

Canadian Council of Ministers of the Environment

**CANADA-WIDE STANDARD
for
MERCURY-CONTAINING LAMPS**

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PREAMBLE

The Canadian Council of Ministers of the Environment determined that mercury levels in fish and wildlife across Canada warrant efforts to reduce atmospheric and waterborne emissions derived from both deliberate use of mercury and from incidental releases of mercury.

Restrictions on the human consumption of fish in order to safeguard the health of both high fish consumers (sustenance and commercial fishers) and sensitive populations (infants, children and women of childbearing age) are widespread. Some of these restrictions are derived from lakes naturally high in mercury, others in lakes and rivers contaminated by historical point source discharges and still others in waters remote from identifiable sources. Traditional lifestyles may be profoundly influenced by mercury contamination.

Mercury levels in fish pose an additional, largely unquantified risk to fish-eating wildlife. Isolated examples of toxicity to loons and otters suggest the potential for large scale and/or widespread impacts. Just as mercury levels in fish affect human consumption, some levels in fish may affect wildlife which consume them. In both instances, the mercury causing the impacts is derived from both natural and anthropogenic sources.

The combined impacts of mercury contamination in Canada are difficult to quantify. The exact proportion of the impact which can be ascribed to natural mercury and to past and present anthropogenic releases cannot presently be quantified. Because it is a natural and persistent bioaccumulative element which can be transported many kilometers in the atmosphere, mercury can have impacts many years and many kilometers removed from its original source. The sediment record from remote lakes has been generally interpreted to support a two to three-fold increase in mercury deposition over natural levels. A common thread through all mercury impacts is that deposition to water bodies from anthropogenic emissions poses a threat to human and ecosystem health, and that reduced deposition will contribute, in time, to reducing that threat.

Under a variety of regional, national, binational and international programs, treaties and agreements, mercury has been consistently targeted for emission reductions. Such a policy position is consistent with the CCME Policy for the Management of Toxic Substances which states that mercury shall be managed through its life-cycle to minimize releases. This is also consistent with the precautionary approach endorsed in the Harmonization Accord and Canada-wide Standards Sub-agreement. Ministers of the Environment have thus agreed to undertake and promote cost-effective actions to achieve further reductions in anthropogenic emissions (releases to the air, water and soil) of mercury.

PART 1:

Rationale for standard

Mercury-containing lamps are an extremely efficient lighting medium, using less electricity than incandescent lamps. Because they use less power per unit of light, use of mercury-containing lamps results in fewer emissions of smog-causing gases, greenhouse gases, and mercury from fossil-fueled electric power plants. Nevertheless, mercury-containing lamps still emit 180 kg/yr of mercury vapour to the atmosphere during their life-cycle: 40 kg/yr (or 22%) is emitted during lamp manufacturing, transport, landfilling, and incineration; while 140 kg/yr (or 78%) is emitted indirectly from power plants.

Mercury-containing lamps, the bulk of which are 4-foot T-12 fluorescent lamps, contain between 7 and 40 milligrams of mercury each, and when they are manufactured, broken or disposed of, they release their mercury contents to different parts of the environment.¹ Other types of lamps (e.g., metal halide and high pressure sodium lamps) contain different amounts of mercury. Given that mercury emissions are directly related to the mercury content of the lamps, industry-led initiatives aimed at reducing the mercury content of lamps are the most effective intervention to reduce releases to the environment.

When lamps burn-out, they normally contain less than 1 mg mercury vapour, which is released when the lamp is broken, resulting in some mercury emissions, but the mercury also can be emitted through the incineration of lamps in municipal waste. Waste lamps, whether broken or intact, contribute about 1150 kg/yr of mercury to landfill each year bound to the phosphor in the glass. This mercury may be emitted with methane gas or released with landfill leachate, though accurate inventories are not available. These releases can be reduced through recycling and safe disposal of lamps.

Nature and application:

The Canada-wide Standard for mercury-containing lamps takes a pollution prevention approach to reducing environmental releases of mercury, by reducing the mercury content of lamps sold in Canada. This approach will reduce subsequent emissions at four stages in the life-cycle of lamps: during lamp manufacturing; during transport; during landfilling; and during incidental incineration.

The manufacturers of mercury-containing lamps have reduced the mercury content of standard 4-foot T-12 lamps, with the average content declining from 48 mg/lamp in 1985 to 12 mg/lamp in 2000. Ongoing efforts to further reduce mercury content will translate directly into reduced emissions due to breakage and reduced mercury going into landfills.

1 Environment includes soils, water, air and municipal waste landfills, the latter in recognition that mercury is persistent, bioaccumulative and toxic, and may leach from conventional landfills or be emitted with landfill gas.

Approximately 75% of mercury-containing lamps in Canada are 4 foot (T-8 or T-12) fluorescent lamps. The major uses of mercury-containing lamps are in industrial, commercial and institutional applications. Currently about one-third of the lighting market is composed of T-8 lamps, which are more energy efficient than the older T-12 lamps. In the pursuit of energy efficiency, and to achieve reductions in greenhouse gas emissions, more energy efficient lighting systems are expected to be installed in large buildings in Canada, and the rate of installation can be accelerated.

It is also reasonable to pursue recycling of lamps with the understanding that while emissions from landfills² appear to be low, lamps may not survive the transport to a landfill site intact. Emissions of mercury at the working face of the landfill can be significant due to breakage. Hence, recycling at the end of the life-cycle – or directly intercepting mercury emissions by using mercury-capturing “crushers” prior to confined landfilling -- can recover about one tonne per year of mercury that otherwise would be released to the environment.

As a complementary activity, jurisdictions that do not currently recycle lamps will determine the environmental merits and feasibility of lamp recovery/recycling, and initiate efforts to encourage recycling and the safe disposal of used lamps consistent with their solid waste management priorities.

Numeric targets and timeframes:

The CWS is a 70% reduction by 2005 and an 80% reduction by 2010 in the average content of mercury in all mercury-containing lamps sold in Canada, from a 1990 baseline.

PART 2:

REPORTING ON PROGRESS:

Ministers will receive reports by jurisdictions and/or partners in the delivery of this standard in 2004, 2007 and 2012, and will ensure that a single national report is prepared and posted on the CCME web site for public access. The reports in 2004 and 2007 will document intermediate progress by manufacturers in reducing mercury content in lamps and describe actions by governments. The 2012 report will include an evaluation of this standard and a recommendation whether changes should be considered. More details on reporting on progress are in Annex 1.

² Conventional landfilling results in emissions during lamp collection and dumping due to lamp breakage, and exposure of the broken lamps to air, rain and sunlight. Systems are available to collect used lamps that filter mercury vapour as the lamps are broken, so that the residue can be landfilled without direct atmospheric emissions, or sent for recycling. Lamp recycling is the preferred end-of-life and landfilling should only take place when the lamp residues are not considered hazardous and will remain contained.

ADMINISTRATION:

Jurisdictions will review and renew Part 2 and Annex 1 five years from coming into effect.

Any party may withdraw from this Canada-Wide Standard upon three month's notice.

This Canada-Wide Standard comes into effect for each jurisdiction on the date of signature by the jurisdiction.

Annex 1

Mercury Reporting Framework

Introduction

Under the Harmonization Accord and its Canada-wide Environmental Standards Sub-Agreement, all jurisdictions are to report to the public and to Ministers on their progress towards achieving the CWS for mercury.

This reporting framework is intended to provide a transparent and consistent mechanism for reporting by jurisdictions in a fashion which minimizes resource requirements for government and industry alike, while maximizing the availability of information on achievement of the CWS. The framework addresses:

- 1) frequency, timing and scope of reporting
- 2) guidance as to the means of determining achievement of the CWS
- 3) common measurement parameters for reporting purposes
- 4) data management and public reporting

Frequency, timing and scope of reporting

The reporting schedule will be tied to assessing the performance of the governments and partners in meeting the benchmarks and timelines relevant to the standard. The reports issued in 2004 and 2007 will include intermediate progress by the manufacturing sector in reducing the mercury content of lamps and describe actions by governments. The report in 2012 will provide an overall evaluation of achievement and any recommendations for revisions. Jurisdictions and partners will cooperate to produce a single national report, under the guidance of CCME, to be posted on the CCME web site for public access. This information is intended to show performance on a national basis.

Means of determining achievement of the CWS

The Canada-wide Standard for mercury-containing lamps has been developed with a view towards a largely voluntary approach undertaken by lamp manufacturers. A commitment has been made by the major lamp manufacturers to reduce their use of mercury in lamps – progress will be closely monitored, to ensure achievement of the CWS.

Common measurement parameters for reporting purposes

Each national report will include, for the purposes of public reporting, a measure of the average mercury content in mercury-containing lamps, as reported by the Electro-Federation Canada to Environment Canada.

As well, jurisdictions may report, where appropriate, on their efforts to encourage lamp recycling and/or to safely dispose of used lamps, and on any other actions taken to address the other parts of the lamp life-cycle in order to further reduce emissions.

Data management and public reporting

Jurisdictions will provide a report prior to September 30 (2004, 2007, 2012) so that the consolidated national report can be prepared for review and approval. The national report will be posted to the CCME web site upon approval by the Council of Ministers. Jurisdictions are encouraged to provide reference to the CCME web site and/or pointers in their own web sites in order to ensure a single location for mercury CWS reporting should errors/ miscalculations have to be corrected at some time.

In addition to the consolidated national report on the mercury CWS, jurisdictions must provide a contact for additional information in the advent that the public wishes to access achievement information. Such data will be supplied in a manner consistent with the normal reporting procedures of the jurisdiction in question.

Canada-wide Standard for Mercury-Containing Lamps

Signed by:

British Columbia	Honourable Ian Waddell
Alberta	Honourable Lorne Taylor
Saskatchewan	Honourable Buckley Belanger
Manitoba	Honourable Oscar Lathlin
Ontario	Honourable Elizabeth Witmer
Environment Canada	Honourable David Anderson
New Brunswick	Honourable Kim Jardine
Nova Scotia	Honourable David Morse
Prince Edward Island	Honourable Chester Gillan
Newfoundland and Labrador	Honourable Ralph Wiseman Honourable Tom Lush
Yukon	Honourable Dale Eftoda
Northwest Territories	Honourable Joseph Handley
Nunavut	Honourable Olayuk Akesuk

Note: Québec has not endorsed the Canada-wide Accord on Environmental Harmonization or the Canada-wide Environmental Standards Sub-agreement.