Environment Canada Environnement Canada

Performance Report:

POLLUTION PREVENTION NOTICE FOR DENTAL AMALGAM WASTE

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Canada

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Pollution Prevention (P2) Planning is a process by which organizations can improve their environmental performance by strategically planning to reduce or eliminate pollution before it is created.

OBJECTIVE

The objective of this report is to provide a summary of the results and progress achieved through the implementation of the Notice Regarding Pollution Prevention Planning in Respect of Mercury Releases from Dental Amalgam Waste (the Notice). The objective is to meet a 95% reduction of national mercury releases from dental amalgam waste, from a base year of 2000. This objective was set under the Canada-wide Standard on Mercury for Dental Amalgam Waste and endorsed by the Canadian Council of Ministers of the Environment (CCME) in 2001.

BACKGROUND

Mercury: What Is It and Why Prevent Its Pollution?

Mercury is a transboundary pollutant of global concern that impacts human and environmental health. Low levels of mercury, a neurotoxin, can cause severe health problems, especially for expectant mothers and their babies. Mercury also has measurable impacts on fish and wildlife. Mercury and its compounds are listed on Schedule 1 of the *Canadian Environmental Protection Act, 1999* (CEPA 1999), which provides authorities for the Ministers of Environment and Health to take action under the Act.

Mercury and dental amalgam

Dental amalgam, also known as "silver fillings," is a restorative dental product consisting of approximately equal amounts of elemental mercury and alloy powder. Mercury is used to bind the other compounds of dental amalgam together to form a hard, stable restorative material. Dental amalgam has been in widespread use for over 150 years, and is one of the oldest materials used in oral health care.

When dental amalgam is washed down drains at dental clinics, it travels through municipal sewer systems to wastewater treatment plants, or directly to waterways. It is also found in sewage sludge.

Mercury can also enter the environment when amalgam waste is disposed with municipal solid waste or biomedical waste from dental clinics.

THE NOTICE

On May 8, 2010, Environment Canada published the Notice in the *Canada Gazette*, Part I, under Part 4 of CEPA 1999. The Notice outlines the requirements to prepare and implement pollution prevention plans for mercury releases from dental amalgam waste, by targeting dental facilities that have not implemented all of the best management practices (BMPs) set out in Appendix A of the Notice or in the Memorandum of Understanding Respecting the Implementation of the Canada-wide

Standard on Mercury for Dental Amalgam Waste between the Canadian Dental Association and Environment Canada for the voluntary implementation of the Canada-wide Standard on Mercury for Dental Amalgam Waste.

The BMPs indicated in the Appendix of the Notice include, but are not limited to:

- Installing an International Organization for Standardization (ISO) certified amalgam separator or equivalent;
- Contacting a waste carrier to ensure proper recycling or disposal of the amalgam waste;
- Staying abreast of advances in restorative materials; and
- Avoiding the disposal of amalgam waste in the trash, down the drain, in the sharps container or with bio-medical wastes.

The deadline for the implementation of the Notice was November 13, 2010, for dental facilities subject to the Notice on the date of publication in the *Canada Gazette*, Part I. Dental facilities were also required to comply with the timelines provided under the Notice and to ensure that the information provided in the declarations was consistent with their pollution prevention plan.

Table 1 – Key milestones of the Notice:

Tasks	Timeline
Prepare a pollution prevention plan and ensure that the plan meets all the requirements of the Notice	August 14, 2010
File Schedule 1 – *Declaration That a Pollution Prevention Plan Has Been Prepared and is Being Implemented*	September 13, 2010
Implement the pollution prevention plan	November 13, 2010
File Schedule 5 – *Declaration That a Pollution Prevention Plan has Been Implemented*	December 13, 2010
Keep a copy of the pollution prevention plan on site	Ongoing
Have the pollution prevention plan available for submission if requested	Ongoing

Dental facilities that have gone or will go into operation after the date of publication of the Notice in the *Canada Gazette*, Part I are required to implement a plan no later than six months from becoming subject to the Notice.

SUMMARY OF RESULTS

Before the publication of the Notice, it was estimated in 2009 that there were 18705 dentists registered in Canada and 9000 dental facilities. Of the total number of facilities, it was estimated that 70% were already using dental amalgam

separators. After the compliance promotion activities done in advance of the publication of the final Notice, it was expected that between 1000 and 2500 dental facilities would be required to prepare and implement a pollution prevention plan.

As of December 31, 2010, Environment Canada had received a total of 204 declarations that a plan had been implemented. This was five times less than the above-estimated number of dental facilities subject to the Notice.

In response to the low participation rate, a survey of dental facilities across Canada was commissioned in 2012. The goal was to assess the awareness of the pollution prevention Notice, the overall implementation of BMPs for dental amalgam waste and the effectiveness of the Notice with respect to the risk management objective. The survey also complemented data collected from two previous national surveys conducted in 2003 and 2007.

A total of 1250 dental facilities participated in the 2012 survey. The survey indicated low awareness of the pollution prevention Notice (27%). However, it also indicated that BMPs were being implemented across Canada and that most of them had a dental amalgam separator in place (97%).

Table 2 – Comparison between data collected from the 2003, 2007 and 2012 National Survey of Dental Facilities

	2000	**2003**	**2007**	**2012**
Percentage of dental facilities using ISO - certified dental amalgam separators[1] (%)	0 (*Virtually*)	27	70	97[3]
Quantity of mercury being released to the environment from dental amalgam waste (kg)	1879[2]	1046	452	75

[1] A high-efficiency amalgam separator that meets ISO 11143:1999 standards.

[2] These numbers were estimated with best available data at the time.

[3] 3% of respondents were unsure if their separator was ISO-certified. As the ISO 11134 standard was developed at the same time as the best management practices (2002), it was important at the time to specify if the separator was ISO certified or not. Today, the major retailers of amalgam separators are only selling ISO-certified equipment. Therefore, we can assume the 3% of dentists who do not know if they have an ISO certified separator actually do have one. In addition, no dentists reported their separator was not ISO certified.

Moreover, the 2012 survey revealed that the use of dental amalgam in Canada has decreased by 43% since 2003. This trend has also been observed in the European Union where dental amalgam is still being used.[1] Removal of dental amalgam, however, has increased by approximately 70% since 2000. These trends are due to a combination of aesthetic concerns, health and environmental awareness, and governmental initiatives.

CONCLUSION

Even with the low awareness rate of the pollution prevention Notice (27%), the 2012 survey indicated an increase in the number of dental facilities that had adopted BMPs and that had installed dental amalgam separators. Several factors outside of the scope of the Notice, including an increased environmental awareness of mercury waste management among dental facilities, marketing efforts from dental amalgam separators suppliers, and provincial and municipal initiatives, may have played an important role in the implementation of BMPs, including the use of dental amalgam separators.

These factors contributed to the achievement of the risk management objective of 95% national reduction in mercury releases into the environment from dental amalgam waste, from a base year of 2000.

If you have any questions regarding this report, please contact the Products Division at 1-888-391-3426 or by email at products.produits@ec.gc.ca.

[1] Study on the potential for reducing mercury pollution from dental amalgam and batteries, European Commission, July 2012

ANNEX

Table 3 – Summary of the risk management actions for dental amalgam waste that have been undertaken

2000	Environment Canada conducted a Mass Balance Study of Dental-related Mercury Wastes in Canada and concluded that a total of 1879 kg of mercury was discharged into the environment (air, water and soil) from dental amalgam waste. The Canadian Council of Ministers of the Environment determined that environmental levels of mercury across Canada warrant efforts to reduce atmospheric and waterborne emissions of mercury and mercury compounds, derived from both deliberate uses and from incidental releases.
2001	The Canada-wide Standard (CWS) on Mercury for Dental Amalgam Waste was endorsed by the Canadian Council of Ministers of the Environment. • The goal of the standard is to reduce national mercury releases from dental amalgam waste by 95% by 2005, from a 2000 baseline, through the application of improved waste management practices. • Jurisdictions established initial actions and developed detailed implementation plans. Negotiations with the Canadian Dental Association and local dental associations were undertaken to promote early implementation. • Jurisdictions were to report on progress in 2004 and 2007.
2002	The best management practices (BMPs) were agreed upon in a Memorandum of Understanding between Environment Canada and the Canadian Dental Association.
2003	First National Survey of Dentists was carried out in all provinces and territories in Canada. • The data obtained showed that 27% of the dentists surveyed used ISO-certified dental amalgam separators, resulting in an estimated reduction of 833 kg of mercury entering the wastewater stream, based on 2000 mercury releases levels.
2003-2007	Environment Canada promoted the adoption of the CWS by all Canadian dentists by attending several dental conferences across Canada and developing tools to aid municipalities in identifying and reducing sources of mercury discharges to sewers. Environment Canada developed and distributed the following documents: • *Municipal Actions to Reduce Mercury*, March 2005 • *Dental Waste Best Management Practices Guide for the Dental Community,* April 2005 (reflecting only the regulatory requirements in Ontario)

2007	Second National Survey of Dentists was carried out in all provinces andterritories in Canada. • The data obtained showed that 70% of dentists used ISO certified dental amalgam separators, resulting in an estimated reduction of 1427 kg of mercury entering the wastewater stream, based on 2000 mercury releases levels.
2007	In October, the CCME published the Report on Compliance and Evaluation for the CWS for dental amalgam waste. The report concluded that: • The objective of 95% reduction of mercury releases from dental amalgam waste had not been achieved. • It was recommended that Environment Canada take further actions under the *Canadian Environmental Protection Act, 1999,* to assist jurisdictions in achieving the CWS target.
2010	On May 8, 2010, Environment Canada published the Notice Regarding Pollution Prevention Planning in Respect of Mercury Releases from Dental Amalgam Waste (the Notice) outlining requirements to prepare and implement pollution prevention plans for mercury releases from dental amalgam waste. • The Notice targets dental clinics that have not implemented the BMPs set out in the Memorandum of Understanding, by requiring them to prepare and implement pollution prevention plans for mercury releases from dental amalgam waste.
2012	Environment Canada conducted a third survey of dental facilities across Canada in order to assess the overall implementation of BMPs for dental amalgam waste and evaluate the effectiveness of the Notice with respect to the risk management objective. • The data obtained showed that 97% of dentists used ISO-certified dental amalgam separators resulting in an estimated reduction of 1804 kg of mercury entering wastewater stream, based on 2000 mercury releases levels.

Sources:

Pollution Prevention Planning Database and Website

www.**ec.gc.ca**

Additional information can be obtained at:

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