

Reducing Mercury and Silver in Medical and Dental Wastewater

By

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Business Pollution Prevention Program

- Technical Assistance for Small Quantity Generators (SQGs)
- Moderate Risk Waste (MRW) Facility “HazoHouse”
- Thurston County Nonpoint Source Pollution Ordinance
 - Requires secondary containment for hazardous waste AND hazardous materials, including petroleum products
 - Requires proper disposal, specifically addresses discharges to soil and water



2004-2005 Medical & Dental Campaigns

Goals:

- Verify installation of state-required mercury amalgam separators
- Verify proper management of x-ray processing wastewater
- Other waste disposal: Lead x-ray waste, disinfectants, etc.
- Partnership with regional wastewater treatment utility (LOTT Alliance) and the Washington Department of Ecology (Ecology)



Mercury Waste from Dental Clinics

- 94% initial compliance rate for mercury amalgam installation
- Successful outreach by Ecology
 - Partnership with the Washington State Dental Association
 - Numerous contacts (i.e. notification letters, educational materials)



Silver-Bearing X-Ray Wastewater

- High silver content: several thousand parts per million
- Treatment options: Vendor or onsite treatment/sewer
- Chemical Recovery Cartridges (CRCs)
- Drawbacks
 - Requires slow, continuous flow to work properly
 - Requires regular testing



Silver-Bearing X-Ray Wastewater

- 75 facilities utilizing CRC systems; 34 dentists, 41 medical clinics
- 72% Out of Compliance
 - Dentists: 97% out of compliance, inadequate systems (single CRC)
 - Medical Clinics: 51% out of compliance, adequate systems, lack of maintenance
 - Septic systems
 - Alternative treatment options

Free Local Disposal Options

- Local Camera Shop
- Thurston County HazoHouse
 - CRC system installed March 2006
 - Over 700 gallons collected to date
 - Total cost installed \$1,215 (Ecology \$922, County \$293)
 - Reclaimed silver produced revenue of \$611 during first year
- Local Wastewater Utility (LOTT Alliance)
 - Second system purchased/installed by LOTT in July 2006
 - Over 300 gallons collected to date
- Customer Base
 - 36 total customers
 - 24% of medical & dental facilities



Notable Outcomes

- Environmental Compliance

- 69 sites achieved compliance
- 14 removed inadequate CRC systems
- 18 upgraded CRC systems
- 17 stopped improper discharges to wastewater

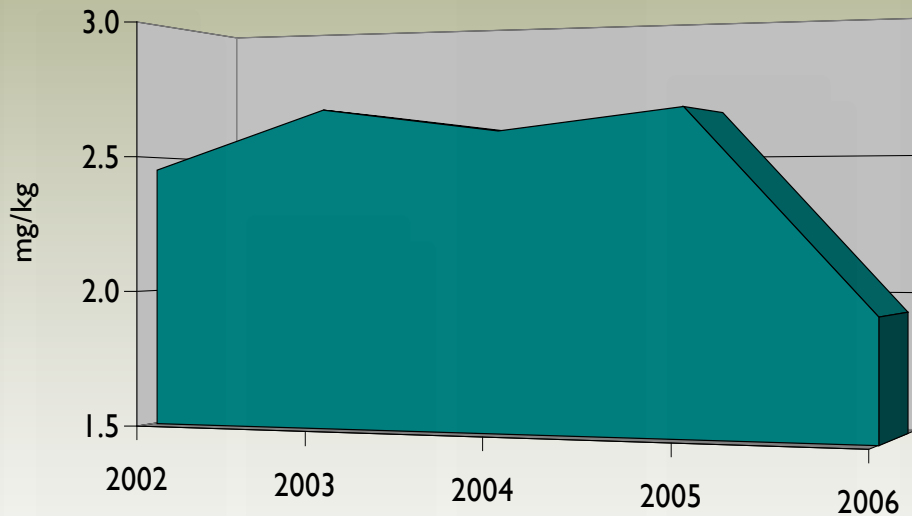
- Wastewater Treatment

- 21-34% decrease in mercury and silver in municipal wastewater
- Timing of decreases coincide with campaigns

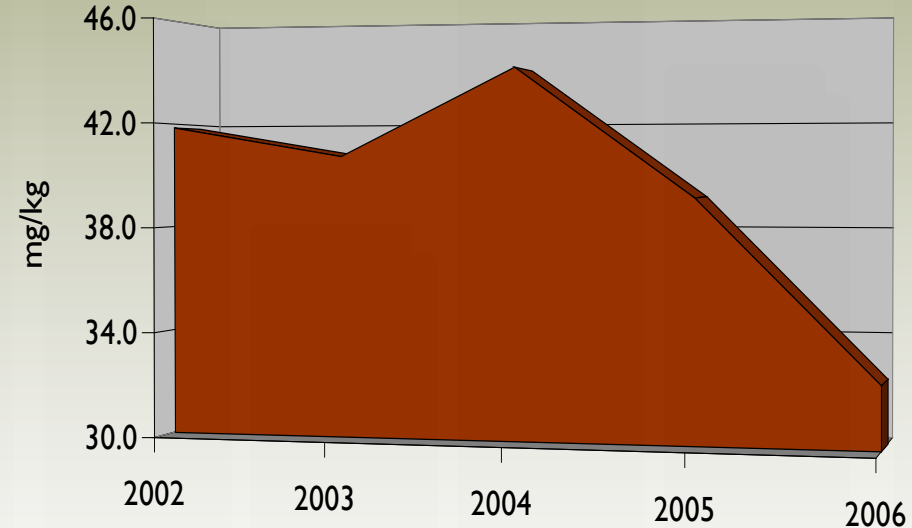


Wastewater Treatment Results

Mercury Levels in Biosolids

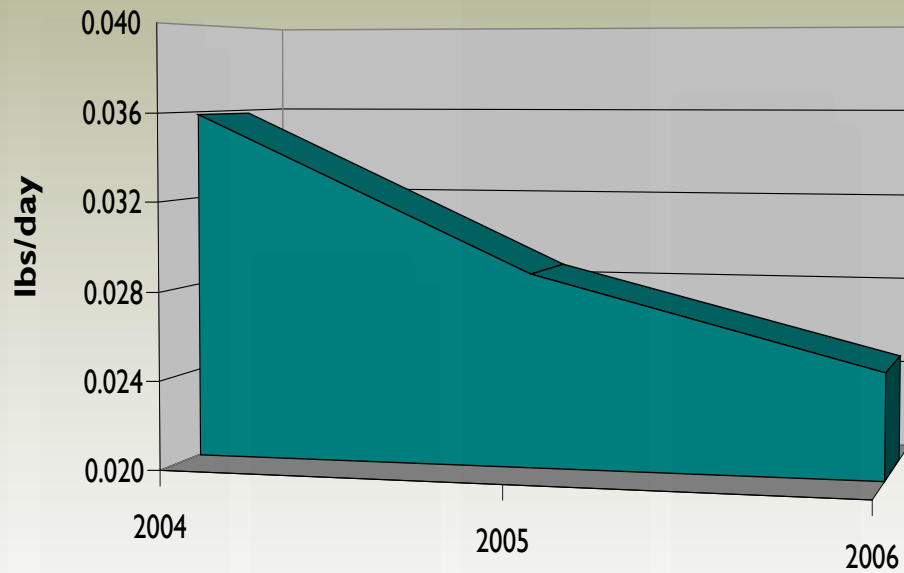


Silver Levels in Biosolids

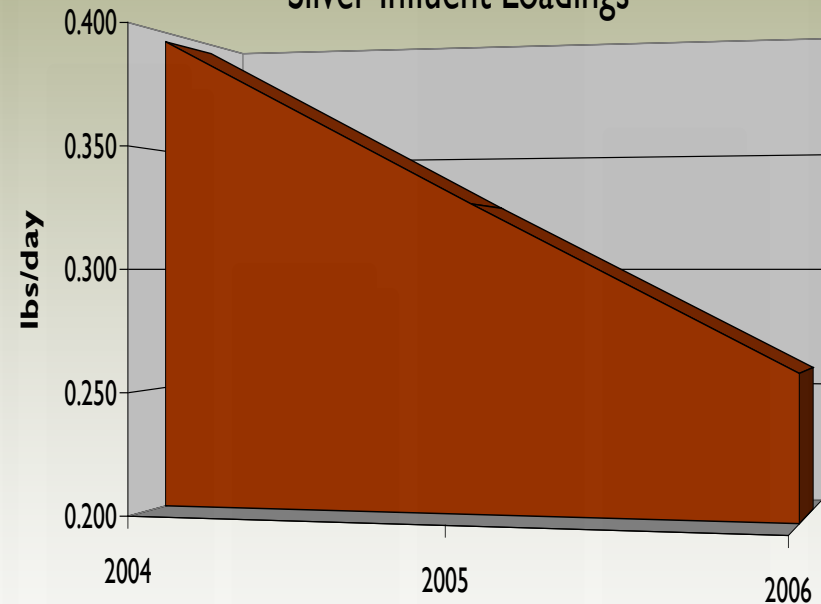


Wastewater Treatment Results

Mercury Influent Loadings



Silver Influent Loadings



Campaign Successes

- Achieved long-term quantitative results
- Established new local recycling options that are financially self-sustaining
- Reduced potential contamination to soil & groundwater
- Reduced heavy metals entering Puget Sound
- Win-win situation for all

