of dental amalgam in Vermont be banned or rapidly phased out." The VDH Dental Program does not believe dental amalgams to be a health issue of concern for adults, adolescents, children, or pregnant women; on the other hand, the Program is concerned about the environmental burden of mercury and further encourages the capturing of dental waste amalgam and proper disposal of that waste. In Norway and Sweden, dental amalgam use is discouraged by the government due to health and environmental reasons. In Sweden, dental amalgam use represents less than five percent of fillings.

The Advisory Committee supports an eventual phase-out of dental amalgam use in the next five years, with limited exemptions provided only in situations or applications where there is no technically feasible alternative. The Committee's position with regard to phase-out of dental amalgam use is consistent with its support for the State of Vermont's goal for the "virtual elimination" of mercury use in products where viable alternatives exist.

The Advisory Committee reiterates its position from its 2006 report to the Legislature that dental patients should be provided with unbiased information on the advantages and disadvantages of the various dental filling materials. Based upon the latest available information, it is the Committee's position that dental amalgam has not been given a clean bill of health. For example, the U.S. Food and Drug Administration developed a draft report that analyzed published research since 1997 on health effects of dental amalgam which concluded that there is no evidence to show that mercury-containing silver fillings are dangerous. However, in

September 2006, two U.S. Expert Advisory Panels selected by FDA that reviewed the draft report, voted 13-7 that the report was not complete, the evidence presented was often contradictory, and that conclusions based on the limited search by FDA should not be made. The panel recommended that the FDA re-evaluate the scientific literature. Specifically, they wanted to know if there was additional information available regarding the effects of dental amalgam on pregnant women, small children, and sensitive individuals, and on exposure levels during initial placement or removal of amalgam fillings. For that matter, other popular alternatives to dental amalgam, such as composite resins may expose patients to chemical compounds that are of health concern. It seems only appropriate that Vermonters be provided with unbiased information on what is known as well as what is unknown concerning the safety of filling materials. The precedent has been set in California, Maine, New Hampshire, and Connecticut where such information has been published by the government agencies in these states. In fact, members of the Advisory Panels recommended similar measures nationally, including that FDA should consider informed consent for patients receiving amalgam and labeling changes restricting its use in pregnant women and children.

Given that elevated blood mercury levels can be found in patients after receiving amalgam fillings, it also seems only appropriate, as a precautionary measure, to restrict amalgam use in the populations most sensitive and affected by mercury exposure (children and pregnant women).

Thimerosal in Vaccines

- Vermont should prohibit the use of thimerosal, a mercury-containing preservative, in vaccines administered to children under 18 years of age and in pregnant women, except in the case of an emergency or a temporary shortage.

Rationale: A preservative, known as thimerosal, which contains 49% ethyl mercury (a known neurotoxin), is commonly added to vaccines to prevent contamination, yet single dose vaccines are generally available for most vaccine types that do not require this mercury preservative. In 1999, vaccine manufacturers began removing thimerosal as a preservative from the vaccines administered to children from birth to age four at the request of the American Academy of Pediatrics and the U.S. Public Health Service. However, thimerosal continues to be used in the optional flu vaccine that is annually administered in Vermont. From a precautionary viewpoint, enough concerns have been raised to justify not allowing thimerosal to be injected into sensitive populations, including pregnant women and children. This concern is based on both the fact that organic mercury is a known neurodevelopmental toxin and because there are viable, non-toxic alternatives that are generally available. However, at this time mercury-free flu vaccines may only be available in Vermont upon request. Yet seven states, including California, Iowa, Illinois, Delaware, and New York have passed legislation banning thimerosal use. Consistent with these other states, the Committee recommends that Vermont should use a similar precautionary approach. Surely, Vermont does not want to be a state where mercury-containing vaccines are dumped when other states are passing laws to keep it away from their citizens.

Exceptions to this prohibition should only be made in the event of a public health emergency such as an epidemic, or a temporary shortage of supply of a vaccine at reasonable cost. Vaccination is an important tool for public health – the Committee does not want Vermonters to fail to vaccinate because of concerns for the safety of the vaccines. In the event of a shortage in supply of a particular vaccine, the Committee believes that preference should be given to providing younger children with thimerosal-free vaccine.

Fish Mercury Monitoring Program

- The Committee supports the recommendations for a proposed fish mercury monitoring program for Vermont's freshwaters in the 2006 legislative report of the Vermont Departments of Environmental Conservation, Fish and Wildlife, and Health. The proposed fish mercury monitoring program would enable the Vermont Fish Contaminant Monitoring Committee (consisting of the three above-mentioned departments) to document the occurrence of and trends in mercury contamination in fresh water fishes in Vermont's lakes and rivers and relate trends to mercury reduction management actions. This monitoring program is essential to understanding and managing the risk of mercury contamination from fresh water fish consumption. The cost of an ongoing fish mercury monitoring program is slightly more than \$35,000 per year. Vermont's efforts to monitor fish mercury from inland waters presently lag behind those of every New England state except for Rhode Island, but this can easily be changed. Adequate funding should be available to the Departments of Environmental Conservation and Fish and Wildlife to perform this important and necessary task.

Rationale: Vermont needs a more rigorous fish tissue monitoring program that can assess trends in freshwater fish mercury levels over time. Mercury in fish poses the greatest known exposure potential to methylmercury in the general public and in wildlife, and there are already proven health impacts at the environmental mercury levels seen. Therefore, it is imperative to monitor the risk over time, by monitoring mercury levels over time. Hopefully through state, regional, and federal management actions being implemented to reduce mercury releases to the environment, we will begin to see reduced mercury levels and reduced risk to humans and wildlife. Recent studies suggest that the recovery may even be rapid. A more rigorous fish tissue monitoring program will allow us to set more accurate fish consumption advisories at the state level and thus provide a greater level of protection to the fish-eating general public.

The State's Fish Contaminant Monitoring Committee has proposed a scientifically sound and affordable fish mercury monitoring program consisting of three biennially recurring rounds of fish tissue sampling. The first round of sampling targets fishes from Lake Champlain and Lake Memphremagog, Vermont's largest lakes. The second round (two years later) targets similar fish species in specified size ranges from 15 inland lakes and 15 larger rivers. The third round (two years after the second round and in year six) of fish mercury sampling would be randomized sampling in 15 lakes and 15 streams, to provide a statistical assessment of statewide fish mercury contamination levels. The assessment cycle then repeats, starting with Lake Champlain and Lake Memphremagog sampling. Adequate funding should be available to the Agency at the earliest possible date to initiate and then maintain this important project.

MERCURY RELEASE REDUCTION RECOMMENDATIONS

Mercury-Thermostats

- The Committee supports legislation similar to that recently adopted in Maine, requiring thermostat manufacturers to provide convenient collection and recycling programs for out-of-service mercury thermostats from all sources; including residential, commercial, and institutional; and provide meaningful financial incentives to significantly increase the collection rate of mercury thermostats. Legislation should also require performance standards on manufacturers to ensure high capture rates of thermostats and annual reports to the Agency from manufacturers on thermostat collection amounts.

Rationale: Mercury thermostats are a significant source of mercury in the waste stream and recycling rates are currently very low despite disposal bans and convenient recycling opportunities for contractors. Mercury thermostats that are currently in use and ones that are replaced each year in older heating systems represent a significant single product source of potential mercury release. Mercury thermostats are banned from sale in Vermont and banned from disposal as solid waste. Municipalities in Vermont must pay for collection programs for mercury-containing waste products and other hazardous wastes from homeowners and small businesses. Product manufacturers should share responsibility for their hazardous products in commerce. The Product Stewardship Institute, a national non-profit member-based organization has developed and participated in pilot mercury thermostat collection programs, successfully mediated legislative agreements with thermostat manufacturers, environmental groups, and state agencies that promote manufacturer responsibility, and has developed model state legislation for mercury thermostat collection programs that provides options for implementation. The Legislature should consider implementing legislation that includes elements similar to the model legislation that was passed in Maine, such as manufacturer responsibility for collection, financial incentives to contractors and homeowners, and performance goals for capture (recycling) rates.

National Management of Surplus Mercury

- The Advisory Committee recommends that the Legislature adopt a resolution requesting the U.S. Congress to enact legislation that: (1) prohibits the sale or transfer to any entity of the large quantities of stockpiled elemental mercury held by the Department of Defense and the Department of Energy; (2) prohibits the export of elemental mercury from the U.S. from all sources; and (3) establishes federal storage capacity sufficient to safely store federal stocks of surplus mercury and also store non-federal stocks that are in excess of quantities necessary for domestic consumption.

Rationale: An excess supply of elemental commodity grade mercury has emerged and will grow in the future as mercury use in product manufacturing declines nationally and internationally. Presently, the U.S. is exporting three times as much mercury as it is importing. Closure of chlor-alkali plants around the world that use large quantities of mercury to produce chlorine are projected to result in the liquidation of elemental mercury stocks in excess of 20,000 metric tons (2600 tons of which is in the U.S.) that will make its way into commerce if export restrictions are not enacted soon. The U.S. Departments of Defense and Energy have stockpiles of surplus mercury in excess of 5700 tons. Increased recycling of mercury from discarded products and processes will further contribute to surplus mercury. If left uncontrolled, these mercury surpluses will end up on the world market, for uses including many small-scale activities, like gold mining, which re-release large amounts of mercury and present acute health and safety hazards to the miners and their families as well. Mercury reduction and recycling efforts like those in Vermont will be for naught if the mercury surplus issue is not adequately addressed. The Environmental Council of States (ECOS) has advocated controls on mercury surpluses and stockpiles for years. The European Union is considering legislation that would prohibit mercury exports, establish storage repository(s), and close the world's largest primary mercury mine by 2011. The U.S. Government has begun to acknowledge the significance of the mercury surplus issue and has recently developed a draft position paper related to managing both federal and non-federal mercury surpluses. However, action has been slow. Such a legislative resolution would be the first in the country, and the Committee believes Vermont can set an example that will lead to further legislative resolutions in other states and reinforce the message that action is needed sooner rather than later to address this critical issue in a timely and comprehensive manner. At the same time, introduction of state resolutions could also send a message

internationally, recognizing the importance of establishing global mercury reduction uses and releases and export restrictions on trade in mercury.

V. Committee Work Plan for 2007

The Advisory Committee has identified the following priority areas of work in 2007.

- **Legislative Recommendations** – The Committee will respond to inquiries and requests for legislative testimony on the content of this report, including recommendations.
- **Status of Mercury Product Law Implementation** – The Committee will assess the status of implementation of the mercury products law passed last legislative session and identify any implementation issues needing attention.
- **Outreach to Sensitive Populations** – The Committee has identified outreach to sensitive populations as a continued high priority area. The Committee will continue to review efforts by DEC and the VDH to inform the general public and those populations most sensitive to mercury exposure from fish consumption. The Committee will assess new information and scientific studies that come to its attention on human exposure and risk of mercury. The Committee will assure that efforts to post state fishing access areas with mercury-in-fish advisories and other educational materials continue.
- **15 Mile Falls Mercury Reduction Fund** – The Committee will review and advise DEC on priority uses of its special mercury reduction fund.
- **Mercury Education and Reduction** – The Committee will continue to evaluate and monitor ongoing mercury education and reduction efforts in DEC and VDH. In particular, the Committee will review mercury reduction efforts in dental clinics and hospitals.
- **Mercury in the Environment** – The Committee will continue to evaluate and assess environmental monitoring and mercury emissions inventory data to better understand potential impacts and trends and further steps that can be taken to reduce the risk of mercury exposure.
- **Exposure Reduction Initiatives** – The Committee will monitor and review developments and identify opportunities to raise awareness and further reduce exposure to mercury.

By the Advisory Committee on Mercury Pollution:

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