

ADVISORY COMMITTEE ON MERCURY POLLUTION



2011 ANNUAL REPORT

To the Governor, General Assembly
and Citizens of the State of Vermont
January 2011

Committee Members:

Chair	Neil Kamman	Vermont Agency of Natural Resources
Vice-Chair	Jen Holliday	Chittenden Solid Waste District
	Michael Bender	Abenaki Self-Help Association, Inc
	John Berino	Vermont Assn. of Hospitals & Healthcare Systems
	William Bress	Vermont Department of Health
	Gary Gulka	Vermont Agency of Natural Resources
	Jim McCullough	House Fish, Wildlife & Water Resources Committee
	Ruma Kohli	IBM Burlington
	Wayne LaRoche	Vermont Agency of Natural Resources
	Richard McCormack	Senate Natural Resources and Energy Committee

INTRODUCTION

This is the thirteenth annual report of the Advisory Committee on Mercury Pollution. The Committee 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. The Committee met six times in the past year. Since 1998 the Committee has met 103 times. Information, minutes, and reports of the Committee can be found at: www.mercvt.org.

This report is divided into the following sections:

- I. Recent Mercury Education and Reduction Efforts
- II. Committee Recommendations
- III. Committee Work Plan for 2011

SUMMARY OF RECOMMENDATIONS

The Advisory Committee's recommendations are summarized below and are further discussed in Section 2 of this report.

Canned Tuna in School Lunch Programs

- The Committee supports collaboration between the Vermont Department of Health and the Department of Education to communicate with Vermont schools and raise awareness among faculty, staff, and parents about the methyl mercury exposure risk to young children of consuming excessive amounts of tuna fish in school lunch programs.

Environmental Concerns of Dental Amalgam

- The Advisory Committee supports the efforts of the Vermont Department of Health to incorporate environmental concerns of dental amalgam use and release of mercury in its public informational materials.

Fish Mercury Monitoring Program

- The Committee reiterates its recommendation in its 2006 through 2010 reports to the Legislature for a proposed fish mercury monitoring program for Vermont's freshwaters. The proposed fish mercury monitoring program would enable the Vermont Fish Contaminant Monitoring Committee (Vermont Departments of Health, Fish and Wildlife and Environmental Conservation) 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 has been estimated to be \$60,000 every other year. This cost supports field operations necessary to acquire and process fish for analysis. This figure is predicated on the continuing availability of analytical capacity at the VT DEC LaRosa Environmental Laboratory, which has for many years supported fish testing, using DEC's operating budgets. Vermont's efforts to monitor fish mercury from inland waters presently lag behind those of most New England states, 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 task

Mercury-Containing Lamps

- Vermont should adopt mercury content limits for general purpose fluorescent lighting products sold, distributed or manufactured in the state, consistent with laws passed in the States of California and Maine and that reflect recently adopted European Union (EU) standards for these products.
- Vermont has one of the most successful lamp recycling programs in the country at municipal, retail, and wholesale levels. A sustainable source of funding should be established to ensure the sustainability of this convenient mercury lamp recycling infrastructure in Vermont for residents and small businesses. The Committee recommends that a sustainably funded program be established by the Legislature which includes shared responsibility for collection and recycling by lamp manufacturers, municipalities, retailers and state government.
- As energy efficient non-mercury lighting products become readily available in the marketplace and are demonstrated to be cost-effective alternatives to mercury-containing lamps, the Committee recommends that a mechanism be put in place to phase out the distribution and sale of these mercury lamps.

Future of the Advisory Committee on Mercury Pollution

- The Committee recommends that the Advisory Committee on Mercury Pollution be sunsetted effective July 1, 2011, after 13 years of work on reducing the risk of mercury and mercury exposure to Vermonters. At the same time, the Committee recommends that state government become more actively engaged in the evaluation of toxic chemicals of all kinds on human health and the environment. Options for engagement in toxic chemicals to consider include: a multi-disciplinary advisory committee, a toxics-in-products evaluation program similar to Maine or Washington State, or an interagency state government working group to advise the Administration and the Legislature on toxic chemical issues of concern.

I. Mercury Education and Reduction Efforts

The Committee was involved with the following mercury education and reduction topics in 2010.

Thimerosal in Vaccines

A preservative, known as thimerosal, which contains small amounts of mercury, is commonly added to multi-dose vials of flu vaccine (not added to single dose vials). Currently flu vaccines, including H1N1, are the only vaccines which have thimerosal added. The Vermont Department of Health (VDH) acquires flu vaccine and distributes it to physician's offices. For the last several flu seasons, about 60% of the vaccine distributed is thimerosal-free. The Advisory Committee has previously recommended that VDH place information about thimerosal on its web site, including how to obtain thimerosal-free vaccines if desired. VDH has placed a thimerosal fact sheet from Centers for Disease Control on its web site and other information that satisfies this recommendation.¹ Some physicians' offices lack adequate refrigeration space for single dose vaccines (mercury-free); they take up more space than the multi-dose vials which contain mercury. The Committee suggested that strategies be explored to get larger refrigerators into physician's offices, perhaps taking advantage of energy efficiency rebates. It was suggested that the vaccine order form used by physicians could be modified to encourage the ordering of mercury-free vaccine.

Mercury Emissions from Cremations

The Advisory Committee continued discussions on mercury emissions from cremations, which largely result from the presence of dental amalgam. There are approximately 2500 cremations annually in Vermont that can potentially result in the release of 20-25 pounds of mercury to the air. The number of cremations is increasing annually. The Committee kept abreast of research at the University of Minnesota on developing an amalgam encapsulating device to capture mercury from dental amalgams during the cremation process. The University of Minnesota evaluated different techniques and focused on testing refractory materials that can insulate the teeth from the heat of the cremation process (thereby preventing the mercury in amalgam from volatilizing). There is no additional funding at this time to continue this initial research. Communications with other state programs indicate that there is little attention being paid to this emission source at present. Given that there are no technically or economically feasible methods at this time for either removing dental amalgams prior to cremation or affordable air pollution control devices for small crematoria, the Committee is not actively exploring this issue further at this time.

Outreach to Sensitive Populations – New Publications

In 2010, VDH and DEC updated and reprinted two mercury in fish publications that have been widely disseminated to physicians' offices, WIC clinics, and other health care providers. These publications have been disseminated by the thousands to Vermonters, including pregnant women, women of childbearing age, and parents of young children who are most sensitive to methyl mercury in the diet. Both publications contain fish consumption advisories and important messages about the benefits of fish in the diet and choosing fish with lower mercury content.

The reprinting of these documents assures continued public outreach to the most mercury-sensitive populations of Vermonters and Vermonters as a whole.

A new mercury in fish poster has been printed for dissemination by Vermont Department of Health inspectors (sanitarians) who visit grocery stores on an average of once every three years. The posters are not mandatory but many grocers agree to display them.

Mercury in Fish Postings at State Fishing Access Areas

Mercury in fish posters were reprinted and mailed to Health Officers, requesting that they post these at the state public access areas with maintained bulletin boards. Over 175 access areas were posted.

Dental Mercury

The Advisory Committee held discussions with the Vermont Department of Health's Oral Health Director in regard to providing the general public with more information on the environmental concerns with dental amalgam use and release of mercury, to complement existing health information on dental amalgam. VDH has agreed to this request and will be providing public information on environmental concerns similar to the Advisory Committee's dental amalgam fact sheet. These discussions were productive, and the Oral Health Director agreed to address the Committee's concern.

Mercury Thermostat Collection Program

Vermont's mercury thermostat collection program commenced in April 2009 with over 50 participating plumbing, heating and electrical contractors, over 70 hardware stores, and 19 municipal collection locations. Vermont's mercury thermostat law requires thermostat manufacturers to provide a no-cost collection program, including a \$5 cash incentive for each mercury thermostat turned in to the program.

DEC focused on visiting each collection location in 2010 to ensure proper implementation of the program. In calendar year 2010, 3349 mercury thermostats were collected, compared to 1890 in 2009, 1665 in 2008, and 1367 in 2007. DEC will be estimating the capture rate of mercury thermostats by proposing a methodology to determine the capture rate of mercury thermostats and seeking public comment. If a 65% capture rate is not achieved by July 1, 2011, the Agency is mandated to require modification to the manufacturer collection plan to achieve the rate.

II. Committee Recommendations

The Advisory Committee on Mercury Pollution's recommendations to the Legislature for reducing mercury risk and exposure are outlined below.

Canned Tuna in School Lunch Programs

- The Committee supports collaboration between the Vermont Department of Health and the Department of Education to communicate with Vermont schools and raise awareness among faculty, staff and parents about the methyl mercury exposure risk to young children of consuming excessive amounts of tuna fish in school lunch programs.

Discussion

Canned tuna is a common school lunch program offering in Vermont schools. Most school lunch programs serve canned light tuna (lower in methyl mercury levels) rather than canned white tuna, however, white tuna is sometimes available. Recent studies suggest that even canned light tuna has above average mercury levels in comparison to other seafood types that are part of the U.S. diet. In fact, tuna as a whole overshadows all other categories of seafood, with 37% of the mercury in the food supply from tuna². Given the adverse impacts of mercury on young children's cognitive development, it is important to communicate the risk of consuming fish with relatively high levels of mercury. At the same time, it is important to encourage the consumption the right kinds of fish to promote the cognitive benefits from fish consumption during prenatal and early childhood stages of development.

Environmental Concerns of Dental Amalgam

- The Advisory Committee supports the efforts of the Vermont Department of Health to incorporate environmental concerns of dental amalgam use and release of mercury in its public informational materials.

Discussion

The Advisory Committee held discussions this year with the Vermont Department of Health about incorporating information in its dental amalgam fact sheet about environmental concerns of dental amalgam. Given that dental mercury contributes very significantly to mercury in municipal wastewaters and Vermont dentists have been required to install and maintain pollution control devices, the Committee feels that this information should be available to dental patients who are considering use of certain dental restorative materials in consultation with their dentist. VDH has agreed to this request and will be providing public information on environmental concerns in its dental amalgam fact sheet.

Fish Mercury Monitoring Program

- The Committee reiterates its recommendation in its 2006 through 2010 reports to the Legislature for a proposed fish mercury monitoring program for Vermont's freshwaters. The proposed fish mercury monitoring program would enable the Vermont Fish Contaminant Monitoring Committee (Vermont Departments of Health, Fish and Wildlife and Environmental

Conservation) 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 has been estimated to be \$60,000 every other year. This cost supports field operations necessary to acquire and process fish for analysis. This figure is predicated on the continuing availability of analytical capacity at the VT DEC LaRosa Environmental Laboratory, which has for many years supported fish testing, using DEC's operating budgets. Vermont's efforts to monitor fish mercury from inland waters presently lag behind those of most New England states, 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 task.

Discussion

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 observed. Therefore, it is imperative to monitor the risk over time, by monitoring mercury levels over time. Given the state, regional and federal management actions being implemented to reduce mercury releases to the environment, we should begin to see reduced mercury levels and reduced risk to humans and wildlife. Recent studies, even in Vermont, 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. Vermont is a participatory state to the Northeast Mercury TMDL, and will be expected to participate in a planned 2010-2011 reassessment of fish mercury levels in our lakes as part of a broad region-wide, consistent sampling program. Other initiatives, such as Vermont's participation as a core site (Underhill) under the National Mercury Monitoring Network, and Lake Champlain Basin Program's State of the Lake Report rely on an ongoing mercury monitoring program.

Funding is being provided through the Lake Champlain Basin Program for a one-time fish tissue sampling of Lake Champlain in 2011 for mercury and PCBs. This study will cover most segments of the lake and will provide valuable temporal data on fish mercury levels.

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-Containing Lamps

- Vermont should adopt mercury content limits for general purpose fluorescent lighting products sold, distributed or manufactured in the state, consistent with laws passed in the States of California and Maine and that reflect recently adopted European Union (EU) standards for these products.
- Vermont has one of the most successful lamp recycling programs in the country at municipal, retail, and wholesale levels. A sustainable source of funding should be established to ensure the sustainability of this convenient mercury lamp recycling infrastructure in Vermont for residents and small businesses. The Committee recommends that a sustainably funded program be established by the Legislature which includes shared responsibility for collection and recycling by lamp manufacturers, municipalities, retailers and state government.
- As energy efficient non-mercury lighting products become readily available in the marketplace and are demonstrated to be cost-effective alternatives to mercury-containing lamps, the Committee recommends that a mechanism be put in place to phase out the distribution and sale of these mercury lamps.

Discussion

Both fluorescent and high intensity discharge (HID) lamps contain mercury. HID lamps generally contain much higher amounts of mercury per lamp than fluorescents (up to one gram for high wattage varieties), but far fewer are produced.

Globally, an estimated 120-150 metric tons of mercury was used to produce lamps in 2005. This mercury accounts for about five percent of global mercury use and is expected to increase significantly due to the energy efficiency of and demand for fluorescent lighting over incandescent lighting. Moreover, federal legislation requires phase-out of inefficient incandescent lighting beginning in 2012. The amount of mercury in a lamp varies by lamp type and manufacturer. Many linear fluorescent lamps (LFL) are currently in the 5-10 milligram range per bulb. Older less efficient models may still contain 10-50 milligrams. The most advanced LFLs (such as T8 and T5) will be able to meet new European Union standards of 3-5 milligrams. Compact fluorescent lamps (CFL) have relatively low amounts of mercury. For screw-in CFLs, a typical household variety CFL will be required to meet an EU limit of 2.5 milligrams by 2013.

The European Union, through the Restriction on Hazardous Substances (RoHS) Directive, has been the most active regulatory body setting mercury limits for lamps. These new standards were developed in a multi-year process involving expert review and stakeholder involvement. These standards have been recently revised and the mercury content standards lowered for many lamp types.³ In addition to setting mercury contents standards for various lamp categories, the EU RoHS Directive will ban the sale of certain of the least energy efficient lamps such as mercury vapor and halophosphate lamps. In prior years, lamp manufacturers represented by the National Electrical Manufacturers Association, have supported lower mercury limits in lamps. The State of California has passed a law which requires that any lamp manufactured or sold into the state meet the applicable standards under the EU RoHS Directive. The State of Maine passed legislation in 2009 that requires mercury content standards for lamps sold or manufactured in the state by 2012; these standards must be based on California standards, but Maine may adopt mercury content standards for lamp categories exempted in California (for example, HID and neon). In addition to reducing global mercury consumption by this sector, setting mercury-content limits will help protect consumers by minimizing the amount

of mercury in each lamp and thus potential exposure during use and subsequent handling, and will promote the use of improved mercury dosing techniques which better protect workers and minimize mercury losses to the environment. It would simultaneously reduce emissions of mercury and other toxic pollutants from coal-fired power plants.

Vermont has been successful as a state in establishing infrastructure for collection and recycling of spent fluorescent lamps. Larger institutions, businesses, utilities, municipalities, and state government are complying with the disposal ban on spent lamps by utilizing lamp recycling programs and paying a fee for transportation and recycling services. Residential and smaller businesses and institutions utilize collection infrastructure established at hardware stores and retail stores as well as municipal solid waste district programs. These fluorescent lamp recycling programs have grown significantly from year to year and do not currently have a sustainable funding source into the future. Efficiency Vermont has agreed to level fund the current lamp recycling program at hardware stores through 2011 as the state works toward finding a sustainable to fund the program.

In the fall 2010, the Vermont Department of Environmental Conservation (DEC) brought stakeholders together twice to discuss funding mechanisms for residential and small business lamp recycling. DEC initially proposed a funding mechanism and the National Electrical Manufacturers' Association subsequently presented the stakeholders with an alternative proposal.

The Committee has not taken a position on a specific funding mechanism for lamp recycling but urges the Legislature to act this session to resolve the funding mechanism and not jeopardize the recycling programs that have been established.

Future of the Advisory Committee on Mercury Pollution

- The Committee recommends that the Advisory Committee on Mercury Pollution be sunsetted effective July 1, 2011, after 13 years of work on reducing the risk of mercury and mercury exposure to Vermonters. At the same time, the Committee recommends that state government become more actively engaged in the evaluation of toxic chemicals of all kinds on human health and the environment. Options for engagement in toxic chemicals to consider include: a multi-disciplinary advisory committee, a toxics-in-products evaluation program similar to Maine or Washington State, or an interagency state government working group to advise the Administration and the Legislature on toxic chemical issues of concern.

Discussion

In 2009, at the request of the Legislature, the Advisory Committee provided recommendations on whether to expand the jurisdiction of the Advisory Committee on Mercury Pollution to include review of additional toxic substances.⁴ The Committee recommended creation of a new Advisory Council on Toxics in place the Advisory Committee on Mercury Pollution, whose responsibilities would include establishing a list of chemicals of high concern to public health and the environment, and recommending actions or strategies to reduce health risk from exposure to chemicals of high concern.

The Advisory Committee strongly believes that Vermont state government should become more actively engaged in the identification and evaluation to toxic chemicals in our environment and acknowledges that there are other options of engagement including legislative approaches such as in Maine and Washington, where priority chemicals are identified and evaluated for restrictions or bans in products sold into the state. Another option to consider would be an

interagency working group, consisting of the Department of Health, Department of Environmental Conservation, and Agency of Agriculture, Food and Markets (pesticides) to identify issues of concern and to advise the Administration and Legislature. The Committee has taken no position on these options or approaches, but urges the Legislature to consider them.

The Advisory Committee on Mercury Pollution has now reported recommendations to the Legislature for 13 years and has met over 100 times since 1998. We believe that there have been many successes over the year in achieving the core mission of the Committee – to review and recommend programs to reduce mercury contamination and health risk to Vermonters. A partial list of the accomplishments in the state includes:

- National leadership on the labeling of mercury-added products;
- Comprehensive mercury product legislation that passed in 2005 that restricts the sale of many mercury products for which alternatives exist, bans mercury from schools, and required dental offices and hospitals to better manage mercury products;
- Participation in the Mercury Task Force through the New England Governors and Eastern Canadian Premiers that has reduced regional mercury emissions by nearly 75% since 1998;
- Numerous public projects to reduce mercury products in the state, conducted by state agencies and municipal solid waste districts. These included: a statewide mercury fever thermometer collection and exchange; a school science lab mercury and hazardous chemical cleanout of 83 schools; a voluntary cleanout of elemental mercury from dental offices; a mercury dairy manometer replacement project with 180 mercury manometers collected from active and inactive farms; permanent recycling of mercury-containing fluorescent bulbs at municipal solid waste district facilities and hardware stores; mercury thermostat collection at over 120 locations across the state; and a statewide maple sugaring thermometer exchange with over 100 sugar makers;
- Numerous outreach and education efforts to sensitive populations and the general public on mercury in fish, including publication and dissemination of several brochures and posters that have been distributed widely to health care providers and grocery stores selling fish; and
- The first state Legislature to pass a resolution requesting the U.S. Congress to ban the exportation of elemental mercury and develop adequate capacity for storage of excess mercury. Several other states followed suit with resolutions, and Congress subsequently passed mercury export ban legislation.

The original sunset date established in enabling legislation for the Advisory Committee was 2010. This sunset date was extended two years ago by the Legislature to 2015. However, given that the most pressing mercury contamination issues that the Advisory Committee can address have been dealt with, it is the unanimous consensus of Committee members that the Advisory Committee be sunsetted effective July 2011. Any option for engagement in toxic substances by state government to be enacted in the future should also include mercury contamination issues. In any event, the work of DEC and VDH on mercury education and reduction efforts such as fish consumption advisories outreach to sensitive populations, and mercury product reduction will continue.

III. Committee Work Plan for 2011

The Advisory Committee has identified the following priority areas of work in 2010:

- Review efforts by the Vermont Department of Health and Department of Education to communicate to Vermont schools the risk to children of consuming excessive amount of tuna fish in school lunch programs.
- Review efforts of the Vermont Department of Health to incorporate environmental concerns of dental amalgam use in its public educational materials on dental amalgam.
- Monitor the progress of the new mercury thermostat collection program in capturing mercury thermostats for recycling. In particular, the Committee will monitor the process conducted by DEC to develop a collection rate methodology and the actual collection rates calculated using recent collection data.
- Review efforts by DEC and VDH to provide outreach to the public, and in particular, more sensitive populations, on reducing mercury exposure from fish consumption.
- Evaluate and assess environmental monitoring and mercury emissions inventory data to better understand potential impacts and trends, as well as further steps that can be taken to reduce the risk of mercury exposure.
- Participate as requested by Legislative committees in discussions on the future of the Advisory Committee.

Endnotes

¹ Vermont Department of Health web site: <http://healthvermont.gov/hc/imm/public.aspx#safety>

² Groth, Edward, 2010. Ranking of contributions of commercial fish and shellfish varieties to mercury exposure in the United States: Implications for risk communication. *Environmental Research* 110, 226-236.

³ European Commission of the Environment:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:251:0028:0034:EN:PDF>

⁴ Advisory Committee on Mercury Pollution Report to the Legislature: Opportunities for action on toxic chemicals: Recommendations of the advisory committee on mercury pollution for the formation of an advisory council on toxics, January 2009. See: <http://www.mercvt.org/acmp/index.htm>

By the Advisory Committee on Mercury Pollution:

Neil Kamman



Chair of Advisory Committee on Mercury Pollution

On behalf of the members:

Michael Bender	Abenaki Self-Help Association, Inc. – Executive Director Mercury Policy Project
John Berino	Representative for the Vermont Association of Hospitals and Healthcare Systems
William Bress	PhD, Diplomat American Board of Forensic Toxicology, State Toxicologist and Chief of the Environmental Health Division, Vermont Department of Health
Gary Gulka	Waste Prevention Section Chief, Environmental Assistance Office, Vermont Agency of Natural Resources
Jen Holliday	Environmental & Safety Compliance Manager, Chittenden Solid Waste District
Representative Jim McCullough	House Committee on Fish, Wildlife and Water Resources
Ruma Kohli	Chemical Management Program Manager, IBM, Burlington
Neil Kamman	Vermont Agency of Natural Resources, Environmental Scientist
Wayne LaRoche	Commissioner, Department of Fish and Wildlife, Vermont Agency of Natural Resources
Senator Richard McCormack	Senate Natural Resources and Energy Committee