



12TH CANADIAN POLLUTION PREVENTION ROUNDTABLE

June 10-12, 2008
Edmonton, Alberta

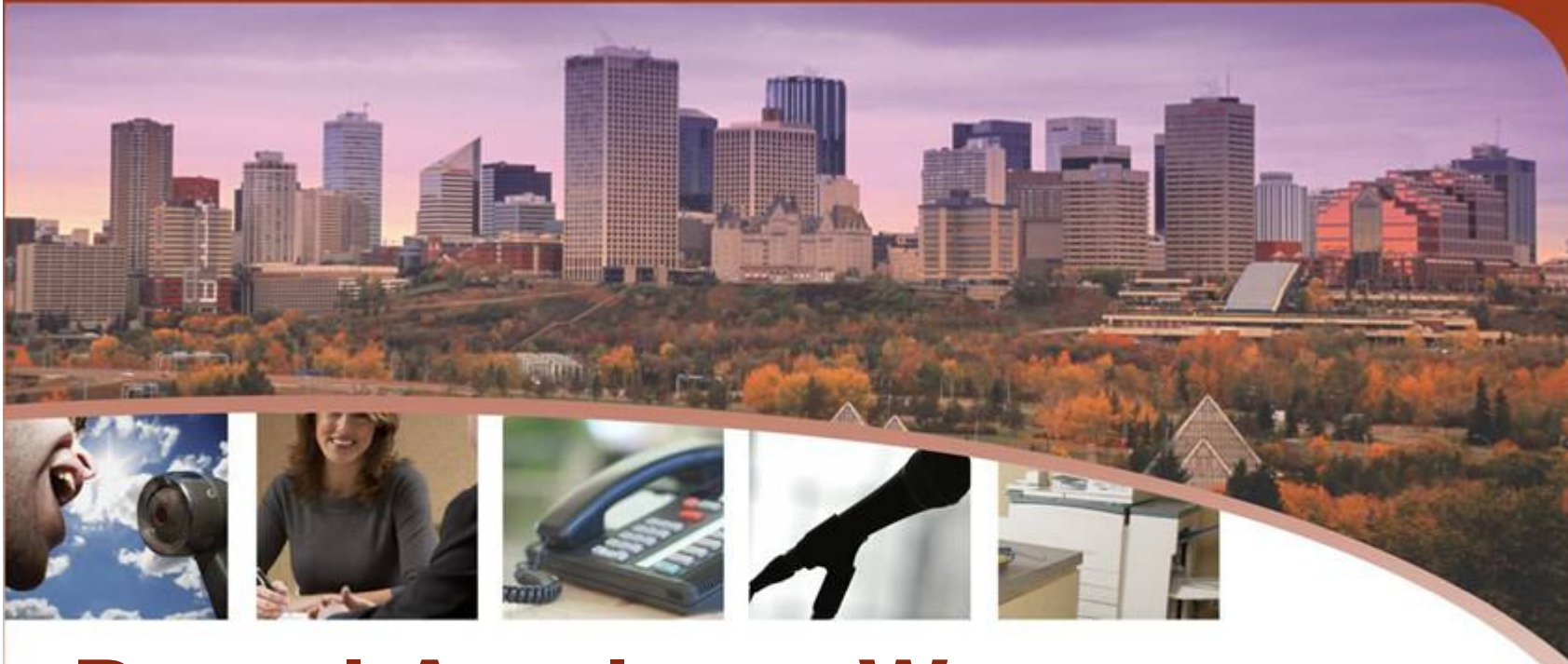
Crowne Plaza- Chateau Lacombe





8.2 “The City of Edmonton Dental Amalgam Separator Program”


Harry Abbink & Kevin Zhang
City of Edmonton - Drainage Services Branch



Dental Amalgam Waste Reduction Program in Edmonton

C2P2 Roundtable Conference, Edmonton
June 12, 2008



- 
- * Metro Population of 1,034,945 (2006)
 - * Population of Edmonton is about 750,000
 - * There are approximately 350 dental offices in Edmonton

Bylaws

***Keeping our City
Safe, Clean and Attractive***



Contents

- Mercury and dental amalgam
- Early Voluntary program
- Dental Amalgam surveys
- Edmonton Sewers Bylaw amendment
- Edmonton Enforcement Strategy

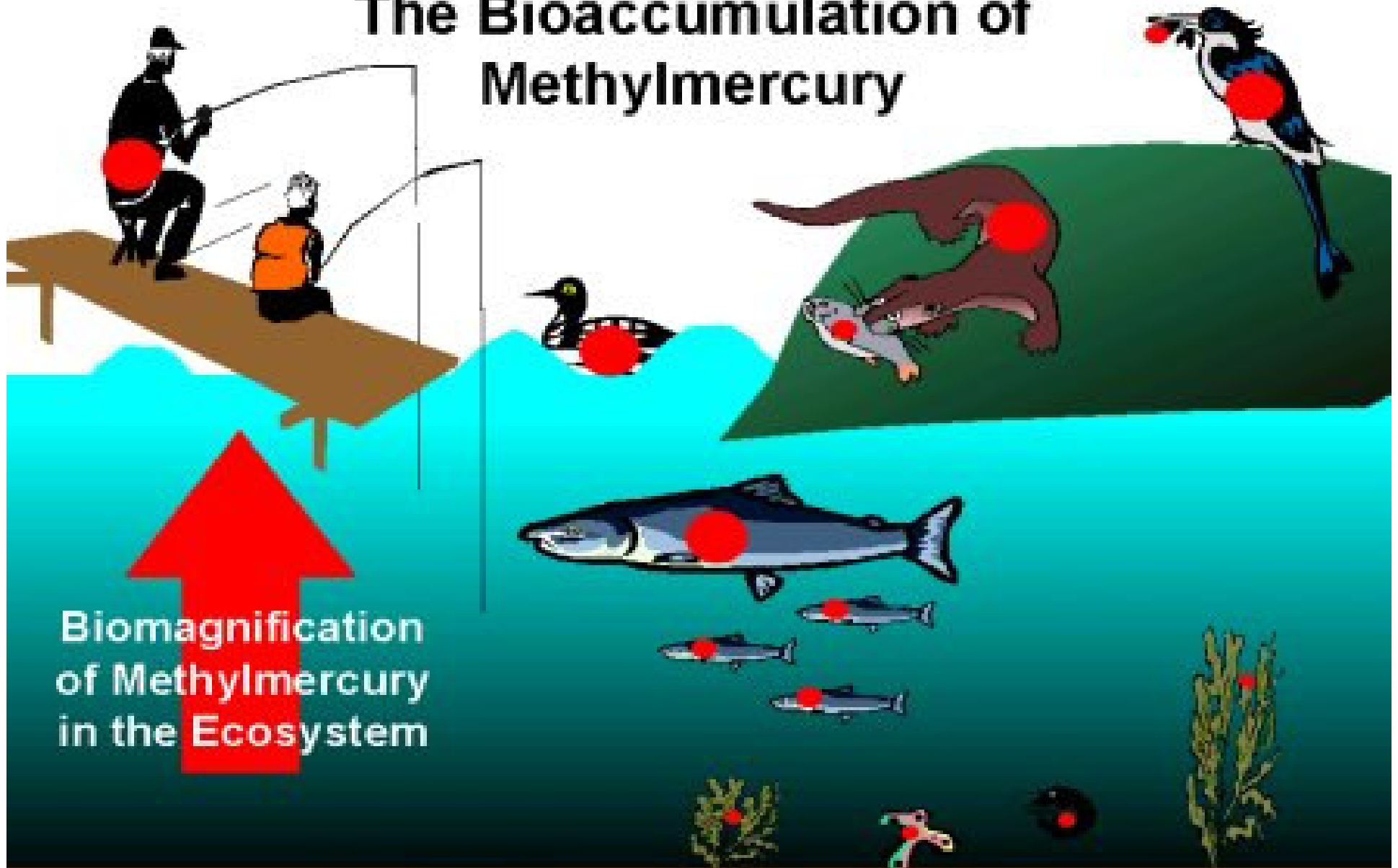
Mercury



- * Specific gravity : 13.5
- * Melting point : - 38.9 oC
- * Boiling point : 357.3 oC
- * Non – biodegradable
- * Methylmercury



The Bioaccumulation of Methylmercury



● Methylmercury Bioaccumulation in Organisms



Mercury Toxicity

- Mercury is a neurotoxin.
- Eating contaminated fish is the primary path of mercury intake.
- Currently, 98% of fish consumption advisories issued in Canada are due to mercury.
- The Minamata tragedy – “dancing cat disease”

Dental Amalgam

- * Combination of mercury with other metals, such as tin, copper, gold and silver
- * One of the most significant sources of mercury released to municipal sewer system



Canada Wide Standard on Mercury For Dental Amalgam Waste

- Endorsed by CCME in September 2001
- The objective is to achieve a 95% reduction of mercury releases from dental amalgam waste, by 2005, from a base year of 2000
- Supported by CDA and local dental associations

Memorandum of Understanding

- The MOU was signed on Feb. 18, 2002.



- The goal is to establish Best Practice of management of Dental Waste and assist in implementation of CWS

Alberta Dental Association & College

- Best Practice Management - Dental Waste
- As suggestions for handling dental waste to assist in implementation of CWS



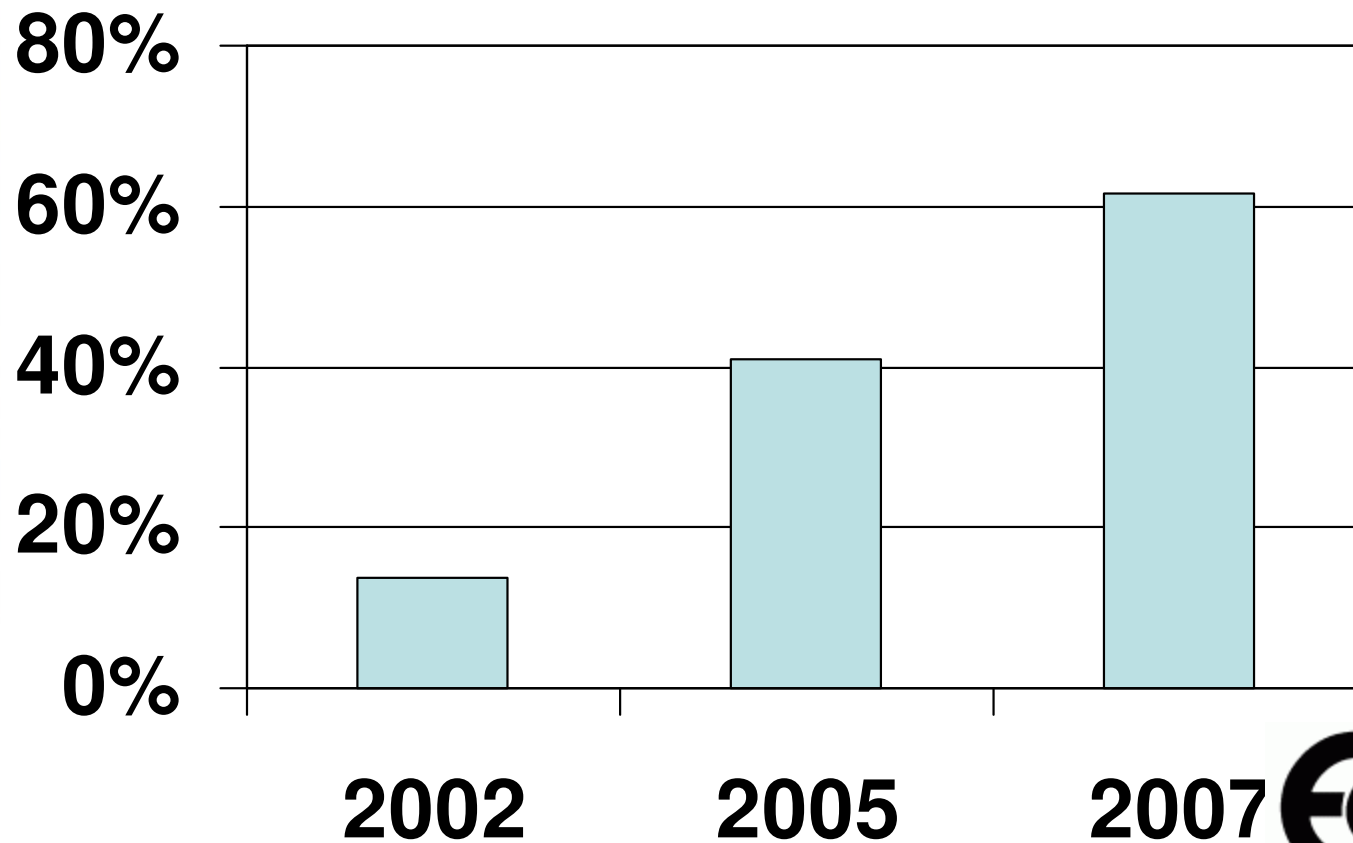
ISO11143

- The efficiency of the amalgam separator shall be at least 95% (mass fraction) when tested as specified in 9.3 to 9.6
- Warning system – warning level of the collecting container
- Alarm system – maximum level of the collection container or malfunction

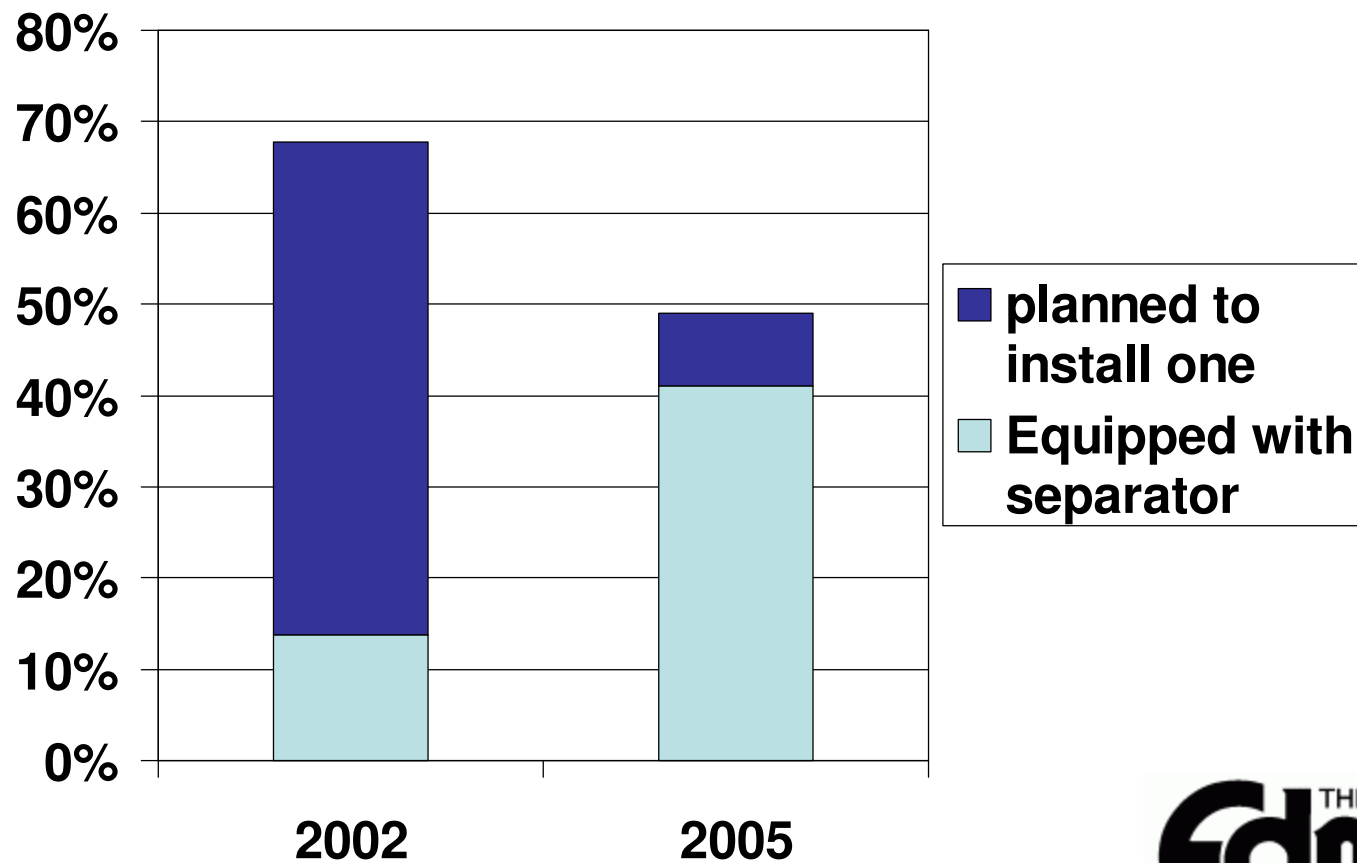
Dental Amalgam Survey

- ADAC membership survey (2002)
- Alberta dental amalgam survey (AENV, 2005)
- National dental amalgam survey (University of Toronto, 2007)

Dentists equipped with ISO 11143 certified amalgam separator in Alberta.

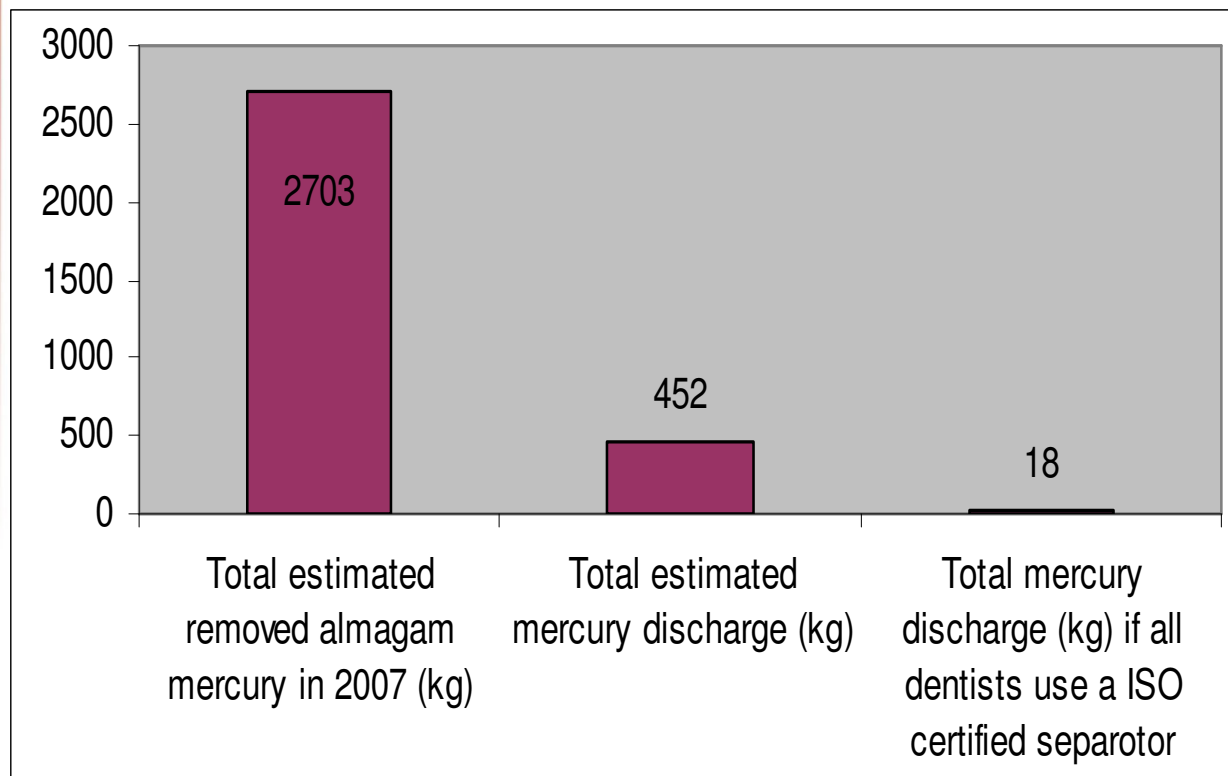


CWS target may not be achieved by voluntary program in Alberta.



2007 National Survey Results

- 69.9% dentist had a certified amalgam separator
- 2703 kg mercury was removed as dental amalgam; 452kg of which ended into wastewater.



2703 kg mercury contained
in amalgam removed



1170 kg Hg trapped in
ISO certified separators
with 70% dentists using
the separator

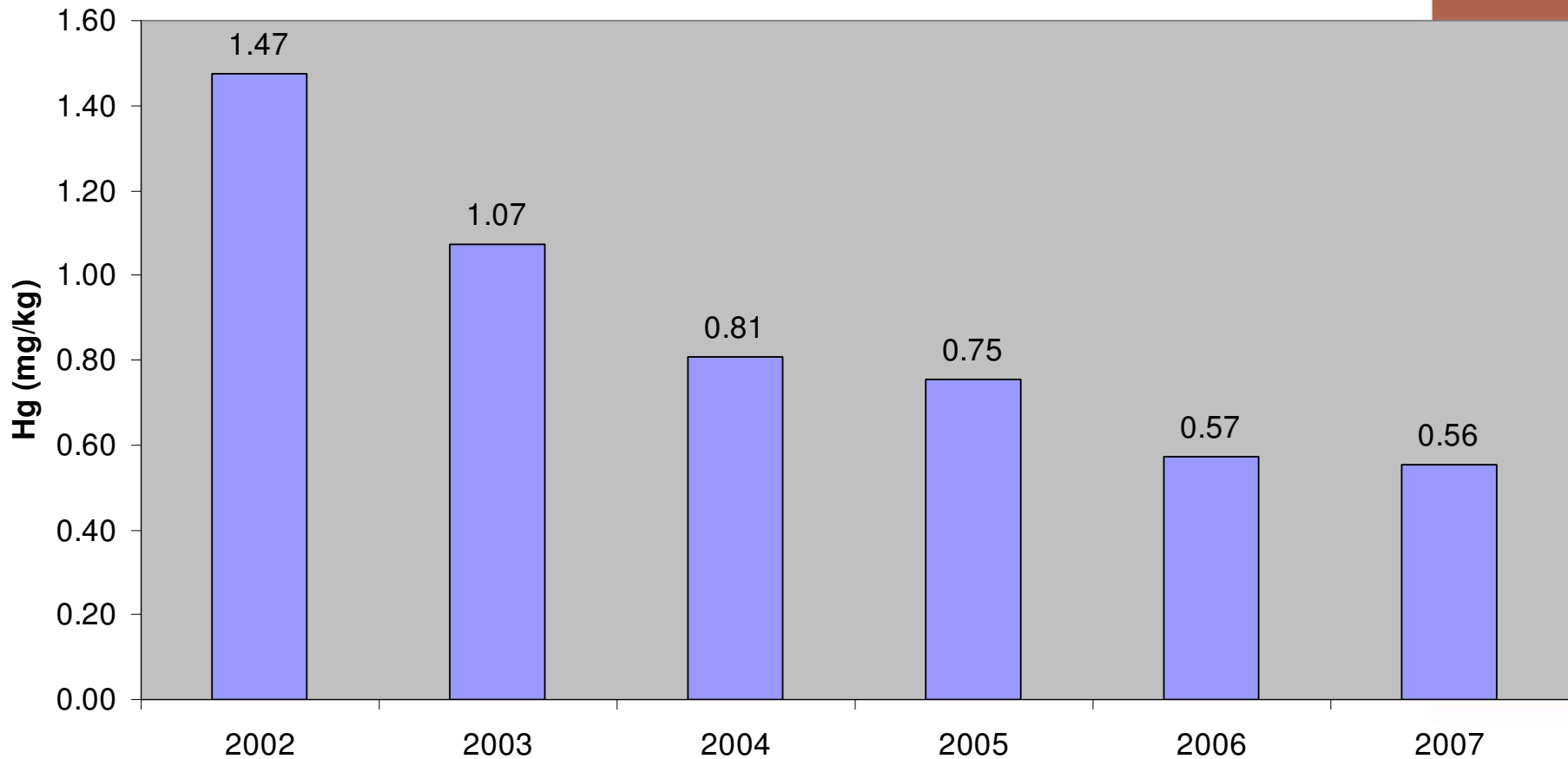
1081 kg Hg trapped in
chair-side separators
and pump filters

452 kg Hg enter
into sewer system

Summary of Survey results

- Voluntary program had reduced dental amalgam mercury releases significantly
- The CWS target was not achieved in 2007
- Mandatory program seems necessary to further reduce dental amalgam release to achieve CWS target, .

Digester Sludge Mercury Concentration



Edmonton Sewers Bylaw Amendment

- Education regarding dental amalgam was started in 2002 through the voluntary program
- Bylaw amendment was first presented at a meeting in June 2005 hold by AENV
- 2005 AENV survey indicated that only small amount of the dentists who didn't have a certified separator may voluntarily install it.

Edmonton Sewers Bylaw Amendment (cont.)

- The City Council endorsed the Bylaw Amendment on June 19, 2007.
- Dental facilities are required to install an ISO certified amalgam separator by January 1, 2008
- Sewers Use Bylaw was not amended (Hg < 0.10 mg/L)
- Exemptions: Orthodontics and Dentofacial Orthopaedics, Oral and Maxillofacial Surgery, etc.

Bylaw Enforcement Strategy

- Education first, Sent every dentist a survey form together with an information package regarding the Bylaw amendment and ISO certified amalgam separator.
- Allow some time for dentists to achieve compliance with amended Bylaw

Dental Offices Inspection

- 207 dentists (about 30%) responded and installed a certified amalgam separator
- We started inspection for all dental offices this January.
- So far, We have inspected all dental offices who did not reply to our survey.



Dental Office Inspection

- Most of the general practice dentist had installed an ISO certified amalgam separator.
- Many of the separator were installed last year after bylaw amendment.



Amalgam Separators used in Edmonton



Amalgam Separators used in Edmonton



Amalgam Separators used in Edmonton



Bylaw Enforcement Protocol

- Some dentist already ordered a separator but had not installed it yet, because of the intense market requirement.
- No enforcement actions, but conduct follow-up inspection to ensure it is installed properly.

Bylaw Enforcement Protocol

- Some dentists waited until our inspection to order a separator.
- A few dentists still had no plan to install an amalgam separator.
 - To issue a Notice to Comply
 - An amalgam separator shall be installed within 120 days.

Bylaw Enforcement Protocol

- An certified Separator were not installed as required within timeline.
 - A ticket of \$2,500 would be issued under Section 19(1) of Sewers Bylaw 9425.

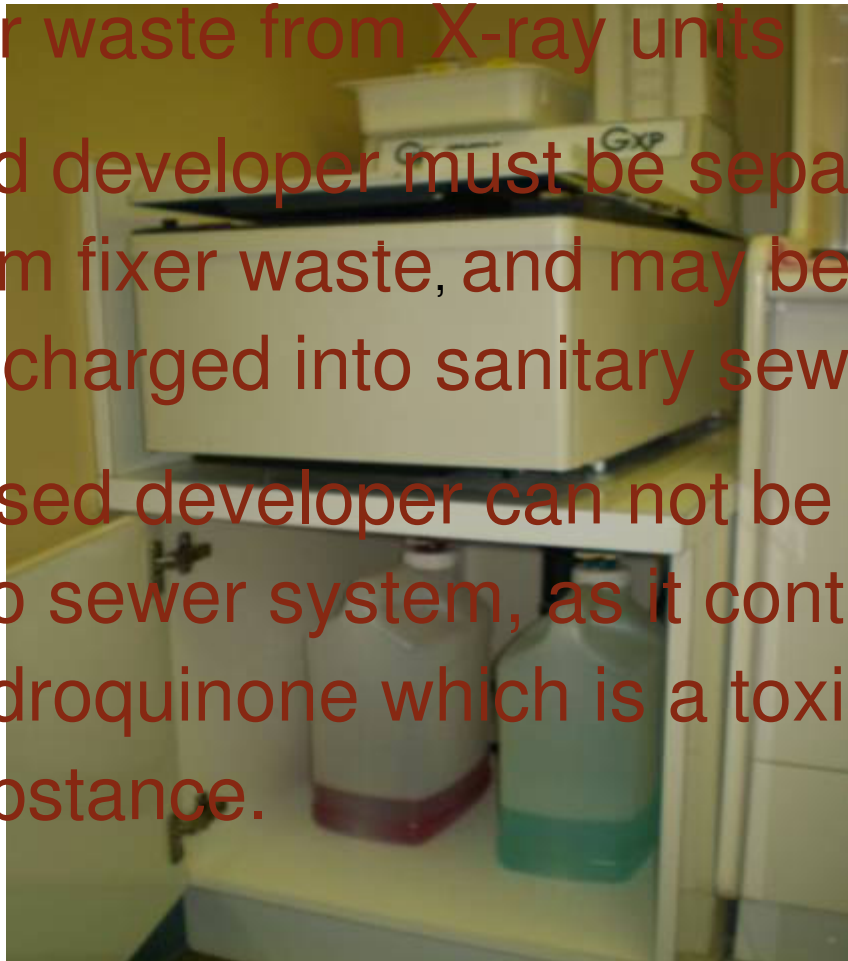
Other Concerns with Dental Wastes

- Proper maintenance of the Separator.
- Proper disposal of the collected amalgam recyclables and amalgam waste.
- Maintenance record and disposal document may be required during follow up inspections.



Other Concerns with Dental Wastes

- Fixer waste from X-ray units
- Used developer must be separated from fixer waste, and may be discharged into sanitary sewer.
- Unused developer can not be dumped into sewer system, as it contains hydroquinone which is a toxic substance.



Questions?



Amalgam waste disposal

- Amalgam waste should be collected from separators, filters and chair-side traps and stored in waste amalgam container
- The waste amalgam container must be air tight, and be clearly labeled: Waste Amalgam – HAZARDOUS
- Waste amalgam shall be sent to approved site for treatment
- Amalgam waste should not be mixed with other wastes.

Amalgam safety

- Dental amalgam contributes detectable amounts of mercury to the body. However, this exposure is not causing illness in the general population
- It is advisable to avoid procedures involving amalgam in pregnant women or individuals with kidney disease.
- Evidence does not warrant the removal of existing amalgam filings from individuals who have no indications of adverse effects.