AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

ASSESSING STATE AND LOCAL REGULATIONS TO REDUCE DENTAL MERCURY EMISSIONS

HEARING

BEFORE THE

SUBCOMMITTEE ON DOMESTIC POLICY

OF THE

COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

JULY 8, 2008

Serial No. 110–167

Printed for the use of the Committee on Oversight and Government Reform

Available via the World Wide Web: http://www.gpoaccess.gov/congress/index.html
http://www.oversight.house.gov

U.S. GOVERNMENT PRINTING OFFICE

49–972 PDF WASHINGTON : 2009

For sale by the Superintendent of Documents, U.S. Government Printing Office
Internet: bookstore.gpo.gov Phone: toll free (866) 512–1800; DC area (202) 512–1800
Fax: (202) 512–2104 Mail: Stop IDCC, Washington, DC 20402–0001

COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM

HENRY A. WAXMAN, California, *Chairman*

EDOLPHUS TOWNS, New York
PAUL E. KANJORSKI, Pennsylvania
CAROLYN B. MALONEY, New York
ELIJAH E. CUMMINGS, Maryland
DENNIS J. KUCINICH, Ohio
DANNY K. DAVIS, Illinois
JOHN F. TIERNEY, Massachusetts
WM. LACY CLAY, Missouri
DIANE E. WATSON, California
STEPHEN F. LYNCH, Massachusetts
BRIAN HIGGINS, New York
JOHN A. YARMUTH, Kentucky
BRUCE L. BRALEY, Iowa
ELEANOR HOLMES NORTON, District of Columbia
BETTY McCOLLUM, Minnesota
JIM COOPER, Tennessee
CHRIS VAN HOLLEN, Maryland
PAUL W. HODES, New Hampshire
CHRISTOPHER S. MURPHY, Connecticut
JOHN P. SARBANES, Maryland
PETER WELCH, Vermont

TOM DAVIS, Virginia
DAN BURTON, Indiana
CHRISTOPHER SHAYS, Connecticut
JOHN M. McHUGH, New York
JOHN L. MICA, Florida
MARK E. SOUDER, Indiana
TODD RUSSELL PLATTS, Pennsylvania
CHRIS CANNON, Utah
JOHN J. DUNCAN, Jr., Tennessee
MICHAEL R. TURNER, Ohio
DARRELL E. ISSA, California
KENNY MARCHANT, Texas
LYNN A. WESTMORELAND, Georgia
PATRICK T. McHENRY, North Carolina
VIRGINIA FOXX, North Carolina
BRIAN P. BILBRAY, California
BILL SALI, Idaho
JIM JORDAN, Ohio

PHIL BARNETT, *Staff Director*
EARLEY GREEN, *Chief Clerk*
LAWRENCE HALLORAN, *Minority Staff Director*

SUBCOMMITTEE ON DOMESTIC POLICY

DENNIS J. KUCINICH, Ohio, *Chairman*

TOM LANTOS, California
ELIJAH E. CUMMINGS, Maryland
DIANE E. WATSON, California
CHRISTOPHER S. MURPHY, Connecticut
DANNY K. DAVIS, Illinois
JOHN F. TIERNEY, Massachusetts
BRIAN HIGGINS, New York
BRUCE L. BRALEY, Iowa

DARRELL E. ISSA, California
DAN BURTON, Indiana
CHRISTOPHER SHAYS, Connecticut
JOHN L. MICA, Florida
MARK E. SOUDER, Indiana
CHRIS CANNON, Utah
BRIAN P. BILBRAY, California

JARON R. BOURKE, *Staff Director*

CONTENTS

	Page
Hearing held on July 8, 2008	1
Statement of:	
Bender, Michael, director, Mercury Policy Project; Richard D. Fischer, former president, International Academy of Oral Medicine and Toxicology; Curt McCormick, former Administrator, Environmental Protection Agency Region 8; and William Walsh, counsel, American Dental Association	12
Bender, Michael	12
Fischer, Richard D.	41
McCormick, Curt	49
Walsh, William	58
Magnuson, Patricia, industrial waste investigator, King County, Seattle, WA; Ann Farrell, director, Engineering Department, Central Contra Costa County Sanitary District; Dr. C. Mark Smith, deputy director and co-chair, Massachusetts Department of EPA, New England Governors and Eastern Canadian Premiers Task Force; and Owen Boyd, CEO, Solmetex	97
Boyd, Owen	152
Farrell, Ann	115
Magnuson, Patricia	97
Smith, Dr. C. Mark	133
Letters, statements, etc., submitted for the record by:	
Bender, Michael, director, Mercury Policy Project, prepared statement of	18
Boyd, Owen, CEO, Solmetex, prepared statement of	155
Farrell, Ann, director, Engineering Department, Central Contra Costa County Sanitary District, prepared statement of	118
Fischer, Richard D., former president, International Academy of Oral Medicine and Toxicology, prepared statement of	43
Kucinich, Hon. Dennis J., a Representative in Congress from the State of Ohio, prepared statement of	4
Magnuson, Patricia, industrial waste investigator, King County, Seattle, WA, prepared statement of	100
McCormick, Curt, former Administrator, Environmental Protection Agency Region 8, prepared statement of	52
Smith, Dr. C. Mark, deputy director and co-chair, Massachusetts Department of EPA, New England Governors and Eastern Canadian Premiers Task Force	136
Walsh, William, counsel, American Dental Association, prepared statement of	60
Watson, Hon. Diane E., a Representative in Congress from the State of California, letter dated December 17, 2004	77

ASSESSING STATE AND LOCAL REGULATIONS TO REDUCE DENTAL MERCURY EMISSIONS

TUESDAY, JULY 8, 2008

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON DOMESTIC POLICY,
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM,
Washington, DC.

The subcommittee met, pursuant to notice, at 2:35 p.m., in room 2154, Rayburn House Office Building, Hon. Dennis J. Kucinich (chairman of the subcommittee) presiding.

Present: Representatives Kucinich, Watson, and Burton.

Staff present: Jaron R. Bourke, staff director; Noura Erakat, counsel; Jean Gosa, clerk; Leneal Scott, information systems manager; and Jill Schmalz, minority professional staff member.

Mr. KUCINICH. Good afternoon to our witnesses and to all those in attendance. I am Congressman Dennis Kucinich, chairman of the Domestic Policy Subcommittee of the Oversight and Government Reform Committee.

Our hearing today is going to be on assessing State and local regulations to reduce dental mercury emissions.

I am pleased to be joined today by the distinguished Congressman from the State of Indiana, Representative Dan Burton, who I had the privilege of serving with in many different capacities over the last 12 years.

Congressman Burton, thank you for joining us, sitting in as the ranking member today for Congressman Issa.

This hearing today continues an examination that this subcommittee began last November into the detrimental impact of mercury on the environment. In particular, we are taking a closer look at mercury released from the dental industry and how State and local governments have worked to reduce those emissions.

Elemental mercury and most of its compounds are extremely toxic substances that can cause chronic and acute poisoning in human beings who come into contact with them. Young children and unborn fetuses are particularly susceptible to mercury poisoning. Today, improper disposal of mercury into wastewater by industries and persons who use it has caused dangerously high contamination levels in many of the country's water bodies.

The dental industry contributes substantially to the amount of mercury that ends up in wastewater and eventually in fresh water. In places where the disposal of dental amalgam is not subject to regulation, amalgam is frequently discarded by simply washing it down the drain.

Last November, the subcommittee held its first hearing on this matter, where it heard testimony from the EPA, as well as the Food and Drug Administration. In the aftermath of the hearing, the FDA set a deadline to issue a final regulation on the reclassification of dental amalgam and its components, which would increase FDA oversight of dental amalgam. We are pleased with the FDA's decision to issue this proposed rulemaking.

During our first hearing, we learned that dental offices constitute the largest source of mercury in wastewater influent. Once in the wastewater, mercury contaminates the environment in several ways. Most of the mercury entering the wastewater stream concentrates in the sewage sludge, 60 percent of which is spread over land as fertilizer; 20 percent is incinerated, resulting in the atmospheric release of mercury; and 15 percent is land-filled.

The mercury that does not concentrate in sludge is discharged to downstream surface waters along with the treated effluent, namely into lakes, oceans, streams and land. We have also learned that a number of States and municipalities have made attempts at preventing the release of dental mercury from dental offices.

Subsequently, the subcommittee took a closer look at State and local efforts aimed at reducing dental mercury emissions. The subcommittee surveyed nine States and eight local governments that have attempted to do so and found that when States evaluated the cost and benefits of choosing how to prevent environmental emissions of mercury, they all found that the most economical means for doing so was to prevent the dental mercury from entering their wastewater, as opposed to removing mercury from the wastewater.

The technology used to capture mercury in the dentists' offices before it enters the wastewater stream is the mercury amalgam separator. Our survey revealed that to prevent dental mercury from entering municipal wastewaters, State and local governments have either encouraged voluntary use or mandated the use of separators.

Our findings indicate that successful voluntary programs were incentivized programs that offered less cumbersome compliance requirements and were underpinned with the threat of a mandatory program. Moreover, most of the State and local governments that we surveyed initiated a voluntary program before enacting provisions in the form of a regulation, ordinance or statue mandating the installation of separators and a recycling program. Only after the failure of their voluntary programs to achieve their desired compliance goals did these governments switch to a mandatory program.

Today we are going to hear from several of those States and local government representatives about how they grappled with these challenges, what were their lessons learned and how their regulatory experience can help States and local governments seeking to reduce dental mercury discharges to their wastewater.

We will also hear from the American Dental Association. The ADA constitutes one of the most significant stakeholders in the effort to reduce dental mercury emissions. As we will hear today, among the most valuable lessons learned in the effort to achieve compliance is the importance of the cooperation and leadership of local and State dental societies.

The ADA has already made significant strides in leading the effort to reduce dental mercury emissions. Most recently, it amended its best management practices to reflect its endorsement of amalgam separators as an effective tool to reducing mercury contamination from the dental industry. The ADA writes that "the use of separators will allow greater recycling and reduce the amount of amalgam which contains mercury entering wastewater treatment plants."

Some of the questions we hope to address in today's hearings are: First, what is the impact of dental mercury on the environment? Second, what is the efficacy of amalgam separator units? Third, what is the cost-benefit analysis of amalgam separators made by State and local governments? And, fourth, what are the considerations to make when deciding between a voluntary and a mandatory dental mercury reduction program?

The subcommittee looks forward to hearing the testimony of witnesses today, and we will continue our investigation of how State and local governments can effectively reduce dental mercury emissions.

At this time I would like to introduce the gentleman from Indiana, Congressman Burton, for his opening statement thank, Mr. Burton.

[The prepared statement of Hon. Dennis J. Kucinich follows:]

Opening Statement
Of
Dennis J. Kucinich, Chairman
Domestic Policy Subcommittee
Oversight and Government Reform Committee
Tuesday, July 8, 2008
2154 Rayburn HOB
2:30 P.M.

"Assessing State and Local Regulations to Reduce Dental Mercury Emissions"

Good afternoon and welcome.

This hearing continues an examination we began last November into the detrimental impact of mercury on the environment. In particular, we are taking a closer look at mercury released from the dental industry and how state and local governments have worked to reduce those emissions.

Elemental mercury and most of its compounds are extremely toxic substances that can cause chronic and acute poisoning in human beings who come into contact with them. Young children and unborn fetuses are particularly susceptible to mercury poisoning. Today, improper disposal of mercury into wastewater by industries and persons who use it has caused dangerously high contamination levels in many of the country's water bodies.

The dental industry contributes substantially to the amount of mercury that ends up in wastewater, and eventually in fresh water. In places where the disposal of dental amalgam is not subject to regulation, amalgam is frequently discarded by simply washing it down the drain.

Last November, the Subcommittee held its first hearing on this matter where it heard testimony from the EPA as well as the Food and Drug Administration (FDA). In the aftermath of the hearing, the FDA set a deadline to issue a final regulation on the reclassification of dental amalgam and its components which would increase FDA oversight of dental amalgam.[1] We are pleased with the FDA's decision to issue this proposed rulemaking.

During our first hearing, we learned that dental offices constitute the largest source of mercury in wastewater influent.[2] Once in the wastewater, mercury contaminates the environment in several ways. Most of the mercury entering the wastewater stream concentrates in the sewage sludge, sixty percent of which is spread over land as fertilizer, twenty percent is incinerated resulting in the atmospheric release of

[1] FDA Proposed Rulemaking, 21 CFR Part 872 (2008) pp. 22877-22879.
[2] Domestic Policy Subcommittee, Oversight and Government Reform Committee, Testimony of Michael T. Bender, *Hearing on Environmental Risks and Regulatory Responses to Mercury Dental Fillings*, 110th Cong. (November 14, 2007).

mercury, and fifteen percent is land-filled.[3] The mercury that does not concentrate in sludge is discharged to downstream surface waters along with the treated effluent, namely into lakes, oceans, streams, and land. We also learned that a number of states and municipalities had made attempts at preventing the release of dental mercury from dental offices.

Subsequently, the Subcommittee took a closer look at state and local government efforts aimed at reducing dental mercury emissions. The Subcommittee surveyed nine states and eight local governments that have attempted to do so and found that when states evaluated the costs and benefits of choosing how to prevent environmental emissions of mercury, they all found that the most economical means for doing so was to prevent the dental mercury from entering their wastewater as opposed to removing the mercury from the wastewater.

The technology used to capture mercury in the dentists' offices before it enters the wastewater stream is the Mercury Amalgam Separator. Our survey revealed that to prevent dental mercury from entering municipal wastewaters, state and local governments have either encouraged voluntary use or mandated the use of separators. Our findings indicate that successful voluntary programs were incentivized programs that offered less cumbersome compliance requirements and were

[3] *Id.*

underpinned with the threat of a mandatory program. Moreover, most of the state or local governments that we surveyed initiated a voluntary program before enacting provisions, in the form of a regulation, ordinance, or statute, mandating the installation of separators and a recycling program. Only after the failure of their voluntary programs to achieve their desired compliance goals did these governments switch to a mandatory program.

Today we will hear from several of those state and local government representatives about how they grappled with these challenges, what were their lessons learned, and how their regulatory experience can help other states and local governments seeking to reduce dental mercury discharges to their wastewater.

We will also hear from the American Dental Association (ADA). The ADA constitutes one of the most significant stakeholders in the effort to reduce dental mercury emissions. As we will hear today, among the most valuable lessons learned in the effort to achieve compliance is the importance of the cooperation and leadership of local and state dental societies. The ADA has already made significant strides in leading the effort to reduce dental mercury emissions. Most recently, it amended its Best Management Practices to reflect its endorsement of amalgam separators as an effective tool to reducing mercury contamination from

the dental industry. The ADA writes that "the use of separators will allow greater recycling and reduce the amount of amalgam which contains mercury, entering wastewater treatments plants."[4]

Some of the questions that we hope to address in today's hearing are:

(1) What is the impact of dental mercury on the environment?

(2) What is the efficacy of amalgam separator units?

(3) What is the cost-benefit analysis of amalgam separators made by state and local governments?; and

(4) What are the considerations to make when deciding between a voluntary and a mandatory dental mercury reduction program?

The Subcommittee looks forward to hearing the testimony of our witnesses today and to continue our investigation of how state and local governments can effectively reduce dental mercury emissions.

[4] ADA, Press Release, "ADA Updates Environmental Recommendations for Handling Waste," (October 2, 2007) *available at* http://www.ada.org/public/media/releases/0710_release01.asp.

Mr. BURTON. Thank you, Mr. Kucinich.

Dr. Fischer, it's good seeing you again. Haven't seen you for a while.

I will tell you a little story. This weekend I had a cap come off of one of my teeth, and I had to call my dentist for an emergency so he could put that cap back on. But when I got there, I asked him, I said, "What kind of a filling do I have in that tooth that was under that cap?" He says, "Well, it's an amalgam." I said, "Well, that's partially mercury, isn't it?" He says, "Yeah, but it's inert, and it can't cause you any problem."

I just want you to know that it split, and a lot of that came into little bitty chunks and it got in my mouth, and I had to rinse it out. I was thinking, as I was rinsing it out, I wonder how much of this I am going to swallow and what kind of an impact it might have on me later in life.

And I had to have him go ahead and put the cap on it, so it is still there. So, Dr. Fischer, I may be coming to you to have to get that out of there, because I had to have my tooth fixed over the weekend.

But that's an example of—and he is a very good dentist; don't misunderstand. He is trying to do what he thinks is right, and he gets his direction from the ADA, who doesn't like me very much. You guys worked hard to beat me in the primary. I just want you to know you didn't win.

But, anyhow, the thing about mercury is it is toxic, and it shouldn't be in our drinking water, it shouldn't be in our teeth, it shouldn't be in our vaccines, it shouldn't be in anything that goes into the human body. There's just no question, it shouldn't be in anything that goes into the human body.

And even the FDA—I guess it was the FDA—the U.S. Food and Drug Administration just recently said they no longer ignored the science after dodging its duty to classify mercury fillings for decades. The U.S. Food and Drug Administration recently settled a lawsuit with several consumer groups promising to complete its end of the settlement within a year. As part of the settlement, the FDA has even publicly withdrawn its claims that amalgam is safe for all. And now it warns, "Dental amalgams contain mercury, which may have neurotoxic effects on the nervous systems of developing children and fetuses." Well, what about the person who has it in their mouth?

You know, we had hearings on this for 2 years, Mr. Chairman. When I was chairman of the Government Reform Committee, my grandson became autistic. And I started looking into the mercury that was going into the human body, and I found that the vaccinations that children were getting contained 50 percent ethyl mercury and what was called the thimerosal preservative.

And it used to be kids would get, you know, two or three vaccinations and then go to school. When I was a kid, if you had measles, it was a quarantine, or chicken pox or anything. Today, they give you vaccinations for all of that. And, as a result, children get as many as 28 to 30 vaccinations before they start to school.

And, as a result, we have gone from one in 10,000 children that are autistic to one in 150. It is an absolute epidemic in America. And those kids are going to grow up, and they are going to get

older, live to maybe 70 or 75, and be a burden not only to their families but on society and the taxpayers, because they are going to need help.

And we still have mercury in adult vaccinations, and we have been able to get it out of almost all of the children's vaccinations except three or four. But a lot more needs to be done, and that's why I congratulate you on having this hearing.

Representative Watson, your colleague on the Democrat side, who unfortunately couldn't be here today, she worked on this very hard in California. And she was able to get legislation passed out there that dealt with the mercury in dentistry, so that California is way ahead of the Federal Government and the ADA on this issue.

I understand that other substances that they have put into our teeth may have some side effects. I have heard the ADA before, when we have had these hearings before, and there are some things that people should be concerned about. But mercury is the most toxic substance aside from radioactive material in the world. If you spill it on this floor, they are going to evacuate the building. They did that in high school in a science class here in Washington, DC. They spilled some on floor, they cleared the room, they evacuated the school, and they took the kids who had the mercury spilled on the floor near them and burned their clothes and had them watched by doctors for a long period of time.

I am anxious to hear from our witnesses today. I have heard most of you before, and I am sure I am going to hear pretty much the same kind of testimony I have heard before.

But I really do appreciate Dennis Kucinich, the chairman of this committee, who ran unsuccessfully for President but nevertheless he has a national following now. And even though Dennis is in the other party, him holding a hearing on this, I think, will bring far more attention on the subject. And I really appreciate him holding the hearing.

Mercury should not be ingested in the human body in any way.

One more thing, in Newport News, Virginia, when we were holding these hearings, the dentist down there, when they did the dental work on the naval personnel, they evidently were letting a lot of the mercury get into the wastewater system. And so the wastewater treatment system down there, the people that were head of the Newport News, Virginia, went to the naval leaders at Newport News and said, those all have to be put in containers, they can't allow any of the amalgams to leach into the water system because it was getting into the recycling system and it was getting into the water and causing problems. And so they started making sure it was put into lead-covered containers so it couldn't get into the system down there.

That tells you pretty clearly that the residual impact of mercury fillings, even if you could keep them inert and wouldn't hurt you in your mouth, certainly hurt when they get into the ecological system, the water systems. And if you burn them in an incinerator, they get into the air. And so mercury should be not allowed to be put into amalgams or into the human body in any way.

I am sorry if I droned on a little bit too long, Mr. Chairman, but when you have a grandson——

Mr. KUCINICH. The gentleman is entitled to take whatever time he thinks is necessary.

Mr. BURTON. Well, thank you.

But when you have a child who is a normal child, and he is your grandson, and he gets nine shots in 1 day, seven of which have mercury in it, and he becomes autistic within just a short period of time, and you have hearings on it for 2 or 3 years, and you find out from leading scientists and doctors from all over the world that the mercury in the vaccinations was a contributing cause, they believe—and there have been studies that show it does—that it's a contributing factor to autism, mercury in the amalgams.

We had scientists from all over the country and the world come in and talk about the leaching effect of the vapors from hot and cold water getting into the mouth that could cause neurological problems from the mercury amalgams that are in people's teeth.

And so this is a very big issue. It's one that is not focused on very often. And I really appreciate, Mr. Chairman, you taking the lead on this today. And I want you to know that, as long as you do this and as long as I am in Congress, I will do everything I can to get mercury out of everything that goes into the human body.

Thank you, Mr. Chairman.

Mr. KUCINICH. I want to thank the gentleman for his passionate opening statement and also to indicate to you that this subcommittee is going to have an ongoing interest in this.

The gentleman from Indiana and I have had other conversations about exploring the research and the causative effects of autism.

I want to thank you very much, Mr. Burton, for the heart that you put into this. Thank you.

Mr. BURTON. Thank you, Mr. Chairman.

Mr. KUCINICH. Without objection, Members and witnesses may have 5 legislative days to submit a written statement or extraneous materials for the record.

Since there is no other Member seeking recognition, we are going to go to the witnesses' testimony. I want to begin by introducing our first panel.

Mr. Michael Bender is the director and cofounder of the Mercury Policy Project. Over the past 12 years, Mr. Bender has worked extensively on reducing mercury uses, reduce trade and exposure at the State, national and international levels. He serves as cochair of the State of Vermont Advisory Committee on Mercury Pollution, where he has represented the Abenaki, a local indigenous tribe, since 1998.

Dr. Rich Fischer is the former president of the International Academy of Oral Medicine and Toxicology. He has published scientific papers internationally, and in 1998 he authored a chapter in the British dental textbook entitled, "Complementary Therapies in Dental Practice." Dr. Fischer is also a member of several professional organizations, including the Academy of General Dentistry, the American Academy of Biological Dentistry, and the National Academy of Research Biochemists.

Mr. Curt McCormick is the former administrator of the Environmental Protection Agency's Clean Water Act Industrial Pretreatment Program in Region 8. He worked for the EPA as an environmental scientist from 1987 to 2007, during which time he

conducted hundreds of inspections of local government pretreatment programs and industrial facilities. Mr. McCormick is currently the owner of CWA Consulting Services and a board member for the Consortium for Research and Education on Emerging Contaminates.

Mr. William Walsh—welcome—is legal counsel for the American Dental Association. He is of counsel in the Washington office of Pepper Hamilton LLP, where he heads the office's environmental practice group. He is also a member of the firm's sustainability and climate change team. His experience encompasses all major Federal environmental statutes and many State and local environmental laws, as well.

I want to welcome all of our witnesses and thank you for appearing before the subcommittee today.

It's the policy of the Committee on Oversight and Government Reform to swear in all the witnesses before they testify. I would ask that all the witnesses please rise and raise your right hands.

[Witnesses sworn.]

Mr. KUCINICH. Let the record reflect that the witnesses answered in the affirmative.

I will ask that each of the witnesses now give a brief summary of the testimony. Please keep this summary under 5 minutes in duration. And I want you to keep in mind that your presentation is very important. We want to be able to have it on the record, and we will, because your written statement is going to be included in the hearing record. So if you can present for 5 minutes, everything else in the record.

Let's start with Mr. Bender. You are our first witness. Please proceed.

STATEMENTS OF MICHAEL BENDER, DIRECTOR, MERCURY POLICY PROJECT; RICHARD D. FISCHER, FORMER PRESIDENT, INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY; CURT MCCORMICK, FORMER ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY REGION 8; AND WILLIAM WALSH, COUNSEL, AMERICAN DENTAL ASSOCIATION

STATEMENT OF MICHAEL BENDER

Mr. BENDER. Thank you, Mr. Chairman, members of the committee. My name is Michael Bender.

Mr. KUCINICH. You know what? I am sorry. Before we begin, I want to ask if—Congresswoman Watson just entered the room, and she has done so much on this.

Did you want an opening statement, Congresswoman?

Ms. WATSON. Yes.

Mr. KUCINICH. OK. The Chair is going to use his prerogative to go to Congresswoman Watson, who has done a lot of work on this issue in the State of California, as Mr. Burton noted.

And so, Ms. Watson, when you are ready, you may proceed. Just take your time. Thank you.

And then we will return to you, Mr. Bender.

Ms. WATSON. Mr. Chairman, thank you so much for your leadership and your hard work on this issue and for holding this hearing.

And I want to thank all of the witnesses for being here today.

Mercury is a toxin. And we all are concerned about the welfare of the patients, but I am also worried about the long-term effects of exposure to mercury to dentists and to the staff. For many years, there has been a research study on this very topic, and it was discovered that all dentists and staff who either replace or remove mercury fillings have extremely high levels of mercury in their systems.

Some of the dental offices do not insert mercury fillings; they only remove them. Therefore, they are breathing in the mercury vapors and dust, and a regular mask does not help. One needs to wear a respirator. And this toxic material enters their systems via the respiratory tract. Absorption through the skin is another mode of transport.

Dentists and staff, when compared to the general population, have a large mercury content difference. And it is not because they eat a lot of fish. Forget about the aesthetic component; the need of the dentists and staff, the health aspect, should be also a major concern.

It's amazing to me that the EPA has not gotten involved with this. The long-term danger of mercury inhalation is as detrimental as dental mercury fillings in one's mouth. It makes you think we might be hiding something, doesn't it?

And allow me to ask this question: Why is it that dentists have the highest suicide rate among any other health professional?

Did you know that one of the side effects of mercury toxicity is depression and suicidal tendencies, known years ago as the Mad Hatter's Disease?

I, myself, Mr. Chairman—and I am so pleased to see Congressman Burton here. We have been on this issue for years together, and I appreciate your interest and your focus and your being here. Look at the vacant seats.

I, myself, did not know I was being poisoned for decades. I got my mercury fillings when I was 9 years old. And I noticed that I had these allergies to everything, that I was getting headaches, I was getting splotches in my skin. My skin was much, much darker.

And so a group of researchers came into my office. They had been doing research in Europe. And they said, you know, have you ever been tested for mercury poison or vapors? They brought in the tester. It's a metal tube that goes down. And mine hit almost off the charts.

I had to go to Mexico. I asked my own dentist about it, and he stuck something in my mouth and wouldn't even discuss it. And I have been going to him for 30 years.

I went down to Mexico, and the dentist down there said he had to go to Mexico because he was to do 40 mercury fillings, amalgam fillings, he refused, and he couldn't pass his boards. So he went to the University of Mexico, passed his boards, lives in California but goes down to work there. So he explained to me. It took 6 weeks. I went from Washington, down to Mexico, to LA. That was my route, until the work was done.

I looked like a different person. I went to the dermatologist. He said, I am going to pull out the poison through your skin. So, along with getting the mercury fillings out, they were going, the fumes

were going up through my T-zone. I was having trouble remembering names. I said, what's wrong with me? I was being poisoned.

I called in the National Dental Association, and they told me that black people didn't like to go the dentist, and so certainly they are going to continue to use amalgam fillings because they were cheaper. And I tried to explain to them what I knew scientifically; did no good. They were looking at cost. And I was just amazed. I said, you are going to put young people under risk? And they didn't seem to care.

So I said, you take my bill. You take it home with you, look at it, and then you tell me how I can amend that bill to suit your needs. I got the same letter back from them that they sent in the beginning.

So I see that profit for dentists—you know, don't make a wave. People won't know. We are dulling down our children's brains. And I think pregnant women, you know, whatever goes in here seeps through the placenta and has an effect on that fetus.

And I think it's high time that any professional start looking at this. And I am surprised. The Environmental Protection Agency wouldn't really want to look at it seriously without our prompting?

Senator—Congressman Burton—I just promoted you to Senator.

And we were told in southern California, do not eat the tuna along the coast; it's infested with mercury. Do not eat it. Why? Because, as you know, the waste from dental offices go into the sewage plant and then out into the ocean.

And so I am really, really concerned. We need to wake up to this new threat.

And, again, Mr. Chairman, I wish to thank you for your leadership, your hard work. Mercury is an environmental disaster. It's the number-one toxic substance in terms of the WHO. And dentists have alternatives. They might be a little more expensive, but why would you want to take the risk and put a toxic substance in, particularly, a young person's mouth? Because you say it's well-sealed. Well, I haven't seen a child who hasn't fallen, cracked a tooth, or tooth is pulled, or whatever. And that mercury goes right up into your T-zone.

So, Mr. Chairman, I know that we are going to be enlightened today, and I want to thank you. And I want to thank my partner over there, Representative Burton, for his interest, his focus, in setting this as a priority.

Thank you very much. I look forward to hearing from the witnesses.

Mr. KUCINICH. I thank the gentlelady for her comments.

Let's proceed with Mr. Bender. Thank you.

Mr. BENDER. Thank you, Mr. Chairman, members of the committee. My name is Michael Bender. I am the director of the Mercury Policy Project. We work locally, nationally and globally to eliminate mercury releases and the use of mercury and exposures to mercury.

Next slide, please.

In my brief presentation today, I am just going to recap some of the information that we have heard from the last hearing.

First of all, that there's over 1,000 tons of mercury tooth fillings in Americans today that, when released, will pollute our environment. And mercury use is continuing.

Second, nine States require dentists to have amalgam separators to reduce mercury into wastewater. That's one good step forward, and we will talk about others.

Third, that the voluntary efforts are not effective at convincing dentists to install separators. They need some kind of an incentive.

Fourthly, that the ADA and the State associations are reportedly blocking State and local amalgam separator initiatives, even though they voluntarily say they promote them.

And then finally, we will summarize the discussion that the amalgam separators is the most cost-effective at controlling dental mercury pollution.

We will also want to draw the committee's attention to a report we provided to the committee where we do a cost analysis. Representative Watson mentioned the higher cost of the amalgam separator. When you factor in the externalities, the cost of keeping mercury out of wastewater and keeping mercury out of the airstream from cremations and the costs of the amalgams aren't cheaper. In fact, they are comparable, or the composites are actually more cost-effective.

So, next slide, please.

This is a pie chart from the U.S. EPA where they have alerted us that there's over 1,000 tons of mercury walking around in Americans' mouths. It's the largest single current use of mercury in the United States today.

Next slide, please.

That dental mercury, on average, accounts for over 50 percent of the load of mercury into wastewater. And we see some examples there. And, again, this was background.

I would like to move to the next slide, which is some new information that we just got from the Northeast Waste Management Officials' Association, the interstate mercury education and reduction clearinghouse. They just released the 2004 data on mercury uses from the amalgam manufacturers.

Unfortunately, we are saddened to hear that the U.S. dentists are still using 30 tons of mercury annually in 2004, just as they were in 2001. This is significant because, contrary to what we have heard from the dental sector, their mercury pollution will continue unabated without controls.

Next slide, please.

Although you can't see this on this screen very well, you can see the actual numbers and that the dental mercury use is about 25 percent of all the use in the United States today. And it indicates the numbers from 2001 to 2004.

Mr. Chair, these are actual numbers that were reported by State law from the amalgam manufacturers to the NEWMOA group. And so, unfortunately, we keep hearing from the dentists that they are reducing the use of mercury; we are not seeing it in the hard numbers. We have heard it anecdotally, and unfortunately we are not seeing it.

Next slide, please.

As I indicated earlier, there are State mandates for amalgam separators. Nine States require mandatory separator installation. Why? Because the voluntary programs aren't effective at convinc-

ing dentists to install separators. And there are numerous examples of this, and we will hear more of those today.

Data from the Boston area showed a 48 percent reduction in mercury concentration and sludge as amalgam separator use increased from less than 20 percent to over 80 percent due to mandates.

Next slide, please.

The ADA unfortunately and apparently is continuing—even though they are now supporting these amalgam separator initiatives as a voluntary BMP, what we are hearing from their own news reports is that they are reportedly training their trainers to support these BMPs, best management practices, and, along the way, use this argument as a way to oppose the amalgam separator initiatives.

The ADA and the State dental associations appear to have blocked amalgam separator initiatives in California, Wyoming, Michigan, Ohio, Montana and likely elsewhere, and they have slowed the requirements for installation in Oregon. They are also blocking local separator initiatives as well, as we know from their recent work in the city of Philadelphia.

Next slide, please.

In summary—I am sorry, I am jumping ahead of myself. I just wanted to emphasize Chairman Kucinich's statement about amalgam separators being very cost-effective. We had consultants do an analysis over a certain period of time, using 2005 numbers. The cost per filling for amalgam separators is an add-on cost of about $2 a filling. As I indicated earlier, we also did an economic analysis of the cost of putting the controls on the cremation. That will be $18 more a filling. So that's where the numbers add up, that, in fact, the amalgam is not cheaper.

Then, finally, I would like to conclude with some information that's in our longer-term and our larger report that's available for the record, and it sort of reiterates a little bit of what Representative Watson was saying.

In summary, the encapsulated dental amalgam is shipped from manufacturers to a dentist's office with a skull and crossbones affixed next to the word, "Poison, Contains Metallic Mercury," MSDS 2007, from Dentsply. Amalgam manufacturers—Kerr, Vivadent and Dentsply, among others—advise dentists against placing amalgam in the teeth of pregnant women, nursing mothers, children under 6, and anyone with kidney disease.

Dentsply, for example, warns, "Contraindication ('contraindication' is a directive to forbid, not just a 'warning'): in children 6 and under and in expectant mothers." Dentsply also supplies a warning on their MSDS to dentists that amalgam is dangerous for the environment. And you can see a copy of their MSDS on a report that's on the table.

But then that information apparently gets stuck at the dentist's office. We did a national poll. We hired Zogby International, and what we found is that most Americans, 76 percent, don't know mercury is a primary component of amalgam fillings; that 92 percent of Americans overwhelmingly want to be informed of their options with respect to mercury and nonmercury dental filling materials prior to treatment; and, finally, once they are aware that

there is mercury in the amalgam, 77 percent of those surveyed would choose higher-cost fillings that did not contain mercury if given the choice.

Mr. Chairman, I would like to join others and express my appreciation to you for holding this hearing. It's a very important topic area. I was joking that this dental sector seems to be one of the last sacred cows in the continued use of their justification for mercury.

We know, from a ruling in Norway and Sweden just having banned amalgam in January 2008, that there is no reason to continue using amalgam. Those societies are just doing fine. They aren't having any kind of a health epidemic over there. They are doing very well. And they worked cooperatively with their dental association over a number of years to put controls on in their facilities and also to recognize that dental mercury is not appropriate in the human mouth.

So what concerns me about the 30 tons of mercury that is still being used, which is 60 million mercury dental placements a year, is that I think that this dental sector is stuck in complacency, and it needs some kind of a regulatory incentive to move forward.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Bender follows:]

Hearing on "Assessing State and Local Regulations to Reduce Dental Mercury Emissions"

Testimony to the US House Committee on Oversight and Government Reform Subcommittee on Domestic Policy

By Michael Bender, Director
Mercury Policy Project/Tides Center
www.mercurypolicy.org ~ 802.223.9000
Washington, DC
July 8, 2008

Mercury Policy Project

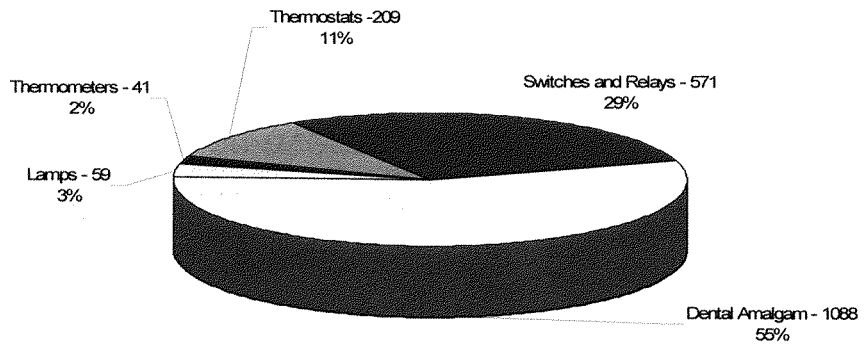
Presentation Overview

- Background: 1,000+ Tons Mercury Tooth Fillings Polluting Environment; Mercury Use Continuing
- 9 States Require Dentists to Have Amalgam Separators to Reduce Mercury into Wastewater
- Voluntary Efforts Not Effective at Convincing Dentists to Install Separators
- ADA/State Associations Reportedly Blocking State, Local Amalgam Separator Initiatives
- Summary: Amalgam Separators Most Cost Effective at Controlling Dental Mercury Pollution

Mercury Policy Project

Amalgam Comprises 55% of Mercury In Use in the US, According to EPA (2004)

Total =1968 tons



Source: EPA 2004 International Mercury Market Study and the Role and Impact of US Environmental Policy.

Mercury
Policy Project

Dental Mercury in Wastewater

- Dental Hg identified as "by far" the greatest Hg contributor to wastewater
- Over 3 times more mercury than next largest source
- Accounts, on average, for 50% of the load

City	Mercury load from dental offices
Duluth, Minnesota	36%
Seattle, Washington	40-60%
Palo Alto, California	83%
Greater Boston Area, MA	13-76%

Mercury Policy Project

US Dental Mercury Use DID NOT Diminish from 2001 to 2004

- Northeast Waste Mgt Officials Association's Interstate Mercury Education and Reduction Clearinghouse just released the 2004 data on mercury uses from the amalgam manufacturers
- U.S. dentists still using 30 tons of mercury annually in 2004, just as they were in 2001
- This is significant because, contrary to what we have heard from the dental sector, their mercury pollution will continue unabated without controls

Mercury
Policy Project

Total Amount of Mercury Sold in Fabricated & Formulated Products
U.S. For Calendar Years 2001 & 2004

Products/Components	Total Mercury (pounds)		Number of Total Manufacturers Reporting	
	2001	2004	2001	2004
Switches & Relays	119,660	102,162	53	46 + 3 nr*
Dental Amalgam	61,537	60,781	5	5
Thermostats	30,971	29,943	9	8 + 1 nr
Lamps	21,438	20,118	177	185 + 8 nr
Miscellaneous	8,505	4,807	12	10 + 2 nr
Batteries	5,914	5,122	40	41
Measuring Devices:				
Sphygmomanometers	4,305	2,219	2	2
Thermometers	5,347	4,524	13	8 + 4 nr
Manometers	1,936	2,545	4	4
Barometers	353	234	1	1
Psychrometers/Other Measuring Equipment	4	3	3	3
Chemicals & Solutions	2,060	1,810	20	20 + 1 nr
Total	**262,030** (131 tons)	**234,268** (117 tons)	**339**	**352**

State Mandates for Amalgam Separators

- Nine states have opted for a mandatory requirement for amalgam separators, either through law or regulation.
- Why? Voluntary programs aren't effective at convincing dentists to install separators
- For example, data from the Boston area shows a 48% reduction in mercury concentration in sludge as amalgam separator use increased from less than 20% to over 80% due to mandates.
- You will hear many other examples like this today

Mercury
Policy Project

ADA/State Dental Associations Reportedly Blocking Amalgam Separator Initiatives

- ADA reportedly "trains trainers" to support BMPs, oppose amalgam separator initiatives
- ADA/state dental associations appear to have blocked amalgam separator initiatives in California, Wyoming, Michigan, Ohio, Montana & likely elsewhere
- Also slowing down separator installations in other states, including Oregon
- Blocking local separator initiatives also

Mercury
Policy Project

Typical clinic cost of removing amalgam waste with a separator

[all costs in "2005 dollars"]

Combined separator equipment & installation cost	$1,096.67
Lifetime of separator equipment (yrs.)	10
Amortized separator equipment & installation cost per year	$109.67
Operating, maintenance, recycling cost per year	$528
Total equipment and operating cost per year	$638
General practice (GP) dental facilities	183480
Total separator costs for all GP facilities per year	$116,999,141
Number of amalgam fillings placed per year	60000000
Separator cost per filling placed for all GP facilities	$1.95

Summary

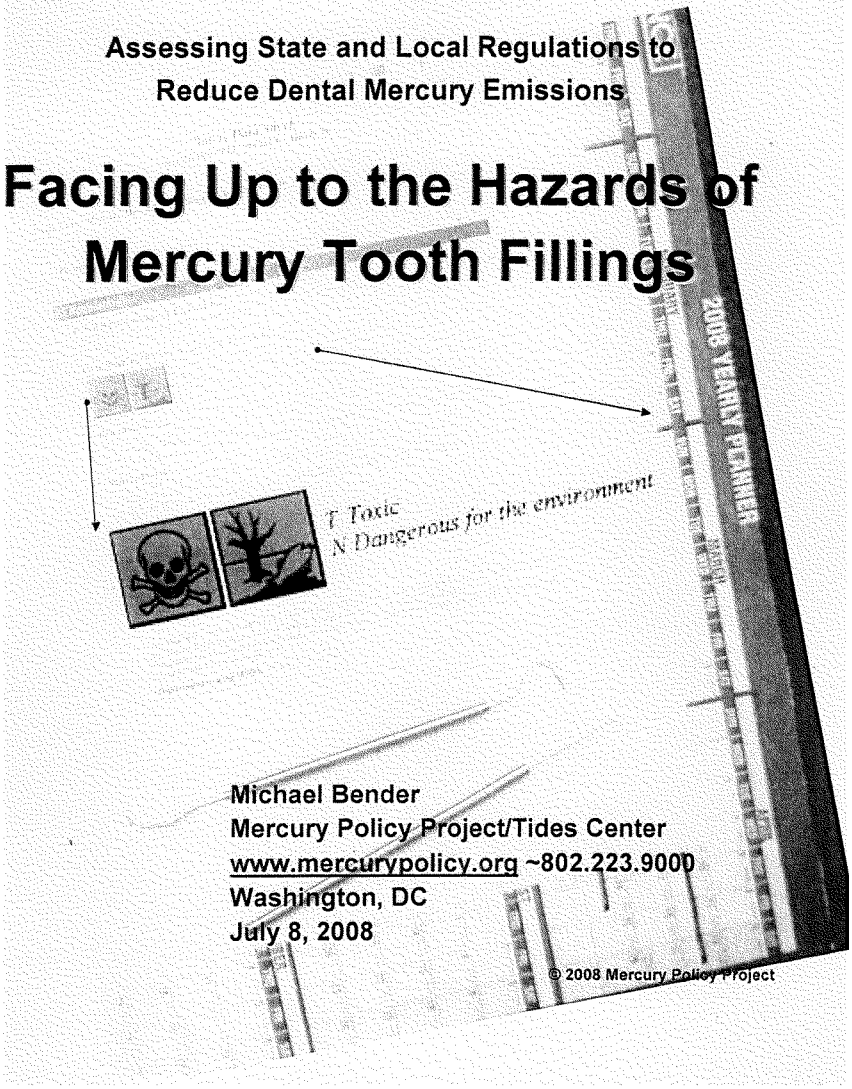
- The use of amalgam separators is highly cost effective in preventing releases of mercury
- Cost to remove mercury at a wastewater plant is $21 million per pound, or $46,000 per gram (AMSA 2002b) compared w/amalgam separator cost of $1.95 for average mercury filling removal
- The record clearly shows that voluntary programs are not effective at convincing dentists to install amalgam separators.
- State, local separator initiatives slowed by ADA
- To prevent future pollution and costs, separators should be required and amalgam phased out

Mercury Policy Project

A Report to US House of Representatives
Government Oversight Subcommittee on Domestic Policy

Assessing State and Local Regulations to
Reduce Dental Mercury Emissions

Facing Up to the Hazards of Mercury Tooth Fillings



Michael Bender
Mercury Policy Project/Tides Center
www.mercurypolicy.org ~802.223.9000
Washington, DC
July 8, 2008

© 2008 Mercury Policy Project

Acknowledgments

The Mercury Policy Project would like to thank the following people for their assistance with the research, writing and/or editing of this report:

- Peter Maxson, Concorde East/West
- Eric Uram, Headwater Consulting

The Mercury Policy Project would like to thank the Garfield Foundation for their generous support.

This report is available via World Wide Web at: www.mercurypolicy.org

The Mercury Policy Project (MPP) is a project of the Tides Center and works to promote policies to eliminate mercury uses, reduce the export and trafficking of mercury, and significantly reduce mercury exposures at the local, national, and international levels. We strive to work harmoniously with other groups and individuals who have similar goals and interests.

Mercury Policy Project
1420 North St.
Montpelier, VT 05602
www.mercurypolicy.org
©2008 Mercury Policy Project

Mercury Policy Project

Introduction

It's becoming increasing clear that the recent improvements in technology for the non-mercury filling—most commonly the "composite"—have rendered the mercury tooth filling—aka "amalgam"—obsolete. One only has to look at the recent bans on new amalgam placement in Norwegian or Swedish dental patients or elimination of insurance coverage for amalgam restorations in Danish patients to document mercury-free tooth restoratives as a viable substitute.

Practically speaking, the age of amalgam is over.

So why do over 60 million mercury tooth fillings still get placed into Americans' mouths every year?

Is it because it is simply cheaper and quicker for your dentists to place an amalgam and they make more money doing so?

Is it because, as the expression goes, "you can't teach an old dog new tricks," and in some cases dentists are reluctant to change or take the time to master the new techniques for placement of composites?

Or is it because the US dental sector, led by the American Dental Association and its state associations, remains in denial that mercury is a neurotoxin — a hazardous material before it is placed in the mouth, and a hazard that releases toxic vapors after it is in the mouth? And could concerns about potential legal liability reinforce this denial?

Or finally, is it because dentists are not aware or held accountable to the fact—undisputed by the US EPA since it was presented to the US House subcommittee last fall-- that the continued use of amalgam is resulting in the release of upwards of 10 tons—and growing—of mercury into the air and water each year in the U.S. And that at least some of that mercury gets taken up in the fish Americans eat and, in particular, poses the most acute risk to pregnant women and their developing fetus and young children?

The answer certainly includes some or all of the above points, depending upon the expert you may be talking with.

While the calculations here are necessarily based on a certain number of assumptions, estimates and projections, the basic fact remains that up until now significant added costs of using amalgam—the so-called "externalities"—have not been factored into the fee charged by your dentist. This report demonstrates when factoring in these external costs, even under multiple scenarios, the cost of placing an amalgam filling virtually meets or surpasses the cost of placing a non-mercury composite filling.

Assuming that it is not yet politically viable for decision-makers in the US to ban amalgam outright, this report – for the first time ever-- lays out the rationale for placing a user fee on the continued use of dental mercury as a means to cover the costs of preventing dental mercury pollution from environmental release.

This report also clearly shows the cost-effectiveness of amalgam separators at preventing mercury from getting into the environment. It also clearly demonstrates that voluntary programs are not effective in convincing dentists to install and properly maintain separators.

1 Dental mercury, wastes and emissions

1.1 Mercury in the environment

Mercury is a naturally occurring metal and a persistent, bio-accumulative neurotoxin, especially affecting the brain and nervous system. It enters the environment via natural events, such as volcanic eruptions, but more-so through human activities. Methylmercury is more mobile and even more toxic than elemental mercury, and it easily finds its way into the food chain, contaminating fish. Methylmercury is synthesized by microbial action on mercury-polluted sediments and soils. The consumption of fish from waters contaminated with mercury is the source of greatest risk of exposure to this pollutant (NACWA 2002).

While mercury releases to wastewater should clearly be avoided, most methylmercury is generated from the by-products of the combustion of mercury-containing materials. The release of mercury by combustion occurs in a variety of settings, including coal-fired power plants, municipal incinerators, sludge incinerators, hazardous waste incinerators, industrial boilers, cremation chambers and other industrial processes including metal refining and cement production.

The widely documented effects of mercury exposure on human health and wildlife have driven a great range of efforts, in the US and overseas, to significantly reduce the level of this toxic, persistent, and bio-accumulative metal in the environment. The rest of this paper will address one key source of mercury releases to the environment, which is the use of mercury in dentistry.

1.2 Dental mercury wastes

The primary sources of mercury waste that originate in the dental clinic include amalgam waste generated producing amalgam for use in the procedure; the excess material carved from new amalgam fillings; the removal of old amalgam fillings; the removal of teeth containing amalgam; other mercury going to solid waste or wastewater; mercury emissions directly to the air; the traps, filters and other devices in dental clinics to remove mercury from the wastewater – and the "downstream" flows of mercury from there.

Most dental mercury waste results from the removal of previous fillings from patients' teeth. Together with waste generated during the replacing of fillings, removed teeth, etc., these dental wastes typically follow these main paths. They may be

- Captured for subsequent recycling or disposal,
- Washed down drains that lead to the general municipal wastewater system,
- Placed in special containers as medical waste, or
- Discarded as municipal waste.

It is commonly accepted that most municipal wastewater systems encounter significant levels of mercury, and it has been determined that typically close to 50% of that mercury originates from dental practices (AMSA 2002a). Some observations are summarized in the following table.

City	Mercury load from dental offices
Duluth, Minnesota	36%
Seattle, Washington	40-60%
Palo Alto, California	83%
Greater Boston Area, MA	13-76%

1.3 Dental mercury emissions

Dental amalgam is a large source of mercury waste in the environment. According to EPA, "Mercury discharges [in wastewater] from dental offices far exceeded all other commercial and residential sources." (EPA 2006) EPA cited an estimate that 36 percent of mercury reaching municipal sewage treatment plants is released by dental offices. Other investigations have put the figure closer to 50 percent (NEG-ECP 2007). The costs of largely eliminating discharges of dental mercury to wastewater are assessed in Section 3 of this report.

Despite regulations regarding the characterization and disposal of mercury bearing wastes, many solid dental wastes still follow the low-cost route of disposal as municipal solid waste and are subsequently disposed of in landfills or by municipal incineration. Depending on the characteristics of the landfill, dental amalgam may decompose over time and the mercury may enter the leachate (which may itself be disposed of in a manner that permits the mercury to be released), groundwater, soils, or volatilize into the atmosphere. Studies have documented methylmercury in gases emitted from landfills (Lindberg *et al.* 2001).

Mercury from dental amalgams is also a significant source of airborne emissions. EPA has estimated airborne mercury attributable to wastewater sludge incineration to be 0.6 ton per year, but the discussion in Section 4 below provides evidence that the EPA estimate is seriously underestimated. Among other failings, EPA emissions estimates do not include total mercury emitted during the cremation of human remains. However, cremation has been shown to be a significant source - over 3 tons of emissions - due to the large amount of mercury in existing dental fillings. In comparison, the largest source of airborne mercury is coal-burning power plants, which emit an estimated 48 tons of mercury per year.

The 2002 EPA National Emissions Inventory (version 3) put atmospheric emissions related to dental mercury at 1.5 tonnes, as in the first column of the table below. The EPA numbers are compared with the more rigorous estimates submitted in testimony last fall, summarized in the second and third columns, which suggest air emissions at least 5 times higher than the EPA estimates. (Bender 2007) The EPA has not contested these revised estimates.

Atmospheric emissions of dental mercury (tons)			
Pathway	**EPA National Emissions Inventory 2002**	**This report 2005 (low estimate)**	**This report 2005 (high estimate)**
Human cremation	0.3	3.0	3.5
Dental clinics	0.6	0.9	1.3
Dental mercury sewage sludge incineration	0.6	1.5	2.0
Dental mercury sludge spread on land and landfilled	n.a.	0.8	1.2
Dental mercury MSW incineration and landfill	n.a.	0.2	0.5
Dental mercury infectious and hazardous waste	n.a.	0.5	0.7
Human respiration	n.a.	0.2	0.2
Total	**1.5**	**7.1**	**9.4**

1.4 Quantities of dental mercury consumed

Contrary to what the US dental sector maintains, there has been very little evidence of reduction in the amounts of mercury used in dental restorations in recent years.

The Interstate Mercury Education and Reduction Clearinghouse (IMERC), a program of the Northeast Waste Management Officials' Association (NEWMOA), published a report online showing that mercury use in products sold in the U.S. declined from 131 tons in 2001 to 117 tons in 2004, an 11 percent reduction. The IMERC study, *Trends in Mercury Use in Products: Summary of the Interstate Mercury Education and Reduction Clearinghouse (IMERC) Mercury-added Products Database* (IMERC 2008), summarizes mercury use in products sold in the United States in 2001 and 2004 from information submitted by hundreds of manufacturers.

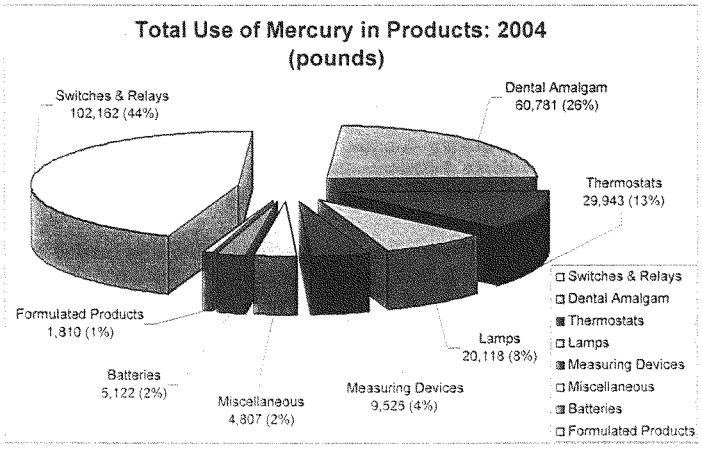
From IMERC's latest report, we see little change from 2001-2004 in the amount of amalgam provided to dental facilities from these five major manufacturers. For both years analyzed, 2001 and 2004, about 30 tons (61,537 in 2001 and 60,781 pounds in 2004) of mercury was used for the placement of almost 60 million amalgam fillings. This is detailed in the following table provided by IMERC.

Total Amount of Mercury Sold in Fabricated & Formulated Products
U.S. For Calendar Years 2001 & 2004

Products/Components	Total Mercury (pounds)		Number of Total Manufacturers Reporting	
	2001	2004	2001	2004
Switches & Relays	119,660	102,162	53	46 + 3 nr*
Dental Amalgam	61,537	60,781	5	5
Thermostats	30,971	29,943	9	8 + 1 nr
Lamps	21,438	20,118	177	185 + 8 nr
Miscellaneous	8,505	4,807	12	10 + 2 nr
Batteries	5,914	5,122	40	41
Measuring Devices:				
Sphygmomanometers	4,305	2,219	2	2
Thermometers	5,347	4,524	13	8 + 4 nr
Manometers	1,936	2,545	4	4
Barometers	353	234	1	1
Psychrometers/Other Measuring Equipment	4	3	3	3
Chemicals & Solutions	2,060	1,810	20	20 + 1 nr
Total	**262,030** (131 tons)	**234,268** (117 tons)	**339**	**352**

With regard to nationwide consumption of mercury, as shown in the NEWMOA figure below, dental offices are the second largest user of mercury, after switches and relays.

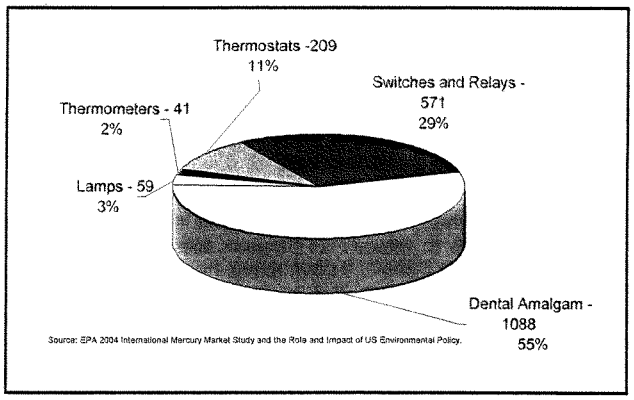
Figure 1 – Mercury consumption in the USA in 2004



Finally, as seen in the following EPA figure, mercury contained in the existing dental fillings of Americans comprises over half of all mercury "circulating in the economy" today,

amounting to over 1000 tons. (EPA 2004) All of this mercury will eventually have to be dealt with in order to keep it out of the environment.

Figure 2 - Mercury circulating in the U.S. economy



1.5 Quantities of mercury in dental wastes

Following the methodology used by EPA (Cain 2007), of the 30 tons of "new" mercury consumed in a typical year by dental clinics, some amalgam is carved away or otherwise lost during a typical clinical procedure – averaging some 20-25% of the total amalgam used. However, most of the mercury lost is not due to "carving" and fitting a new filling, but due rather to the amount of old amalgam that is removed to make room for the new filling. Considering that about 70% of fillings are replacements, that not all new fillings are amalgams, etc., some 31 tons of mercury have been calculated to go to emissions and waste (Bender 2007).

The quantities of mercury consumed and mercury wastes generated by the dental profession are directly related to the average life of a filling. In a US Geological Survey report published in 2000, it was noted that the average life of a mercury amalgam filling is reported to be from 5 to 8 years, while a 1995 article in a Swiss dental medical journal reported the average life to be 10 years. Other estimates have ranged as high as 10-20 years (Reindl 2007).

2 Status of efforts to minimize the risks of amalgam

2.1 Norway, Sweden Ban Amalgam

Starting in January 2008, Norway banned amalgam. In announcing the ban, Norwegian Minister of Environment Erik Solheim said:

> "Mercury is among the most dangerous environmental toxins. Satisfactory alternatives to mercury in products are available, and it is therefore fitting to introduce a ban. When the environmental toxin mercury is released to the environment it is very harmful, and *inter alia* the development of children may be damaged as a result."

According to the Norwegian Ministry, mercury is among the most dangerous environmental toxins. Satisfactory alternatives to mercury in products are available, and it is therefore fitting to introduce a ban. Minister Solheim further stated that the Norwegian ban shows that Norway is taking responsibility at home. It is an important signal, to the EU and other countries scrutinizing various uses of mercury, that there are satisfactory alternatives to mercury, the minister concluded.

Sweden announced a similar ban on amalgam, and Denmark announced that it will not provide public insurance to cover mercury in fillings after April 1, 2008. Such measures would be politically impossible if entirely satisfactory mercury-free alternatives were not available, or if these governments were not absolutely convinced that amalgam carries a higher risk than mercury-free alternatives.

2.2 FDA Settles Lawsuit, Agrees to Classify Amalgam as a Medical Device, Revamps Website

After 32 years of delay, the Food and Drug Administration has finally agreed to comply with Federal law and set a date to classify mercury amalgam as a substance that poses a health risk, especially to pregnant women and unborn babies, and to children. This about-face resulted from settling the lawsuit, *Moms Against Mercury et al. v. Von Eschenbach, Commissioner, et al.*, in which the judge cited FDA for an "*unreasonable delay*" and "*a reasonable case of failure to act.*" As reflected in the May 16, 2008, court transcripts, Judge Ellen Huvelle stated that the "*probability of harm is enormous,*" and asked the FDA: "*How could you drag your feet for 32 years? Do what you are supposed to do.*" Judge Huvelle also stated that she couldn't "*order a ban, but can compel [FDA] to act,*" observing that this was "*government at its worst*" and that she wanted this "*public safety issue to be resolved.*" The FDA must now finish classification within one year of the close of the public comment period on its amalgam policy, that is, by July 28, 2009.

As part of the settlement, the FDA agreed to, and with uncharacteristic speed has already, change its website— dramatically. The updated June 3, 2008 FDA website now states, for example:

> *"Dental amalgams contain mercury, which may have neurotoxic effects on the nervous systems of developing children and fetus." ... "Pregnant women and persons who may have a health condition that makes them more sensitive to mercury exposure, including individuals*

> *with existing high levels of mercury bioburden, should not avoid seeking dental care, but should discuss options with their health practitioner."*

The FDA website (FDA 2007) also states, "Some other countries follow a 'precautionary principle' and avoid the use of dental amalgam in pregnant women," and provides links to advice about amalgams from regulatory agencies in other countries, including Canada, France and Sweden. For example, the FDA website link to Health Canada advises dentists to take the following measures:

- Non-mercury filling materials should be considered for restoring the primary teeth of children where the mechanical properties of the material are suitable.
- Whenever possible, amalgam fillings should not be placed in, or removed from, the teeth of pregnant women.
- Amalgam should not be placed in patients with impaired kidney function.

These warnings are similar to those sent by amalgam manufacturers. Encapsulated dental amalgam is shipped from manufacturers to a dentist's office with a skull-and-crossed-bones affixed next to the words: "*POISON, CONTAINS METALLIC MERCURY.*" (MSDS 2007) Amalgam manufacturers – Kerr, Vivadent and Dentsply, among others – advise dentists against placing amalgam in the teeth of pregnant women, nursing mothers, children under six, and anyone with kidney disease. Dentsply, for example, warns:

> "Contraindication [N.B.: "Contraindication" is a directive to forbid, not just a "warning"]: "*In children 6 and under*" and "*In expectant mothers.*"

15 Regulations

· ***Labelling according to EU guidelines:***
The product has been classified and marked in accordance with EU Directives / Ordinance on Hazardous Materials

· ***Code letter and hazard designation of product:***

T Toxic
N Dangerous for the environment

· ***Risk phrases:***
23 Toxic by inhalation.
33 Danger of cumulative effects.
50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· ***Safety phrases:***
1/2 Keep locked up and out of the reach of children.
7 Keep container tightly closed.
45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
60 This material and its container must be disposed of as hazardous waste.
61 Avoid release to the environment. Refer to special instructions/safety data sheets.

· ***National regulations***

· ***Waterhazard class:*** *Water danger class 3 (Assessment by list): extremely hazardous for water.*

However, these warnings are apparently not being passed along to the public, based on the results of a national poll conducted for the Mercury Policy Project by Zogby International whereby:

- Most Americans (76 percent) don't know mercury is the primary component of amalgam fillings;
- 92 percent of Americans overwhelmingly want to be informed of their options with respect to mercury and non-mercury dental filling materials prior to treatment; and
- 77 percent of Americans would choose higher cost fillings that do not contain mercury if given the choice.

2.3 ADA & State Dental Associations Blocking Amalgam Separator Installations

The American Dental Association (ADA) now recommends that amalgam separators be installed in all dental offices as part of their "best management practices (BMPs)," but they maintain that adequate levels of compliance with their recommendation can be achieved through a voluntary program. (ADA 2007) Meanwhile, they have successfully blocked amalgam separator initiatives across the country. For example, it's clear that the ADA is actively helping State Associations find ways to avoid installing separators, or block any kind of requirements to do so, at least in the following states and local jurisdictions.

California The CA Dental Association (CDA) was the sole opponent of Assembly Bill 966 in 2005, authored by Assemblymember Lori Saldaña, and stopped the bill in the Assembly. The bill would have mandated separators. In 2003, CDA was sole opponent of AB 611, authored by Assemblymember Gloria Negrete-McLeod, which also would have required separators. They actually hijacked the bill and got the author to substitute a mere codification of BMPs. The bill then died in Appropriations Committee.

Michigan In Michigan, a colleague had a very brief conversation with a MI Dental Association director who informed him that the ADA lawyer who was "helping" with the separator issue told him that they would not have to deal with the issue until 2011.

Montana According to the *ADA News,* "Immediately after the drafting of HB 665, members and staff of the Montana Dental Association, including two dentists in the Montana legislature, promptly met with the bill's sponsor, Rep. Teresa Henry. At what MDA executive director Mary McCue described as a congenial, professional meeting with a very reasonable lawmaker, the MDA explained its nearly two-year efforts, statewide, to educate dentists and promote voluntary adoption of the ADA's Best Management Practices for handling amalgam waste. The one-two punch was successful; MDA was able to convince Rep. Henry to amend her bill, who shortly removed all language Feb. 18 requiring dentists to install separators. The issue is no longer on the table. "Thanks to the assistance of the ADA, we got out ahead of the issue and it certainly helped us," said Ms. McCue.

Oregon After many delays, an amalgam separator bill was passed with an extraordinarily long compliance date (2011) due to the efforts of the lobbyist for the Oregon Dental Association. Yet the Oregon Dental Association was a bit too clever in how it arranged for such a long lead time. The provision that the ODA inserted into SB 704 deferred the effective date if the dentist is "certified by a special district that manages wastewater

treatment to be following 'best management practices.'" There are a few such districts in the state, but none of them were the least bit interested in becoming a certifying agency for 11,000 Oregon dentists. So, in Oregon's first-ever even-year legislative assembly, the ODA dropped a bill seeking a fix to SB 704, expanding the kind of entities that could certify a dentist's BMPs. Instead, a shorter time frame was adopted for the separator requirement to become law (2010).

Philadelphia Last year, the PA Dental Association blocked a proposed ordinance by the Philadelphia City Council would have required most dentists residing in Philadelphia to install amalgam separators. According to their newsletter, the PA Dental Association worked in conjunction with the ADA, its lobbyists and public relations team and other dental organizations in what they termed a "strong lobbying effort to amend the ordinance." The ADA and PDA were explaining the financial hardships that would be encountered by the Dentists and the city's poorer population because composites were more expensive and the "poor", who could not afford the more expensive fillings, would not take their children to the dentist, causing untold hardships and disease to the less fortunate.

While multiple and complex factors may influence the success, or lack thereof, of a voluntary program, there is a growing body of evidence that a mandatory approach, while administratively more demanding, is necessary to achieve a faster and more comprehensive result. Even more importantly, this creates a level playing field that does not discriminate against the vast majority of dentists who wish to comply with the ADA recommendation to install separators.

The use of amalgam separators is highly cost effective in preventing releases of mercury to the environment, particularly when compared to the cost to remove mercury at a wastewater treatment plant of approximately $21 million per pound, or $46,000 per gram (AMSA 2002b).

Recent data from the Boston area Metropolitan Water Resources Authority (MWRA) (see figure below) showed a 48% reduction in mercury concentration in sludge as amalgam separator use increased from less than 20% to over 80%. Additional data is being collected and assessed to evaluate whether these reductions are typical across the region, and to estimate the overall regional reduction in mercury releases attributable to these programs (NEG-ECP 2007).

King County in Seattle may be taken as an example. King County employed three distinct strategies to limit or control the amount of mercury discharged from dental offices over the 13-year time frame of this case study. The initial resistance of the ADA and dental community to installing separators contributed to the length of time and the changing strategies that had to be employed by the county. The King County Program 1995-2000 focused on an intensive outreach program for dentists, including an annual poster, monthly ads in a local journal, a Voucher Incentive Program, EnviroStars, information dissemination, and trade shows/mercury roundups.

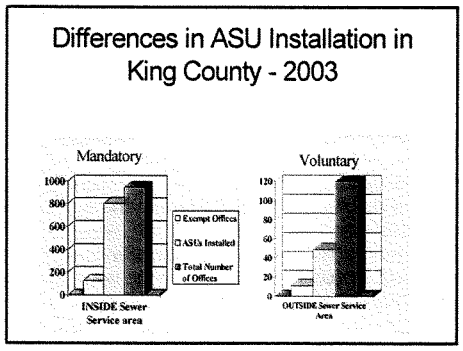
Even after these efforts, a 2000 study in King County found that more than three-quarters of dental offices did not recycle or sequester mercury-bearing waste captured in chairside traps and vacuum pump filters. Rather, they put it in the waste bin, included it with medical waste, stored it onsite for eventual disposal or flushed it down the drain (Savina 2003).

As a result, the following practices were made mandatory by July 1, 2003:

- Use best management practices (BMPs) for amalgam waste;

- Demonstrate compliance with King County local limits (0.2 mg/l) for mercury discharge to sewer (0.1 mg/l for > 5000 gpd, and 0.2 mg/l for < 5000 gpd). These limits are readily achievable for dental offices with adequate amalgam separators.

The following figure demonstrates the difference in compliance by 2003 in King County between an area with mandatory requirements and an area with voluntary requirements, despite the fact that the county's outreach program was targeted at the entire county. By 2005 there was a 97% compliance rate in the King County sewer service area – where separators are mandatory.



For these reasons, a growing number of states (9 states thus far) have opted for a mandatory requirement for amalgam separators in dental offices, either through law or regulation.

3 Costs of Controlling Amalgam Releases to Wastewater

The purpose of this section is to calculate the cost of removing Hg from the wastewater effluent of dental clinics. A formula to calculate this cost was developed and is explained below. (It should be noted that in order to account for uncertain developments in the future with regard to inflation, and also to facilitate cost comparisons, "constant dollars" of 2005 have been used in the calculations.)

$$C_t = N\,(E/10 + I/10 + O)$$

C_t = total cost for all US dental offices
N = number of dental offices requiring an installation
E = average equipment cost per separator (amortized over 10 years)
I = installation costs per separator
O = operating and maintenance costs per year

In order to derive the total cost (C_t) for installing dental amalgam separators nationally, the total number of dental offices (N) was obtained from ADA records. This information included the number of dentists in general practice as well as those operating as dental

Mr. KUCINICH. Dr. Fischer.

STATEMENT OF RICHARD FISCHER

Mr. FISCHER. Thank you, Mr. Chairman, Ms. Watson and Mr. Burton.

Current estimates indicate that the dental profession uses about 40 tons of mercury per year in the fabrication of amalgam fillings. These mixtures emit mercury vapor continuously for decades and are the major contributor of mercury to human body burden. EPA requires that the excess unused newly mixed amalgam be handled as a toxic waste disposal hazard, just as it does the amalgam particles from removing old mercury fillings.

There are four major routes by which dental mercury may come into contact with the environment.

The first is dental clinic wastewater. The process of either placing or removing mercury fillings generates a slurry of mercury-rich amalgam waste, which is vacuumed into the chair-side suction unit. According to a recent study commissioned by the ADA, 6½ tons of mercury are released to wastewater treatment plants annually by dentists in the United States. This represents more than 50 percent of the total mercury entering wastewater treatment facilities.

The IAOMT, recognizing that the dental profession has the opportunity and the obligation to eliminate or reduce this environmental hazard, urges all general dentists to install effective mercury separator equipment. We support efforts to make this a regulatory requirement, since efforts toward voluntary compliance by dental associations have failed.

No. 2, air discharge. Mercury vapor has also been measured in air vented from the central vacuum systems to the outside of the dental office. An estimated one ton of mercury vapor per year finds its way into the atmosphere through this route in the United States. There is currently no known technology to prevent this form of pollution.

No. 3, amalgam in human cadavers. The EPA estimated that in 2005 over 3 tons of mercury were released to the environment in the United States from crematoria.

Four, human waste. Published studies have concluded that each and every amalgam bearer excretes an average of 100 micrograms of mercury per day in his or her urine and feces. Assuming two-thirds of this mercury is derived from dental fillings, then 5.7 tons of dental mercury annually are flushed directly into our wastewater. Again, there is no known technology to prevent this form of pollution, nor are there any regulations over this form of domestic waste.

The above four routes of mercury entering the environment combined for at least 16 tons of mercury annually from dental fillings. Less than half of that total, the 6½ tons from dental wastewater, can be captured by best management practices and amalgam separators in dental offices, but then only if mandatory.

Over 1,000 tons of mercury are implanted in the teeth of Americans nationwide. Assuming a 10- to 15-year average durability of these mercury fillings in patients' mouths, this enormous reservoir

of mercury will be continuously flushed into the environment for decades to come.

Organized dentistry has established best management practices for managing hazardous waste. These practices have had disappointing participation by dentists when purely voluntary.

For example, in the Seattle/King County area of Washington State, after 5 years of promises from local dental societies, 2.5 percent of offices had complied. Currently, 11 States in various municipalities have replaced their voluntary programs with mandatory regulations, resulting in nearly 100 percent compliance.

In those States and municipalities where amalgam separators are required, there has been a 50 percent reduction in the amount of total mercury from all sources entering wastewater treatment plants.

When considering whether or not an amalgam separator installation should be voluntary or mandatory, we should consider information published in the fall edition of the ADA Professional Product Review. There it was reported that, "A survey of members showed that relatively few panel members own an amalgam separator or plan to purchase one."

I have been practicing dentistry for 35 years, the last 26 without using mercury fillings. I stopped using them when I discovered that the mercury was not locked in the fillings, as I had been told in dental school. I purchased an amalgam separator approximately 15 years ago when I discovered that this technology was commercially available.

As a health professional, I am ethically bound to err on the side of caution for my patients, my staff, my colleagues and my environment. To place a mixture containing 50 percent mercury, the most neurotoxic element known on Earth, within inches of a child's brain stem and assume it's harmless is, at best, counterintuitive.

To release the same pollutant into the wastewater is irresponsible when simple and available technology exists to reduce that release by over 95 percent. But that still leaves more than half of the dental-derived mercury that is dumped into the environment that remains beyond our ability to capture.

We all remember the character The Mad Hatter from "Alice in Wonderland." The character was based on the historical observation of workers who made felt hats in Connecticut in the 1800's. The workers, or hatters, used mercury nitrate to shape the hats. The hatters frequently suffered from shakes, hallucination and dementia or madness due to that mercury exposure.

The hatmakers stopped using mercury in 1943. It's now 2008. It's time for dentistry to stop the madness. Until dentistry joins the rest of the 21st-century health-care profession and abandons its use of mercury, there can be no effective environmental solution to the dental mercury crisis.

Thank you.

[The prepared statement of Dr. Fischer follows:]

Dr. Richard D. Fischer
The International Academy of Oral Medicine and Toxicology (IAOMT)

Domestic Policy Subcommittee
Oversight and Government Reform Committee
Tuesday, July 8, 2008
2154 Rayburn HOB
2:00 p.m.

"Assessing State and Local Regulations to Reduce Dental Mercury Emissions"

For more than a decade the I.A.O.M.T. has been concerned with the environmental impact of dental amalgam mercury because of its extreme toxicity. Environmental scientists label it a "Persistent Bioaccumulative Toxin" (PBT), and as such it is important to reduce it from the environment by eliminating its source, wherever possible.

Current estimates indicate that the dental profession uses about 40 tons of mercury per year in the fabrication of mercury ("silver" or amalgam) dental fillings. These fillings are a mixture of 50% elemental mercury and 50% powdered alloy (silver, copper , tin & zinc). Even after combined, placed and hardened into tooth fillings, these mixtures emit mercury vapor continously for decades and are the major contributor of mercury to human body burden. EPA requires that the excess unused newly mixed "scrap" amalgam be handled as a toxic waste disposal hazard, just as it does the amalgam particles resulting removing old mercury fillings.

There are four major routes by which dental mercury may come into contact with the environment:

1. DENTAL CLINIC WASTEWATER [6.5 tons per year]

Dental offices have been shown by many studies to be significant contributors of mercury to the environment. The process of either placing or removing mercury fillings generates a slurry of mercury-rich amalgam waste which is vacuumed into the chairside suction unit. Most of it passes right through the chairside screens or traps, which capture only the larger particles. Facing no other obstacles, this slurry passes directly into the dental office wastewater and out to the environment. According to a recent study commissioned by the American Dental Association [1] **6.5 tons of mercury are released to waste water treatment plants annually by 133,059 dentists in the United States.** This equates to approximately 230 milligrams of mercury per dentist per workday and **represents more than 50% of total mercury entering wastewater treatment facilities.**

A report released in 2002 by the National Association of Clean Water Agencies (NACWA) [2] indicated that **dental clinics are the single largest source of mercury in our nation's wastewater.**

Levels of mercury measured in dental office wastewater far exceed local limits for discharge by "small quantity generators" of hazardous waste. Because wastewater treatment facilities are not designed to process or handle heavy metals, most of the mercury settles out into the sludge, or "biosolids" as wastewater is treated. These biosolids are usually incinerated or used as fertilizer, the mercury content going directly into the environment.

Amalgam separators exist which capture 95% to 99% of the mercury from the wastewater before leaving the dental office. Studies in the United States, Canada and Europe have shown that when such devices are installed in dental offices community-wide there is a significant drop in mercury entering the wastewater treatment plants. Such studies have led to recommendations or regulations in several European countries that all dental offices install mercury separating equipment.

The I.A.O.M.T., recognizing the scientific validity of the statements above, and recognizing that the dental profession has the opportunity and obligation to eliminate or reduce this environmental hazard, urges all general dentists to install effective mercury separator equipment. We support efforts by municipal agencies to make this a regulatory requirement, since efforts toward voluntary compliance by dental associations have failed. We have for years urged all our IAOMT Academy members to take a leadership role and install such equipment without delay.

2. AIR DISCHARGE [1 ton per year]

Mercury vapor has also been measured [3] in air vented from the central vacuum systems to the outside of the dental office. An estimated one ton of mercury vapor per year finds its way into the atmosphere through this route in the US. **There is currently no known technology to prevent this form of pollution.**

3. AMALGAM IN HUMAN CADAVERS [3 tons per year]

If mercury fillings are not removed from a patient's mouth and disposed of ecologically before death, the mercury contained in them will eventually find its way into the environment. It may contaminate the earth and ground water if the person is buried and it will contaminate the atmosphere if the body is cremated. A mercury flow worksheet developed for EPA [4] estimated that in 2005 over 3 tons (6613 pounds) of mercury were released to the environment in the U.S.from crematoria.

4. HUMAN WASTE [5.7 tons per year]

Published studies [5 & 6] have concluded that each and every amalgam bearer excretes an average of 100 micrograms of mercury per day in his/her urine and feces. That

amounts to 8.5 tons of mercury entering the environment annually in the US. Assuming 2/3 of this mercury is derived from dental fillings [7] then 5.7 tons of dental mercury annually are flushed directly into our wastewater. **There is no known technologiy to prevent this form of pollution nor are there any regulations over this domestic waste**. 100% of this mercury ends up in the environment.

The above 4 routes of mercury entering the environment combine for **at least 16 tons of mercury annually from dental fillings. Less than half of that total- the 6.5 tons from dental office wastewater - can be captured by Best Management Practices and Amalgam Separators in dental offices- and then only if mandatory.** Of the total mercury currently used in all products in the U.S., our EPA estimates that mercury fillings comprise 55% of that total repository- or over **1,000 tons of mercury implanted in the teeth of Americans nationwide!** Assuming a 10-15 year average durability of those mercury fillings in patients' mouths, this enormous reservoir of mercury will be continuously flushed into the environment for decades to come.

Amalgam Separators and Dental Amalgam Best Management Practices

Sewer utilities may be required to reduce the levels of heavy metals in their bio-solids, the material that is removed from the sewer as solids. These solids are sent to farmlands as a soil nutrient enhancer, are deposited in landfills, or they are incinerated. If the biosolids contain too much mercury the farmers will not accept them and the utility company may have to pay to dispose of them. If it is incinerated it liberates mercury in its most toxic form - elemental mercury vapor. Therefore these utilities, in order to operate economically and meet their own discharge limits, are looking to place the responsibility on the largest contributors, the dentists.

Organized dentistry has responded by establishing 'Best Management Practices' or (BMP's) for managing hazardous waste. Historically these practices have had disappointing participation by dentists when purely voluntary . For example, in the Seattle/King County area of Washington State, after five years of promises from the local dental society and efforts from King County Hazardous Waste, less 2.5% of offices (25 out of 1000) had complied [8]. A fter regulations were passed, it's now close to 100%. *Currently* 11 states and various municipalities have replaced their voluntary programs with mandatory regulations (which include amalgam separators) resulting in nearly 100% compliance. In those states and municipalities where amalgam separators are required there has been a 50% reduction in the amounts of total mercury -from all sources- entering the wastewater treatment plants.

It should also be noted that many dental clinics are now using a different type of vacuum pump system than was used in the past. The new more common type ("dry", or "turbine") uses no extra water and does not have a vacuum filter at the pump. Therefore when clinics do not install an amalgam separator, yet switch to a turbine vacuum pump, there will actually be an increase in the amount of amalgam and mercury discharged to the sewer.

When considering whether amalgam separator installation should be voluntary or mandatory, program managers should consider information published in the Fall edition of the ADA Professional Product Review (2007, 4:1). There it was reported that a "survey of [ADA Clinical Evaluator Panel] members shows that relatively few panel members own an amalgam separator or plan to purchase one" [9]. Various manufacturers produce amalgam separators which remove 95%-99% of the mercury from dental office wastewater. Their costs - ranging from a few hundred to a few thousand dollars to purchase - are reasonable , especially in comparison with the costs for most other dental equipment.

The biggest challenge for many dentists and regulators regarding separators will be understanding, testing and certification of separator models , and who is properly accredited to perform these functions. There are ISO guides and standards [10] to help insure that these functions are performed well and fairly, but they have to be required by the regulators to be implemented. Given the complexities with ISO testing, certification and accreditation a centrallized (possibly set up nationally) separator model review is necessary to avoid the difficult and duplicative effort of each and every regulatory jurisdiction in the US being faced with evaluating separators.

CONCLUSION

I have been practicing dentistry for 35 years - the last 26 without using mercury fillings. I stopped using them when I discovered that the mercury was not 'locked in' the amalgam, as I'd been told in dental school. I purchased an amalgam separator approximately 15 years ago when I discovered that this technology was commercially available. As a health professional, I feel ethically bound to err on the side of caution in matters of health for my patients, my staff, my dental colleagues and my environment. To place a mixture containing 50% mercury - the most neurotoxic element known on earth- within inches of a child's brainstem and assume it to be harmless is **at best** counterintuitive. To release this same pollutant into the environment is irresponsible when simple and available technology exists to reduce that release by over 95% . **But that still leaves more than half of the dental derived mercury that is dumped into the water supply that remains beyond our ability to capture.**

We all remember

the character the Mad Hatter from Alice in Wonderland. This character was based on the historical observation of people who made felt hats in Danbury Connecticut in the 1800's. The workers (hatters) used mercury nitrate to shape the hats. These hatters frequently suffered from 'shakes', hallucinations and dementia ('madness') due to that mercury exposure . The hat makers stopped using mercury in 1943! **It is high time for dentistry to stop the madness** ! Until dentistry joins the rest of the 21st century health care profession and abandons its use of mercury there will be no effective environmental solution to the dental mercury crisis.

Respectfully submitted,

Richard D. Fischer, DDS, FAGD, MIAOMT

Past President, IAOMT

[1] Vandeven, J. and McGinnis, S.L. , An Assessment of Mercury in the Form of Amalgam in Dental Wastewater in the United States , *Water, Air and Soil Pollution,* 2005, 164, 349-366

[2] Association of Metropolitan Sewerage Agencies (now the National Associantion of Clean Water Agencies) . Mercury Source Control & Pollution Prevention Program Evaluation: Final Report. March 2002 (Amended July 2002)

[3] Rubin, P.G. and Yu, Ming-Ho "Mercury Vapor in Amalgam Waste Discharged from Dental Office Vacuum Units" Arch Env Health, 51:4 335-337 , 1996

[4] Cain, A. Mercury Flow Workbook, US EPA, Region 5, Excel Spreadsheet, January 2006

[5] Skare I. & Engqvist A. Amalgam Restorations - An Important Source of Human Exposure of Mercury and Silver. Lakartidningen 15: 1299-1301, 1992

[6] Skare I., Engqvist A.: NIOH, Arch. Env. Health, 1994 Sep-Oct; 49(5): 384-94

[7] Aposhian, H.V. et al, Urinary Mercury After Administration of 2,3-dimercaptopropane-1-sulfonic acid: Correclation with Amalgam Score FASEB Journal, Vol. 6, pp2472-2476, April 1992

[8]"Management of hazardous dental wastes in King County, 1991-2000" by Gail Savina, Hazardous Waste Program Oct 5, 2000, page 14. As of March, 2000, the cumulative # of units installed over a target dental population of 1000 offices was 25 units.

[9] The ADA Clinical Evaluator Panel is a volunteer group of ADA members who contribute feedback for the clinical input segments of the ADA Professional Product Review program. More on the ADA Clinical Evaluator Panel can be found at http://www.ada.org/prof/resources/pubs/ppr/ace.asp

10] For more information, see www.ansi.org the website for the American National Standards Institute. Look under "Accreditation Services", and then click on "Product Certification Accreditation".

A direct link is:http://www.ansi.org/conformity_assessment/accreditation_programs/accreditation_certification_programs.aspx?menuid=4

Mr. KUCINICH. Thank you.

Mr. McCormick, you may proceed.

STATEMENT OF CURT MCCORMICK

Mr. MCCORMICK. Good afternoon, Mr. Chairman, Mr. Burton, Ms. Watson and members of the subcommittee.

I am Curt McCormick. I currently own a small business. But I think I was asked to show up today because I just recently retired or left the Environmental Protection Agency, the Denver office of the EPA.

For 17 years, I was regional pretreatment coordinator there, which is a program which regulates local governments and requires that discharges to their sewer systems are controlled for pollutants.

I also worked on a mercury-control strategy for the region. EPA in Colorado, Wyoming and Montana was the primary pollution control authority on municipalities, as the States do not have authority or do not authorize that program.

I want to preface my comments today that, while I probably will be mentioning the ADA in some parts of this, I don't believe the ADA did anything inappropriate in their lobbying of Region 8 or EPA headquarters. I think most of my comments are directed toward the internal EPA process of developing guidance and providing technical assistance.

I have to admit that the ADA was fairly tenacious in its efforts. And the outcome of their lobbying was fairly surprising in some areas, which I will go into.

Your subcommittee has heard the testimony of EPA and others in the past about the importance of reducing mercury in the environment and contribution of dental waste amalgam. One EPA senior manager referred to the Clean Water Act pretreatment program, and that is the program I oversaw for much of my career. This federally mandated program makes controlling the discharge of mercury and other pollutants into a sanitary sewer system a regulated and local responsibility.

While EPA Region 5, which was the Chicago office, the Great Lakes initiative, had acquiesced to the ADA's position that treatment not be a requirement for controlling dental discharges, EPA Region 8, which is the Denver office, we did not opt to adopt that voluntary approach to controlling mercury. We had a more mandatory requirement in the guidance that we developed. Our premise was that where a problem exists with a specific pollutant, local government pretreatment programs were required to control discharges of this pollutant into the sewer system. This approach is clearly reflected in the regulatory objectives of the pretreatment program that implement the Clean Water Act.

As mentioned earlier, the ADA focused its efforts on all levels of government. And Jerry Bowman, assistant general counsel for the ADA, attended and spoke at a public hearing at a city council meeting in Laramie, Wyoming. The city intended to adopt mercury controls to address problems at their wastewater plant. Presentations by myself and the city pretreatment staff, in addition to local support by other locally regulated industries, was enough to assure that Laramie City Council that the Region 8 approach was consistent with their local regulations and a fair approach that in-

cluded dental offices as part of a solution to an identified mercury problem.

This outcome intensified the ADA efforts to work through the EPA Office of Water. In a letter to Ben Grumbles dated February 16, 2005, the ADA made it clear that they were very unhappy with the lack of progress that EPA headquarters had made in stopping my program's efforts.

The ADA opens the letter stating, "We appreciate the opportunities you have afforded us in the past. On December 15, 2004, representatives of the American Dental Association were able to spend approximately an hour with you discussing, among other things, the association's deep concern with the contemplated approach of EPA Region 8 to dental wastewater. As we discussed, the region's draft guidance, on which the ADA submitted extensive comments, prohibits the very type of voluntary partnership which the administration otherwise supports. Moreover, the draft guidance requires amalgam separators whenever a POTW has a need to address mercury. At the end of our meeting, you indicated that you would speak to the Region 8 administrator on these topics. We have not heard back from you."

The letter continues with references to Region 8, its proposed mercury control efforts, and a concern that Region 8's approach will influence the rest of the country. EPA Region 8 senior management responded directly and independently to the ADA in an April 22, 2005, letter stating that the Region 8 supported the approach by my program and that the final document would continue to be consistent with the Clean Water Act and its implementing regulations.

I have not seen copies of any responses by the Office of Water on the February 16, 2005, ADA letter. However, after the Region 8 letter of April 22nd, I was informed by my Region 8 senior management team that my program strategy document would not be issued final. The message was that the Office of Water did not want it published final. Region 8 senior management told me that the draft version of the document would be made available to anybody requesting a copy and would be posted for download on the Internet. And it currently is still available, the draft, for download on the Internet.

Regardless of the status of that document, my program, I continued to approve local programs, mercury-control regulations so that they would fully implement amalgam separator requirements where necessary. But the stoppage of this document put a dampening effect on some of the POTWs or on some of the cities adopting it.

I will wrap up here quickly.

I left the EPA in October 2007. I have written newsletters on interest groups and the regulation of mercury. A current one discusses a State of Michigan bill that allows for self-regulation of dental dischargers. This bill specifically prohibits the State-mandated pretreatment programs from requiring any more stringent than what the State dental association deems necessary. EPA has been notified of this legislation and has taken no identified action to ensure that this bill will be consistent with the Clean Water Act.

In conclusion, I believe that many scientists and regulators at EPA are perplexed at the evolving level of influence at the decision-

making levels within EPA. As with other EPA staff, I took seriously the oath to uphold the law and believe in the mission of the EPA, even now having left the agency. However, I believe that there's a reinterpretation of that mission which has and will continue to result in the eroding of credibility and the loss of experts from the agency.

Mr. Chairman, this concludes my statement, and I will be happy to answer any questions you or your colleagues have.

[The prepared statement of Mr. McCormick follows:]

STATEMENT
Of
CURT MCCORMICK
PRINCIPLE/OWNER, CWA CONSULTING SERVICES, LLC.

Domestic Policy Subcommittee
Oversight and Government Reform Committee

"Assessing State and Local Regulations to Reduce Dental Mercury Emissions"

Tuesday, July 8, 2008
2154 Rayburn HOB
2:00 P.M.

Good afternoon, Mr. Chairman, Mr. Issa and Members of the Subcommittee. I am Curt McCormick, Principle and Owner of CWA Consulting Services, LLC (www.CWACS.com). I was previously employed by the US Environmental Protection Agency for over 20 years. The last 17 years was spent as the Regional Pretreatment Coordinator in the EPA Denver Regional office. I appreciate this opportunity to discuss my efforts while at the Agency to develop a Strategy that local and state governments would use to control discharges from dental and other facilities when mercury was identified as a pollutant of concern.

INTRODUCTION

Your Subcommittee has heard the testimony from EPA and others in the past about the importance of reducing mercury in the environment and the contribution of waste dental amalgam. The program that I oversaw for much of my career is the pollution control program that local governments implement to reduce pollutants being discharged to the sanitary sewer system from commercial and industrial businesses. Sewage treatment plants are owned by municipal governments, typically a city or a district, and are termed a *Publicly-Owned Treatment Works* or **POTW**. The local pretreatment program regulates pollutants in the discharge from commercial and industrial dischargers to prevent (1) contamination of receiving waters; (2) interference with the operations of the POTW; (3) contamination of the sewage sludge; and (4) adverse effects to worker health and safety. These local pretreatment programs operate a permits and enforcement program similar to the EPA Clean Water Act permitting program. These approved pretreatment programs are federally enforceable.

SETTING OF POLLUTANT CONTROLS ON COMMERCIAL AND INDUSTRIAL USERS

Local pretreatment programs have been required to establish specific pollutant limits for *Industrial Users*. In the early to mid-1990's, POTWs, began to identify that some smaller, commercial users were discharging significant quantities of pollutants. The discharge of silver from photo and X-ray processing related activities was a common example. While the volume of each discharge was low, the cumulative effects of many photo and X-ray processing facilities did cause problems for the environment and POTWs.

Pretreatment Programs did not want to convert these commercial users to SIUs, which under EPA regulations would require that permits be issued to these commercial users. POTWs opted to develop *Best Management Practices* (**BMPs**) for these silver dischargers, which included silver capture or treatment, in most cases. EPA Region 8 was one of the offices that supported and promoted the use of enforceable BMPs to control the discharge of silver from photo processing operations.

MERCURY AND PRETREATMENT PROGRAM LIMITS AND CONTROLS

Mercury water quality standards are often in the low parts per trillion. Many critics of mercury regulation liken it to a drop in a swimming pool or some other analogy. What you should take from those critic's analogies is just how toxic mercury can be.

Prior to the year 2000, EPA approved test methods dictated that mercury was measureable down to a level of 200 parts per trillion. Water Quality Standards and discharge permit limits were usually well below this level. A discharger had no real way to determine compliance with a mercury limit at environmentally relevant levels. Since that time, EPA has an approved mercury test method that can measure mercury in the 2 to 5 parts per trillion level. POTWs now can accurately evaluate compliance with permit limits and water quality standards. This evaluation has shown that there are many POTWs with mercury levels that exceed permit limits and water quality standards.

MERCURY SOURCES IN DISCHARGES TO POTWS

As POTWs began to identify these mercury problems, they implemented a typical pretreatment program scenario: Sample, Track Down, and Control. Many of these POTWs around the Great Lakes, San Diego, and a few other areas provided much of the original data on mercury sources. While there may be some unique industrial discharges that contain mercury, dental offices became one of the most significant sources of mercury discharge to POTWs. The total loading from dental offices could be 40% or more of the total mercury being discharged to the POTW.

REGULATING DENTAL DISCHARGES

In a very similar attempt by POTWs to control mercury discharges to the POTW, they began designing programs similar to the silver control programs that proved so successful in the past.

The POTW designed BMPs to be used by dentists to reduce the discharge of amalgam waste rather than applying specific limits that dental facilities could not meet. This is where the problems start. One BMP recognized by many regulators, including EPA Region 8, is treatment to remove solids from the dental discharge, most commonly referred to as an amalgam separator. The *American Dental Association* (**ADA**) was actively opposed to any mandatory requirements for treatment at dental facilities. It was not until late 2007 that the ADA included amalgam separators in its list of BMPs. This is around the same time that EPA had intended to issue a final methylmercury water quality criterion document that also includes the use of amalgam separators. This document will move regulatory activity away from mercury to focusing on methylmercury in fish tissue. Though the Office of Management and Budget (**OMB**) cleared this document earlier this year, EPA has not issued this document final.

EPA EFFORTS TO ADDRESS MERCURY DISCHARGES AT POTWs

EPA Region 5 was on the cutting edge of mercury control and pretreatment programs. The *Great Lakes Initiative* (GLI) allowed Region 5 to develop an approach for reducing mercury discharges from POTWs through pretreatment program efforts to regulate discharges from dental offices. EPA Region 5 had extensive input and participation from the American Dental Association (ADA) during the development of its Mercury Pollutant Minimization Program Guidance (November 2004). The ADA was pleased with the final Region 5 document and the use of language allowing voluntary BMPs without a requirement to install amalgam separators. I have no documentation on the degree of ADA influence with Region 5 and EPA Office of Water during the finalization of this document, but the high degree of influence of the ADA was common knowledge.

EPA Region 8 did not receive such positive accolades from the ADA for its efforts during 2004 and 2005 to develop a strategy for controlling mercury. EPA Region 8 had long recognized that its high quality surface waters are the headwaters for many other states and the local fisheries were a valuable resource. Region 8 believed that mercury control could be achieved in a manner similar to that of silver. This approach included two concepts (1) Where a mercury problem exists, action by the POTW was mandatory; and (2) the dental office can either comply with specific limits or comply with BMPs. Region 8 identified treatment as a component of dental BMPs. The final draft Strategy document was titled: *May 9, 2005, POTW Mercury Control Strategy, Addendum to the Region 8 Strategy for the Development of Local Limits, U.S. EPA Region 8, Industrial Pretreatment Program (www.epa.gov/region08/pretreatment).*

EPA REGION 8 AND THE ADA

EPA Region 8 worked with its regulatory partners at states and local governments to develop an approach to controlling mercury at POTWs where mercury problems were identified. Comments were received from municipal governments, states, EPA OW pretreatment staff, the Office of General Counsel (OGC), and the ADA in draft versions of the Strategy in late 2004. The draft Strategy endorsed the implementation of voluntary programs before mercury problems occurred, as well as, requiring mercury control programs where mercury was a problem. Early on, the ADA expressed its displeasure with Region 8, and in particular, my

program. The ADA believed that the requirement of a mandatory mercury reduction program was unreasonable and that amalgam separators should not be required in any case.

Direct ADA action to stop the Region 8 Strategy was largely ineffective at the EPA Region 8 senior management level.

My office public noticed and approved changes to local government pretreatment programs. The ADA attempted to get involved in that process. In one example, the ADA supplied state dental associations with support to fight efforts by Laramie, Wyoming to adopt a mercury control program. After receiving adverse comment to the proposed regulations for mercury control, the Laramie City Council held a public meeting. I represented EPA and gave a presentation about mercury and Region 8's position on mercury control by pretreatment programs. A presentation was also made by Jerry Bowman, Assistant General Counsel for the ADA that clearly demanded that efforts to control dental amalgam remain as a voluntary approach. Interestingly, regulated industries provided positive support to the proposed regulation. They argued that they had done their part, often installing expensive treatment systems to meet limits. The Laramie City Council rejected the ADA stance and approved the pretreatment program mercury control program. The ADA was less than pleased with this outcome and intensified its efforts to work through the EPA Office of Water.

During the course of its work with Region 5, the ADA appears to have obtained a communication pathway with the Office of Water (OW). In particular, the ADA had identified the AA for Water (Ben Grumbles) as an effective contact, in addition to an assistant, Sharon Frey, who dealt with mercury issues for the Office of Water. There were many communications from the ADA to EPA OW during this time. One email I recall referred to EPA Region 8 as "out of control". I was told by Ms. Frey that there were a number of phone calls and emails that referred to me and my program directly that were less than professional or flattering. The February 16, 2005, ADA letter to the AA for the Office of Water was typical of the influence that the ADA exerted. As quoted by the opening paragraph from the letter states:

"We appreciate the opportunities you have afforded us to meet with you in the past. On December 15, 2004, representatives from the American Dental Association were able to spend approximately an hour with you discussing among other things the Association's deep concern with the contemplated approach of EPA Region 8 to dental wastewater. As we discussed, the Region's draft guidance, on which the ADA submitted extensive comments, prohibits the very type of voluntary partnership" which the administration otherwise supports. Moreover, the draft guidance requires amalgam separators whenever a POTW has a need to address mercury. At the end of our meeting, you indicated that you would speak to the Region 8 Administrator on these topics. We have not heard back from you".

The letter continues:

"Region 8 has clearly not shifted its position one inch since our meeting with you. And, as we stated then, this is a very damaging position. It undermines all of the efforts by the ADA (and EPA) to promote voluntary steps by dentists to reduce amalgam discharges and to promote recycling. Every dentist in Region 8 (and likely elsewhere) will ask why he or she should join with EPA in a partnership or undertake voluntary measures when mandatory separators is the only solution acceptable to EPA *Thus, through its proposed guidance, Region 8 will wipe away EPA's efforts to reach consensus* to *work with small businesses and to encourage*

voluntary efforts and replace those goals with a rigid command and control strategy. Of course, action in Region 8 will influence the rest of the country as well."

Region 8 was not part of the December 15, 2004, meeting that I am aware. I was also not provided with copies of any final written communications from the Office of Water regarding this letter. Subsequent to receipt of the letter cited above, Region 8 requested that OW provide a direct statement to the ADA saying that the use of amalgam separators was effective at reducing the loading of mercury discharged into a POTW. This is a statement of irrefutable fact. This request was not granted.

EPA Region 8 Senior Management responded directly and independently to the ADA in a letter dated April 22, 2005, stating that the Region 8 supported the approach by my program and that the final Strategy document would be consistent with the Clean Water Act and its implementing regulations.

STATUS OF THE EPA REGION 8 STRATEGY DOCUMENT FOR MERCURY CONTROL

Subsequent to the April 22, 2005, letter from Region 8 to the ADA and a briefing to the AA for the Office of Water, I was told that the document would not be issued final. The general message was that the Office of Water did not want it published final (an August 16, 2005 final Strategy document had been prepared). The final document did not deviate from the proposed approach. EPA Region 8 Senior Management told me that the May 9, 2005, draft version would be made available to anyone requesting a copy. It is currently available on the EPA Region 8 website. No final document has ever been issued.

PERSONAL STATEMENT

In the years since 2000, it has not been unusual that guidance and strategy documents that were controversial or opposed by a vocal and influential group would be held up. This approach did not seem to be a secret at the EPA OW level or at the Regional level. This approach to dealing political controversy became a way of doing business.

This cooling of EPA staff's ability to provide guidance and technical support was formalized by the integration of the Office of Management and Budget into the review process for all regulations, guidance and policy that EPA intends to issue. This integration has provided OMB a direct role in the formulation of guidance, policy and regulation, and with more direct influence than the EPA regional offices. The perception is that the OMB represents interests that are often the target of environmental regulation thus thwarting efforts by EPA to protect the environment. I am not suggesting bias of one political party over another. A prior Republican Administration had William Riley serve as the EPA Administrator. During his tenure as Administrator, he provided leadership that made the Agency a respected scientific and technical resource that focused on implementing the Agency's mission that was defined during the previous 20 years.

Mr. Chairman, this concludes my statement. I would be happy to try to answer any questions you or your colleagues may have.

Mr. KUCINICH. I thank the gentleman.

Mr. Walsh, you may proceed.

STATEMENT OF WILLIAM WALSH

Mr. WALSH. Thank you, Mr. Chairman, Mr. Burton and Ms. Watson. Thank you for the opportunity to speak today.

I am William Walsh from Pepper Hamilton LLP, outside counsel for the American Dental Association on amalgam wastewater issues. I have represented the ADA on these issues since 2001.

The ADA is the world's largest and oldest dental association, representing more than 155,000 dentists nationwide. The ADA has issued and continually updates, as appropriate, its best management practices for handling waste amalgam. These BMP call for the use of standard control methods, recycling of collected amalgam and, since last fall, the use of amalgam separators.

Even without separators, dentists capture in their office approximately 80 percent of the waste amalgam, with almost all of the remaining 20 percent being captured by wastewater treatment plants before the wastewater is discharged to surface water. In other words, 99 percent of the amalgam is already captured prior to discharge from the POTW. Adding a separator allows the capture of that additional waste in the dental office instead of at the wastewater treatment plant.

The ADA has devoted substantial time and resources to promoting its best management practices. For example, in 2001, the ADA commissioned an independent study to determine how much mercury might be entering the surface waters from amalgam wastewater discharges. The ADA evaluated the effectiveness and the cost of amalgam separators, including contributing to the development of standards for testing separators that were being developed by the International Standards Organization.

In 2003, ADA proposed to the Office of Water to initiate a voluntary amalgam wastewater reduction program in partnership with EPA, and has continued those discussions. The ADA proposed to EPA and participated in developing a standard for recycling amalgam waste that is collected in the offices.

The ADA has conducted a comprehensive outreach and education program for dentists and dental societies, including numerous seminars for dentist and dental societies, articles in the ADA News, the peer-reviewed journal of the American Dental Association, and the ADA Professional Product Review, partnering with EPA to produce and distribute BMP brochures and videos to 43,000 dentists in the Great Lakes region in 2005.

Several factors favor ongoing efforts.

First, the dentist industry's goals as of last fall comport exactly with those of the government to minimize dentistry's discharge of amalgam waste.

Second, dentists, as health professionals, would respond to scientific evidence and cooperative approaches. Some of the early efforts were not successful because of the lack of understanding on both sides. But the ADA and dentistry have learned from this past experience, they have calibrated their approach, and voluntary and cooperative partnerships have succeeded in some of the subsequent efforts.

Third, according to the 1997 report to Congress by EPA, dentistry contributes to less than 1 percent of the total mercury found in our lakes and streams—0.4 percent mercury in surface waters.

Fourth, mandating separators would require a costly inspection and enforcement apparatus, given that there are some 100,000 dental offices that would need to be regulated.

Fifth, nothing precludes in the proposals that the ADA has made the State or local agencies for enacting mandatory programs, should voluntary efforts fail. As the testimony submitted by some of the other witnesses indicate, many of them encourage cooperative efforts between the regulators and the local dental associations to determine whether mandating separators in a dental office is appropriate. And we think that decision is best left to the local authorities.

Dentists drink and fish and swim in the same waters as everyone else in their communities, and they believe that ongoing efforts to encourage the use of BMPs, which includes separators, are succeeding and will continue to increasingly succeed.

In closing, dentists have steadily reduced their already-minimal contribution to metal mercury discharges to surface waters over the past decade. They bring to these efforts the same commitment they bring to providing the best possible oral health care to the American people.

I will be pleased to answer any questions you might have.

[The prepared statement of Mr. Walsh follows:]

STATEMENT FOR THE RECORD

William J. Walsh
American Dental Association
before the

Domestic Policy Subcommittee
Oversight and Government Reform
"Assessing State and Local Regulations to Reduce Dental Mercury Emissions"
Tuesday, July 8, 2008
2154 Rayburn HOB

The ADA is the world's largest and oldest dental association, representing more than 155,000 dentists nationwide. For nearly 150 years, the ADA has actively sought to promote the oral health of the public and promote the development of scientifically accurate information. Based on our understanding of the subject of this hearing, the ADA is pleased to comment on its voluntary efforts to limit the already small environmental impact of dental amalgam.

Dental amalgam is an alloy made by combining silver, copper, tin and zinc with mercury. It has been studied and reviewed extensively and, based on the best available science, dentists continue to rely on it as a safe and effective option for treating dental decay. The use of dental amalgam is steadily declining. In 1990 dental amalgams constituted 67.6 percent of all dental restorations. By 1999, that figure had dropped to 45.3 percent. Our most recent estimate is approximately 30 percent. We expect this trend to continue, driven primarily by many patients' preference for tooth-colored composite restorations. In other words, this is an issue shrinking on its own. That said, amalgam remains a valued option for some patients, including those with large cavities in back teeth, for which amalgam's unique durability remains a desirable quality.

It is also important to understand that dentistry plays a very small role in the overall issue of mercury in surface waters. Dentistry contributes less than one percent of the total mercury found in our lakes and streams. This is not simply a statement by the American Dental Association. This fact was stated by EPA in a 1997 report to Congress, attributing 0.4 percent of the mercury in surface waters to dentistry. (1997 EPA report to Congress EPA-452/R-97-004.) The minimal role of dentistry was restated by EPA's Director of the Office of Science and Technology in the Office of Water, in testimony before another House subcommittee in 2003: "Dental amalgam contributes a small proportion of all mercury released to the environment from human activities." Testimony of Benjamin Grumbles, Director, Office of Science and Technology, U.S. Environmental Protection Agency, Before THE SUBCOMMITTEE ON WELLNESS AND HUMAN RIGHTS OF THE COMMITTEE ON GOVERNMENT REFORM, UNITED STATES HOUSE OF REPRESENTATIVES, October 8, 2003.

However, despite the very small share of mercury in surface waters from dental amalgam, America's dentists want to do the right thing and minimize even further their impact on the environment. Adherence to the ADA's best management practices (BMPs) does that.

For many years now, organized dentistry has voluntarily sought to limit the environmental impact of delivering dental care. For example, the ADA developed and actively promoted its (BMPs) for handling waste amalgam. And our voluntary efforts have had a very positive impact. Dentists used to have bottles of liquid mercury in the office for mixing their own dental amalgam. Now, through our voluntary efforts, we have virtually eliminated the use of bulk mercury in dentistry. Today, dentists use encapsulated amalgam, capsules containing a small amount of elemental mercury and the powdered metals with which it is mixed to form dental amalgam. The mercury and metals are separated by a membrane which is ruptured while the capsule remains intact. Because amalgam is now encapsulated, mercury spills are virtually eliminated in the dental office.

The ADA's voluntary BMPs have also greatly promoted the recycling of waste amalgam, eliminating this potential source of mercury from entering the environment. The ADA has worked voluntarily with the U.S. Environmental Protection Agency (EPA) to help make greater amalgam recycling a reality. Together, we developed a national consensus standard to make amalgam recycling better and more universal. That standard is known as American National Standards /American Dental Association Specification 109 "Procedures for Storing Dental Amalgam Waste and Requirements for Amalgam Waste Storage/shipment Containers." In developing this standard, we reached out to EPA, recyclers and other parties of interest. We now provide dentists with lists of available recyclers, and we advocate compliance by these recyclers with this new consensus standard.

ADA's BMPs call on all dentists to use chair-side traps and (where compatible with the suction system used in the office), vacuum pump filters, and these standard control methods remove approximately 77 percent of the scrap amalgam from dental office wastewater. The waste amalgam captured by these devices can be recycled, rather than going down the drain. Now, the ADA has gone further and included amalgam separators as part of its BMPs, resulting in the capture for recycling of more than 95% of all the waste amalgam.

We want to make it clear to the Committee; even if every dentist installed a separator, it would have little effect on the environment. Based on a recent study by the National Association of Clean Water Agencies and on previously published work, separators will do little to reduce mercury levels in surface waters. [See Vandeven J, McGinnis SL. An Assessment of Mercury in the Form of Amalgam in Dental Wastewater in the United States. Water, Air and Soil Pollution 2005, 164:349-366.] The reason for this is that both separators and wastewater treatment plants remove approximately the same portion of waste amalgam. In other words, the amalgam is either captured in a separator or at the treatment plant. However, the ADA supports the use of separators because we see two chief advantages: (1) they permit the captured amalgam waste to be available for recycling; and (2) they likely prevent a significant amount of waste amalgam from being deposited in wastewater treatment plant biosolids.

This data and much more is presented fully in a peer-reviewed article commissioned by the ADA on the environmental impact of dental amalgam. [Vandeven J, McGinnis SL. An Assessment of Mercury in the Form of Amalgam in Dental Wastewater in the United States. Water, Air and Soil Pollution 2005, 164:349-366.] This paper is by far the most comprehensive examination of this question. A copy of this paper was filed with the Committee along with our comments as part of the last hearing on this issue.

The ADA supports the use of its BMPs, but does not believe that mandatory separator programs are needed. Dentistry's record of voluntarily meeting the highest standards of health and safety make that clear. Dentistry did not need the government to mandate the use of encapsulated

amalgam; we did that on our own. Dentistry did not need the government to mandate development of and outreach on best management practices; we did that on our own. And dentistry did not need the government to force a recycling standard on it; dentistry developed just such a standard itself, in cooperation with EPA and other stakeholders. The government does not need to mandate amalgam separators, other specific technologies or practices related to the profession's environmental impact. This very point was made just last year by EPA when it recognized in a Federal Register notice, "It appears that the dental industry is already actively working towards voluntarily reducing its mercury discharges." [EPA's effluent guideline and pretreatment plan for 2008, 72 Fed. Reg. 61335, 61348, October 30, 2007].

There are a number of other reasons why a voluntary program is preferable. First, there is little incremental difference in the amount of amalgam collected and recycled using a voluntary separator program compared to a mandatory plan (see attached ADA Comments, particularly Attachment 1, submitted to EPA). Thus, a voluntary program will be just as effective as a mandatory approach, but without the added administrative burdens for both dentistry and the regulators.

A voluntary program is also more appropriate to attain mercury reduction from a professional group such as dentists than a "command-and-control" approach. Nearly all US dentists are small business owners, and EPA policy strongly favors a voluntary program when small businesses are involved. The ADA also believes that the best results of any effort occur when the state authorities work closely with state dental associations.

In Minnesota, the state dental association working with the Metropolitan Council of Environmental Services launched a voluntary effort to install separators. One hundred percent of the dentists in the metropolitan area have complied and currently 80 percent of the dentists in the rest of the state have separators. But the dental association expects to have 100 percent statewide by the end of the year. In 2004, the Massachusetts Department of Environmental protection worked with the state dental association to establish a voluntary program. By the end of the first year, 75 percent of the dentists had installed separators, exceeding by 25 percent the expected outcome. It has been suggested that these and other voluntary programs were not truly voluntary, because there was a possibility of later government enforcement. That is always the case. If the threat of some future government action negated the voluntary nature of an effort on virtually any issue, nothing in this country would ever be considered voluntary. The fact that various state dental associations fully supported efforts in Minnesota, Massachusetts, and elsewhere is enough to demonstrate that they undertook participation in these programs voluntarily.

As stated earlier, a mandatory separator requirement would have little or no effect on the concentration of mercury in the treatment plant's effluent entering surface water or deposition of mercury into surface water from land applied or landfilled amalgam. The mercury having (by far) the greatest impact on our surface waters is mercury from air deposition and not mercury bound up as amalgam.

The ADA and organized dentistry are fully mobilized to protect the environment. We are acting voluntarily, educating our members, encouraging recycling and promoting highly effective best management practices. This system works. Mandates are unneeded and will only increase the cost of dental care, as well as the cost of regulating dentistry. Dentistry's record of voluntarily meeting the highest standards of health and safety make it clear: The government does not need to mandate amalgam separators, other specific technologies or practices related to the profession's environmental impact.

Dentistry is proud of all of its efforts to protect the environment, just as we have always protected the health and well being of our patients. We pledge to continue our efforts. We appreciate the opportunity to share these views with you.

Mr. KUCINICH. I thank the gentleman.

I just want to remind all the witnesses that this Chair takes it very seriously when witnesses rise and take an oath to tell the truth. I just want you to understand that.

I also want to ask the members of the committee, without objection, if each of us may proceed for a period of 10 minutes for the questioning of the witnesses.

Without objection, so ordered.

I am going to begin here and ask some questions of Mr. Walsh.

I want to say that the subcommittee appreciates your participation on behalf of the ADA, because we are dealing with a matter that cannot be addressed without the participation and cooperation of the dental community.

After listening to your testimony, I am somewhat confounded by the substance of it, because it seems that the ADA is at odds not only with the witnesses on this panel and the next panel but also with its best management practices, which recommend the use of amalgam separators. And this committee is going to ask you to help us understand.

I want to begin with the impact of dental mercury emissions on the environment. Now, in your testimony—and you said it twice in the last minute—you said that dentistry plays a very small role in the overall issue of mercury in surface waters. Today, we have been discussing the impact of dental mercury emissions into the environment from wastewater, not surface water.

Testimony for today's hearing indicates that dental mercury emissions constitute about 40 to 50 percent of the mercury found in wastewater, far exceeding the level of mercury discharge from all other commercial and residential sources.

Mr. Walsh, do you agree with this finding, that dentistry is the largest contributor of mercury to municipal wastewater?

Mr. WALSH. Yes, we do. The study we commissioned that I mentioned in my testimony determined that between 40 and 50 percent of the mercury from amalgam discharged into wastewater treatment plants——

Mr. KUCINICH. OK, I am glad that you agree, because I have here a statement that agrees with your position. The World Health Organization that says that one-third of the mercury in the sewage system comes from dental amalgam flushed down the drain. And, more discretely, the Association of Metropolitan Sewage Agencies found that dentistry contributed 40 percent of mercury into wastewater, over three times the next greatest contributor.

And so, in your opinion, Mr. Walsh, does dentistry play a significant role in mercury contamination into the environment? Yes or no?

Mr. WALSH. No, because the wastewater treatment plant removes 95 percent of that mercury that goes into the wastewater treatment plant. You are looking at influent numbers, also the amount that may be collected in the sludge. The reason it is being collected in the sludge is it is not being discharged through.

The study I mentioned looked at both the effect of incineration of the sludge for the 20 percent of the sludge that is incinerated, as well as the direct discharges.

Mr. KUCINICH. Thank you.

To the other panelists, I would like you to respond to that, starting with Mr. Bender. Keep it brief, please.

Mr. BENDER. Wastewater treatment plants aren't set up to treat hazardous waste. It's very clear that most of the mercury ends up in the sludge, and the sludge gets incinerated or it gets land-applied or it gets used as a soil amendment.

And there are a number of studies out there, which are in my previous testimony, I can provide to the committee, which indicate that mercury gets released into the environment; it does not get captured.

Mr. KUCINICH. Dr. Fischer.

Pull that mic closer, please.

Dr. FISCHER. I would agree that 95 percent of the mercury in the wastewater from the amalgam does settle, but then it just goes from one pocket to another. I mean, I mean it's not reclaimed, recycled or captured in any way that's effective. It's been just put back into the environment in some other manner. The wastewater treatment plants aren't alchemists. I mean, mercury comes in; mercury's got to go out somewhere.

Mr. KUCINICH. Mr. McCormick.

Mr. MCCORMICK. Now, from a regulatory standpoint, all you're doing is disposing it from one media to the next. You're not actually reducing discharges to the environment. You are just sending them out either through the solids, through land application, incineration, generally through biosolids, so——

Mr. KUCINICH. Mr. Walsh, I want to ask you again, considering that dentistry is the largest contributor to mercury in wastewater and in light of the fact that once in wastewater mercury becomes part the sludge that is incinerated, landfilled or sprayed over the land, volatilized in some way, would you agree that dentistry does in fact play a significant role in mercury contamination into the environment?

Mr. WALSH. No, because when we looked at various studies that had been done——

Mr. KUCINICH. OK. I'm going to go on. I'm going to go on with my questioning.

In your testimony, you also say that, "even if a dentist installed a separator, it would have little effect on the environment because amalgam is ultimately captured at the treatment plant."

I want to ask you a few questions about this. Are you suggesting that mercury discharged into wastewater is not an issue because it can be treated before the water is released into the effluent?

Mr. WALSH. I'm suggesting that if the impact is surface water, which is what the impact——

Mr. KUCINICH. The question is——

Mr. WALSH. If you prevent that——

Mr. KUCINICH. You keep on drawing a distinction between wastewater and surface water, but you're talking about surface water. This hearing is about the effect on wastewater. This is the point that I'm asking you; I'm asking you again, are you suggesting that mercury discharged in the wastewater is not an issue? Wastewater, you know the difference. Can you answer the question, yes or no?

Mr. WALSH. I know the difference between wastewater and the surface water.

Mr. KUCINICH. Can you answer the question, yes or no, sir?

Mr. WALSH. The wastewater is what is going into the POTW. It is captured. It is not discharged. The limits and the regulatory requirements are based on protecting the surface water and protecting the fish that are in the surface water. So it's relevant that the wastewater is in fact captured, whether it was originally designed, POTWs do in fact, and there is data that NACWA has done, many studies looking at many different treatment plants——

Mr. KUCINICH. This is one chairman who isn't going to let you run out the clock.

Mr. McCormick, what about the wastewater and mercury capture at the publicly owned treatment works?

Mr. MCCORMICK. Well, as I indicated before, it is partitioned primarily—or it settles—it absorbs primarily to the sludge. I would have to take a little bit of an issue in that water quality, surface water quality, is one criteria that drives limits. However, I think what isn't being talked about is there are also standards for biosolids for mercury. There is—there are various standards that have to be met. And while surface water quality is one standard that has to be considered, I think biosolids or sewage——

Mr. KUCINICH. I want to go back to Mr. Walsh.

Mr. Walsh, is it true or not that the International Academy of Oral Medicine and Toxicology has said that wastewater treatment facilities are not designed to process or handle heavy metals?

Mr. WALSH. I don't know that particular reference, but I think the statement is correct that they were originally designed in the turn of the century to treat wastewater. The physics of the amalgam particles and the data that has been looked at across the board by the National Association of Clean Water Agencies show that in fact because of that physics 95 percent plus of the amalgam particles are captured in the sludge, as was indicated. And in fact NACWA has said, looking at the mercury levels in biosolids across the country, that there are today, as a result of a number of mercury reduction programs, the levels are well below EPA's standards for biosolids.

Mr. KUCINICH. Well, we've received—as members of this committee, we've received testimony from several representatives of municipal wastewater plants. And in that testimony, we are told that precisely because wastewater plants cannot adequately remove mercury, the respective sewage district adopted a prevention policy and began with its dental community, who constitute the largest contributors of mercury to wastewater.

Does everyone have this wrong, Mr. Walsh, or are we not understanding something about your presentation here? Could you help us a little bit?

Mr. WALSH. The, particularly in the Great Lakes, which have——

Mr. KUCINICH. Can you be close to the mic?

Mr. WALSH. Yes. Particularly in the Great Lakes, there is a very low water quality standard; I believe it is 1.3 parts per trillion. The level of mercury in rain, mainly from combustion sources, some of them outside the United States and some in, exceed that level. So the municipalities were faced with a tough problem; the level cannot be reached no matter what the discharge is. And in those

areas, many of the municipalities are using a variety of techniques to try to get their sources to reduce the levels. And so—but there are other areas where there are aren't such low water quality standards, and there are no biosolids limits being exceeded, and there are no discharge surface water quality levels being exceeded. And in fact, the fish are not being—containing levels that are above the level.

But remember, the ADA has taken the position that we should—every dentist in the country should in fact install a separator; that, as has been said, it is better to recycle this material; and that the preferable way is using the good offices and resources of the ADA to help communicate these requirements to the thousands of health and dental professionals to work cooperatively with government for the mutual goal.

The goal here now is the same now. Admittedly when we started our discussions and were educating ourselves as to what was happening, the goal wasn't the same. But the goal is now the same: Gather as much of this as possible in the dental offices, get it recycled. There is a difference as to whether a voluntary program initially, as is always true in a voluntary program, the potential of it becoming mandatory is the preferable way. And we have to think for a number of reasons that it is preferable, but I think there is more agreement now than there has been historically on what to do.

Mr. KUCINICH. I thank the gentleman.

I just want to conclude this round of questioning for myself by making this observation, and that is that you've said that the ADA supports the use of separators because they prevent, and this is a quote, a significant amount of waste amalgam from being deposited in wastewater treatment biosolids. And if the plants will treat the water in any case, then, you know, it is obvious, why would the ADA support the use of separators?

What's happening here is that, while your best management practices say that, you focus on the word "voluntary." That's where you're holding on to that for dear life, voluntary as opposed to mandatory. But we're talking about a neurotoxin here.

Now I can understand and I've had debates with my Republican colleagues on the whole issue of regulation. And you know, there are some honest debates about it. How far do you go with regulation? But this is a particular area that has to do with a substance that has been found to not just be a neurotoxin, but that particular neurotoxin is associated with a whole other range of serious health implications.

And so the questions of this subcommittee are going to challenge your position on the—I'm assuming will challenge your position on the difference between voluntary participation and mandatory. And it becomes particularly important since the ADA itself has taken a position that you support the use of separators.

So the Chair recognizes Mr. Burton. I took 13 minutes. You can have the like amount.

Mr. BURTON. Thank you very much.

The Association of Metropolitan Sewage Agencies estimates it costs as much as $21 million per pound to safely remove mercury once it becomes part of the wastewater stream.

The Environmental Protection Agency estimates that sewage sludge nationally contains about 15 tons of mercury per year from all sources, not just dental amalgam. However, the Association of Metropolitan Sewage Agencies estimates that 35 to 40 percent of the mercury load comes from dentists. That's roughly 6 tons of mercury. At 2,000 pounds per ton, that means it costs taxpayers roughly $252 billion per year to remove dental mercury from sewage sludge.

In contrast, the company Solmetex sells amalgam separators priced from a low of $715 to $2,490. If every one of the 155,000 members of the American Dental Association purchased an amalgam separator, it would cost anywhere from a low of $110.835 million to a high of $38—385.95 million one time only. Wouldn't you agree the most cost effective solution is to simply stop mercury contamination at its source within a dentist's office?

Mr. WALSH. We looked at the cost effectiveness, but I believe the numbers you are quoting is if a POTW had to do additional reduction to meet numbers like the Great Lakes water quality standard of 1.3. The existing cost to POTWs, since their sludge levels are not exceeding the regulatory levels that were based on risk, as I understand it, is nothing. The plants, as designed, although that wasn't the purpose of the design, in fact collect the numbers we are talking about. Separators collect slightly more; it is an additional amount of collection.

When you look at using the same kind of methodology that EPA uses, and you have to include the cost of recycling all of the amalgam that's collected because that's part of the cost, it is actually higher than it would cost to reduce mercury emissions from coal-fired plants. Despite that, the ADA has taken the position——

Mr. BURTON. Do you have any amalgams in your mouth? .

Mr. WALSH. Yes, I do.

Mr. BURTON. Do you? Do you remember when they put those amalgams in your mouth?

Mr. WALSH. I remember generally. It started when I was a child, and I have quite a few.

Mr. BURTON. Do you remember when they mixed it up, they put the mercury in and they mixed it up with this little machine; do you remember that?

Mr. WALSH. I actually don't remember that. I know that was the practice until recently.

Mr. BURTON. I remember how they did it. They mix it up, and the dental assistant mixes it, and they put it in this thing, and then they put it into a device that inserts it into your cavity. And when put that into your cavity, they say, well, it is going to be inert; it is not going to cause any problems. But every time I every had an amalgam put my mouth, there was a lot of it that squished out and went into my mouth. And then I would rinse it out after they—while they were doing it, and we would spit it into the water container. And you know where that mercury goes then, don't you?

Mr. WALSH. Yes, it goes down into the sewer system.

Mr. KUCINICH. It goes down the sewer system.

Mr. BURTON. The sewer system. What about the mercury that doesn't go down the sewer system that you swallow, because you can't get it all out? Does that have any impact on a human being?

Mr. WALSH. Well, my testimony is focused on the environmental. I am an attorney. I think it would be beyond my capacity to testify on——

Mr. BURTON. Well, let me just tell you, it is my belief that if you consume mercury in any form or have it injected into your body, it is a contaminant that can cause neurological problems. And that's why I believe that they shouldn't be putting amalgams in a person's mouth in the first place. Separators are a plus. They are going in the right direction. But why in the world even put amalgams into a person's mouth? It doesn't make any sense to me.

I know that, I've talked to some dentists who say, well, it costs more to put another kind of filling into a person's mouth and it may not be as durable as the amalgam, but nevertheless, you can do it. And for the additional cost, I think most people, if they are made aware that the amalgam is about half mercury, that they would opt not to have the mercury put into their bodies in the first place. And I just think there is an educational process that should take place in the dentist's office saying, the side effects of having mercury ingested into the human being either in the form of a vaccination or in the form of an amalgam.

We were talking about the sludge that goes into the wastewater treatment system. Where does that sludge go when it leaves the treatment center?

Mr. WALSH. About 20 percent of it nationwide is incinerated.

Mr. BURTON. Wait, let's stop right there. It is incinerated.

Mr. WALSH. Correct.

Mr. BURTON. When it is incinerated, where do the particles go?

Mr. WALSH. You mean the mercury?

Mr. BURTON. Well, anything that's incinerated, doesn't it go up in the air?

Mr. WALSH. Some of it becomes ash. Some of the mercury is emitted. About 95 percent, 96 percent, I forget the exact figure, is captured in the pollution control device of the incinerator.

Mr. BURTON. OK, where does it go then?

Mr. WALSH. I don't remember off the top of my head where it goes then.

Mr. BURTON. Well, it doesn't just disappear.

Mr. WALSH. No, I assume it is disposed of.

Mr. BURTON. Is it recycled in some form into another mercury product?

Mr. WALSH. I'm afraid I don't know what the——

Mr. BURTON. But you know it does exist; it is there.

Mr. WALSH. Oh, no question, it's an element.

Mr. BURTON. So the mercury is in the environment after it comes out of an amalgam and goes through the system, right?

Mr. WALSH. Could you repeat the question?

Mr. BURTON. The mercury that's in the amalgam, when goes through the system, the sludge or whatever it is, it is back in the environment some place.

Mr. WALSH. It is in the sludge, which is either landfilled, and we've looked at the studies that have been done historically on the emissions from landfills and looked at the percentage of mercury that would be from sludge; it is a very small amount, but——

Mr. BURTON. Wait a minute. It says that 30 tons of mercury is going into the amalgams a year. That's the estimate.

Mr. WALSH. Yes.

Mr. BURTON. Excuse me, 6 tons of mercury, excuse me, 6 tons of mercury is going into the amalgams per year. That 6 tons is going to go some place. It is either going to stay in a person's mouth or into the wastewater treatment system, and it is either going to be incinerated, in the sludge, or it is going to be sent someplace else, or it is going to be put into a landfill. If it is put into a landfill, it's going to leach down into the ground and into the groundwater.

We've had tests of water in Indiana that's found mercury in the groundwater.

Now, why in the world—I'm not talking about the separators now—why in the world wouldn't dentists or anybody that deals with mercury say, hey, it is a toxic substance, we ought to get it out of the environment in any way possible? And a dentist, knowing that they are working with it on a daily basis, why wouldn't they want to get it out of system?

Mr. WALSH. Well, we looked at EPA's regulation, and these are long standing regulations from the 90's. They looked at all of those issues when they issued the regs. The National Academy of Science reviewed the biosolids limits, and the, I believe NACWA has said that all the evidence suggests that those metals, mercury included, are not causing health hazards when they are disposed of in compliance with those regs.

Mr. BURTON. Recently, the U.S. Food and Drug Administration settled a lawsuit with several consumer groups promising to classify dental amalgam and list the possible hazards involved with mercury-based fillings within a year. As part of the settlement, the FDA has even publicly withdrawn its claims that amalgam is safe for all and now warns—this is the FDA now—dental amalgams contain mercury which may have neurotoxic effects on the nervous systems of developing children and fetuses.

Why—does the American Dental Association agree with that warning?

Mr. WALSH. Again, the purpose of my testimony and the focus is on the environmental impacts, and I am an attorney. I'm sure if you want to submit a question to the American Dental Association, they will provide an answer. But you're asking the wrong—you're just asking the wrong person.

Mr. BURTON. You don't have the answer to that.

But the FDA has publicly withdrawn its claims that amalgam is safe for all and now dental warns dental amalgams contain mercury which may have neurotoxic effects on the nervous systems of developing children and fetuses. And that being the case, why would they put them in an adult's mouth in the first place, because obviously it could have an adverse impact on the adult as well? I just don't understand the ADA. I just do not understand it.

When I had the amalgams put in any mouth, I can remember vividly, because I had some pretty bad teeth at one time, and I remember vividly them mixing it up and squirting it into my mouth. And I can remember, remember them sucking it out with a vacuum cleaner and it going down into the water system, going through the

system. And when I'd spit it out, it was going into the water and down into the sewage system. And when I—and the part that went flushed out or vacuumed out went into my body. And I just can't understand why people don't realize that mercury is toxic, and it shouldn't be inserted into a human being in any form. And no matter how much you say—and I won't take any more time, Mr. Chairman—but no matter how much you say all the science and research——

Mr. KUCINICH. The gentleman has another 2½ minutes actually.

Mr. BURTON. Thank you.

No matter what is said by scientific research or anything else, common sense would dictate to me and to any human being that's made aware of the dangers of mercury that it shouldn't be in your mouth. They took it out of thermometers. They took it out of Merthiolate, Mercurochrome. They took it out of ophthalmologic liquids. They take it out most of the children's vaccinations. It is still in—it is in almost all of the adult vaccinations. And I just cannot understand, it just alludes me why a substance that is as toxic to the neuro—neuro system would be put into the human body. I just can't understand it.

With that, Mr. Chairman, I don't—I have a sense of frustration that goes on every time we have one of these hearings.

I will just yield back the balance of my time.

Mr. KUCINICH. I thank the gentleman.

Congresswoman Watson you may proceed for 13 minutes.

Ms. WATSON. I just want to let Representative Burton know I am sitting here so frustrated.

And I really want to know, Mr. Chairman, why the American Dental Association would send their attorney and not a health professional for this hearing. Since the counsel for the ADA is here, we ought to have someone from the opposing side, some attorney come, because I've been listening to the responses. And these are truly the responses from a defense attorney and not the responses from a health professional who is interested in the health of every single human being here in the United States.

So I'm going to address my questions to you, Mr. Walsh. Does the ADA support local and State government efforts to reduce mercury? And how does it encourage its members to cooperate in these programs?

I want to go further to say, you said many minutes ago that it should be a local and State, but Mr. Burton is from a different state; I'm from a different state, and Mr. Kucinich is from a different state. We ought to have some kind of Federal regulation because the risk is the same regardless. I'm from California, and the risk is high, and you keep talking about the surface water. I want to tell you about the water that is waste that apparently is not being processed, because I have evidence.

And I'm sure, Mr. McCormick, when I direct some questions, knows that there is evidence showing that the mercury comes from the waste that comes from dental offices mainly.

And I also understand that Mr. McCormick's report in some way has been curtailed when it was completed, but I will address this to him.

So will you please deal with what the ADA is thinking in terms of local and government efforts to reduce mercury? And then if it encourages its members to cooperate in these programs? Would you please respond?

Mr. WALSH. Well, the ADA has been supporting, since at least 2002, efforts to reduce the discharge of amalgam into wastewater treatment plants, initially through what was then the use of best management practices that were limited to chair-side traps.

Ms. WATSON. Period, period. These were voluntary efforts, yes, no?

Mr. WALSH. The ADA best management practices are voluntary recommendations of the ADA. We have no——

Ms. WATSON. OK, they are voluntary?

Mr. WALSH. Yes.

Ms. WATSON. Thank you very much.

Mr. WALSH. We also have worked cooperatively with regulatory agencies and various State agencies—State associations.

Ms. WATSON. OK, put a period there, because I'm going to use my time——

Mr. WALSH. Yes.

Ms. WATSON [continuing]. Very thoroughly and wisely.

How does the ADA encourage its members to cooperate with these programs? And what is the percentage of cooperation, voluntary cooperation?

Mr. WALSH. The answer to that, you need to understand——

Ms. WATSON. Wait a minute. How does it encourage its members? Can you get right on point?

Mr. WALSH. Well, they have developed their understanding. Dentists were not familiar with the regulatory system. They were being faced——

Ms. WATSON. So you're talking about enlightenment——

Mr. WALSH. Well, first you have to educate anyone——

Ms. WATSON. I am an educator so I like that response.

Mr. WALSH. Whatever it is, whether it is an enforcement action or a voluntary program, first, you've got to inform the regulated community——

Ms. WATSON. Good. Period on that, period, period, on that.

Should we educate the patients as well when they walk through that door? Should we educate them about what the amalgam contains?

Mr. WALSH. Again, that is not the subject of my testimony.

Ms. WATSON. Yes or no?

Mr. WALSH. It's just not within my area of expertise.

Ms. WATSON. So you don't know. You don't know. You don't know if we should educate the patient?

Mr. WALSH. I am——

Ms. WATSON. You know, that's why I want a health professional here, not you the counsel, because you represent just one side of this. And you're going to give me the legal jargon, and that's not getting to the problem.

I'm going to have my staff give you the bills that I have introduced, 7 years. And we're trying to get them moving because my interest, my interest personally is protecting the health of the public. That's my interest. My interest is letting them know the risk

they undertake when they have—I'm passionate about this because it happened to me. And they would send you the counsel and not the health professional.

OK, you didn't tell me what percentage of the dentists are cooperating. Do you know that? Do you know that?

Mr. WALSH. There are no hard figures. EPA——

Ms. WATSON. OK, you don't know it.

Mr. WALSH [continuing]. Estimated——

Ms. WATSON. Don't give me the jargon, please. My time is limited. You don't know it. You don't have those figures; yes, no?

Mr. WALSH. There——

Ms. WATSON. You don't have those figures——

Mr. WALSH. We do not have any figures, correct.

Ms. WATSON. Yes, no?

Mr. WALSH. We do not have any figures,

Ms. WATSON. OK, thank you.

What was the difference about the experience in EPA Region 8? And according to Mr. McCormick, you were strongly opposed to the EPA's guidance on setting and meeting local limits for toxic metal discharge.

Mr. WALSH. We started voluntarily coming to EPA, over a year and a half before Mr. McCormick ever issued his guidance, seeking to put a voluntary program together to reduce the amount of amalgam. In the midst of that, we found out that the city of Laramie was being told that they would be enforced against if they didn't meet a number in a draft guidance.

We asked to see the draft, so we could comment on it. Mr. McCormick mentioned a Region 5 draft. We had commented earlier in the year on a Region 5 draft, which in fact does not say "use only voluntary." It says, "you may use a voluntary; you may use a mandatory." And it says you can use what was then just chairside traps and vacuum filters or you could require separators——

Ms. WATSON. Period, period. Did you try to influence the outcome of the EPA policy in Region 8?

Mr. WALSH. We filed public comments with Region 5, with Region 8, with EPA headquarters. We continue to fill comments in regulatory proceedings. Those comments are public record. Those comments have been given and are on the Internet. In fact, we file and attach all those comments.

Ms. WATSON. Let me read this. subcommittee staff spoke to the ADA and asked your representatives about the case. Jerry Bowman, the ADA's general counsel told my staffer or this staff of the committee that the ADA has no control over an EPA representative. However a letter written by Mr. Bowman to Benjamin Grumbles, the assistant administrator in February 2005, reveals that the ADA tried to interfere with Mr. McCormick's initiative. Now I'm going to give you a relevant quote from that letter: Region 8 has clearly not shifted its position one inch since our meeting with you. As we stated then, this is a very damaging position. Through its proposed guidance, Region 8 will wipe away EPA's effort to reach consensus to work with small businesses and to encourage voluntary efforts and replace those goals with a command and control strategy.

Mr. Walsh, please help me understand this, the ADA supports the use of amalgam separators, and you conceded the environmental impact of dental mercury on the environment was great. So why was the ADA so strongly opposed to EPA's efforts in Region 8? Do other State or local governments who try to initiate similar policies have the same to look forward to from the ADA? Do you have any idea? You're representing them. You're the counsel.

Mr. WALSH. These decisions are made on a case-by-case basis. The Michigan Dental Association is supporting, contrary to what was said earlier, a statute that would require amalgam separators in Michigan. What we were doing then, this was before the recent amendment to the BMPs that required amalgam separators, is we're taking the position that the local governments, the State and local entities should be free to choose a voluntary program or a mandatory program.

What Mr. McCormick, and he is trying to fulfill his duties, he precluded any voluntary program. We believe, given the number of sources, given the nature of the sources, professional people who were not familiar with the environment, that the preferable way and the more effective way to use the limited resources that the agency has on enforcement is to use a voluntary program always backed up, and we would be remiss if we didn't tell our members that this they don't fulfilling voluntary program, if it is not effective, a mandatory program would follow. But this has been done——

Ms. WATSON. OK, period, period, period, please.

Mr. WALSH. Done by a number of——

Ms. WATSON. Period, period, when I say that, please cease, because I'm on time. They are keeping time on me.

Mr. KUCINICH. The gentle lady has another minute.

Mr. WALSH. I apologize.

Ms. WATSON. The ADA supported a lawsuit filed by Laramie dentists opposing the Region 8 guidance; is that correct?

Mr. WALSH. No, that's not correct. We filed comments publicly and appeared at the council meeting, and we explained the reasons we thought a more cooperative voluntary approach was appropriate——

Ms. WATSON. I got it, I got it.

Mr. WALSH [continuing]. As was pointed out.

Ms. WATSON. Mr. McCormick, can you tell me about the—give me a summary of what your report showed for Region 8.

Mr. MCCORMICK. The strategy?

Ms. WATSON. Yes, and what your recommendations would be.

Mr. MCCORMICK. The chairman asked a really good question earlier. It was rhetorical, unfortunately, and deals with what exactly you're asking, is how far do you go with regulation? I kind of want to make it clear because everything seems to get spun here, and that's a frustration, when I was a regulator, that I always had. The law already exists, the Clean Water Act exists, and the regulation exists, and they clearly say, although the ADA probably wouldn't accept this, that we have a problem with the pollutant; it's mandatory to implement controls. It is not a voluntary reaction to a pollutant problem.

The regulations already exist. They are black and white. There isn't a gray area there. And that's where—that's sadly where the influence is kind of coming in twisted. There is no leadership to make sure that these regulations are implemented and enforced. The regulations are there: If mercury is causing a problem, you must control it being discharged into a sanitary sewer system. There is no gray area in the regulations. That's what my strategy said. It said, like we do with every other pollutant that's causing a problem with an environmental criteria standard, you shall control discharges from nondomestic sources, which include dentists——

Ms. WATSON. A question to the Chair, "shall" and "may" are two different legal terms.

Mr. MCCORMICK. Absolutely.

Ms. WATSON. "Shall" was used, making it mandatory, correct?

Mr. MCCORMICK. In the regulations, it's "shall."

Ms. WATSON. The attorney is moving his head, because these are legal terms, "shall" and "may." "May" is permissive; you do it if you want. "Shall" is mandatory.

Mr. MCCORMICK. I would just direct the ADA to the objective——

Ms. WATSON. OK. I just asked my staff to get me the language.

Mr. WALSH. You should also look at the Court of Appeals opinion——

Ms. WATSON. Mr. Walsh, I was addressing——

Mr. WALSH. Oh, I'm sorry.

Ms. WATSON [continuing]. Mr. McCormick. Thank you.

Mr. Walsh, are you a member of Pepper Hamilton, L.L.P.

Mr. WALSH. Yes, I am.

Ms. WATSON. Is that your firm? OK, the lawsuit I believe was filed—I'm not sure of this date—December 17, 2004.

Mr. WALSH. That's the date——

Ms. WATSON. Somewhere in there.

Mr. WALSH. That's the date we filed comments with the city.

Ms. WATSON. And you have—you wrote this letter, if I'm correct. This is the city of Laramie Public Works, you wrote it to the mayor and the city council member.

Mr. WALSH. Correct.

Ms. WATSON. If there is anything I say, then you can intervene, and say, it is not correct or just not a factoid.

Mr. WALSH. OK.

Ms. WATSON. And remember, you're sworn in, so that is why I say that disclaimer.

You say: I have been retained by the Laramie Dental Association, which represents all 12 dentists in Laramie, WY, and the Wyoming Dental Association, and the American Dental Association to provide their comments on the city of Laramie's proposed local limit of two-millionths of an ounce of mercury per liter, that's 2 parts per billion, for wastewater discharged into the city of Laramie's sewage treatment plant. The ADA has also submitted comments on the EPA Region 8 draft guidance. That is the motivating force behind the enactment of this poorly—poorly—thought out ordinance and has met with the EPA assistant administration—administrator of water and his staff to address this draft document and as a part of its ongoing effort to develop a national

guidance for reducing mercury releases from dental offices. And the Laramie dental community strongly opposes this specific ordinance.

And then you go on to state the reasons. Is this letter authentic?

Mr. WALSH. Yes.

Ms. WATSON. And you still believe those reasons that you state in your letter of December 17, 2004, are relevant to today?

Mr. WALSH. Yes.

Ms. WATSON. OK. And you say there is no need to rush to judgment; the EPA guidance is still draft and is inconsistent with national policy.

The intent and my intent is to change national policy.

So I'm going to have your letter a matter of record, Mr. Chairman.

Mr. KUCINICH. Without objection the letter will be included in the record hearing.

[The information referred to follows:]

Pepper Hamilton LLP
Attorneys at Law

Hamilton Square
600 Fourteenth Street, N.W.
Washington, DC 20005-2004
202.220.1200
Fax 202.220.1665

direct dial: 202-220-1424
walshw@pepperlaw.com

December 17, 2004

Fred Homer, Mayor
Dr. Klaus Hanson, City Council
Ms. Jeanette Reisenburg, City Council
Ms. Wendy Perkins, City Council
Mr. Bryan Shuster, City Council
City Hall
406 E Ivinson Avenue
PO Box C
Laramie, WY, 82070

Ms. Jodi Guerin, City Council
Mr. Bob Bell, City Council
Ms. Amy Sunshine Moon, City Council
Ms. Anni Nordin, City Council
City Hall
406 E Ivinson Avenue
PO Box C
Laramie, WY, 82070

Re:	Amendment to the Industrial Pretreatment ("IPT") Ordinance (August 24, 2004)

Dear Mayor and City Council Member:

I have been retained by the Laramie Dental Association ("LDA") (which represents all twelve dentists in Laramie, Wyoming), the Wyoming Dental Association ("WDA"), and the American Dental Association ("ADA") to provide their comments on the City of Laramie's proposed local limit of 2 millionths of a gram of mercury per liter (i.e., 2 parts per billion or "ppb") for wastewater discharged into the City of Laramie sewage treatment plant.[1] The ADA[2] has also submitted comments on the EPA Region VIII ***draft*** guidance[3] that is the motivating force behind the enactment of this poorly thought out ordinance and has met with the EPA Assistant Administrator for Water and his staff to address this draft document and as part of

[1] City of Laramie Public Works, Wastewater Treatment Plant, Amendment to the Industrial Pretreatment ("IPT") ordinance (August 24, 2004)). As explained below, this approach has been forced upon the City by the regulatory staff of the State of Wyoming and U.S. Environmental Protection Agency ("EPA") Region VIII Office.

[2] The ADA is the largest dental professional organization, representing over 147,000 dentists in the United States ("U.S."), including 71% of the active dentists.

[3] EPA Region VIII, POTW Mercury Control Strategy, Addendum to Region VIII Strategy for the Development of Local Limits, US EPA Region VIII, Industrial Pretreatment Program (2004).

its ongoing effort to develop a national guidance for reducing mercury releases from dental offices.

The Laramie dental community strongly ***opposes*** this specific ordinance, because:

- the ordinance is fatally flawed as a matter of law, science, and sound environmental policy. As a result, it is likely to waste the limited resources of the City, the dental community, the State, and EPA for little or no gain when alternative, less adversarial methods are available (see Section 4, below);

- the approach adopted by the City could require, as a practical matter, the shutdown of all of the dental offices in Laramie since even amalgam separators (a device that collects greater than 95% of the amalgam in the dental office, rather than the current average collection of 78% of the amalgam flushed down the dental office drain) are unlikely to be able to attain a 2 ppb discharge limit;

- the City need not rush to judgment and pass this ordinance based on a **draft** EPA regional strategy that has not yet completed public notice and comment. There are no legal deadlines requiring a precipitous decision by the City. Furthermore, the LDA just received today for first time a more than hundred page document which purports to provide the derivation of the 2 ppb mercury limit. The LDA and WDA need more time to review and comment on this new information. The EPA draft regional strategy may change based on public comment or on national policy decisions (which is still being developed within EPA). Nothing prevents the City from requiring more stringent requirements, if necessary, at a later date; and

- rather than rush to pass an ordinance that is likely to disrupt the dental community, result in exorbitant operating costs, and waste governmental and private resources with **little or no concrete benefit to the environment**, Laramie and Wyoming Dental Associations offer to sit down with the City (and other governmental entities if needed) to work cooperatively toward specific, quantifiable, voluntary measures which would quickly reduce amalgam discharges to the City system. At other places, local and state dental societies have work with local governments to ensure universal and verifiable implementation of the ADA's best management practices.

The Laramie and Wyoming dental communities support measures to reduce mercury releases to the environment. However, the methods and processes used to achieve these shared goals must be consistent with law, science, and sound environmental policy or the effort could be counterproductive. **The Laramie and Wyoming Dental Associations request the opportunity to explain its concerns to the full City Council prior to the next vote on this ordinance.**

The remainder of this letter describes in more detail the concerns of the Laramie and Wyoming Dental Association, which are briefly summarized above. Attached to this letter is a copy of the ADA comments to EPA Region VIII's pretreatment coordinator (Attachment 1). Also attached is a scientific study of the national impact of the discharge of amalgam wastewater, which provides the most extensive and carefully documented scientific review comparing the amount of amalgam currently captured by a dental office using best management practices (i.e., an average of approximately 78% of the amalgam is captured by the existing chairside traps and vacuum filters)[4] to the amount of amalgam captured by amalgam separators (approximately 95%)[5] and the relative impact on the environment of these two options (Attachment 2: ENVIRON International Corporation, Scientific Assessment).[6] We incorporate by reference both of these documents into these comments to the City.

1. THIS APPROACH COULD SHUTDOWN OF ALL OF THE DENTAL OFFICES IN LARAMIE

The City has not evaluated the feasibility of imposing numerical limits on discharges into POTWs. Studies of the effectiveness separators suggest that even after installation of a separator, the discharge from a dental office may still exceed 2 ppb, particularly as the separator becomes filled with amalgam as restorations are being replaced.[7] Thus, the only technology that is know is unlikely to meet the local limit of 2 ppb. The impact of the Laramie

---

[4] Attachment 2 at 6.

[5] Attachment 2 at 15.

[6] This study was funded by the ADA. However, a manuscript of a paper detailing this study is being revised based on peer review comments from independent reviewers selected by a scientific journal. Once this article is accepted for publication, the LDA will provide a copy to the City.

[7] Also see M.E. Stone, M.E. Cohen, R.S. Karaway, J.C. Kuehne, And J.M. Gullett, Naval Institute for Dental and Biomedical Research, Great Lakes, IL, USA, Evaluation of a Commercial Two-phase Amalgam Separator (2004), which Hg levels falling from 15,400 ppb in baseline samples to 8.95 ppb following treatment. Post treatment Hg levels averaged 7.15 ppb for 38 consecutive runs. There was a dramatic increase in Hg levels in the effluent after the 38th run: Hg levels from runs 39 through 95 averaged 362 ppb (n=57, SD=634). available at: http://iadr.confex.com/iadr/2003Goteborg/techprogram/abstract_29687.htm.

ordinance, as proposed, is to cause the closure of all dental offices in Laramie because no dental office will be capable of meeting this limit. Even if all of the dental offices do not close, this ordinance will impose increased costs to the citizens of Laramie. Nothing in the more than 100 pages of calculations received today will change the fact that meeting this limit is infeasible.

2. THERE IS NO NEED TO RUSH TO JUDGMENT, THE EPA GUIDANCE IS STILL DRAFT AND IS INCONSISTENT WITH NATIONAL POLICY

The City's proposed ordinance is particularly puzzling to the Laramie and Wyoming Dental Associations because the "guidance" that seems to be the driving force for the ordinance is in draft and EPA has not yet responded to the substantial comments that it has received. As part of a series of meetings with the EPA Office of Water to develop programs to reduce amalgam discharges to the environment, the ADA was told that deliberations were still ongoing within EPA.

The statement e-mailed to the City by EPA Region VIII that EPA's "position is that we require POTWs to develop and implement local limits"[8] does not appear to be consistent with other expressions of EPA's official policy. For example, EPA Region V draft mercury guidance for sewage treatment facilities does not require the use of local limits (*see* discussion of this guidance in Attachment 1).[9] EPA's national guidance on using local limits instructs sewer authorities to make sure that, if local limits are used, they pass a "common sense test" (including asking whether **the limits [are] sensible in light of actual conditions at the treatment plant"**).[10] The 2 ppb limit for mercury proposed here do not pass that test. Further, EPA approved statewide variances from local limits in both Michigan and Ohio. Finally, in multiple meetings and correspondence with EPA's Office of Water over the last two years, the ADA has discussed voluntary programs, use of the ADA BMPs, and other mercury reduction alternatives (including, but not limited to amalgam separators) and the ADA has never been told that EPA's position is that they only require sewage treatment plants to develop and implement local limits (rigid or otherwise). Clearly, there is a misunderstanding within EPA and the City is a victim of this misunderstanding.

---

[8] E-mail from C. McCormick, EPA Region VIII to O. Chlison, City of Laramie, Re: Dentists (December 2, 2004).

[9] EPA Region V's proposed guidance for mercury discharges from sewage plants (which interprets the Great Lakes Water Quality regulations, which are more stringent than the Wyoming water quality standards), encourages the use of voluntary approaches and allows the use of BMPs. This guidance was subject to substantial public comment. The ADA has been informed that the Region V guidance will be issued in final without a "requirement" for local limits.

[10] EPA, Local Limits Development Guidance at 6-13 (EPA 833-R-04-002A, July 2004), available at: http://www.epa.gov/npdes/pubs/final_local_limits_guidance.pdf.

The Laramie Dental Association believes that the more prudent approach is for the City of Laramie to wait until EPA clarifies its position and the City has an opportunity to assess these comments.

If mercury reduction measures are enacted, in our view, the City should use a phased approach that is commensurate with the relative magnitude of the source and the relatively low cost-effectiveness of amalgam reduction technology. The City should set reasonable benchmarks and schedules and take into consideration the fact that the portion of the sewer discharges associated from dental offices is, although not zero, low and their control will have little impact on current **ambient** levels of mercury. The need for further reductions from existing dischargers to POTWs after the implementation of the initial voluntary amalgam reduction measures should be evaluated. Such evaluation should take into account whether additional measures would be effective and should weigh the costs and cost-effectiveness of such measures. More ambitious goals and measures may be warranted when state mercury water quality standard, mercury sludge limits, and fish tissue limits are exceeded. Those conditions, however, do not exist in Laramie. Voluntary approaches should be utilized before "mandatory," rigid source control measures.

3. LDA AND WDA ARE READY AND WILLING TO WORK WITH THE CITY TO ADDRESS MERCURY ISSUES EXPEDITIOUSLY AND EFFECTIVELY

The Laramie and Wyoming Dental Associations are willing to work with the City and are particularly disappointed in the lack of cooperation to date. As the ADA understands it, EPA has indicated that it would be willing to include voluntary and BMP approaches in the range of acceptable approaches. Thus, the approach proposed by the City seems inconsistent with EPA national and other regional policy and guidance on dental office discharges. Local dentists (who are small businesses and hardworking members of their community) are willing to implement the strategy of reducing mercury releases to the environment rather than fostering a heavy-handed enforcement-oriented approach.

4. THE ORDINANCE IS FATALLY FLAWED AS A MATTER OF LAW, SCIENCE, AND SOUND ENVIRONMENTAL POLICY

The proposed ordinance is fatally flawed as a matter of sound science, sound environmental policy, and law.

There is no scientific or environmental basis for focusing mercury reduction efforts on dentists or more broadly on all of the direct point source dischargers or discharges into sewer systems because it is beyond dispute that dental office amalgam wastes contribution a trivial amount to the mercury levels in the environment that are of legitimate concern.

The purpose of the Clean Water Act and other environmental statutes is to reduce the impact on the environment, **not** on the contents of a sewer plant. The impacts of mercury on the environment in Wyoming fortunately are among the lowest in the nation. The mean level of methylmercury in fish in Wyoming is only 0.095 ppm,[11] well below the EPA fish tissue limit of 0.3 ppm. Wyoming's water quality standard is 50 ppt[12] and, according to EPA, no water body in Wyoming is impaired due to the presence of mercury.[13] The average mercury concentration in POTW effluents is approximately 12 ppt.[14] The Laramie sludge is not incinerated and, as far as we have been able to determine, the mercury concentration in the local sewage sludge is not exceeding even the Wyoming exceptional quality limit of 17 ppm.

In fact, ***EPA has testified before Congress that discharges from dental offices are a minor contributor to mercury entering the nation's water bodies.***[15] Similarly, the national association for sewer authorities (a group to which the City of Laramie is a member) has also noted, "the U.S. Environmental Protection Agency (EPA) demonstrated that when compared to all other sources of mercury released to the environment, wastewater treatment facilities are a minor or *de minimis* source."[16] Additionally, it appears that, in addition to high loadings from

---

[11] EPA and the states sampled fish from 500 lakes and reservoirs selected randomly from the estimated 270,000 lakes and reservoirs in the lower 48 states (*see* http://www.epa.gov/waterscience/fishstudy/results.htm). The first two years of sampling are available (http://www.epa.gov/waterscience/fishstudy/1styr_resultsallcompositestable.pdf and http://www.epa.gov/waterscience/fishstudy/Year2Data.html). The averages from this data were calculated and communicated to the ADA. Personal communication Jay Vandeven, ENVIRON International Corp. (2004). These averages have not been published in any public paper and are not available on EPA's web site. They were calculated based on the raw data that EPA has made public on computer disks.

[12] Available at http://deq.state.wy.us/wqd/surfacestandards/Downloads/11567-doc.pdf at 45 of 51.

[13] *See* EPA, Map of the National advisory data, www.epa.gov.waterscience /fish/map.htm. Also a search of the National Listing of Fish Advisories on EPA's web site (www.epa.gov/waterscience reveals no listings for mercury in Wyoming and few in the other Region VIII states.

[14] Attachment 2 at 10.

[15] Testimony of Geoffrey Grubbs, Director, Office of Science and Technology, U.S. EPA, Before Subcommittee on Wellness and Human Rights of the Committee on Government Reform, United States House of Representatives (October 8, 2003).

[16] *Testimony of Norman LeBlanc, Chief, Technical Services, Hampton Roads Sanitation District on behalf of the Association of Metropolitan Sewerage Agencies ("AMSA"),* Submitted To The Subcommittee On Human Rights And Wellness, The House of Representatives, Committee On Government Reform (October 8, 2003), available at: http://www.amsa-cleanwater.org/advocacy/testimony/10-08-03wtestimony.cfm. *See generally* Attachment 1 at Table 1 for a comparision of the releative contributions. AMSA is the national association of sewer authorities, such as the Department of Public Works in Laramie.

airborne deposition, there are mining sources in many areas within Region VIII (and probably within Wyoming), which could dwarf any loading from a sewage treatment plant.

Thus, regulatory action to control amalgam waste water discharges (even if cost and other adverse impacts were not an issue) would not significantly reduce mercury concentrations in surface water, including in Laramie, Wyoming.[17] However, cost is another factor that the statute governing water discharges requires to be considered. The courts have specifically held that the cost of end-of-pipe **mercury** controls at the POTWs are not **cost-effective,**[18] and EPA's regulation governing water discharges recognizes "the importance of implementing **only** those control strategies determined to be **cost-effective**."[19]

The cost-effectiveness of amalgam waste separators at preventing dental amalgam waste releases to surface water is approximately $380 million to $1.14 billion per ton of mercury.[20] This cost per ton of mercury is well above the range of $65 million to $176 million level predicted for coal-fired electric utilities[21] and well above the cost-effectiveness criteria

---

[17] The national association for sewage authorities has not even completed its study of whether amalgam separators will be effective in lowering the mercury concentrations in sewage treatment plant discharges to surface water. The existing data (prior to this AMSA study on the effectiveness of amalgam separators) is, at best, equivocal. In Duluth and the City of Witchita, the mercury reductions cannot be attributed solely to installation of separators because other mercury reduction efforts were undertaken. In fact, more mercury reduction occurred prior to installation of amalgam separators than afterwards and there was no clear causal link between reduction of mercury concentrations in the discharge from the sewage plant and the installation of amalgam separators.

[18] *American Iron & Steel Institute v. EPA*, 115 F.3d 979, 1001 (D.C.Cir. 1997). In fact, EPA has approved state water discharge control programs that consider costs and feasibility. Michigan Department of Environmental Quality, Draft Mercury Permitting Strategy (issued February 3, 2004), available at: <http://www.deq.state.mi.us/documents/deq-wd-swpas-draftmercurystrategy.pdf, and Ohio EPA, Pollutant Minimization Programs, Permit Guidance No. 7 at *3* (final) (August 13, 2000), available at: <http://www.epa.state.ohio/dsw/guidance/permit7.pdf ("Ohio EPA PMP Guidance").

[19] EPA Final Rule to Amend the Final Water Quality Guidance for the Great Lakes System to Prohibit Mixing Zones for Bioaccumulative Chemicals of Concern, 65 Fed. Reg. 67,638, 67, 640 (November 13, 2000) ("Mixing Zone Rule"). Of course, independently, Executive Order 12866, as amended by Executive Order 13258, as well as predecessor orders, requires the consideration of the cost of regulation in determining how to attain the statutory objective. Office of Management and Budget, *Economic Analysis of Federal Regulations under Executive Order 12866*, <http://www.whitehouse.gov/omb/inforeg/riaguide.html; and <http://www.whitehouse.gov/omb/inforeg/eo13258.pdf; and EPA, *Guidelines for Preparing Economic Analyses* (EPA 240-R-00-003, September 2000).

[20] Attachment 1 and Attachment 2: ENVIRON International Corporation, Scientific Assessment (November 15, 2003).

typically used for deciding when a pollution control options is warranted (*see* Attachment 1 at Table 2).

The major legal flaws with the City ordinance and the EPA draft guidance upon which it is based are:

- There is no legal basis for the City's proposed action.
  - There is no federal, state or local statutory basis for banning or virtually banning the discharge of mercury into sewer systems in this situation. The courts have held that the Clean Water Act's mercury reduction requirements do **not** require "total elimination" of mercury "at any cost," not even in the Great Lakes.[22] Moreover, as discussed above, there is a cost and it is likely to be inordinate compared to the benefit.
  - The Clean Water Act has also been held "not ... to regulate the pollutant levels in a facility's internal waste stream,"[23] which seems to be the purpose of EPA Region VIII draft guidance.
  - A regulator must also "justify its failure to take account of circumstances that appear to warrant different treatment for different parties."[24] The City has failed to take into account the episodic nature of the dental office discharges which requires this waste discharge to be regulated (if at all) differently than more uniform continuous discharges.

(continued...)

[21] EPA, Proposed National Emission Standards for Hazardous Air Pollutants; and, in the Alternative, Proposed Standards of Performance for New and Existing Stationary Sources, Electric Utility Steam Generating Units: Notice of Data Availability, 69 Fed. Reg. 69,864, 69,868, 69,870.

[22] *American Iron & Steel Institute v. EPA*, 115 F.3d 979, 1001 (D.C.Cir. 1997). The LDA and WDA have reviewed the Wyoming Department of Environmental Quality's water discharge permit for the Laramie wastewater treatment plant and can find no provision that explicitly requires reduction of discharges of mercury into the plant and, in fact, makes no mention of mercury. The LDA and WDA will review the more than 100 pages of materials submitted by the City to day to determine what legal requirement is the basis of these limits.

[23] *American Iron & Steel Institute v. EPA*, 115 F.3d 979, 996 (D.C.Cir., 1997). .

[24] *Petroleum Communications v. FCC*, 22 F.3d 1164, 1172 (D.C. Cir. 1994), also cited in *Leather Indus. of America*, supra note 7, at 403.

- The City is not bound by the Region 8 draft document since it is only a "guidance" to EPA employees. A regulatory agency's interpretations contained in "agency manuals" and "enforcement guidelines," without "formal adjudication, or notice-and-comment rulemaking... lack[s]s the force of law."[25] Of course, there is also always the question of whether EPA Region VIII and the City have interpreted the national guidance appropriately.

- There is no legal precedent for the City to decide to treat the twelve professional dentists (who have been caring for the dental needs of the community for many years) as an industry and such a position is unreasonable.Until today, the Laramie sewer authority had not provided an explanation of how or why it derived a 2 ppb mercury limit on discharges into its wastewater treatment system. Transparency is the hallmark of the United States ("U.S.") legal system and it is missing in this case. The LDA and WDA will review the materials submitted today, but it will take a significant amount of time (particularly given the holiday season) to evaluate these documents.

Attachment 1 describes additional legal, scientific, and environmental policy flaws in this proposal

In summary, the use of voluntary programs and the implementation of the ADA Best Management Practices ("BMPs") (measures such as collecting and recycling the, on average, approximately 78% of the amalgam entering the drains at dental offices which are currently collected by the existing chair side traps and vacuum pumps) would avoid the legal and scientific problems with the proposed ordinance, yet still preserve the City's right to require further necessary reduction, **if necessary**. Substantial progress can be made without resorting immediately to draconian measures.

The Laramie Dental Association and the Wyoming Dental Association (in cooperation with the ADA) welcomes the opportunity to present its position to the full council prior to the next vote on this ordinance and to work together with the City in developing sensible measures to reduce mercury discharges to the environment. If you have

[25] *Christensen, et al. v. Harris County, et al.*, 529 U.S. 576, 587 (2000).

any questions, please call or e-mail me or Dr. Debra I. Shevick, D.D.S. PC, 402 Custer Street, Laramie, Wyoiming 82070 ((307) 742-7934).

Yours truly,

William J. Walsh
Pepper Hamilton LLP
On behalf of the Laramie and Wyoming Dental Associations

WJW/twx

c: Oliver Chilson, Director of Laramie Sewer Authority
Debra I. Shevick, D.D.S. PC, Laramie Dental Association
Dr. Tim Pieper, Wyoming Dental Association
Robert Roberts, Region VIII Administrator
Diane Sipe, Director, Water and Drinking Water, Region VIII
Ben Grumbles, Assistant Administrator for Water
Sharon, Frey, Office of Water
Karen V. Brown, Small Business Ombudsman
Kevin Bromberg, Small Business Administration
Jerome Bowman, ADA
Joseph Nicosia, ADA

Ms. WATSON. And I want you to look at my proposed legislation, and I want to you respond to me and to the other members of this subcommittee as to how my proposed legislation would be opposed by the ADA and why.

Do I have your commitment to do that, to look at my legislation and tell me if it's inconsistent with this letter that you wrote opposing the draft coming from Region 8?

Mr. WALSH. We will look at it and respond.

Ms. WATSON. And get back to me.

Mr. WALSH. As positively as possible.

Ms. WATSON. If you would respond, which I would appreciate it, I'm going to look at your letter, and I will read your response. And I will share it with the subcommittee and the Chair.

Mr. KUCINICH. I thank the gentle lady.

Without objection, the Chair is going to continue with one more 5-minute round of each of the witnesses or of this next—of this panel.

I would like to begin with a question for Mr. Walsh.

I want to ask you a question about what you term as your voluntary success stories in the ADA's comments to the EPA concerning its dental office scoping study. You reference five examples of voluntary success stories in Massachusetts, Duluth, Washington, Madison—and Madison, WI, and the Minnesota Metropolitan Council for Environmental Services. We have looked at these carefully, and this is what we found: With the exception of the Minnesota case studies, all were a combination—a combination—of voluntary and mandatory provisions. Even the exception proves the rule. In Duluth, MN, there are only 55 dental offices, and the lead chemists in the Western Lake Superior Sanitary District obtained a grant for all the separators acquired.

Moreover, the sanitary district had a very hands-on approach and worked with every office to install the separators. Even the sanitary district told us that this model could not be replicated in a larger city.

Duluth, MN, has submitted testimony to be entered into our hearing record.

If we have a slide ready, can staff put up slide 3? Do you have that available? OK, between—is that the right chart? We're looking at the slide that has to do with the Massachusetts Dental Society.

I'm just going to—do you have it? OK. Yeah, that looks like the right one.

Is that OK?

Between 2001 and 2004, a memorandum of understanding between the Massachusetts Dental Society and the State, and by 2003, there was only a modest increase in the installation separators. In 2004, the Massachusetts Department of Environmental Protection initiated a followup program to speed up the process. It did two things. One, it offered incentives for voluntary compliance; and two, announced that mandatory regulations would be adopted in 2006. So that, by 2006, the compliance rate in Massachusetts was about 75 percent, and after the implementation of the mandatory program, compliance had jumped to 95 percent.

Mr. Walsh, despite your testimony that deems Massachusetts a model for voluntary compliance, it should be noted that when it

was strictly voluntary, between 2001 and 2004, it wasn't very successful at all.

We also have testimony from Washington State; Madison, Wisconsin; and they tell a different story than the one that you've told. Like Massachusetts, their purely voluntary approach had no impact until there were incentives to install the separators and the government announced a looming mandatory program.

In view of a full reading of the history of these case studies, wouldn't it be more accurate to describe these cases as models of government-dental collaboration as opposed to voluntary success stories?

Mr. WALSH. I think my testimony, my opening statement, indicated that we had learned a lot in the dental community. We were talking about a problem that really wasn't on the horizon, certainly regulatorily, before 2001. And the dental community is 155,000 different people. They had to be educated as to the law. They had to be assured that, in fact, the separators—and they went out and did it themselves—could be tested, were effective, that we did surveys of the costs.

I've mentioned a number of times the amendment of the best management practices last year to include separators; that—dentistry makes many of the big decisions by vote of the House of Delegates. These are people elected by dentists geographically, and they vote. It was an overwhelming vote. There is no question that understanding and cooperation was not there initially, has grown over time. We believe that dentistry and the fact that we have a common goal now of 100 percent of all dentists should follow the best management practices, that this is still more like other examples. In 1999, EPA went to the laundries and said, there are so many little laundries, we want a voluntary program. It has been done with a number of different industries, including mercury in laundries; a lot of laundry detergents have mercury. The kind of——

Mr. KUCINICH. But we are not drinking the dirty water out of the laundry.

I just want to point something out to you, and that is that, you know, you're suggesting that dentists now install separators because they are better educated, which is, you know, good, obviously. I mean, you're also suggesting, we've learned; we're trying to move in the right direction; and here is what we're doing; and this is the progress that we're having voluntarily. But in your testimony, you write that voluntary programs are just as effective as a mandatory approach. But according to the subcommittee's national survey, that doesn't seem to be the case.

Can we put that next slide up there?

Now, if you look at these figures and understand them, it shows that voluntary programs don't exact the same results as mandatory ones. That's what the record suggests.

Would you like to respond to that, Mr. Walsh?

I mean, what are your thoughts about this? Your whole presence here is trying to defend voluntary as opposed to mandatory, but here we've got some actual survey data that seems to contradict.

We're informed that we have an up-to-date slide. Do you want to get it up there? Have you got it now?

I'll give Mr. Walsh a moment to take a look at it.

Mr. Walsh, do you have—does the committee staff have a copy of this?

Can you see that, Mr. Walsh?

Mr. WALSH. The slide that's up on the screen? I can see it.

Mr. KUCINICH. The name of the State, county municipality offices with separators installed; voluntary separators installed; mandatory.

Mr. WALSH. And the question is?

Mr. KUCINICH. Well, the question is, voluntary or mandatory? I mean, you're defending a voluntary approach, and it seems that the compliance level just isn't there. And if you are recommending these amalgam separators on a voluntary basis, but it doesn't appear to work, why wouldn't the ADA change its position and tell people they have to have them in there? Why wouldn't you do that?

Mr. WALSH. Well, what I think we would be doing, and this, again, the BMPs, we added the separators last October. The separator pieces are being put into the education requirements. What we have now is the leadership overwhelming voting for separators. That didn't exist, and there is no question, when this first came up, they first asked how can we be regulated; we're dentists? There is an education process, information process. Dentists like science. We went out and did the science. Many of these things the ADA has done on, you know, its own expense to help set the pieces that would allow for putting in separators, and we are willing to do other things to keep track of the information rather than a lot of paperwork going around, keeping track of actually how much dentists send amalgam to either recyclers or the amalgam separator manufacturers so we have hard figures, rather than pieces of paper that say this is what is being done.

Mr. KUCINICH. I just have to say that anyone who is watching this, just I would assume, as the unbiased observers that are out there, it seems that the ADA has a resistance to mandatory regulations with respect to dental mercury. It seems that your resistance to it is almost theological. Faced with a tremendous amount of evidence, you just don't want to get off that position of saying it is voluntary instead of mandatory.

I'm wondering—it seems to me, and I don't know how my colleagues feel about this, but in listening to Mr. Walsh, he's very well spoken and obviously a very effective witness from the ADA's standpoint, albeit that there are some concerns that there are questions you couldn't answer, and we are going to submit followup questions to the ADA to give them a chance to go on record. But are there product liability concerns here? Is there something deeper here that you're—that a class action could be in the offing if all of a sudden, you take this, you feel that it would be fortifying a position and would undermine your position? Did you ever have any discussions about that?

Mr. WALSH. Well, that would be attorney-client if I had discussions.

But frankly, our concern is, it has to do with the nature of, I think, dentistry and what we think is the more effective way; 100,000 different dental offices is larger than most point-source dischargers in the country.

Mr. KUCINICH. Indeed, I mean that's why this has some consequences.

Mr. WALSH. It also makes it difficult to enforce. We think that whatever the final decisions of either Congress or the agency, there should be cooperation between the government and dentistry.

I understand that one can say it should have been done quicker, but there is a process that the American Dental Association goes through in terms of getting the science behind things, getting educated. And because they elect their leadership and some of these discussions are made by the House of Delegates, it is done with deliberate process, and we are now at a stage that's different from when we were in these other things.

I mentioned a few minutes ago, the Michigan Dental Association is supporting now a statute making separators mandatory. Each State differs. There are different circumstances, and we think——

Mr. KUCINICH. I just want to say, this is very interesting, this assertion, because here we are, mandatory or voluntary, case-by-case basis, as if the science should be applied on a case-by-case basis. We either have scientific facts here that underlie the concerns that bring this subcommittee to this moment and health concerns, or it is just a case-by-case basis.

You're an attorney. Surely, as an attorney, you are—bodies of law, it's understood, are—you know, the basis of them are not voluntary; they are mandatory. And when we're talking about regulation, the entire structure of regulation in this country is based on certain things you can't do.

When Moses came down from the Mount, he didn't say, these are 10 voluntary ideas here, commandments; thou shalt not, thou shalt not pollute, perhaps. Or maybe, whether you like it or not, if you like to you could pollute, if you don't—this is where this whole meeting turns today. I would suggest to you respectfully as someone who has a great deal of admiration for the kind of effort that goes into a dental practice, into the life of a dentist, who understands the commitment that dentists have to their patients, the ADA, it seems to me, for whatever reason, whether it is product liability, class-action exposure, or what, the ADA is really behind the curve on this, and I don't understand why that is——

Ms. WATSON. Mr. Chairman, would you yield for a question?

Isn't the Hippocratic Oath that you do no harm?

Mr. KUCINICH. I'm not a doctor, but I know that to be so.

Ms. WATSON. Well, next time we hold a hearing like this, would you bring me someone from the association who is involved with taking that oath rather than an attorney who doesn't take that oath?

Mr. KUCINICH. Well, we asked—in fairness to Mr. Walsh, I mean, we asked the ADA. First, we invited the president. The president wasn't available. We agreed that Mr. Walsh would be an effective witness on the question of regulation. Now, I will give you that much.

Ms. WATSON. He is.

Mr. WALSH. Thank you.

Ms. WATSON. But not being a health professional who——

Mr. KUCINICH. But we have to set the ADA on record——

Ms. WATSON. Thank you so much.

Mr. KUCINICH. To say that mercury contamination to wastewater is environmentally hazardous. We still don't have that out of you Mr. Walsh, but I think that—I think we'll somehow be able to establish that with or without you.

Mr. Burton, your time.

Mr. BURTON. I won't take much time——

Mr. KUCINICH. I just want to say, why else would they support separators if they don't believe that mercury contamination to wastewater is environmentally hazardous?

Mr. BURTON. I think, Mr. Chairman, a high school student studying science would know that mercury is not the sort of thing you would stick into a human being in any form. I mean, I don't think this is rocket science. I think anybody with any common sense knows that.

And no matter how much you talk about it, mercury is a toxic substance, it shouldn't be injected into the human body in any form, period. It's just crazy.

Now, I'm a conservative, and I don't believe in government regulation unless it is absolutely necessary. But when an organization doesn't voluntarily comply with something that's a public health hazard, dealing with public health hazards, then the government has no alternative than to do something about it.

You know, in your testimony, you highlighted two programs to encourage dentists to voluntarily install separators as examples of why voluntary problems are better than mandates. The first program you talked about was by your ADA counterpart in 2003, involved dentists in Duluth, MN, where a voluntary program achieved a 100 percent remarkable compliance rate. Are you familiar with that?

Mr. WALSH. I am, yes.

Mr. BURTON. Do you know that was paid for by the government, all those separators?

Mr. WALSH. I know the dentists and the local POTW applied for a grant.

Mr. BURTON. But you didn't say that in your testimony. I mean, this was a voluntary program? I mean, the dentists didn't pay for any of it. It was paid for by the sewage treatment organization there.

Mr. WALSH. The biggest cost of amalgam separators is not the purchase of the separator, but it is the recycling of all the amalgam. That cost is borne by——

Mr. BURTON. In any event, when you say it was a voluntary program, it was not a voluntary program. They voluntarily let them put them in their offices, but they didn't pay for them. And so I think there is a little bit of misleading of the committee there.

Let me just say that I don't understand why we don't have somebody from the ADA here who is on the Board of Governors, whatever it is. You are a competent attorney, obviously, but a lot of these questions we have had and a lot of these statements that we have had that we wanted to make today was to the ADA itself. I think it is unfortunate that we don't have somebody from the ADA here to testify.

Do we have anybody? Hold up your hand if you are a member of the ADA here. I would just like to know. You are a member of

the ADA. Anybody else? But you are on the other side. I mean, is there anybody here with the ADA—no, nobody except you.

Do you practice dentistry?

Mr. WALSH. No.

Mr. BURTON. I just wanted to check.

Mr. WALSH. I was a research physicist. If that helps.

Mr. BURTON. You were a research physicist.

Mr. WALSH. Before I became a lawyer.

Mr. BURTON. Really.

Mr. WALSH. Went to work for EPA.

Mr. BURTON. Did you ever put an amalgam in somebody's mouth?

Mr. WALSH. No.

Mr. BURTON. I didn't think so. I tell you what. We have three other witnesses here who might have some things they might like to say on my time. So if any of you have anything you would like to comment on—you have heard all this testimony and the questioning.

Mr. Walsh has been pretty kind to sit there and take all the punishment we have been giving him today, so I admire you for that. But I would like to hear from the three of you.

Dr. Fischer, go ahead.

Dr. FISCHER. I am a member of the ADA, and have been for many years. I think one of my big disappointments professionally over the years has been the lack of leadership from the ADA on this issue.

It is been a quarter of a century or longer now since I have stopped using amalgam, not because of anything I learned at an ADA meeting, but the ADA has sort of gotten in the way of a lot of informed consent legislation, as Congresswoman Watson knows, in California. They are not really trying to be responsible stewards. If they are putting 40 tons or 30 tons, whatever figure you want to use, into people's mouths every year, and there is 1,000 tons out there in people's mouths, you know, the only way to fix this is to put an amalgam separator on everybody's bathroom toilet or else stop putting it in.

Mr. BURTON. Mr. Bender.

Mr. BENDER. Thank you. First, thanks for the opportunity. I would like to correct for the record a statement Mr. Walsh made. I don't believe that sewage sludge incinerators have any kind of pollution control equipment, so they certainly aren't capturing 95 percent of the mercury without any kind of capture.

Mr. BURTON. While you are talking about that, you might elaborate and tell us where all that mercury goes and how it is distributed in the environment.

Mr. BENDER. Sure, thank you. Once the mercury gets volatilized it goes into the atmosphere and some of it, a certain percentage of it, rains down or dried up in a position locally, some of it regionally, and some of it goes into this global pool.

Part of the concern about any dental mercury that goes into the air is that it will methylate, and when it methylates, it will get into the fish, and we know that is a problem.

So, you know, a big area that hasn't been discussed today, which is in my written report, has to do with the cremation and the other air sources.

During my last testimony in the fall, I presented information that there was between 7 and 9 tons of mercury air emissions from dental mercury releases each year. And I believe that Chairman Kucinich wrote a letter to the EPA asking questions about that number compared to the EPA's number of something like 1.5 tons, and I don't know whether or not the EPA has ever responded.

But, you know, again, in Washington there seems to be a great concern over air releases, and we have had this—rightly so—a major focus on coal-fired plants which are estimated to emit 48 tons a year. Well, here you have another sector out there that is maybe emitting 10 tons per year.

So, again, the concern there has to do with the methylization of the mercury and it gets in the fish, and we all know about the tuna and all the rest.

But there are many different places, and Dr. Fischer did a great job in his testimony of laying out all the different places, where mercury gets released into the environment, and if there is the—the U.S. dental sector is still using 30 tons per year, 60 million mercury filling placements each year in 10 years or however many years the life of those fillings, that mercury is going to get released into the environment, and it is a perpetual cycle. As much as you use the mercury, it is going to get released into the environment.

One area that we focused on with State legislation is the manufacturers, and I have actually been thinking, in putting this report together the last few days, that maybe it is time to hear from the amalgam manufacturers, because there is about five or six of them in the United States, and I think most of them made both the mercury free so-called composites and the mercury fillings.

So maybe we are—some of the focus we haven't had today is on all of these individuals dentists who are really trying to do the best job with misguided information, unfortunately, from the ADA, that we need to hear from these five amalgam manufacturers. Because their numbers don't—you know, they have to report by State law.

We lost the Federal arm to be able to track this mercury-use category with the U.S. Bureau of Mines stopping this tracking mechanism in 1999.

Mr. BURTON. I just want to make sure I get a chance to hear from Mr. McCormick, too. Go ahead.

Mr. BENDER. Sure. But the other thing I wanted to mention is there is a sort of a difference between sort of a laissez faire like voluntary installation of amalgam separators and the facts on the record. And the facts are on the record, and I have it in my written testimony, in California in 2005 the CDA single-handedly—sole opponent of assembly bill 996—defeated the legislation. In Michigan, ADA lawyers, helping with the separator issue, told a colleague that they would not have to deal with the issue in 2011.

In Montana, in the ADA's own newsletter they talk about their one-two knockout punch. So, essentially at this point—and it goes on and on, Oregon, Philadelphia, where have you, that we can't move this issue any more on the State and local level because they

made it their business to stop us. So at this point we are coming to you because this State strategy is not working for us any more.

Mr. BURTON. So the point you are making very vividly is that they have a concerted effort to block anything but a voluntary program and the voluntary program simply is not working?

Mr. BENDER. Absolutely. Thank you.

Mr. BURTON. Let me followup with just one thing that you said and then I will just yield the rest of my time to Mr. McCormick, and that is that I, like you, believe that most of the dentists, probably 99 percent of them, are very honorable people trying to do a job, just like the doctors. But they are getting their information from the ADA just like the doctors are getting theirs from the AMA. I have talked to doctors and dentists, and unless it is coming from the gospel, which is the ADA, they don't believe it.

Mr. BENDER. Right.

Mr. BURTON. When you talk to them, and I have talked to a number of them about mercury, they say, hey, that is scientific research and the ADA says that, and that is gospel. So until the ADA changes and starts giving them facts as we see them, I don't think they are ever going to accept that. It is not because they are not good people, it is just that is what they are getting.

Mr. BENDER. Well, the only other pressure point we had, Representative Burton, I was a party in the lawsuit against the FDA to classify mercury as a medical device, and that is where we are starting to see a chink in the armor where the FDA, as you quoted, from their new information on their Web site, is now saying, admitting it is a neurotoxin. So I think we can also push on the FDA. Thank you.

Mr. BURTON. Mr. McCormick.

Mr. MCCORMICK. Yes, I was 17 years—among my other job duties—I was a credentialed enforcement officer with the Agency. I worked a lot of criminal cases as well as civil cases, and I have been cross-examined by some of the best environmental attorneys out there.

I am an expert on the pretreatment regulations that cities have to comply with and that part of the Clean Water Act. If you want to keep it out of the sewer, the regulations are in place.

The ADA can disagree, but 40 C.F.R. 403.2 says here are the objectives of the pollution pretreatment program, and it very clearly establishes that you can't cause problems with surface waters or any other environmental criteria.

You know, again, my frustration is all we have to do is say let's enforce the regulations. That is what Region 8 strategy said, said where there is a problem you have to control it, and this is what it says in the pretreatment regulations implementing the Clean Water Act.

It is not a gray area. OK, I have been on the stand. I have been grilled on pretreatment regulations. I am very well aware of the preambles to them, so I guess that is all I have to say. The tools are there.

Mr. BURTON. In 40 C.F.R. What?

Mr. MCCORMICK. 403.2—it is the objectives of the general pretreatment regulations. The tools are there. The regulations are there. What I was trying to do was take a document and provide

technical guidance to State and local governments that said, and it is guidance, OK, it is not even rules. It said, here is a good way of doing it. OK. Here is a way to approach reducing mercury discharges to a sanitary sewer system when you have a problem with mercury.

Very simple. I mean, it was very clear, and the ADA doesn't disagree with that, that is exactly what they admit it says.

Mr. BURTON. OK.

Mr. MCCORMICK. But it is mandatory at that point.

Mr. BURTON. Thank you, Mr. McCormick. Thank you all. Mr. Chairman, I yield back to you.

Mr. KUCINICH. Will the gentlelady yield?

Ms. WATSON. Certainly, and would you also ask the question of Mr. McCormick why did WHO ban mercury in thermometers.

I will yield.

Mr. KUCINICH. I am still wondering, Mr. Walsh, before we wrap up work on this panel, the ADA supports separation, right, of the amalgams?

Mr. WALSH. Correct.

Mr. KUCINICH. Why?

Mr. WALSH. We believe that the best environmental result is to recycle the amalgam——

Mr. KUCINICH. You don't do it because it is about recycling, it is not about contamination to wastewater being environmentally hazardous?

Mr. WALSH. Every study that has been done by NACWA, by EPA and our own studies show there is a contribution, but it is a very small, less than 1 percent contribution. We are willing to do our fair share.

Mr. KUCINICH. You then would agree that mercury contamination to wastewater is environmentally hazardous? You are just saying it is a question of the degree; is that right?

Mr. WALSH. We have never attacked the water quality standard, which is a fish tissue number or the biosolids numbers. There are a number of plants across the country where the biosolids numbers are, in fact, on average, about 3, the limit is 57. And, in many places, the water quality standard is 50 parts per trillion and the level, for example in Laramie, is 8. And the fish levels are not exceeding 0.3. Even there we think the mercury ought to be recycled, because that is the best beneficial use.

Mr. KUCINICH. Is it environmentally hazardous? That is the bottom line. You basically say yes, but you are saying the degree to which the effluent exists from dental offices isn't significant, is that your testimony?

Mr. WALSH. Yes.

Mr. KUCINICH. Why do you support recycling? Is it just because you are for recycling everything or because you think that mercury ought to be recycled?

Mr. WALSH. We think mercury—well.

Mr. KUCINICH. Why?

Mr. WALSH. The ADA hasn't taken a position on recycling in general. I personally think many more things ought to be recycled. But the mercury ought to be recycled because it is the way you can ensure that the mercury is reused. You don't have new mercury being

created, and it doesn't—even the small amount of mercury that is incinerated or otherwise gets into the environment would be lessened.

Mr. KUCINICH. You know, I was struck by your candid admission that you are not a dentist, but you are a physicist. That is very interesting.

When a piece of mercury metal is heated in air, it comes together with oxygen in the air, and then if it is weighed it is found to have a greater mass that the original piece of metal had. If, however, the mass of the oxygen of the air that combines with the metal is taken into consideration, it would be shown that the mass of the product is within the limits of accuracy of any one instrument equal to the sum of the masses of mercury and oxygen that combine.

Are you familiar with that principle?

Mr. WALSH. I am afraid, just the way——

Mr. KUCINICH. As a physicist?

Mr. WALSH. You just read something that is very complex.

Mr. KUCINICH. Are you familiar with the law of conservation matter?

Mr. WALSH. Yes, I am.

Mr. KUCINICH. As a physicist.

Mr. WALSH. Yes, I am.

Mr. KUCINICH. As a physicist, do you see any relationship between mercury deposits in land and air as a function of the law of conservation and matter, of matter?

Mr. WALSH. All the studies I have seen show that the levels in the environment are related primarily to air emission levels. The Everglades study, the Metallica study, various other studies. It is emissions in an oxidized form that ends up creating the methylated mercury that is accumulating in fish.

Mr. KUCINICH. Does the law of conservation matter, or does it not say that during an ordinary chemical change there is no detectable increase or decrease in the quantity of matter?

Mr. WALSH. Mercury is an element. It is the same amount no matter what happens——

Mr. KUCINICH. So what happens to the mercury when it goes down the drain?

Thank you. You are a physicist, and I am glad you showed up.

This panel is appreciated, and dismissed.

Mr. KUCINICH. I will ask the individuals who are here from the second panel to come forward. Are there any physicists on this panel? Anybody? Do we have a physicist? Is there a physicist in the house? Let's get started.

Well, since you are all standing.

[Witnesses sworn.]

Mr. KUCINICH. Thank you. The witnesses have been sworn. Let the record reflect that the witnesses have answered in the affirmative.

I am going to introduce them now, and we will proceed with our second panel.

Ms. Pat Magnuson is an industrial waste compliance investigator for King County in the State of Washington, and which, of course, includes Seattle.

She was responsible for coordinating the implementation of the county's plan to control dental office wastewater discharges. She also issues permits for and conducts inspections of a wide range of industrial dischargers to the county's sewage treatment plants.

Ms. Ann Farrell is a Director of the Central Contra Costa County Sanitary District Engineering Department. Recently she has been heading up pollution prevention activities aimed at reducing the amount of mercury entering the wastewater treatment facility and eliminating the need for costly mercury removal projects.

This source control program recently completed the implementation of a very successful mandatory amalgam separator program for the dental community.

Dr. Mark Smith, Deputy Director of the Massachusetts Department of Environmental Protections, Office of Research and Standards. Dr. Smith is the cochair of the New England Governors and Eastern Canadian Premiers Task Force. Dr. Smith has been published numerous times in the areas of environmental policy, molecular epidemiology, genetic markers of susceptibility and risk assessment. He has been involved in mercury as well as environmental research for over 15 years.

Mr. Owen Boyd is the CEO and principal founder of Solmetex. Under his direction Solmetex became the first water treatment company to migrate biopharmaceutical separation science to wastewater applications, and is also the first company to launch nanotechnology into water treatment fields. Mr. Boyd also coauthored a 2003 paper entitled Environmental Concerns of Dental Mercury. He has received numerous awards for his work, including the EPA's Environmental Technology Innovator Award.

The witnesses have been sworn. We will go to Ms. Magnuson for an opening statement.

As I indicated to the last panel, please keep your statements under 5 minutes in length. Your entire written testimony will be included in the record of the hearing, and you may proceed. Thank you.

STATEMENTS OF PATRICIA MAGNUSON, INDUSTRIAL WASTE INVESTIGATOR, KING COUNTY, SEATTLE, WA; ANN FARRELL, DIRECTOR, ENGINEERING DEPARTMENT, CENTRAL CONTRA COSTA COUNTY SANITARY DISTRICT; DR. C. MARK SMITH, DEPUTY DIRECTOR AND CO-CHAIR, MASSACHUSETTS DEPARTMENT OF EPA, NEW ENGLAND GOVERNORS AND EASTERN CANADIAN PREMIERS TASK FORCE; AND OWEN BOYD, CEO, SOLMETEX

STATEMENT OF PATRICIA MAGNUSON

Ms. MAGNUSON. Mr. Chairman and members of the subcommittee, thanks for this opportunity to tell our story.

King County operates the major wastewater treatment system for the metropolitan Seattle area, including two large treatment plants with average flows of over 200 million gallons per day. We discharge treated effluent in the Puget Sound, a sensitive marine waterway. One hundred percent of the residual solids from our treatment plants, known as biosolids, are reused beneficially in wheat and hop fields in Washington, on forest lands in the Cascade

Mountains, and in a composted product available for landscaping. We control the source of contaminants into our system by means of our industrial waste pretreatment program and extensive work with small businesses and households.

Most mercury that enters our system ends up in the biosolids, even though our marketability. Even though our biosolids currently meet all Federal and State regulations for mercury, our concerns for future marketability of these solids drives our efforts to continuously make them cleaner. And, also, the potential for stringent mercury limits in the future is also a concern.

Under an agreement with the Seattle-King County Dental Society we conducted an extensive collaborative program from 1995 through 2000 to promote voluntary compliance. We encouraged purchase and installation of amalgam separator units, which showed they could meet our limit for mercury. And the results, after 6 years, were that 24 dental offices out of approximately 900 had installed the amalgam separators.

In 2001, in consultation with the local dental society, we decided that the voluntary program had failed and notified the local dentists that they would be required to meet our local discharge limits of 0.2 milligrams per liter total mercury. Using our existing authority we gave them the choice of installing separators or applying for a permit and proving they meet our limits without a separator, and we gave them 2 years to meet compliance.

During that time, we provided extensive outreach to the dental offices, including technical assistance site visits by staff from the Public Health Seattle-King County to every office in the county. Local dentists did not fight this requirement but rather sought practical information about purchasing the separators and got on with the task.

After the compliance date, approximately 750 additional dental offices had installed the amalgam separator units with the remaining offices quickly following suit by the end of 2003.

Since 2003, we continued to perform outreach to the dental community through letters and the dental office Web pages. Compliance rates are determined through ongoing compliance inspections and by monitoring the amount of mercury in the biosolids.

In conclusion, the voluntary program did not result in a significant change in King County. When separators were mandated, compliance happened quickly, dramatically and with little resistance.

Partially as a result of this initiative, mercury levels in King County biosolids have dropped by about 50 percent, and this represents about 75 pounds of mercury that are kept out of our biosolids each year.

Then I am going to go to the attached slides, and the first one graphically demonstrates the number of amalgam separator units sold in our county during the voluntary phase from 1995 through 2000 and the 2-year transition period from 2001 to 2003, during which they were required to be in compliance.

Slide 2, and this provides an interesting look at two different areas within King County that received technical assistance visits from the public health inspectors, and the chart on the left is the number of amalgam separator units installed within our source

service area, which is only a portion of King County. And this is where our pretreatment regulations apply and compliance was mandatory.

The chart on the right includes all other dentists in King County, and there are areas served by other sewer districts or on septic systems, and our regulations did not apply to those dentists.

All dentists received the same visits and information packets by public health inspectors, but the dentists outside our service area didn't receive our mailing and were told it is not mandatory.

Slide 3, that just presents the annual median concentration of mercury in our biosolids from 2000, the last year before we introduced our mandatory program, till now. And that shows about the 50 percent decline, and that remained there.

Finally, I would like to close by saying that we were able to work with the local dental community and citizens of our county using existing regulations, and to develop a relatively low-cost method of achieving measurable reductions of mercury in our biosolids. Other communities have found different approaches that better met their particular needs, and local communities need to have the flexibility to address this issue in the manner that will work with them.

[The prepared statement of Ms. Magnuson follows:]

King County

Wastewater Treatment Division
Industrial Waste Program
Department of Natural Resources and Parks
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
206-263-3000 Fax 206-263-3001
TTY Relay: 711

Testimony of Patricia Magnuson, King County, Washington, before the U.S. House of Representatives, Domestic Policy Subcommittee of the Oversight and Government Reform Committee, at its hearing on *Assessing State and Local Regulations to Reduce Dental Mercury Emissions*, held July 8, 2008.

Mr. Chairman and members of the Subcommittee, my name is Patricia Magnuson and I am an Industrial Waste Investigator for King County's Department of Natural Resources and Parks, based in Seattle, Washington. King County operates the major wastewater treatment system for the metropolitan Seattle area, including two large wastewater treatment plants with total average flows of 200 million gallons per day. We discharge treated effluent into Puget Sound, a sensitive marine waterway. One-hundred percent of the residual solids from our treatment plants, known as biosolids, are reused beneficially in wheat and hop fields in Eastern Washington, on forest lands in the Cascade Mountains, and in a composted product available for landscaping. We control sources of contaminants into our system by means of our industrial pretreatment program and extensive work with small businesses and households.

Toxic metals, including mercury, don't go away or get magically "treated" in wastewater treatment plants; rather, they either settle out into the solids or are discharged in the water effluent. Most mercury that enters our system ends up in the biosolids. Even though our biosolids currently meet all federal and state regulations for mercury, our concerns for future marketability of these solids drives our efforts to continuously make them cleaner. The potential for more stringent mercury limits in the future is also of concern.

Under an agreement with the Seattle-King County Dental Society, we conducted an extensive, collaborative program from 1995 through 2000 to promote voluntary compliance. We encouraged purchase and installation of amalgam separator units, which research showed would allow dentists to meet King County's local mercury limit. The results after six years were that 24 dental offices, out of approximately 900, installed amalgam separators.

In 2001 King County, in consultation with the local dental society, decided that the voluntary program had failed and notified local dentists that they would be required to meet our local discharge limit of 0.2 milligrams per liter (or parts per million) total mercury. Using our existing authority, we gave them the choice of installing separators or applying for a permit and proving they meet our limits without a separator. We gave them two years to meet compliance – until July 1, 2003.

We provided extensive outreach to the dental offices, including technical assistance site visits by staff from Public Health–Seattle & King County to every office in the county. We provided monetary incentives via vouchers reimbursed at 50 percent of costs up to $500. We worked closely with the local dental society as they held trade fairs and technical workshops. Local dentists did not fight this requirement but rather sought practical information about purchasing separators and got on with the task. After the compliance date approximately 750 additional dental offices (more than 85 percent) had installed amalgam separator units, with the remaining offices quickly following suit by the end of 2003. In 2004, 97 percent of the dental offices in our service area were in compliance with our regulations.

Since 2003, we continue to perform outreach to the dental community through letters and the dental office Internet pages. Compliance rates are determined through on-going inspections and by monitoring the amount of mercury in the biosolids.

In conclusion:

- Mercury is best controlled at the dental office, not at the wastewater treatment plant. Control at the source is the best way to manage such toxic metals.
- A voluntary program did not result in significant change in King County. Once separators were mandated, compliance happened quickly, dramatically, and with little resistance.
- Amalgam separator units are effective at removing 95 percent of mercury; they are readily available, low tech, reasonably priced, and easily installed and maintained.
- Partially as a result of this initiative, mercury levels in King County biosolids have dropped by 50 percent. This represents approximately 75 pounds of mercury that are kept out of our biosolids each year.
- The attached slides illustrate King County's experiences:
    1. Slide one graphically demonstrates the number of amalgam separator units sold in our county during the voluntary phase from 1995 through 2000, and the two year transition period to the dental offices being required to be in compliance, during which each dental office received technical visits by Seattle–King County Public Health inspectors informing them of the regulations and assisting as needed.
    2. Slide two provides an interesting look at two different areas within King County that received the technical assistant visits from the public health inspectors. The chart on the left is the number of amalgam separator units installed within our sewer service area, which takes in a portion of western King County, primarily the urban areas of Seattle and surrounding cities. This is where our pretreatment regulations apply and compliance is mandatory. The chart on the right includes all other dentists in King County's eastern and southern regions. These dentists are in areas served by other sewer districts or are on septic systems. Our regulations do not apply to these dentists. All the dentists received the same technical assistance visits by the public health inspectors, including receiving copies of our dental office

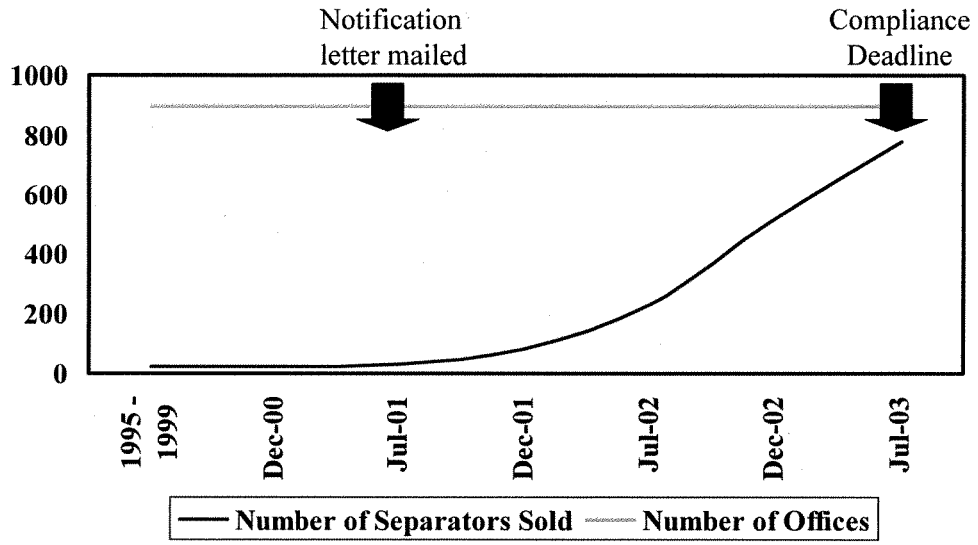
fact sheet. The dentists outside our service area, however, did not receive our initial mailing informing them of the new requirements. They were generally told the installation of amalgam separator units was desirable, but not mandatory. You can see the difference in installation rates – 93 per cent where mandatory versus 44 per cent where voluntary.

3. Slide three presents the annual median concentration of mercury in our biosolids from 2000, the last year prior to our initiation of the visits and notification of the requirements, to 2004, the first full year after compliance became mandatory. The concentration of mercury declined about 50 percent and has remained at that point for the last few years.

Finally, I would like to close by saying that we were able to work the local dental community and citizens of our county, using existing regulations, to develop a relatively low cost method of achieving measurable reductions of mercury in our biosolids. Other communities have found that different approaches have better met their particular needs. Local communities need to have the flexibility to address this issue in a manner that will work best for them.

Thank you for the opportunity to testify today. I would be happy to answer any questions from the committee members.

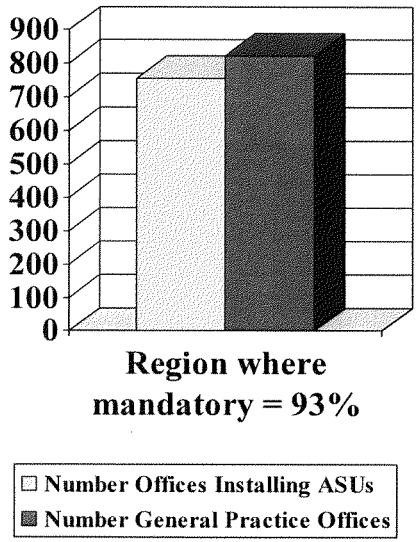
Amalgam Separator Sales Data

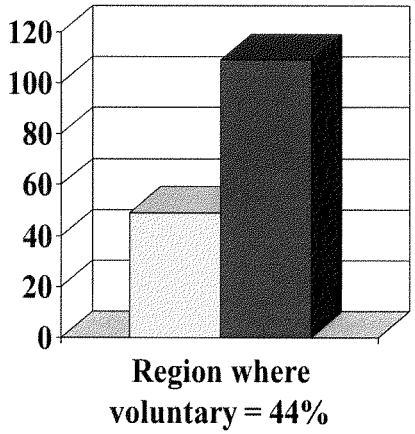


Source: Sales data supplied by manufacturers of ASUs

King County

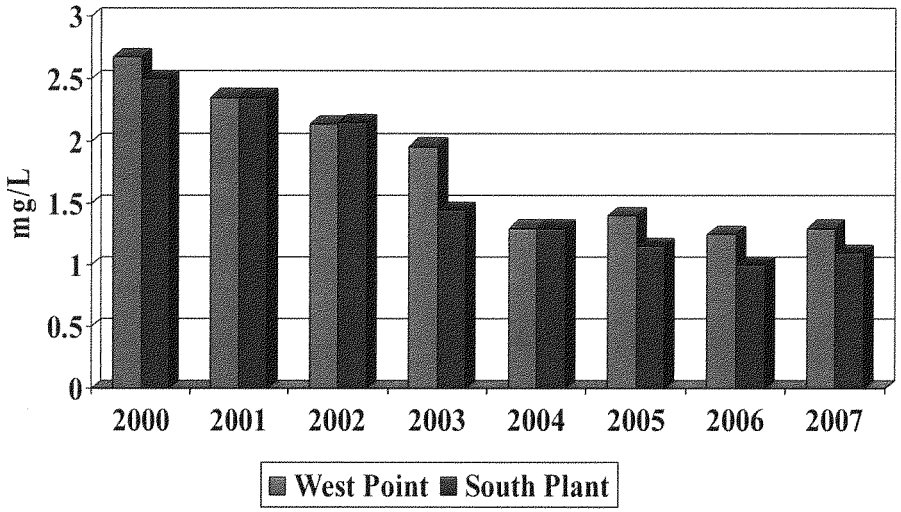
Differences In ASU Installation Rates Within King County – December 2003





King County

Annual Median Mercury Concentration in Biosolids



King County

King County

Wastewater Treatment Division
Industrial Waste Program
Department of Natural Resources and Parks
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
206-263-3000 Fax 206-263-3001

Managing Wastewater from Dental Offices
King County, Washington's Experience

Background for testimony presented by Patricia Magnuson, King County Department of Natural Resources and Parks, Seattle, Washington before the U.S. House of Representatives Domestic Policy Subcommittee of the Oversight and Government Reform Committee at its hearing, *Assessing State and Local Regulations to Reduce Dental Mercury Emissions,* held on July 8, 2008.

King County's Wastewater Treatment System: An Overview

King County operates a regional wastewater collection and treatment system with two major treatment plants. The system protects water quality and prevents water pollution by providing wastewater treatment. The 420-square mile service area includes metropolitan Seattle, most of urbanized King County, and parts of south Snohomish County. The wastewater treatment system, with an average flow of 200 million gallons per day, serves approximately 1.4 million people. Ninety-five percent of the flow comes from residential homes and small businesses and five percent from industrial sources. The treatment system serves an estimated 1,400 general practice dentists in 900 general practice dental offices.

King County's wastewater treatment system discharges treated effluent into Puget Sound, a sensitive marine waterway. Residual solids from the county's treatment plants known as biosolids are land-applied on wheat and hop fields in Eastern Washington and on forestlands in King County. Some are sold as a composted product available for landscaping.

Wastewater treatment plants aren't designed to handle toxic metals, like mercury. Heavy metals that enter the treatment system don't go away, or get magically "treated." Rather, these metals collect in the sewer lines, settle out in the solids, or are discharged in the water effluent (to Puget Sound). Most mercury entering King County's treatment system ends up in the biosolids. King County actively controls contaminants, including mercury, from entering the wastewater system by means of a major industrial pretreatment program and extensive work with small businesses and households.

While King County's biosolids currently meet all federal and state limits for mercury, an ongoing need to protect the future marketability of these solids drives the county's efforts to continuously make them cleaner. In addition, the possibility of more stringent mercury effluent limits, such as those imposed in the Great Lakes region, motivates King County's efforts to remove this contaminant at the source.

1991-2000: Attempts to Manage Mercury Discharges from Dental Offices

Attention turned to dentists in the early 1990s when the Washington State Department of Ecology noted occasional high levels of mercury in the King County wastewater treatment system and required Metro, the wastewater treatment agency (now King County), to reduce discharges of mercury at the source. Because of their numbers, King County considered dental offices to be a potentially significant source of mercury, and a 1991 King County study confirmed that the dental sector was indeed a "significant and identifiable" source of mercury to the wastewater system.[1] (These findings have subsequently been corroborated in other municipalities.[2])

Pollution source control in a dental office means settling or otherwise capturing mercury-bearing amalgam particles from wastewater before discharge to the sewer system. In the early 1990s, only a few amalgam separation units—manufactured in Europe—were available. During the period 1991-1994, Metro (now King County) reviewed available amalgam separation units for their effectiveness, developed a set of considerations by which to evaluate separation units, and published a hazardous waste guidebook for dentists.

1994: Proposed "Rule" Mandating Amalgam Separators. In early 1994, Metro/King County proposed a rule requiring dental offices to install amalgam separation equipment to demonstrate compliance with local discharge limits for mercury, 0.2 milligrams per liter (mg/L). Due to a number of factors, including information received during the public comment period and pressure from organized dentistry, Metro/King County decided to forego the rule. Instead, the agency agreed to work cooperatively with the dental community to achieve voluntary compliance:

"...the King County Department of Metropolitan Services (Metro) has decided to postpone promulgating the rule. Rather than establish the mechanisms required for regulatory compliance, Metro will promote voluntary compliance by continuing to work cooperatively with the dental community.

"Many dental offices have already installed amalgam separation units and we expect this practice to continue without a formal regulatory requirement. We believe this decision is in our community's best interest because it is cost effective and protects our environment. If information contradicts this decision in the future, we will reconsider promulgation of a rule at that time."[3]

---

[1] Metro (1991). (Municipality of Metropolitan Seattle) (now King County). Report titled Dental Office Waste Stream Characterization Study. Contact: Cynthia Balogh at 206-263-3075 or cynthia.balogh@metrokc.gov.

[2] Chapman, P. and McGroddy, S. (n.d.). Report titled Bioavailability of Mercury from Dental Amalgam. Contact: Capital Regional District, 524 Yates Street, P.O. Box 1000, Victoria, British Columbia V8W 2S6 Canada.

[3] Grigsby, D. (1995) Director, Water Pollution Control Department, Municipality of Metropolitan Seattle. Memo dated February 3, 1995.

One reason for postponing the rule was that amalgam separators developed in Europe were not readily available on the West Coast. Given more time, the county assumed that separators would become more available; they would be cheaper, more effective, better serviced, and more reliable.

In addition, dentists expressed interest in voluntarily controlling their mercury discharges—*if given time to do this.* The local dental society expressed a willingness to collaborate on the issue.

1995-2000: Outreach, Education, and Voluntary Compliance. In collaboration with the local dental society, King County conducted an extensive outreach program to promote voluntary compliance in the management of amalgam wastes and wastewater during the period 1995-2000. Specifically, the Seattle–King County Dental Society and the King County Hazardous Waste Management Program worked on a variety of fronts to educate dentists about the need to properly manage amalgam wastes and to install amalgam separators. Activities during the six-year period include:

- Articles and paid advertisements in the Seattle–King County Dental Society *Journal*;
- *Handling Dental Wastes Poster* (seven editions), mailed to all members of the society;
- *Dental Waste Management Guidebook*, developed, published, and provided to all dental offices;
- Presentations/workshops at dental conventions, study groups, and society meetings;
- Cash rebates (subsidized by the county) for purchase of amalgam separators;
- Newspaper articles acknowledging "green" dentists;
- Outreach to dental supply companies;
- Curriculum prepared for dental assistant/hygienist training programs; and
- Technical assistance visits to dental offices.

Of special note, the county, the dental society, and three hazardous waste service providers collaborated to provide a one-time *free* waste pick up for dental offices in 1999. The county underwrote pick up and disposal costs, the society promoted the project and screened applicants, and the waste haulers offered a special rate. An ongoing county voucher incentive program provided matching funds (in the form of rebates) to dental offices that purchased amalgam separators and/or contracted with waste management service providers.

As a result of these efforts, the Seattle–King County Dental Society won a "Golden Apple" award from a professional association and a Waste Information Network Environmental Achievement Award.

2000: Evaluation of the Voluntary Program. In 1999-2000, 212 dental offices in several representative zip code areas in King County received visits by King County staff to assess disposal practices for amalgam and other wastes. In addition, manufacturers of amalgam separation equipment provided sales data about installations of separators. These data provide

a basis to evaluate whether the voluntary compliance program was effective. Results are summarized in a King County report.[4]

Briefly, the study showed that less than half of King County dentists collected and properly disposed of their waste amalgam solids—38 percent properly handled scrap amalgam, 27 percent properly handled amalgam from chairside traps, and only 13 percent properly handled amalgam in pump filters.

More significantly, only 24 of an estimated 900 dental offices had installed amalgam separators—that is, less than three percent of offices needing separators had installed them.

In 2001, King County, in consultation with the Seattle–King County Dental Society, concluded that the voluntary program had failed. King County then notified dentists that they would be required to meet local discharge limits of 0.2 milligrams per liter (mg/L) total mercury.

2001-2003: King County Dentists Required to Meet Discharge Limits

Because the voluntary program failed to achieve compliance in managing dental wastewater—less than three percent of dental offices had installed separators—King County established a mandatory compliance schedule for dental offices in June 2001. This schedule required dental offices to comply with existing local discharge limits for mercury by July 1, 2003.

Decision-making. Before that notification, the county assessed four alternatives to obtaining compliance from the dental community:

1. Continue with the voluntary program.
2. Require compliance with the existing regulations.
3. Promulgate a rule requiring that each dental office install an amalgam separator.
4. Issue a general permit to discharge that would require the installation of an amalgam separator.

Briefly, requiring compliance with existing regulations was chosen because it was the most direct way to achieve compliance without creating redundant legislation as would occur if a new rule was promulgated or generating additional paper work associated with issuing a general permit. The voluntary program had proved to be ineffective.

The decision to regulate the dentists was made because King County, as a delegated pretreatment program, is required to enforce its regulations by state (RCW 35.58) and federal laws such as the Clean Water Act (33 U.S.C. 1251) and General Pretreatment Regulations (40 CFR 403). Additionally, the marketability of biosolids is of critical importance to King County. (A mandated goal is "to improve opportunities for recycling and reclamation of wastewater and biosolids." [K.C. Code 28.81.020]) King County land-applies approximately 110,000 wet tons of biosolids each year at a cost of $35 per wet ton. If biosolids weren't land-

[4] Local Hazardous Waste Management Program in King County (2000). Management of Hazardous Dental Wastes in King County, 1991-2000. King County Department of Natural Resources, Seattle, Washington.

applied, the cost to landfill them would rise to an estimated $90 plus hauling costs per wet ton. Public perception and future regulatory uncertainty make it imperative that King County use its resources to continually improve the biosolids quality.

Notification: In July 2001, King County informed dental offices served by the King County treatment system that they must comply with local discharge limits for mercury (0.2 mg/L). Letters and fact sheets with instructions on how to meet the limits were sent to all dentists. In addition, the Seattle–King County Dental Society inserted a copy of the fact sheet in their July newsletter.

From August 2001 to July 2003, inspectors from Public Health–Seattle & King County, working as part of the Local Hazardous Waste Management Program, visited King County dental offices to explain the regulations and to assist dentists in getting their practices into compliance. In December 2003, inspections to determine the compliance status of dental offices began; a portion of dental practices continue to be inspected each year.

Compliance Requirements: In King County, a dental office can demonstrate compliance with sewer limits if it: a) follows Best Management Practices (BMPs) for amalgam wastes (these are detailed in the fact sheet); b) properly handles used X-ray fixer; and c) installs amalgam separation equipment approved by King County *or* obtains a permit to discharge in King County. (In most cases, dental offices that apply for a permit must sample their wastewater to demonstrate that it meets the local limit for mercury.) Fact sheets, permit applications, and other documents are available on the King County Internet site.[5]

Exempt Specialties: King County specifically exempts certain specialties from the requirement of installing an amalgam separator or obtaining a permit. These are periodontics, orthodontics, oral pathology/oral medicine, oral and maxillofacial surgery, radiology, and prosthodontists and endodontists that do not place and remove amalgam as a courtesy for their clients. Dentists that place or remove amalgam on three days or less each year are also exempt. (This latter exemption most often applies to pediatric dentists that don't place amalgams.) While dental offices that fall under the exemption don't need to install a separator or apply for a permit, they must follow BMPs, and they may be inspected.

Assistance to Dentists: Compliance assistance was provided to the King County dental community in a number of ways. As noted above, inspectors from Public Health–Seattle & King County, working as part of the Local Hazardous Waste Management Program, visited every dental office to explain the regulations and provide other technical assistance. This face-to-face contact appeared to be helpful in promoting proper management of a number of wastes of interest to King County in addition to amalgam wastewater (e.g., X-ray fixer containing silver, amalgam scrap, lead foils, and instrument sterilants).

---

[5] See King County Internet site at http://dnr.metrokc.gov/wlr/indwaste/dentists.htm

The Voucher Incentive Program—essentially a matching fund rebate program subsidized by the county was used to promote the purchase of amalgam separators during the first year of the program. (It was discontinued in 2003.) Approximately 371 vouchers (totaling $162,000) were redeemed by dentists to buy amalgam separators.

King County maintained an Internet site explaining the regulations and compliance requirements.[6] Amalgam separators approved by the county were listed on the site, and a list of hazardous waste management firms was provided. A permit application could be downloaded from the site.

The Seattle–King County Dental Association provided regular information about requirements in its monthly newsletter and held two dinner meetings at which separator manufacturers introduced their products. The manufacturers of amalgam separation equipment marketed their products through advertisements, direct mail, and dental supply firms.

Results of Mandatory Program: The deadline for dental offices to achieve compliance with King County's local limit for mercury was July 1, 2003.

Aggregate sales data from manufacturers of amalgam separators indicate that more than 775 dental offices had installed amalgam separators as of July 1, 2003. (This is more than 85 percent of the 900 dental offices estimated to need separators to meet mercury discharge limits.) Purchases of amalgam separators by dental offices rose dramatically after the July 2001 letter requiring compliance with discharge limits was sent. (See Table 1 on page 7.)

There was little, if any, resistance from the dental community about compliance requirements. The Seattle–King County Dental Society assumed a role of providing information to member dentists via its newsletter and meetings. The Washington State Dental Association requested clarification about particular legal requirements. Individual dentists, for the most part, were interested in the practical issues of how, where, and what type of separators to buy.

As of the compliance date, King County had received fewer than 20 applications for permits from dental practices that did not feel that they needed to install an amalgam separator. One dentist was issued a permit and the rest were issued letters of exemption, as they did not readily fit into any category.

2003 to Present: Program Maintenance

In December 2003, King County started conducting random compliance inspections with a budget of $55,000 the first year. The county continues to maintain the program with existing staff and at a minimal cost by inspecting a certain percentage of dental offices each year, handling these inspections in conjunction with other field work.

---

[6] See King County Internet site at http://dnr.metrokc.gov/wlr/indwaste/dentists.htm

In addition, the Dental Office Waste Fact Sheet was revised in 2006. The county continues to perform outreach to the dental community through letters and the dental office Internet pages. Compliance rates are determined through on-going inspections and by monitoring the amount of mercury in the biosolids.

King County's dental waste program served as a model for the Washington State Department of Ecology and Washington State Dental Association, *Memorandum of Understanding*, a two-year program to encourage mercury reduction from dental offices statewide. The dental waste program also serves as a model for numerous other pretreatment programs' dental waste projects both in and out-of-state.

Since the dental program was initiated there has been a 50 percent reduction in the amount of mercury in King County biosolids from 2000, the year before mandatory requirements were announced (mercury concentration averaged 2.6 mg/L), to 2004, the year after compliance was mandatory (mercury concentration averaged 1.3 mg/L). This decline in the annual median concentration of mercury in the biosolids leveled out in 2005 and currently remains between 1.1 mg/L and 1.4 mg/L at each plant, which represents approximately 75 pounds of mercury removed each year, when compared to 2000.[7]

Table 1 Dental Offices Installing Separators in King County

1994 – 1999	24	
Jan – Dec 2000	2	
Jan – Jun 2001	5	
Jul – Dec 2001	53	Notification letter mailed, July 2001
Jan – Jun 2002	150	
Jul – Dec 2002	286	
Jan – Jun 2003	259	Compliance deadline, July 2003
Total	779	

[7] There are currently insufficient data to determine causality and trends for this noted reduction of mercury in the biosolids.

King County

Wastewater Treatment Division
Industrial Waste Program
Department of Natural Resources and Parks
130 Nickerson Street, Suite 200
Seattle, WA 98109-1658
206-263-3000 Fax 206-263-3001

July 14, 2008

Supplemental testimony provided by Patricia Magnuson, King County Department of Natural Resources and Parks, Seattle, Washington to be considered by the U.S. House of Representatives Domestic Policy Subcommittee of the Oversight and Government Reform Committee for its hearing, *Assessing State and Local Regulations to Reduce Dental Mercury Emissions,* held on July 8, 2008.

Mr. Chairman, Mr. Burton, Ms. Watson, and Members of the Subcommittee, thank you for the opportunity to share King County's experience regulating dental offices with you last Tuesday. Please accept this supplemental testimony for your consideration.

King County's decision to require that dentists comply with existing regulations was made based on our regulatory obligations as a delegated pretreatment program, and qualitative environmental and program objectives that include maintaining the ability to recycle 100 percent of the biosolids produced by King County wastewater treatment plants. A detailed cost-effectiveness evaluation of the decision was not done at the time.

However, as submitted in prior documents, the marketability of biosolids is of critical importance to King County. (A mandated goal is, "to improve opportunities for recycling and reclamation of wastewater and biosolids." [King County Code 28.81.020]) King County land-applies approximately 110,000 wet tons of biosolids each year at an estimated cost of $12.50 plus hauling costs per wet ton (in prior submittal this number was listed as $35, which included estimated hauling costs). If biosolids weren't land-applied, the cost to landfill them would rise to an estimated $90 plus hauling costs per wet ton. Public perception and future regulatory uncertainty make it imperative that King County use its resources to continually improve the biosolids quality.

During the hearing, it was mentioned by another party that the regulatory limit for mercury in biosolids was 57 milligrams per kilogram (mg/kg). That limit is the maximum (or ceiling) concentration that must not be exceeded for land application found in Table 1 of 40 CFR 503.13. In Table 3 of 40 CFR 503.13, the pollutant concentration limit for mercury is 17 mg/kg. By meeting Table 3 pollutant concentration limits, programs can land-apply biosolids without the burden of tracking cumulative pollutant loading limits.

King County prides itself on operating a nationally recognized program to land apply biosolids. Our program is successful because of our collaboration with environmental groups and our efforts to inform the general public and property owners of King County's commitment to maintain the high quality of our biosolids. Public support of biosolids is critical for successful land-application programs, and public perception of biosolids quality can adversely affect an otherwise successful program. Prior to the installation of amalgam separators by our dental community, our mercury concentrations were around 2.6 mg/kg. While that was significantly below the Table 3 pollutant concentration limits for unrestricted land application, our stakeholders would expect us to take the opportunity to further reduce the mercury concentration through all available means. Measurable reductions were achieved through simply requiring dental offices to be in compliance with our existing regulations, which was most often achieved by the dentist installing an amalgam separator pretreatment unit.

Finally, I would like to reiterate that while the county considers our program a success, local communities need to have the flexibility to develop their own mercury waste reduction policies. The county's Wastewater Treatment Division supports the National Association of Clean Water Agencies' position against legislation for this group at the federal level.

Submitted by: Patricia Magnuson

Patricia Magnuson
King County Department of Natural Resources and Parks

Mr. KUCINICH. Thank you very much.
Ms. Farrell.

STATEMENT OF ANN FARRELL

Ms. FARRELL. Good afternoon, Mr. Chairman, Ms. Watson and Mr. Burton. I am Ann Farrell, Director of Engineering for Contra Costa Sanitary District, a special discharge district in Martinez, California. We are responsible for the collection and treatment of wastewater for approximately 450,000 residents and more than 10,000 businesses in central Contra Costa County, which is directly east of Oakland and San Francisco.

I appreciate this opportunity to discuss our successful program to require dentists in our service area to install amalgam separators and reduce the mercury entering the San Francisco Bay.

The San Francisco Bay is impaired for mercury. As the development of the total maximum daily load of allowable mercury for the San Francisco Bay was occurring, it became clear to us in late 2003 that significant reductions in our mercury load to the bay would be required.

We knew from previous studies that 50 percent of our influent mercury was coming to us from dental offices. We had tried in the past to implement mandatory programs, but the dental community had approached our elected board, and we did not obtain board support.

This time we wanted to try a different approach and enlist the support and cooperation of the dental community so that we could be successful in implementing an amalgam separator program. We developed outreach materials, and we were basically trying to acquire informed consent, which was mentioned earlier. We wanted to document the changes in the regulatory climate and our potential regulatory risk, as well as our legal authority, to regulate the dental community. And we began meeting with the local and State dental societies.

Once we began educating the societies themselves we received a great deal of cooperation from the Contra Costa Dental Society and the California Dental Association and particularly from Patricia Conley, Roseanne Harding and Theresa Pichay, who worked with us hand-in-hand throughout this process.

In 2004, we began with a survey of the dental practices in our service area to obtain accurate inventory of the best management practices they were utilizing. The best management practices were voluntary, but the survey was required so that we could get accurate information.

After analyzing the information we obtained, we observed that while many BMPs were being used, which accounted for basically general and good housekeeping, very few of the dentists had installed amalgam separators, less than 15 percent. During that time, as we monitored our influent mercury, we found that the mercury had stayed about the same.

We continued our outreach efforts to the dental community and shared the results of our inventory.

At each of our meetings, the majority of the dentists were very supportive. They acknowledged that it was relatively inexpensive for them to install the amalgam separator equipment, and they un-

derstood that it would significantly reduce their mercury discharge to the environment, but they further suggested that it could be a competitive disadvantage and that they—it was not likely they would make the investment unless a program that was mandatory was implemented.

During this same time period we continued with the carrot, not the stick approach. We took the opportunity to recognize any dental practice that voluntarily installed an amalgam separator through our annual pollution prevention awards program. However, during this time, this recognition was only conferred upon 13 dentists of the approximately 300 to 400 dentists in our service area.

Based on the continued series of meetings and discussions with the local and State associations, we determined that it was necessary to go back to our board and recommend a formal and mandatory dental amalgam program.

At that time, because we had the endorsement of the local and State dental societies, our elected board adopted an enforcement program in April 2006. We then began the implementation of the program and the actual permitting of materials, and we continued to partner with the local and State dental societies. We allowed them to review the draft copies of our permits and provide input.

The permit requires self-certification. In other words, the dentist certifies that he has installed an amalgam permit—an amalgam separator.

We mailed the permits in three batches, and the compliance dates were staggered because we had learned from other municipalities and States that the dentists had been charged outrageous sums to comply with the deadlines by some of the plumbers. And so we wanted to give them plenty of time and stagger deadlines so that they could negotiate with their plumbers, with their amalgam separator suppliers and have reasonable costs.

The mandatory permit and certification process was completed in about 10 months. After the final deadline of December 31, 2007, had passed, only a few dentists had not submitted the required forms. Today a total of 318 dental practices have been issued a BMP permit and 314 of them have submitted the required self-certification form, for a 98 percent compliance rate.

But we also need to look at the effectiveness of the program with respect to the mercury and our influent, and I believe there is a slide that shows our influent, which you can't read, so I will explain it. And, actually, I wanted to point out an error in the slide. Where it says parts per million, it should actually be parts per billion.

But what we found is that our influent mercury concentration was reduced by over 70 percent, from 0.27 parts per billion in 2002 to 0.08 parts per billion in 2008. That is an annual average. Then our effluent, which is the mercury going into the San Francisco Bay, was reduced by 50 percent from 0.029 parts per billion in 2002 to 0.0149 parts per billion for 2008.

I also wanted to point out, if you have the written testimony, there were some discussions earlier about the removal through a treatment plant. Our treatment plant is somewhat unique in that we have incineration, and we have wet scrubbers. So the mercury

is removed from the air and goes into the wet—basically the treatment plant influent.

Because it is in the scrubber water it is dissolved. So it is more difficult to remove it because it is not a solid that settles out. So if you study the chart, you will see that we only actually got about 27 percent removal of mercury in 2002, and with our reduced numbers we have about 29 percent removal of mercury.

So the claim that you can get 90 percent removal of mercury through a wastewater plant is completely dependent on how much mercury is in the solids, because the solids are what is removed. If you have a lot of dissolved mercury, which may occur if you have an incineration process, then the mercury removal through the treatment plant is much less, and therefore the value to the environment of the mandatory amalgam separator program is that much greater because we are removing the mercury upstream before it can come in, be volatilized, be captured in the scrubber water and go out into the bay.

So, in summary, the staff and our board are very pleased with the cooperation we received from the dental community, and we feel it is a very successful program, and we are going to continue to monitor it each year, to meet them, make sure the maintenance is occurring.

And I welcome any questions when we get to the question period.

[The prepared statement of Ms. Farrell follows:]

STATEMENT OF

ANN E. FARRELL
DIRECTOR OF ENGINEERING
CENTRAL CONTRA COSTA SANITARY DISTRICT
MARTINEZ, CALIFORNIA

BEFORE THE
SUBCOMMITTEE ON DOMESTIC POLICY
OF THE
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM
UNITED STATES HOUSE OF REPRESENTATIVES

ASSESSING STATE AND LOCAL REGULATIONS
TO
REDUCE DENTAL MERCURY EMISSIONS

Tuesday, July 8, 2008

2154 Rayburn House Office Building

2:00 PM

INTRODUCTION

Good afternoon Mr. Chairman and Members of the Subcommittee. I am Ann Farrell, Director of Engineering for Central Contra Costa Sanitary District (CCCSD), a special district in Martinez, California, responsible for the collection and treatment of wastewater for approximately 450,000 residents and more than 10,000 businesses in central Contra Costa County. I appreciate this opportunity to discuss our successful program to require dentists in our service area to install amalgam separators to significantly reduce the mercury entering our treatment system and making its way to the receiving water and to the atmosphere.

BACKGROUND

The San Francisco Bay had been impaired for mercury for many years, due to the historical mercury discharges from upstream gold mining operations. The wastewater treatment facility community had long lobbied for a program to clean up acid mine drainage before focusing on wastewater discharges. However, the regulatory agencies determined that regulating point dischargers, such as wastewater treatment plants, was a more feasible solution and began development of regulatory limits to significantly reduce the amount of mercury wastewater treatment plants such as CCCSD could discharge in our effluent.

While there are many sources of environmental mercury, there are none that represent as significant a contributor to domestic wastewater treatment plants as dental amalgam wastes. In 2002, CCCSD conducted a study of the wastewater coming into our plant and found that approximately 50% of the mercury it contained was coming from dental practices. At that time we began encouraging dentists in our service area to voluntarily use Best Management Practices (BMPs) which included installing amalgam separators and other actions to minimize the amount of mercury from amalgam wastes that entered our system. We used an extensive outreach program, with pieces such as the one labeled #2 and attached to this statement, to reach out to the dentists and encourage their participation. We attempted to survey the dental community to determine the number of dentists using BMPs, but received a very poor response to our survey. CCCSD staff also explored the concept of a mandatory amalgam separator program with the local dental community and found little support. The dental community appealed to our elected Board and claimed, accurately, that dental mercury represented a very small proportion of the actual mercury in the environment. At that time, our Board was sympathetic, and instructed staff to continue with outreach materials but not to pursue any type of a mandatory dental amalgam separator program.

OUTREACH TO THE DENTAL COMMUNITY

As the development of a total maximum daily load (TMDL) for the San Francisco Bay progressed, it became clear in late 2003 that significant reductions in CCCSD's mercury load to the Bay would likely be required. Now, with the changed regulatory situation, District staff wanted to enlist our elected Board and the dental community as partners in

our efforts to reduce mercury at the source and avoid the resistance we had experienced in the past.

Staff developed additional outreach materials documenting the changes in the regulatory climate and our potential regulatory risk, and began meeting with the local and state dental societies. We received a great degree of cooperation from Patricia Conley of the Contra Costa Dental Society (CCDS) and Roseanne Harding and Theresa Pichay of the California Dental Association (CDA) and thank them for their foresight. After discussions with the dental societies and our elected Board, staff determined that a logical first step would be to conduct an inventory of all dental practices in our service area to see what BMPs were actually being followed.

In 2004, we conducted a survey of the dental practices in the CCCSD service area to obtain accurate inventory of the level of BMP implementation the dentists were employing. The use of the BMPs was voluntary but we made completion and submittal of the survey form mandatory so that we could obtain comprehensive data. After analyzing the information obtained from the survey responses, we observed that many of the BMPs were being used by most of the dental practices except that very few had installed amalgam separators; less than 15%. In addition, we found no significant change in the amount of mercury in the wastewater coming into our treatment plant between 2002 and 2004.

We continued our outreach efforts with the dental community, sharing the results of our inventory and emphasizing our anticipated more stringent mercury discharge limitation. An outreach piece used as part of the inventory program is included as attachment #3. Through the assistance of the CCDS, we were able to set up an educational seminar at one of their meetings where we could explain our regulatory situation. The CCDS and CDA arranged for the attendees to receive continuing education credits, and for a variety of amalgam separator vendors to sponsor an equipment fair at the same venue. We were able to show that equipment costs for separators had decreased and that installation costs were not prohibitive. We also emphasized that dentists should be good stewards of the environment and should advertise to their clients that they were taking extra steps to keep mercury out of the environment.

At each of our outreach meetings the majority of the dentists were supportive. They acknowledged that it was relatively inexpensive for them to install equipment that would significantly reduce their mercury discharges to the environment. They further suggested that many dentists would likely not make the investment unless a mandatory program was implemented. In a cost competitive environment, it is unlikely that any but the most serious environmentalist would disadvantage themselves by incurring a cost that their neighboring dentist did not.

During this same time period, we took the opportunity to recognize any dental practice that voluntarily installed an amalgam separator through our annual Pollution Prevention Awards Program. However, this recognition was only conferred upon thirteen dentists during the voluntary phase of the program.

Based on this series of meetings and discussions with CDA and CCDS staff and the CCDS Executive Board, District staff became comfortable that the majority of the dental community would comply with a mandatory amalgam separator program. Staff asked representatives of the CCDS and CDA to address our elected Board to demonstrate that we had worked collaboratively with the professional societies to design the program elements. We then came to the Board with a formal proposal to implement a mandatory dental amalgam program with the endorsement of the CDA and CCDS. The proposal received unanimous support from our Board in April 2006. At the same time, the Board eliminated permit fees for the class of permits that included dental practices. Our Board recognized that the reduction of mercury benefited all CCCSD ratepayers by reducing, or eliminating, the need for costly mercury removal treatment processes at the treatment plant. This decision was seen as a positive step and an indication of our desire to partner with the dental community.

DEVELOPMENT OF PERMITTING APPROACH

After achieving buy-in by the dental community and the approval of our Board, staff worked on developing the details of the approach. We determined that each dentist would receive a BMP permit which would detail a number of BMPs, including the installation of an amalgam separator. Due to the number of dental practices to be permitted (preliminary estimate in the 300-400 range), the permitting program would be phased in over a one year period in order to spread out the demand on suppliers and installers. The dentists would be asked to self certify and include some documentation that a separator had actually been installed. If the dental office did not place or remove amalgam fillings, they could apply for a permit exemption if they had not already done so during the inventory project described above. The permitting concepts were developed and reviewed with CCDS and CDA representatives and with our Board to maintain consensus on the program details as we moved forward.

IMPLEMENTATION OF PERMITTING PROGRAM

The implementation began with the development of the actual permitting materials. Again, the CCDS and CDA were provided with draft copies for input. Attachment #4 contains a sample permit letter and permit. The permit required a self-certification that an amalgam separator had been installed. The permits were mailed in three batches and the compliance dates were staggered to facilitate CCCSD workload but also to ensure that the plumbers and amalgam separator vendors would not be overburdened with all the dentists in the service area having one compliance date. The mandatory permit and certification process was completed in ten months and was complicated because of turnover of dentists at many offices. After the final deadline of December 31 2007 had passed only a few dentists had not submitted the required certification forms. Today, a total of 318 dental practices have been issued a BMP permit and 314 have submitted the required certification forms for a 98+% compliance rate. The next step in the permitting program is to begin site visits to verify proper maintenance of the separators and proper implementation of other best management practices. Our goal is to visit all offices over a 5-year period.

MONITORING TO ESTABLISH EFFECTIVENESS OF PERMITTING PROGRAM

The effectiveness of the program is demonstrated not only by percent compliance, but also by the reduction in mercury in our influent and effluent. A targeted monitoring program downstream of two sites where dental practices are concentrated has shown a significant reduction in mercury within our collection system at these locations. Our influent mercury concentration entering the treatment plant has been reduced over 70% from 0.27 parts per million (ppm) in 2002 to 0.08 ppm in 2008 (through April). Our effluent mercury concentration being discharged to Suisun Bay has been reduced by almost 50% from 0.029 ppm in 2002 to 0.0148 ppm in 2008. In addition, the variability, or range of results, for both the influent and effluent sampling has decreased since the mandatory program was initiated in 2007 (see the graphs included as Attachment #1 to this testimony).

REASONS FOR SUCCESS

Our experience has shown that a voluntary dental amalgam separator installation program does not achieve significant results with regards to dental practices installing amalgam separators. While many of the dental community are aware of their potential impact on the environment, they are not motivated to the point where they will devote the time and money to install an amalgam separator without an external driver. However, if you work with your local dental society to roll out a mandatory dental amalgam program with a reasonable time for compliance and involve dentists in the development of the program details, our experience is that the majority of the dentists will readily comply. By mandating amalgam separator installation for all, the playing field is essentially leveled with no competitive disadvantage for a dental practice to comply.

In summary, CCCSD staff and our elected Board are extremely pleased with our program. We have significantly reduced the mercury emissions to the environment with the willing cooperation of the dental community. To thank them for their efforts, we have recently sent all dental offices a letter from our Board president and we have recognized them in our customer newsletter.

ATTACHMENTS TO STATEMENT OF ANN E. FARRELL

BEFORE THE
SUBCOMMITTEE ON DOMESTIC POLICY
OF THE
COMMITTEE ON OVERSIGHT AND GOVERNMENT REFORM
UNITED STATES HOUSE OF REPRESENTATIVES

ASSESSING STATE AND LOCAL REGULATIONS
TO
REDUCE DENTAL MERCURY EMISSIONS

Tuesday, July 8, 2008

2154 Rayburn House Office Building

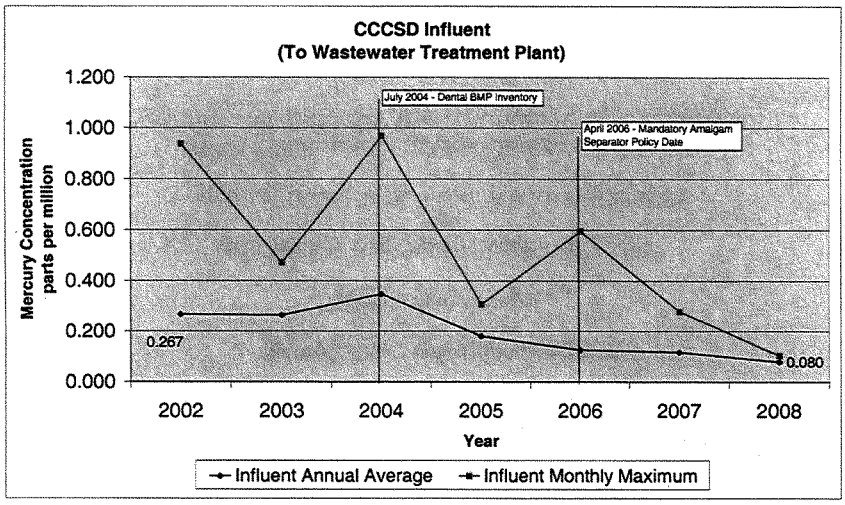
1. CCCSD Influent and Effluent mercury data from 2002 to 2008.

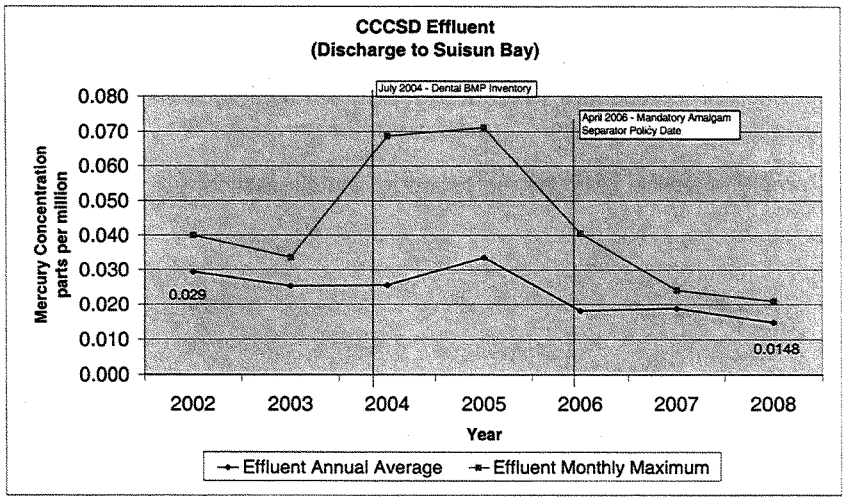
2. Initial dental outreach Best Management Practice (BMP) brochure.

3. Outreach BMP brochure sent out with Dental Inventory BMP survey.

4. Example of dental BMP permit issued to dental practice with cover letter.

Attachment 1
Ann Farrell Testimony
July 8, 2008





Central Contra Costa Sanitary District
Dental Practice Class III Wastewater Discharge Permit

Dental Practice Name: Mohamed Ali
Address: 3189 DANVILLE Blvd Ste. 110, ALAMO, CA, 94507
Responsible Party: Mohamed Ali
Effective Date of Permit: March 1, 2007
Renewal Date of Permit: January 1, 2010
Permit Fee: $0

In order to reduce the amount of mercury introduced to the District's wastewater flow, the Permittee shall comply with the following requirements:

1. Install an ISO Standard 11143 certified amalgam separator on:
   a. all vacuum lines that receive amalgam waste that directly discharge to the sanitary sewer; or
   b. the central vacuum system upstream from its connection to the sanitary sewer.

2. Certify by mail by August 31, 2007 (using the enclosed certification form) that the separator is installed, operating, and maintained according to manufacturer's specifications. A one-time extension of up to two months may be granted if the Permittee submits written justification for the extension to the District and the District approves the extension.

3. Maintain the amalgam separator(s) in accordance with the manufacturer's specifications. Keep a maintenance log per manufacturer's recommendations. Retain amalgam separator maintenance, amalgam waste generation and off-haul records onsite for five years, available for District review upon request.

4. Ensure that all appropriate staff have read and follow the District's "Dental Mercury Best Management Practices" (BMPs) that are included with this permit and available on the District website.

5. Eliminate any and all discharge of x-ray developing fixer and associated rinses unless these solutions are treated to meet the District's Local Discharge Limit for silver of 1mg/L.

6. Zero discharge of chemical sterilant solutions unless these solutions have been treated to render them nonhazardous.

7. Provide the District with the names of all dentists practicing at this office.

8. Submit an annual Periodic Compliance Report (PCR) to the District's Source Control Section by July 31st of each year using the enclosed form certifying compliance with the conditions of this permit and providing information on permit condition 7 above.

9. Report to the District within 10 days of any changes, permanent or temporary, to the premises or operations that materially deviate from the terms and conditions under which this permit is granted.

Permittee's compliance with the requirements of this permit shall be deemed to be in compliance with the District's Local Discharge Limit for mercury (0.003mg/L).

Enforcement of violations of Permit Terms and Conditions, and provisions of District Ordinance Title 10, may result in enforcement remedies and penalties provided for in Title 10, Chapter 16.

The above-named Permittee is hereby authorized to discharge wastewater to the sanitary sewer, subject to said Permittee's compliance with District Title 10 and the above Permit Terms and Conditions.

Timothy Potter
Source Control Program Superintendent

FEB 28 2007
Date

Central Contra Costa Sanitary District

5019 Imhoff Place, Martinez, CA 94553-4392 (925) 228-9500 • www.centralsan.org

FAX: (925) 372-7635

JAMES M. KELLY
General Manager

KENTON L. ALM
Counsel for the District
(510) 808-2000

ELAINE R. BOEHME
Secretary of the District

February 28, 2007

Mohamed Ali
3189 DANVILLE Blvd Ste. 110
ALAMO, CA 94507

Dear Dr. Mohamed Ali, DDS:

DENTAL PRACTICE WASTEWATER DISCHARGE PERMIT

Central Contra Costa Sanitary District (District) staff have worked with the Contra Costa Dental Society (CCDS) and the California Dental Association (CDA) to develop outreach materials that explain the challenges of mercury source control, especially that of dental amalgam mercury discharged to the District's sewer system. In October 2006, the District, the CCDS, and the CDA held a training on the mandatory amalgam separator program and a separator vendor fair at a Dental Society meeting. More than 100 participants received continuing education credit for attending.

Enclosed please find a Central Contra Costa Sanitary District Dental Practice Wastewater Discharge Permit for your practice. There is no fee for this Permit. Central San's Local Discharge Limit, as mandated by State regulation, is very low for mercury discharges to the sanitary sewer system. However, by implementing all the applicable Best Management Practices (BMPs), including the installation and proper operation of an ISO-certified amalgam separator as noted in your Permit, your practice will be considered to be in compliance with this limit.

Be sure to keep all records required by the Permit for an on-site visit to your practice to verify compliance.

You must complete the required forms and mail them to the District by the deadlines specified in the Permit. The first form for submission is a self-certification form stating that you have installed, operate, and maintain an amalgam separator downstream of all areas where amalgam is placed or removed. A return envelope is enclosed for your use.

The District has attempted to identify the dental practices that qualify for exemption from the mandatory amalgam separator requirement before mailing out these permits. If you believe that this requirement does not apply to your practice, please fill out and return the enclosed Exemption Certification. A decision on your application for an exemption may depend on a site visit by District staff.

Also enclosed are the District-approved Dental BMPs for the operation of ISO-certified amalgam separators, and a list of Frequently Asked Questions. Workshops to help you or your staff understand and comply with this Permit will be held on March 26, 2007 and April 5, 2007. Please refer to the enclosed flyer for times and locations.

Thank you for your time to review and understand the goals and elements of this important program. Please contact me with any questions at (925) 229-7380 or tpotter@centralsan.dst.ca.us, or Steve Linsley at (925) 229-7107 or slinsley@centralsan.dst.ca.us.

Sincerely,

Timothy Potter

Timothy Potter, Source Control Program Superintendent
TP:cb / Enclosures

Recycled Paper

◆ Dental Inventory Program

Because CCCSD has identified dental offices as the major source of mercury in our wastewater, we need the help of the dental community to reduce this amount. CCCSD's Board of Directors endorsed a Dental Inventory Program as a first step toward achieving this reduction.

The Dental Inventory Program will provide CCCSD with more comprehensive information on what dental offices are discharging and will help to better promote the use of dental Best Management Practices (BMPs) to control mercury sources. All dental offices that generate mercury wastes in CCCSD's service area will be required to complete an Inventory Report Form which identifies the dental office's current BMPs on proper disposal of mercury wastes. By using BMPs, dentists can easily reduce their mercury wastes, which we anticipate will significantly reduce CCCSD's mercury discharge into the Bay.

◆ Mercury pollution prevention is the answer

Pollution prevention is the best approach to reduce the release of mercury into the environment. CCCSD's Dental Inventory Program is the next step in our campaign to control mercury pollution. CCCSD already encourages people to bring mercury thermometers, elemental mercury, fluorescent lamps and other mercury-containing products to our HHW Collection Facility for proper disposal.

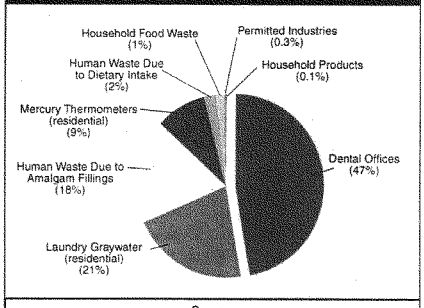
It is more effective to contain and dispose of mercury waste at the source than to develop expensive treatment and disposal technologies to manage it after dilution with wastewater. The California Dental Association agrees and has expressed support for State regulations encouraging small businesses to implement pollution prevention practices designed to reduce targeted wastes, including mercury.

◆ Let's work together

BMPs are some of the most effective ways to prevent mercury from reaching the sewer. Work with CCCSD as partners in our mercury pollution prevention program by incorporating the BMPs contained in this fact sheet into your office. For more information, refer to the CCCSD web site www.centralsan.org .

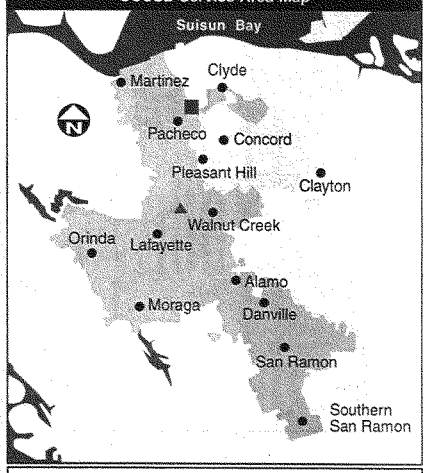
Together, we can work to protect our environment.

Sources of mercury discharged into CCCSD Sewer System



Source:
CCCSD Mercury Source Reduction Technical Memorandum, January 29, 2003

CCCSD Service Area Map



Sewage collection and wastewater treatment (and Household Hazardous Waste collection service) for 303,980 people

Wastewater treatment for 135,845 residents in Concord and Clayton by contract and Household Hazardous Waste collection service

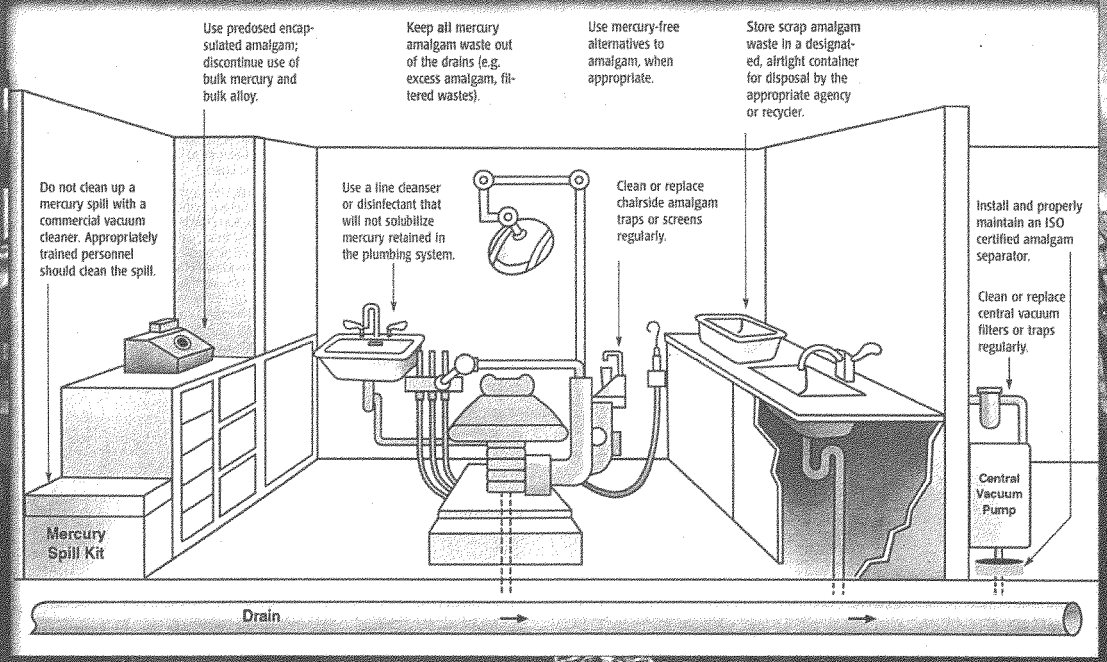
Household Hazardous Waste collection service only

CCCSD's Headquarters Office Building, treatment plant, and HHW Collection Facility are located in Martinez

CCCSD's Collection System Operations Division (sewer maintenance) is based in Walnut Creek

Best Management Practices (BMPs) In Dental Offices

It is more effective to contain and dispose of mercury waste at the source than to develop treatment and disposal technologies to manage it after dilution with wastewater. In order to contain mercury at the source, we are asking you to consider taking the following actions:



BEST MANAGEMENT PRACTICES

BMP

CENTRAL CONTRA COSTA SANITARY DISTRICT

Dental Offices and Mercury Pollution Prevention

BMPs facilitate regulatory compliance; they go beyond meeting established minimum requirements. They provide ways of carrying out your business activities that can significantly reduce the risk of pollution and may even save you money. They're good for the environment, your patients, and your business.

◆ Reducing mercury in wastewater is key

Central Contra Costa Sanitary District (CCCSD) is concerned about mercury levels in our wastewater. As part of our operating permit, we are required to meet specific discharge limits. Most of the pollutants in our treatment plant discharges, including mercury, come from our customers. While most of the mercury we receive is removed during the treatment process, the rest has to be discharged into the Bay because no treatment method currently exists to completely remove it from wastewater. Reducing sources of mercury prior to reaching the sewer is the best way to reduce mercury contamination in both air and water.

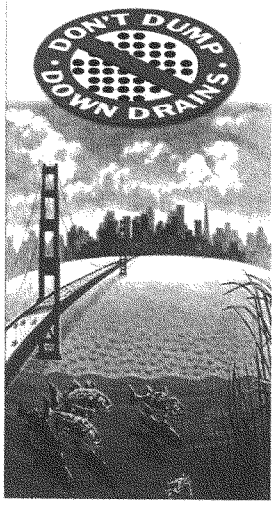
CCCSD currently meets Federal, State and Regional limits for mercury in our discharged wastewater. However, earlier this year the San Francisco Bay Regional Water Quality Control Board slashed the amount of mercury CCCSD will be allowed to discharge into the Bay by 58%. In order to stay in compliance, we will have to significantly reduce the amount of mercury coming into the treatment plant. This will especially impact our largest mercury contributors – dental offices.

◆ Wastewater from dental offices is a major source of mercury

Sources of mercury pollution in wastewater include dental offices, medical facilities, schools, residences, businesses and industry. In a recent survey of seven major wastewater treatment plants in California, Minnesota, Ohio, and Maine, dentists were identified as the greatest contributors of mercury. CCCSD estimates that approximately 50% of the mercury in our wastewater comes from dental offices. That's more than double the second largest source, residential laundry gray water.

The use, removal and improper disposal of amalgam are currently the most significant mercury contributors to our wastewater treatment plant. We estimate that about 88% of the dental mercury discharged to our sewers is from filling removals. Over 32.3 pounds of mercury entered CCCSD's wastewater treatment plant this past year, and our new limit allows the plant to discharge only 4.9 pounds. On average, each dental practice contributes an estimated 0.4 to 0.5 ounces of mercury per year.

Mercury dumped down drains will reach the Bay...



CENTRAL CONTRA COSTA SANITARY DISTRICT

CCSD

We need your help in developing solutions to this pollution problem. We are hoping that the Best Management Practices described in this brochure are techniques that you will be willing and able to implement in your dental practice; many of them may already be part of your routine. The American Dental Association also endorses use of these BMPs.

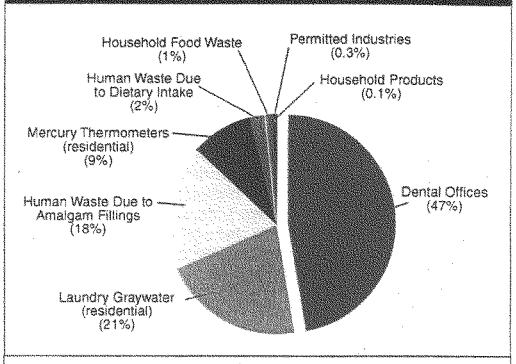
Currently, these are voluntary measures in our service area. However, if voluntary methods are not effective in reducing the amount of mercury present in our wastewater discharge, mandatory mercury-reducing measures may be required for your dental practice. We are hopeful that by working together, this action will not be necessary.

Additional information is available on our web site, www.centralsan.org.

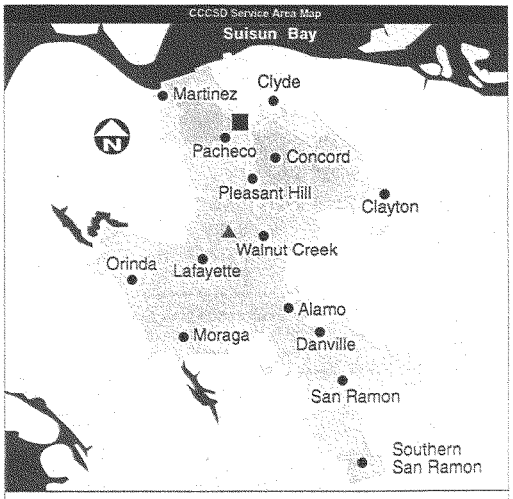
Together, we can work to protect our environment.

5033-11/03

Sources of mercury discharged into CCCSD Sewer System



Source:
CCCSD Mercury Source Reduction Technical Memorandum, January 29, 2003



Sewage collection and wastewater treatment (and Household Hazardous Waste collection service) for 302,675 people

Wastewater treatment for 135,900 residents in Concord and Clayton by contract and Household Hazardous Waste collection service

Household Hazardous Waste collection service only

CCCSD's Headquarters Office Building, treatment plant, and HHW Collection Facility are located in Martinez

CCCSD's Collection System Operations Division (sewer maintenance) is based in Walnut Creek

BEST MANAGEMENT PRACTICES

BMP

BMPs facilitate regulatory compliance; they go beyond meeting established minimum requirements. They are ways of carrying out your business activities that can significantly reduce the risk of pollution and may even save you money. They're good for the environment, your patients, and your business.

Dental Offices and Mercury Pollution Prevention

Preventing Pollution at the Source

Protecting public health and the environment is the primary responsibility of the Central Contra Costa Sanitary District (CCCSD). Besides collecting, treating and safely disposing of wastewater, we also work to effectively prevent pollution at the source.

San Francisco Bay is Impaired by Mercury

The San Francisco Bay Regional Water Quality Control Board (Regional Board) reports that San Francisco Bay is "impaired due to mercury pollution." Mercury is a bioaccumulative toxic heavy metal that can cause detrimental health effects. In the water, some mercury is converted to methylmercury by bacteria or chemical reactions. Methylmercury levels in fish consumed from San Francisco Bay may threaten human health.

Dental Offices and Mercury Pollution Prevention

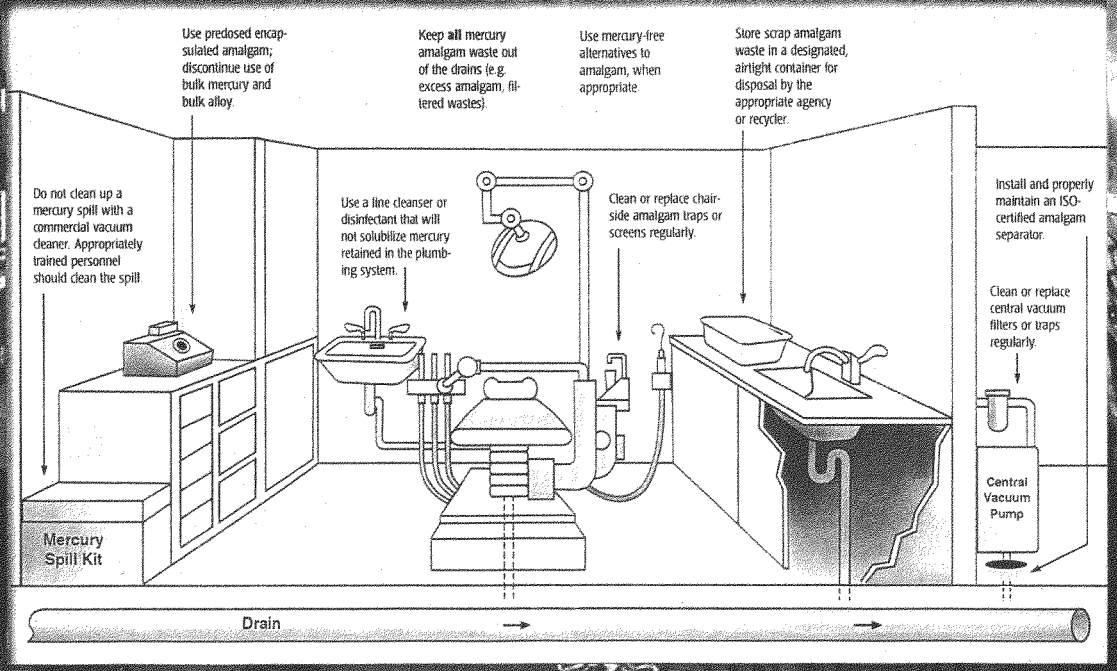
Our research shows that dental offices are the major source of mercury in CCCSD's wastewater which is ultimately discharged to San Francisco Bay (see chart on page 4).

Despite having one of the most advanced facilities in the country, our treatment process cannot completely eliminate toxic heavy metals such as mercury from our effluent. Pollution prevention is a key aspect of our mission and a requirement of our National Pollutant Discharge Elimination System (NPDES) Permit. We currently meet our Federal, Regional and State limits for mercury in our discharged wastewater. However, the Regional Board is considering changes to the mercury limit; future regulatory actions may impose tighter limitations that we will not be able to meet.

CENTRAL
CONTRA
COSTA
SANITARY
DISTRICT

Best Management Practices (BMPs) In Dental Offices Can Reduce Mercury Pollution

It is more effective to contain and dispose of mercury waste at the source than to develop treatment and disposal technologies to manage it after dilution with wastewater. In order to contain mercury at the source, we are asking you to consider taking the following actions:



Mr. KUCINICH. Thank you very much, Ms. Farrell.
Dr. Smith.

STATEMENT OF DR. C. MARK SMITH

Mr. SMITH. Thank you, Chairman Kucinich, Mr. Burton, and Ms. Watson, for inviting me today to testify about our efforts in Massachusetts and in the New England region to reduce mercury from the dental sector. I would also like to thank you all for summarizing, excellently, most of what I am about to say, and bearing with me to say it again.

As a scientist, a fisherman and a father of children who love to fish and occasionally eat fish, I have been very concerned about the effects of mercury on our environment and on our children's health. To address the problem, I have been working in the mercury field in policy and research for the past 15 years.

As we have heard today, many reports have concluded, I think appropriately so, that the dental sector is a significant contributor of mercury releases to wastewater, accounting for 50 percent or more of the mercury found there.

Mercury wastewater can be released to the environment through sludge incineration, through sludge reuse and from wastewater. I would also like to note that sewage sludge incinerators typically do not contain or have mercury specific control technologies, and a substantial fraction of the mercury will be remitted to the atmosphere. What is captured is typically captured by scrubbers, as Ms. Farrell mentioned, and then can be recirculated back to wastewater treatment plants, contributing to wastewater discharge releases as well.

Mercury can also be released from sludge reuse. And in New England we estimate that about 12 percent of our air emissions are attributable to sewage and sludge incineration, which is a significant amount.

Eleven States now, as well as numerous municipalities, have adopted mandatory programs requiring the use of amalgam separators. This is based on recent results from a survey of the States conducted by the Quicksilver Caucus.

In New England, mercury from the dental sector is being addressed through the New England Governors and Eastern Canadian Premiers Mercury Action Plan, which was adopted in 1998 and set a long-term goal of virtually eliminating anthropogenic sources of mercury in our region. We also adopted long-term goals of 50 percent reduction by 2003 and 75 percent by 2010.

We have met and exceeded the plan's first goal, and we are well on the way to the 2010 target. We have done that by adopting State regulations that exceed EPA requirements in essentially all areas, focused on trash incinerators, coal-fired power plants, mercury products and also the dental sector.

I would also like to note that we recently completed a regional total maximum daily load assessment for mercury, indicating that mercury inputs to our water bodies will need to be reduced by 98 percent to restore those water bodies to a fishable condition where the fish will be safe to eat. Yes, 98 percent is pretty high. In order to get there, you have to address all the sources, even ones that you might traditionally think are not significant.

As I mentioned before, just looking at sewage sludge incineration emissions and the dental contribution to that, that is a source that we really do need to address in order to get our fish back to a situation where they will be edible.

In 2005, we specifically adopted goals for amalgam separator use under our regional action plan. These goals were that 75 percent of dentists in our entire New England region would have amalgam separators installed by 2007 and 95 percent by 2010. In order to get there, all New England States have now adopted requirements for amalgam separators, and we currently estimate that over 91 percent of dentists who generate amalgam wastewater in New England are now using these pollution controls, reducing mercury entering the region's sewage by many hundreds of pounds each year and, of course, reducing emission from incinerators and the reuse of the sludge where the mercury concentrates.

In Massachusetts, State regulatory agencies and the dental society of—Massachusetts Dental Society, signed a memorandum of understanding in 2001 to increase the voluntary use of amalgam separators in best management practices. Under this agreement, we did substantial outreach to dentists to educate them and had discount pricing on select amalgam separators.

Although the MOU certainly helped to raise awareness, by 2003 we only saw a modest increase in the sales of separators in our State. In 2004, Mass DEP, my agency, implemented a followup program to speed up the process. At the start of this initiative we announced that we would be adopting regulations in 2006 which would require the installation of amalgam separators to achieve faster reductions, because it typically takes us about that 2-year period to develop and implement new regulations.

We instituted an incentive-based voluntary early compliance program. Dentists participating in this program were required to certify that they used an approved amalgam separator, followed best management practices and recycled all of their waste mercury. As an incentive, the participants in the first year were exempted from permit fees, saving them a few hundred dollars, and the installed units were grandfathered into 2010.

Our local Massachusetts dental society was very helpful in getting the word out about this program, and 75 percent of our dentists participated in that early compliance program with the backdrop of the mandatory regulations coming down the road. Regulations requiring separators were adopted in 2006 pretty much on schedule.

To date, over 98 percent of facilities that were randomly expected have been found to have appropriate amalgam separators installed. Despite some compliance issues that we found in our audits relating to record keeping and recycling, our initiative has been very successful, and over the 2-year period of 2004 to 2006, when amalgam separator use increased to 75 percent in our State, mercury levels in sludge from the greater Boston area decreased by close to 50 percent.

In conclusion, without appropriate pollution controls, the dental sector can be a significant source of mercury pollution to the environment. Amalgam separators can substantially reduce these releases. The successful experiences in Massachusetts and other

States in reducing pollution from the dental sector will only support further national action in this area.

Programs that include outreach through collaboration with State dental societies and that also include quantifiable goals and mandatory deadlines for the use of amalgam separators and other best management practices are both effective and achievable.

Again, I would like to thank you all for the opportunity to testify today, and I am willing to answer any questions that you may have.

Thank you.

[The prepared statement of Mr. Smith follows:]

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

Written Testimony of

C. Mark Smith Ph.D., M.S.

Co-Chair, New England Governors and Eastern Canadian Premiers Mercury Task Force;

Deputy Director, Office of Research and Standards,

Massachusetts Department of Environmental Protection

Domestic Policy Subcommittee

Oversight and Government Reform Committee

Tuesday, July 8, 2008
2154 Rayburn HOB
2:00 P.M.

"Assessing State and Local Regulations to Reduce Dental Mercury Emissions"

This information is available in alternate format. Call Donald M. Gomes, ADA Coordinator at 617-556-1057. TDD Service - 1-800-298-2207.
MassDEP on the World Wide Web: http://www.mass.gov/dep
Printed on Recycled Paper

Introduction

Thank you, Chairman Kucinich and members of the Committee, for inviting me to testify about Massachusetts' efforts to reduce mercury pollution attributable to the dental sector. I am also pleased to share information with you about some of the programs underway in the other New England states to address this issue, which are being implemented under the New England Governors and Eastern Canadian Premiers Mercury Action Plan

As a scientist, a policy-maker, father and a fisherman I am very concerned about mercury pollution and its effects on our environment and on children's health. Throughout much of my professional career in the field of toxicology, in which I have a Ph.D. degree from Harvard University, and in environmental policy, in which I have a M.S. degree from the Harvard School of Public Health, I have been involved in mercury policy and research. I direct the Massachussetts Department of Environmental Protection's (MassDEP) multimedia mercury program, co-chair the New England Governors and Eastern Canadian Premiers (NEG-ECP) Regional Mercury Task Force (MTF); serve as the MA representative to the Quicksilver Caucus, a coalition of state environmental organizations focused on reducing mercury pollution; and serve as the northeast state representative to the Commission for Environmental Cooperation's North American Regional Action Plan for Mercury Task Force.

I am providing testimony at this hearing on behalf of MassDEP and the New England Governors Conference (NEGC). The NEGC, established by the Governors of the six New England states, coordinates regional policy programs in the areas of economic development, transportation, environment, energy and health. The NEGC also represents New England on the bi-national Conference of New England Governors and Eastern Canadian Premiers (NEG-ECP).

Mercury Pollution in Massachusetts and the Northeast

Mercury pollution is a serious environmental and public health issue in MA and the across the country. The New England states and New York recently completed a regional total maximum daily load (TMDL) assessment for mercury that provides insight into the extent and

magnitude of mercury pollution in the northeast. TMDLs are required under the Clean Water Act. Simply put, a TMDL is a calculation of the maximum amount of a pollutant that a water body, or group of water bodies, can withstand and still meet applicable water quality standards, including fish that are safe to eat. A TMDL also includes an implementation plan to resolve the impairment.

The New England Interstate Water Pollution Control Commission coordinated the northeast (NE) mercury TMDL assessment, which covers the New England States and New York (see http://www.neiwpcc.org/mercury/MercuryTMDL.asp; accessed July 2008). This multistate regional TMDL was released for public review and comment in April 2007. Eight public informational meetings were then held throughout the region and a final document, reflecting public input, was submitted to USEPA in October 2007. The TMDL was approved by USEPA on December 20, 2007 (see http://www.neiwpcc.org/mercury/mercury-docs/FINAL%20Northeast%20Regional%20Mercury%20TMDL.pdf; accessed July 2008).

The NE regional mercury TMDL highlights the widespread and serious impacts of mercury pollution in our region, where over 10,000 lakes, ponds, and reservoirs, and over 46,000 river miles are listed as impaired for fish consumption due to mercury. In order to achieve the TMDL calculated in this assessment, anthropogenic mercury deposition to the region's freshwater bodies will need to be reduced by 87 - 98 percent. This will require reductions in mercury pollution from all preventable sources, including the dental sector, coal-fired utilities and other sectors. Furthermore, because mercury pollution can travel for long distances once released into the environment, no single state or region can solve this problem in isolation. Comprehensive and aggressive mercury pollution reductions on a national level are needed.

The New England Governors and Eastern Canadian Premiers Mercury Action Plan and the MA Zero Mercury Strategy

Taking a lead-by-example approach, MA and the other New England states are implementing an aggressive regional mercury reduction strategy. This initiative, the bi-national New England Governors/Eastern Canadian Premiers Mercury Action Plan (MAP), was

unanimously adopted by the Governors of the New England states and the Premiers of the Eastern Canadian Provinces in June of 1998 (http://mass.gov/dep/toxics/priorities/negecp.pdf; accessed July 2008). The MAP established a long-term goal of virtually eliminating anthropogenic sources of mercury pollution in the region. Interim goals of a 50% reduction by 2003 and 75% by 2010 compared to a 1998 baseline, were also adopted. MA is also implementing a statewide Zero Mercury Strategy (http://www.mass.gov/envir/Sustainable/resources/pdf/Resources_Hg_Strategy.pdf; accessed July 2008).

To date these efforts have been a great success. The region achieved a 54% reduction in mercury emissions by 2003 and is well on its way to the 2010 reduction target. In MA, mercury emissions have been reduced by greater than 70%. These reductions have been accomplished through the adoption and implementation of strict mercury reduction programs targeting all major sources of mercury pollution. These include: trash incinerators, for which MA and regional emission limits are 3-fold more stringent than required by the USEPA (see http://www.mass.gov/dep/air/laws/regulati.htm; accessed July 2008); coal-fired electric generating units, for which MA regulations require 85% emissions control in 2008 and 95% by 2012, much more stringent than the recently vacated Clean Air Mercury Rule (see http://www.mass.gov/dep/toxics/stypes/hgfact.doc; accessed July 2008); mercury-added products, where MA and other New England states have adopted legislation that phases-out unnecessary uses of mercury, requires manufacturer funded recycling programs, product labeling and product notification to a regional data-base of mercury-added products (see http://www.mass.gov/dep/toxics/stypes/hgres.htm#mma; accessed, July 2008); and the dental sector, which is discussed in greater detail below. These initiatives substantially exceed USEPA requirements and are being successfully implemented across the region.

Mercury Pollution Attributable to the Dental Sector

Mercury from the dental sector may be released to the environment in several forms including amalgam particulates, soluble mercury, and mercury vapor. Once released into the environment all of these forms of mercury may ultimately be converted into a chemical form of

mercury, methyl mercury, which is extremely toxic to the developing brain of the fetus. Methyl mercury is also strongly bioaccumulated in fish, often to levels that are unsafe for human consumption. As indicated in the regional mercury TMDL discussed previously, mercury contamination of fish is an extensive cause of water body impairment in MA and the northeast.

Dental mercury is disposed of into wastewater when amalgam fillings are installed, shaped or removed. Mercury from the dental sector has been estimated to account for a significant fraction of mercury loadings to municipal sewage. The Massachusetts Water Resources Authority (MWRA), which operates the largest sewage treatment facility in MA, estimated that mercury from the dental sector was responsible for 13% to 79%, with a midpoint estimate of 46%, of mercury loadings to its system in the 1990's, prior to MA state initiatives to address this source (*Mercury in Dental Facilities: Boston* (1997) http://www.mwra.state.ma.us/03sewer/html/dentsum.htm; accessed July 2008). Values of 40-50% are also supported by observations in other cities, where substantial reductions in mercury loadings have been reported following rules mandating the use of amalgam separator pollution controls. Sludge mercury levels in Toronto, Canada were reported to have decreased by more than 50% following the adoption of bylaws that required all dentists to meet stringent mercury discharge limits through the use of amalgam separators (*Toronto Sewer Use Bylaw*, Great Lakes Binational Toxics Strategy Mercury Workgroup presentation by Robert Krauel (2002) http://www.epa.gov/Region5/air/mercury/meetings/Krauel.pdf; accessed July 2008). In Minnesota, mercury reductions of 29% - 44% were reported at two wastewater treatment plants (WWTPs) when amalgam separators were installed at dental clinics (Anderson, 2001). Similar reductions have also been observed in Washington State and Massachusetts. These data indicate that efforts to control dental mercury discharges to wastewater at the source are an effective mechanism to reduce environmental releases of mercury attributable to municipal wastewater and bio-solids treatment and disposal.

The majority of dental mercury entering wastewater is in the form of relatively small particles of mercury amalgam. Larger pieces of mercury amalgam are can be captured by chair-side traps and vacuum filters and would thus not enter wastewater (unless the traps are cleaned in a sink). Although there is debate about the effectiveness of these traps and filters, a study

published by the *Journal of the Canadian Dental Association* (Adegbembo, et al., 2002) demonstrated that they remove about 40% of mercury amalgam. Although this is a substantial fraction, in this study close to 60% of the waste dental mercury was not captured and would thus have entered wastewater discharged from the dental office if secondary pollution controls (amalgam separators) were not in use.

Because the small amalgam particles not captured by chair-side traps and filters have a large surface area to volume ratio, mercury from this amalgam can more easily dissolve and volatilize to the air compared to intact fillings. Thus, although mercury in amalgam is less volatile and soluble than elemental or ionic mercury, it can be mobilized and become available for methylation if released to the environment. This conclusion is supported by experimental evidence that demonstrated that mercury levels in fish increased over 200-fold when they were exposed for only 28 days to representative samples of amalgam typically found in dental wastewater (Kennedy, 2002). Data from dental clinics also demonstrates that soluble mercury can be discharged directly in untreated dental wastewater and that the use of oxidizing cleaners (e.g. bleach) increases the amount of such soluble mercury (Batchu et al, 2006).

Much of the mercury amalgam discharged from dental offices is concentrated into WWTP sludge and can subsequently be released to the biosphere if this material is incinerated or beneficially reused. Sewage sludge incinerators (SSI) do not typically have air pollution controls specifically designed to control mercury. Data on mercury emissions from SSI are sparse and national emission estimates are very uncertain. Based on limited stack test data, Massachusetts' SSI were estimated to emit about 150 pounds of mercury per year prior to regional and state efforts to reduce mercury wastewater discharges (*Mercury in Massachusetts*, MassDEP (1996) http://www.mass.gov/dep/toxics/stypes/hgtoc.htm; accessed July 2008). In the northeast, SSI were more recently estimated to be the region's third largest point source category of mercury emissions accounting for about 12% of the region's total (*Inventory of Anthropogenic Mercury Emissions in the Northeast*, Northeast States for Coordinated Air Use Management (2005) http://www.nescaum.org/documents/inventory-of-anthropogenic-mercury-emissions-in-the-northeast/; accessed July 2008). The inventory did not estimate direct wastewater discharges attributable to WWTP, septic systems, and sewer overflow events nor the amount of mercury

entering the environment from the land application of treated biosolids (sludge). These pathways would considerably increase the total.

The mercury present in sewage biosolids that are beneficially reused contributes to environmental releases of mercury. Mobilization of significant amounts of mercury from land-applied sludge has been documented and was accelerated by exposure to sunlight (Carpi et al., 1997a). Methyl mercury levels in surface soils amended with sewage sludge were also increased (Carpi et al., 1997b). Carpi et al. estimated a total flux of approximately 10,000 pounds of mercury to the air from land applied municipal sewage sludge per year in the US and Europe (Carpi et al., 1997a). Although there is no specific data on the rate at which mercury is mobilized from mercury amalgam particulates in land-applied biosolids, it is likely, given the relatively small sizes of the amalgam particulates in the material as well as its long-term exposure to variable environmental conditions including acid rain, sunlight and temperature, that a significant fraction of such mercury would be mobilized and become available for methylation over time.

In addition to SSI emissions and releases from land-applied sludge, a smaller amount of mercury derived from dental sector discharges will be directly released to surface or ground waters in WWTP effluent. Direct releases of dental mercury from sewers to waterways may also occur via combined sewer overflows during storm events that exceed a treatments system's capacity. High flows during such events are likely to "scour" settled mercury amalgam out of sewer lines resulting in direct discharges. Disposal into septic systems presents another pathway for mercury releases. Because of their high density, mercury amalgam particles will primarily settle out in a septic system's holding tank. Although much of this mercury amalgam would likely be pumped out and disposed of to WWTPs, direct impacts to groundwater, as well as the potential production of methyl mercury within septic systems, may occur.

Best management practices (BMPs) for waste amalgam specify that it be disposed of as a hazard waste or, preferably, recycled. Although the majority of dentists follow BMPs regarding the disposal of waste mercury and mercury amalgam, the available data suggest that some may not, resulting in dental mercury entering the trash or medical waste. Such disposal will result in

releases during handling and transport, potential releases at medical waste sterilization units, and will contribute to municipal solid waste incinerator emissions and landfill releases in leachate and landfill gases.

A 1995 audit of dental practices by the Western Lake Superior Dental Waste Management Program revealed that mercury amalgam was being disposed of in incinerated waste streams (infectious waste and solid waste) (*Western Lake Superior Dental Waste Management Program* http://www.epa.gov/Region5/air/mercury/meetings/tuominen.htm; accessed July 2008). A study by Kings County, WA also documented that mercury amalgam wastes were being disposed of into solid waste (*Mercury in Waste Dental Amalgam: Why Is It Still a Problem?* (2003) Local Hazardous Waste Management Program in King County; http://www.govlink.org/hazwaste/publications/WasteAmalgamProblems_03.pdf; accessed July 2008). Compliance audits in MA have also revealed instances where dental offices or their contractors inappropriately disposed of amalgam waste (see below). Further outreach and compliance assistance to dental offices is needed to help minimize inappropriate handling and disposal of dental mercury wastes.

State Initiatives to Reduce Mercury Pollution from the Dental Sector

The dental sector has been identified as a significant source of controllable mercury releases by many states. The Quicksilver Caucus (QSC), a coalition of state organizations seeking to reduce mercury pollution, recently published a review of state initiatives across the country addressing this source of mercury release (see http://www.ecos.org/files/3148_image_Corrected_Final_Dental_Amalgam_White_Paper_April_2008.pdf ; accessed July, 2008). This report was designed to help inform and assist states developing dental pollution reduction programs. The QSC report concluded that mercury from dental amalgam is a major source of controllable mercury released to the environment and likely will remain a significant concern into the future.

Overall, state initiatives have focused on increasing the use of amalgam separator control technologies and other best management practices to reduce mercury discharges to wastewater

and disposal into other waste-streams. Amalgam separators are relatively inexpensive technologies designed to capture mercury containing amalgam particulates, and in some cases soluble mercury as well, from dental office wastewater. Compliant units can reduce mercury discharges by a significant degree, typically greater than 95 - 99% based on the International Organization for Standardization (ISO) 11143 test protocol. Additional BMPs are primarily designed to ensure the safe handling and storage of waste mercury and to minimize inappropriate disposal.

According to the information compiled by the QSC, eleven states and numerous municipalities have adopted mandatory programs requiring the use of dental mercury amalgam separators to reduce mercury levels in wastewater from dental offices. Multistate regional efforts are also being implemented.

State and Municipal Approaches: Voluntary vs. Mandatory Programs

States and municipalities have used several approaches to increase the use of amalgam separators. Several of the programs considered in depth in the QSC report started with voluntary efforts to encourage the use of amalgam separators and other best management practices (BMPs). All of these programs ultimately transitioned to mandatory requirements either through legislation, regulation or enforcement of wastewater discharge permits.

For example, from 1994-2000, King County, Washington implemented a program to encourage the voluntarily installation of amalgam separators. Extensive outreach was conducted in collaboration with the local dental association and rebates were offered to defray the purchase cost of separators. By 2001, only 3% of the estimated 900 offices in the county had installed amalgam separators. The County then announced that mercury wastewater discharge limits would be enforced. Within 2 years over 80% of dental offices installed separators (see http://www.govlink.org/hazwaste/publications/WasteAmalgamProblems_03.pdf; accessed July 2008). A statewide voluntary program in Washington State achieved only 40% participation, prompting the adoption of mandatory requirements under the state's hazardous waste regulations. In MA, initial efforts to voluntarily increase amalgam separator use also did not

achieve high participation rates. Excellent participation occurred when the state announced a timeline for the adoption of regulations requiring separator use and provided an incentive-based voluntary early compliance program.

Regional Coordination Under the New England Under the NEG-ECP Mercury Action Plan

In order to reduce regional mercury emissions from sewage sludge incinerators and releases attributable to other pathways, the NEG-ECP adopted, in August 2005, a goal that 75% of dentists who generate amalgam mercury containing wastewater in the New England States and Eastern Canadian Provinces should have amalgam separator pollution controls installed by the end of 2007, and 95% by 2010. The Mercury Task Force (MTF) coordinating the MAP recommended this action because, by addressing mercury inputs to wastewater at the source, all subsequent release pathways would be reduced including incinerator emissions, releases associated with biosolids reuse and or disposal, and WWTP and other wastewater discharges.

By 2007 all states in the New England region had adopted legislation and/or regulations requiring the use of amalgam separators and other best management practices to reduce mercury amalgam discharge and disposal. Currently the states estimate that over 91% of dentists who generate mercury waste are now using amalgam separators. These programs are estimated to have reduced mercury entering the region's sewage by many hundreds of pounds each year.

This regional approach has facilitated progress and efficiency by leveling the playing field, providing mechanisms to share outreach materials, and facilitating coordination regarding regulatory and reporting requirements.

Massachusetts Efforts to Reduce Mercury Pollution from the Dental Sector

In MA, regulatory agencies including MassDEP and the Massachusetts Water Resources Authority (MWRA) have worked collaboratively with the Massachusetts Dental Society (MDS) to reduce mercury releases from the dental sector for many years. In the late 1990's the MWRA worked with the MDS on outreach efforts to increase the use of BMPs and amalgam separators

in the greater Boston area in order to reduce mercury levels in treated sludge. Building off of these efforts, in 2001, a joint Memorandum of Understanding (MOU) was adopted between state agencies and the MDS to formalize co-operation on outreach and communication efforts. Outreach efforts included the production and distribution of a BMP placard; inclusion of information on the MDS website; and presentations at state and regional dental conferences. As part of this initiative the MA Innovative Technology program also funded an independent assessment of amalgam separators by the University of Massachusetts to help address MDS member concerns about the efficacy of these units. The study concluded that amalgam separators were effective in reducing mercury discharges (*Development, Evaluation and Implementation of a Testing Protocol for Evaluation of Technologies for Removal of Mercury from Dental Facilities (2003);* see http://www.mass.gov/envir/lean_green/documents/other/removal_mercury_from_dental_facilities_part1.pdf; accessed July 2008).

Although the MOU helped to raise awareness of the environmental impacts of dental mercury wastewater discharges, amalgam separator sales were reported to have increased only modestly in MA.

In 2004, to level the playing field and speed up the use of separator technologies, MassDEP initiated a follow-up two-phase program. At the start of this initiative, MassDEP indicated that it would develop and adopt regulations in 2006 requiring the use of amalgam separators, among other provisions. To achieve faster mercury pollution reductions while the regulations were being developed and implemented, the agency also initiated an incentive-based voluntary early compliance program. This program was devised in collaboration with MDS (*Dental Amalgam/Mercury Recycling: About the Voluntary Program (2004)* http://mass.gov/dep/service/about08.htm; accessed July 2008).

Incentives were provided to encourage dentists to participate in this voluntary early compliance program. Those participating before March 1, 2005 were exempted from permit fees and amalgam separator systems achieving 95% amalgam removal efficiency were grandfathered until February 1, 2010. Dentists who certified participation after February 28, 2005, but before

February 1, 2006, were exempted from permit fees and grandfathered for a shorter period, until February 1, 2007.

This incentive-based early compliance program was very successful. About 75% of MA dentists participated in the first year of the program. Regulations requiring the use of amalgam separators and BMPs were subsequently adopted in April of 2006 (*310 CMR 73.00: Amalgam Wastewater and Recycling Regulations for Dental Facilities* (2006) http://mass.gov/dep/service/regulations/310cmr73.pdf; accessed July 2008). These were developed with the assistance of a stakeholder workgroup including individual dentists, MDS representatives, sewerage authorities, and environmental groups.

The regulations require dental practices and facilities to certify to MassDEP every five years that:

- They have installed an amalgam separator system(s) demonstrated to remove at least 98 percent of mercury amalgam waste based on the International Organization for Standardization (ISO) 11143 protocol or an equivalent method acceptable to MassDEP;
- Every dental chair in the practice or facility where waste amalgam is generated and all wastewater that contains waste amalgam (including wastewater from chairs and cuspidors), is serviced by an installed separator(s);
- Installed separator units are sized appropriately to accommodate the facility's maximum amalgam wastewater flow;
- The amalgam separator system is maintained and operated according to manufacturer specifications;
- They use only non-corrosive and biodegradable vacuum system line cleaners;
- All amalgam waste containing mercury is appropriately recycled;
- Facility staff are informed about procedures for handling waste amalgam, and that at least one employee is familiar with procedures for operating and maintaining the installed amalgam separator system;
- They keep records to document that the program requirements are being met.

Facilities that participated in the voluntary program were allowed to continue using their 95 percent efficient amalgam separators but when the separators need to be replaced, units that meet the 98 percent removal efficiency standard are required.

Further details regarding compliance and filing deadlines, acceptable amalgam separators, companies that provide amalgam mercury recycling services, and recommended practices for handling amalgam and mercury wastes are available at http://www.mass.gov/dep/service/dentists.htm#regs; accessed July 2008).

Both the early compliance program and the final regulations relied on self-certification of compliance with the stipulated requirements. In order to simplify certification filings and database management, an electronic form and submission system were developed. Because not all dental practices were internet capable, hard copy submissions were accepted as necessary.

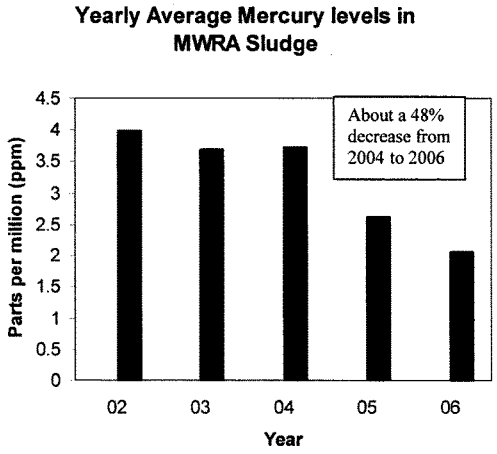
Compliance is being evaluated using audits and site visits to a statistically based sample of dental offices. Initial site inspections of 56 facilities, conducted in 2007, demonstrated excellent compliance with the amalgam separator installation requirements. All facilities had appropriate amalgam separators on-site although at one office the unit had not yet been installed. All installed separators were noted as being operated and maintained appropriately with about one third of the offices using a service provider and the remainder doing the work themselves. The audits did, however, reveal some areas for improvement. About 20% of facilities were not keeping adequate records. Confusion regarding appropriate recycling of amalgam waste was also evident, with close to 20% disposing of some mercury waste to "red bags" (infectious waste) and close to 10% not sending any mercury waste to an approved recycling facility.

On a related issue, MassDEP is investigating a dental amalgam "recycling" service that allegedly charged dentists to recycle waste amalgam, but then treated the amalgam to recover silver and illegally disposed of the residual mercury material into the sewer. Sampling of a sewer drain reportedly used for the illegal disposal contained mercury levels so high that, even with a 1000-fold dilution, the material grossly contaminated an agency mercury analyzer.

Taken together, these results indicate that dental offices and regulatory agencies need to pay close attention to the ultimate fate of collected waste mercury to ensure it is properly recycled or disposed of.

Environmental Results

Despite the compliance issued noted above, the overall effectiveness of the MA dental initiative is supported by data from the Massachusetts Water Resources Authority (MWRA), MA's largest sewage treatment facility, which services close to 2.5 million people. MWRA carefully monitors mercury levels in its treated sludge, almost all of which is beneficially reused as a soil amendment. As indicated in the Figure below, over the 2004 – 2006 period, when amalgam separator use increased to over 75% in MA, mercury levels in MWRA sludge decreased by about 48%.



Similar reductions have been reported in Washington State, Montreal, Toronto, and the Minneapolis-St. Paul area.

Conclusions

1. Substantial data indicate that the dental sector has been a significant source of mercury discharges to wastewater, which ultimately results in environmental releases attributable to sludge incineration, sludge reuse and wastewater discharge.
2. Substantial data also indicate that the use of amalgam separators and related best management practices can significantly reduce such releases.
3. State experiences to date indicate that collaborative initiatives with state dental organizations, which in the case of MA and other New England states have been very supportive of efforts to reduce mercury pollution from their profession, can help to raise awareness about amalgam separators and BMPs.
4. Regional and state goals with timelines for use of amalgam separators and BMPs provide benchmarks for assessing progress, help focus attention and motivate action.
5. In MA and Washington state, purely voluntary efforts to encourage the use of amalgam separators and BMPs did not reach participation levels sufficient to achieve environmental goals. Near complete compliance was quickly achieved when the states transitioned to mandatory programs.
6. The incentive-based early compliance program implemented by MA during the development and finalization of state regulations was highly effective in spurring the early use of amalgam separators and BMPs, rewarded environmentally conscious, proactive dental practices and achieved substantially quicker reductions in mercury discharges.
7. Follow-up compliance checks indicate that continued outreach and communication with dental practices is necessary to ensure that collected mercury wastes are properly recycled.

In summary, the successful experiences of MA and other states in reducing mercury pollution from the dental sector support further national action in this area. Programs that include outreach and education to the dental community, quantifiable goals and mandatory deadlines for

the use of amalgam separators and other BMPs have been demonstrated to be achievable and effective.

References

Adegbembo, A., Watson, P, Lugowski, S, 2002. "The Weight of Wastes Generated by Removal of Dental Amalgam Restorations and the Concentration of Mercury in Dental Wastewater. *Journal of the Canadian Dental Association* 68(9): 553-558.

Anderson, C.T. (2001) Metropolitan Council Environmental Services Report *No. 01-507*. 250 East 5th St., St. Paul, MN.

Batchu, H., Chou, H-N, Rakowski, D. and Fan. P. L. (2006) "The effect of disinfectants and line cleaners on the release of mercury from amalgam" *Am Dent Assoc*, Vol 137, No 10, 1419-1425.

Carpi, A. and Lindberg, S.E. (1997a) "Sunlight-Mediated Emission of Elemental Mercury from Soil Amended with Municipal Sewage Sludge," *Environmental Science & Technology* 31(7):2085-2091.

Carpi, A., Lindberg, S.E., Prestbo, E.M., Bloom, N.S. (1997b) "Methyl Mercury Contamination and Emission to the Atmosphere from Soil Amended with Municipal Sewage Sludge," *Journal of Environmental Quality* 26(6): 1650-1655.

Kennedy, C., 2003. Uptake and accumulation of mercury from dental amalgam in the common goldfish, Carrassius auratus. *Environmental Pollution*, 121: 321-326.

Mr. KUCINICH. Thank you, Dr. Smith.
Mr. Boyd.

STATEMENT OF OWEN BOYD

Mr. BOYD. Good afternoon, Mr. Chairman, Ms. Watson, Mr. Burton. I am Owen Boyd, founder of Solmetex. We founded Solmetex on the principle that we wanted to increase efficiencies in water technologies that were being deployed within the United States. So we took efficiencies that were being used in biopharmaceutical separations; namely, called advanced affinity chromatography, and we were able to migrate it into, at first, a resin that would remove mercury from water.

We put systems into hospitals, we treat incinerator wet scrubber waste to remove mercury down to below a part per billion in water discharges. We do commercial installations to keep mercury out of wastewater. And we were asked to approach the dental industry to see if we could take mercury out of dental waste.

After examining the profile of dental waste, we developed an amalgam separator. We call them amalgam separators because, in any other industry, they would have been called simply a filtration device. Most amalgam separators use, you know, one of four principles of filtration, which is centrifugal, mechanical, chemical or sedimentation. All of them have been used for well over a century. There is nothing novel about an amalgam separator. It shouldn't be viewed as a new technology. It is a simple filtration device held at point of source generation.

We developed the device to make sure that we could not only take the mercury out but recycle the mercury so it didn't end up back in a landfill and just be a transfer waste.

I am going to cover three areas. One is do amalgam separators work, do they have an impact on a sewage treatment plant, the cost and use of amalgam separators and a little bit of our sales history to show the impact of a regulation versus a voluntary approach.

As I said, amalgam separators are filtration devices that have been used in a lot of dental clinics. In the European Union they have been used for well over a decade. The Paris Commission, PARCOM, in their Recommendation 93/2, they cited information received from Belgium, Finland, France, Germany, Iceland, Netherlands, Norway, Spain, Sweden, Switzerland and the U.K. That now will have mandatory regulations that the discharge of dental amalgam in the municipal systems has been significantly reduced by the use of separation equipment in recent years, in most cases by at least 95 percent.

In Toronto, Ontario, the fifth largest city in North America, a 58 percent reduction of mercury in biosolids was recognized when an estimated 73 percent of dental clinics had complied with separator regulations. Their biosolid mercury concentrations were reduced from 17 kilograms a month, or 37 pounds, to 7 kilograms a month. Additionally, a 13 percent reduction of mercury in their final wastewater was measured.

Minnesota, two particular POTWs; that is, a publicly owned treatment work or sewage treatment plant, Hastings and Cottage Grove, their mercury in biosolids were reduced 24 and 49 percent.

U.S. Navy had 53 notices of violations from regulatory folks. That is now down to 3, 52 percent decrease in POTW biosolids.

Duluth, MN, has had the same type of experience. Seattle-King County, they have reduced their amount from 74 pounds per year in 2000 to 38 pounds in 2004.

The Strategic Envirotech Partnership from the Executive Office of Environmental Affairs in Boston, MA, tested amalgam separators in dental settings, and they measured 99.85 percent, 98.94 percent and 99.74 percent reduction in the three amalgam separator sites that they tested.

The cost of an amalgam separator. There is a lot of different, varying costs, I can tell you. With about 120,000 clinics that deal with amalgam, our cost of $750 per system, that would run about $90 million to install at all of those clinics, and it would cost an additional $34 to $34.5 million a year to maintain those systems so they continue to be operational. That would be the cost of the removal at all dental clinics across the United States.

If you can bring up slide 1 for me, these are actual numbers, and what that shows you is our units sold in what we refer to as States with regulations, States with partial regulations, and States with no regulations whatsoever.

Partial regulations, these are States, you know, like California, where you have individuals POTWs or cities that take action, but not the whole State is regulated, and there were a number of States that do that, and it is in my written testimony.

But you can see that, you know, what this chart shows you is that the States with the legislation, our sales are sky high. Those without, which are the yellow bars, are essentially unaffected. Those with partial regulations, we had very good results.

As a matter of fact, if you looked at the results in total, that would show you that within the United States we have 93 percent of our sales are in regulated or nonregulated or partially regulated States. If you took all of our sales internationally and domestic, 99 percent of our sales are in regulated areas or partially regulated areas.

If you look at the next slide, this will give you an impact, because we track our sales month-by-month in every area that is regulated. And what you can see is that the left side of that scale, that is a percent of sales, you can see that as a regulation comes into effect, the first 24 months we see very little activity. As the deadline approaches, you can see, literally, between 8 to 2 months before the deadline, the majority of our sales occur. You can also see—if you notice on the blue line, that is where you can give a lot of credit to the Massachusetts Dental Society for putting extraordinary effort into a voluntary approach. And we tracked that 24 months as a period of voluntary approach with a threat of regulated approach, but they got an awful lot accomplished in a short period of time.

But what all that data shows you, in summary, first off amalgam separators do, in fact, work, if maintained properly. You can see the impact on regulations. If there were no regulations in the United States, we wouldn't be marketing here, we would be marketing elsewhere. And the cost for Solmetex systems is about $120 million to acquire the equipment and another $34.5 million to maintain that equipment.

That number is not an estimate, it is reality, because we keep track of how many replacement cylinders are sent to each dentist every year, and the average is they change a little less than one replacement filter per year.

I am going to go back to that graph just for 1 second. There is an interesting little note on followup. The yellow line you will see after the regulation, the deadline date, you will see another bump in sales. That bump in sales actually correlates to a letter that the Connecticut DEP wrote to dentists after regulations had passed. They had an indication that a lot of dentists had not complied. So they asked for a serial number, manufacturer number, installation date and the installer. And we saw another bump in sales as the enforcement arm of the regulation took place.

Thank you.

[The prepared statement of Mr. Boyd follows:]

STATEMENT

OF

OWEN BOYD

FORMER CEO OF SOLMETEX, INC.

BEFORE THE

DOMESTIC POLICY SUBCOMMITTEE

OVERSIGHT AND GOVERNMENT REFORM COMMITTEE

Tuesday, JULY 8TH, 2008

2154 Rayburn HOB

2:00 p.m.

"Assessing State and Local Regulations to Reduce Dental Mercury Emissions"

Good afternoon, Mr. Chairman and members of the Subcommittee. I am Owen Boyd, founder and past CEO of SolmeteX, Inc. ("SolmeteX"). SolmeteX was formed as a company to migrate technology used in biopharmaceutical separations to treat water that was either consumed, processed or discharged. As early as 1992, the biopharmaceutical separation technology was orders of magnitude more effective at concentrating molecules than the sorbent technology used for water treatment. In fact, most water treatment sorbents do not magically remove toxins from water; they concentrate them onto a substrate as water comes into contact with them so that the net affect is to lower the concentration in the outgoing water stream. In effect, the better the ability to concentrate toxins onto a sorbent, the more efficient the technology. Although many technology hurdles had to be overcome, SometeX successfully migrated advanced affinity chromatography type separation methods into water treatment. The first sorbent we developed targeted mercury and its success in mitigating mercury issues from wastewater discharge from clinical laboratories, hospital effluents, industrial wet scrubber discharge and industrial discharge earned the company an EPA Innovator award.

INTRODUCTION

First of all, I have a very keen interest in seeing action taken to ensure dental discharges are filtered through amalgam separators. I am a manufacturer of an amalgam separator and personally profit by their sales. For that reason, I will try my best not to give you my opinions, philosophies or beliefs. I will stick to the data. I will focus my statement, as best I can, to three specific areas.

1. the impact of amalgam separator use on POTW's both on mercury concentration in sludge and on waste water discharge

2. the cost of use of amalgam separators
3. the impact of mandatory regulation versus voluntary action.

IMPACT OF AMALGAM SEPARATORS ON POTW MERCURY SLUDGE & WASTEWATER

It should be noted before I present some documented results illustrating the efficacy of amalgam separators in their ability to reduce the amount of mercury discharged from dental clinics that amalgam separator is a term used to describe a filtration device applied in a dental setting. These devices are known to use four method of filtration; mechanical, sedimentation, chemical and centrifugal. The most common separators generally use two main principles of filtration; mechanical filtration and sedimentation. These two methods of filtration have been used for over a century to reduce particles, both light and heavy, in water. They are proven. They are still widely used today. They are two principles of filtration that particularly lend themselves to the filtration of amalgam particles as amalgam is primarily comprised of mercury, copper and zinc. Those heavy metal particles will settle rapidly in low flow and are easily mechanically filterable in rapid flow due to their size. The use of these filtration techniques in a device used to filter/settle amalgam particles out of dental wastes is called by the industry "amalgam separation". However, using these same techniques to remove heavy metals in any other industry is called "heavy metal removal".

There have been many studies documenting the reduction of mercury received by POTW's as a result of the use of amalgam separators. For example, The Paris Commission (PARCOM) in their Recommendation 93/2 cited information received from Belgium, Finland, France, Germany, Iceland, Netherlands, Norway, Spain, Sweden, Switzerland and the UK and stated "the discharge of dental amalgam into municipal sewerage systems has been significantly reduced by the use of separation equipment in recent years, in most cases by at least 95%".

In Toronto, Ontario the 5th largest city in North America a 58% reduction of mercury in biosolids was recognized when an estimated 73% of dental clinics had complied with separator regulations. Biosolid mercury concentrations were reduced from 17 kg/mo (37 lbs) to 7 kg/mo (15 lbs). Additionally, a 13% reduction of mercury in WWTP wastewater was measured.

In Minnesota, two POTW's (Hastings and Cottage Grove) mercury in biosolids were reduced 44% and 29% respectively in three months.

The U.S. Navy, after installing separators, reduced the number of Notice of Violations (NOV) from 54 to 3 while documenting a 52% decrease in POTW biosolids.

In Duluth, Minnesota the mercury concentration in biosolids was reported reduced from 2.5 mg/kg to 0.19mg/kg. Additionally, they further reported a WWTP effluent decrease from 20.6 ng/liter to 1.9 ng/liter.

In Seattle, King County the installation of amalgam separators reduced the amount of mercury received per year from 74 pounds (year 2000) to 38 pounds (year 2004).

The Strategic Envirotech Partnership of the Executive Office of Environmental Affairs of the Commonwealth of Massachusetts tested three amalgam separators at dental clinics in an effort to show particle removal efficiency as compared static testing. The results showed particle removal efficiencies of 99.85%, 98.94% and 99.74% at the sites which were less than a 1% variance from static tests.

COST OF USE OF AMALGAM SEPARATORS

Although I am familiar with my competition and their equipment costs as well as maintenance costs, I will discuss only the costs associated with the SolmeteX product line. There are three models that are used by dental clinics based on the number of operatories. The most common is our standard Hg5® which is sold to dentists at $750 per unit. This specific unit will effectively manage the discharge of between 1 – 10 operatories which coincidentally represents over 98% of our dental market sales. As such, I will focus my cost analysis on this product as it most representative of the dental market.

The system is delivered with a collection chamber that is intended to be replaced every 6 – 12 months depending on the level of patient activity within the dental clinic. This collection chamber, when replacement time occurs, is replaced at a cost of $285 which includes a new collection chamber, packaging for the return of the old container, postage for transportation to a recycling facility, recycling of the spent collection chamber and recycling verification reporting. The historical recycling frequency experienced by SolmeteX per dental clinic from 2001 to 2008 is 0.8 collection chambers per year. This number is derived from our actual sale of replacement collection chambers life to date versus entire Hg5 systems. In an effort to be conservative when estimating annual operating costs for the entire dental community, the analysis below assumes 1.0 collection chambers per dental clinic per year.

There are approximately 120,000 dental clinics in the United States that replace amalgam fillings. Thus the following can be calculated:

1. Capital costs of equipment acquisition = 120,000 dental clinics multiplied by $750 per Hg5 unit = $90,000,000.
2. Installation Cost estimated at $250/Hg5 unit multiplied by 120,000 clinics = $30,000,000
3. Annual operating costs = 120,000 dental clinics multiplied by $285.00 = $34,200,000
4. Change out time @ five minutes = @ $25/hr = $2.08 annually/clinic multiplied by 120,000 clinics = $250,000 annual labor costs

In summary, the cost for the SolmeteX Hg5 amalgam separator:

	Entire Market	Dental Clinic
Equipment and Installation (1 time cost) =	$120,000,000	$ 1,000.00
Annual Maintenance Cost =	$ 34,450,000	$ 287.08

The above estimates are presented as a worse case scenario as they do not take into account discounts usually given by our distributors. Installation costs may vary either higher or lower than the amount used in this analysis based on site conditions, but is representative of an average installation. Amalgam separation equipment can be depreciated over five years which would serve to place the first five year cost at $487.08 and $287.08 thereafter.

REGULATIONS – MANDATORY VERSUS VOLUNTARY

SolmeteX has been actively selling amalgam separators since 2001 and has kept very detailed records regarding sales into specific States and Countries for strategic marketing purposes. Historically, the SolmeteX system sales have been dramatically driven by mandatory regulations. Interestingly, the sale of the amalgam separators is not only affected by the fact that a regulation has been put in place, but is also affected by the deadline date indicated in the regulation. I will present this data during this part of my statement. We have seen some voluntary efforts impact sales as well but never to the extent of a regulation. Some voluntary programs, like that in Massachusetts, were a collaborative effort by the Massachusetts Dental Society (MDS) and the Executive Office of Environmental Affairs (EOEA) initiated in 2001 and implemented in 2004. The MDS actively supported and pursued the dental community to install amalgam separators. The EOEA made it clear that if 50% of the dental clinics had not installed a system, they would invoke regulations.

Here is how the historical sales occurred in Massachusetts in number of units:

	2001	2002	2003	2004	2005	2006	2007
MA Unit Sales	161(*)	16	32	1,042	328	341	126

(*) SolmeteX sold units at cost to introduce the Hg5 program

As is evident, the impact of the MDS work along with the initiative of EOEA drove sales in 2004. A similar scale up of sales could be seen in Maine where regulations were implemented in January 2003 with an implementation deadline of June 1, 2004.

Here is how the historical sales occurred in Maine in number of units:

	2001	2002	2003	2004	2005	2006	2007
ME Unit Sales	0	1	26	237	26	8	5

We keep detailed records of sales of amalgam separators by State and year for all 50 U.S. States. Each State unit sales in placed into one of three major categories. They are:

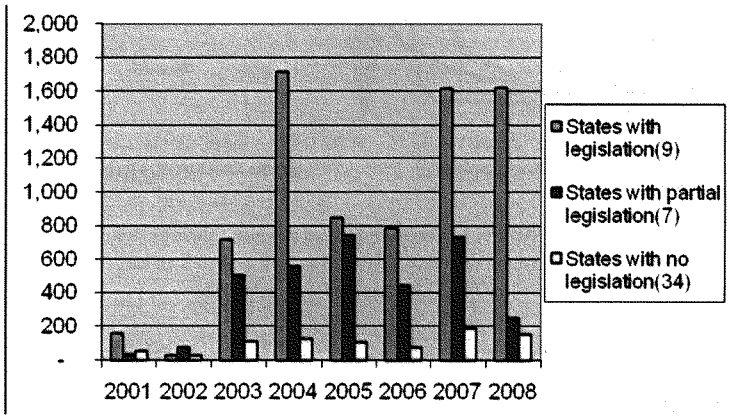
1. States with Regulations
2. States with Partial Regulations
3. States with no Regulations

States with partial regulations are States where local sewer districts have mandated amalgam separators for a specific discharge area. This has occurred in California, Kansas, Colorado, Michigan,

Minnesota, Washington and Wisconsin. By charting the three categories it is evident that the impact of mandatory regulations is significant. As matter of fact, SolmeteX life to date sales is as follows:

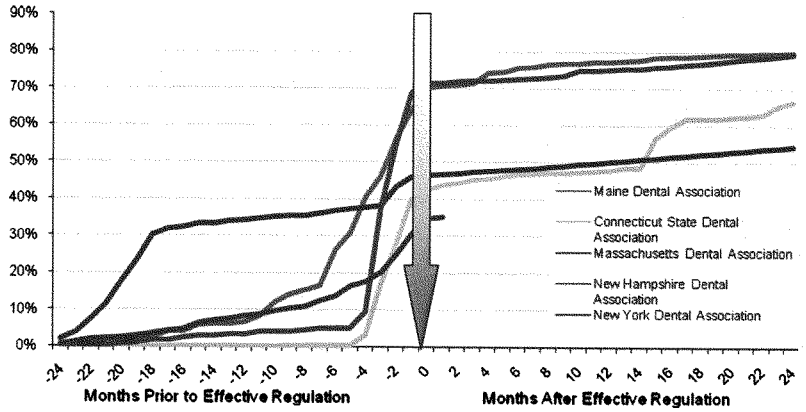
Units sold to States with Statewide Regulations	7,508
Units sold to partially regulated States	3,368
Units sold to States with no regulations	867

2001-2008 Sales Analysis



Once regulations are threatened, our data indicates a slow ramp up of sales. Once a regulation is passed the ramp up of unit sales accelerates. When a regulatory deadline draws near, Hg5 unit sales peak. After the deadline passes, sales level off. The "bump" in Connecticut coincides with a follow-up letter by the Connecticut DEP requesting installation date, manufacturer and amalgam separator serial numbers be submitted by all dentists.

Deadline Date



The above chart is actual sales data for five regulated States in which SolmeteX Hg5 products were sold. The "Y" axis is percent of sales within each represented State and as such is an excellent indicator of what percent of our total sales within that State occurred near a deadline.

SUMMARY

In summary, the data presented illustrates the following:

1. Amalgam separation is technology used in dental clinics that enhances the particle filtration over current mechanical filters being used and has been proven to be effective at removing substantial quantities of mercury from dental discharges.
2. The installation of amalgam separators in areas served by POTW's has been shown through several studies to significantly reduce the amount of mercury in sewage sludge and in some studies reduce WWTP discharge water.
3. The cost to install the Hg5 amalgam separator in all dental clinics (approximately 120,000 clinics) is near $150,000,000 and the operating costs are near $34,500,000.
4. SolmeteX unit sales are dramatically impacted by regulations and sales in non-regulated States are minimal.

Thank you for your time. If you have any questions or comments I will take them now.

Mr. KUCINICH. I thank all the witnesses. I would like to begin with a 5-minute round of questioning, begin with Ms. Magnuson.

As an alternative to installing separators, King County could have chosen to treat its wastewater mercury. Why did you decide against that option instead of treating it and installing the separators?

Ms. MAGNUSON. Instead of treating it at the treatment plant?

Mr. KUCINICH. Yes, yes.

Ms. MAGNUSON. I don't think—it is costly to treat it at the treatment plant. Is that the question?

Mr. KUCINICH. Yes, you had a choice. Why did you do the one instead of the other?

Ms. MAGNUSON. We had the choice? No, actually, King County—our treatment plant effluent limits and even the biosolids mercury levels were within our limits for our MPDS permit.

Mr. KUCINICH. What about the cost of treating it at the treatment plant? Is there a cost involved there? Is it a high cost?

Ms. MAGNUSON. If the technology, yes, is there, it is a high cost. I don't have the costs for treating it at the treatment plant right now. NACWA did some studies, so I don't——

Mr. KUCINICH. Do you have any information about the cost as far as the breakdown?

Ms. MAGNUSON. For the treatment plant, to treat it at the treatment plant?

Mr. KUCINICH. Yes. You said it would be prohibitive?

Ms. MAGNUSON. It is prohibitive, and it runs in the millions of dollars, like tens of millions of dollars, if it exists, you know, if the technology would be viable.

Mr. KUCINICH. So you are saying then that the separators are preferred to trying to——

Ms. MAGNUSON. Treating it at the source. Any of the pretreatment for metals, it is always preferable to treat it at the source.

Mr. KUCINICH. Ms. Farrell, I understand the first time you considered installing separators in dental offices you experienced strong resistance. What was different about your second attempt and what can you recommend to other counties considering policies to reduce dental mercury emissions?

Ms. FARRELL. Well, the first time we just kind of rolled out the program, and we didn't go work—do the prework with the dental societies. And so they immediately came to our board meeting and complained to our board, who is an elected board, and that was kind of the end of that.

So the second time we got a little bit smarter, and we approached them. I think, also, times had changed where they were beginning to understand that this was coming down the road.

We had a real regulatory requirement that we were going to have to meet that was going to cost us in the tens of millions of dollars, so we basically need to educate them that this was the least expensive way to meet our requirements for the community at large.

Mr. KUCINICH. Thank you. During your outreach meetings to dentists, you have said that dentists actually requested that the

central Contra Costa County make separators a mandatory policy. Why was that?

Ms. FARRELL. I am not sure I said they requested. I think they acknowledged that it was unlikely we would get a high rate of participation without a mandatory program.

Mr. KUCINICH. Thank you.

Dr. Smith, do you think it is accurate to describe the Massachusetts program as a voluntary one? Why or why not?

Mr. SMITH. I would say that the overall program was not strictly a voluntary program.

Mr. KUCINICH. Meaning what?

Mr. SMITH. Meaning the voluntary component was really applicable only to the incentivized early compliance part of our program, which was backstopped with a mandatory regulation.

Mr. KUCINICH. Did you offer incentives? What incentives did you offer to dentists who voluntarily installed separators before the program became mandatory?

Mr. SMITH. The two incentives that we offered, one was that we waived the permit fee so they did not have to pay permit fees if they came in early in the process. And the second incentive was that the units they installed were grandfathered.

And in the voluntary compliance program, that early compliance component, we only required separators to achieve a 95 percent removal efficiency. The regulation specifies 98 percent, so it is modeled on regulatory certainty.

Mr. KUCINICH. So based on your experience, have you or would you recommend other States offer similar incentives?

Mr. SMITH. Yes, I think the incentives worked extremely well and were highly supported by the Massachusetts Dental Society. I think it really galvanized attention to dentists who really wanted to do the right thing, who realize that they needed or should be putting on the amalgam separators. And here is the shot in the arm to actually get them to take the step to do it.

Mr. KUCINICH. So you have established that a beneficial effect can be made on the environment if every dentist installed a mercury separator; do you believe that?

Mr. SMITH. Yes, absolutely.

Mr. KUCINICH. What have been the costs in terms of time and money associated with maintaining the dental mercury program?

Mr. SMITH. For the State?

Mr. KUCINICH. Yes.

Mr. SMITH. We haven't broken it down that way, but in order to minimize the expense in terms of staff resources to the Agency, and also to make it easy for the dentists to basically submit, we have been using a self-certification process. And we developed an electronic e-form that the dentist can basically fill out and submit to the Agency, which makes it very easy once the form was developed. Getting the form developed was difficult. So the cost to the Agency has been relatively modest.

Mr. KUCINICH. I would just like to say that the staff will submit some questions so that we can better quantify this as we prepare our report on this committee.

Mr. SMITH. If I could just add one more thing because it was brought up earlier.

Mr. KUCINICH. Sure.

Mr. SMITH. On the compliance and enforcement end, you don't have to go visit every single dentist to verify compliance and enforcement. We are using statistically based sampling to do that, which really minimizes the expense and gives you good data.

Mr. KUCINICH. That is noteworthy. I appreciate that. Thank you.

Mr. Burton.

Mr. BURTON. Thank you, Mr. Chairman. Dr. Smith, you said that the amount of mercury in the fish up there really hasn't improved all that much.

Mr. SMITH. We actually have been seeing some improvements over the past—well, since 2000 to 2007, mercury levels in fish in Massachusetts have decreased by approximately 20 percent, depending on where you look.

Mr. BURTON. Are you eating fish up there that comes out of that area?

Mr. SMITH. Some of the fish are edible, are safe to eat. Many of them are still not safe to eat. I think we have a long way to go before they are.

Mr. BURTON. How do you decide when you go to the supermarket which fish to buy?

Mr. SMITH. Well, the smaller fish. Stay away from the tuna, the swordfish. Stick to the cod, the flounder and fish like that. Farm-raised salmon tend to have lower levels.

Mr. BURTON. Isn't that a heck of a thing you have to go through?

Mr. SMITH. It is.

Mr. BURTON. I don't eat much meat. I eat fish and chicken. It just bugs me to death to think that there is a lot of mercury in there.

Mr. SMITH. Yes.

Mr. BURTON. Ms. Farrell, without the separators the percent of mercury remains fairly consistent; is that correct?

Ms. FARRELL. That is correct. We saw very little reduction until we had the mandatory program.

Mr. BURTON. And, Mr. Boyd, you said that in Europe the compliance was almost 100 percent because it was mandatory; is that right?

Mr. BOYD. That is correct.

Mr. BURTON. So I deduce from all of your testimony what the lawyer for the ADA was saying wasn't quite correct in that he thought that the voluntary program was going to be effective. I mean, all of you can answer once, if you want to. You don't think the voluntary programs work that well?

Mr. SMITH. I would say there is no good evidence that would support that.

Mr. BURTON. Well, there you go. As Ronald Reagan would say, there you go.

I just wish they were still here so they could hear your testimony. I am sorry, but I think they already know it. It is just a matter of making sure that the message gets through to them. I know you don't have anything to do with this, but I just wish you guys didn't have to worry about this. I wish we weren't putting amalgams in people's mouths in the first place. But anyhow I really appreciate your testimony.

Mr. Chairman, again, I want to thank you for having this hearing. I yield back.

Mr. KUCINICH. I thank the gentleman. The Chair recognizes Ms. Watson from California.

Ms. WATSON. I want to thank all of our witnesses for providing us with the empirical evidence, and I will join with my colleague and say I wish the attorney were still here. You know, we sit through a lot of these hearings, and these attorneys come in and they tend to get you all tied up in legalese so that we miss the point. Thank you for coming and giving us the specific evidence from what you are doing in your respective locations.

I want to thank Dr. Smith in particular. I found your information to be very helpful. And Mr. Boyd, you have had some experience from the commercial, retail end. So I would like to have you tell about one experience where you provided free separators to dental offices, dental offices in Highland Ranch, Colorado, to encourage them to install separators in their clinics, and what was the outcome from this pilot project. Do you remember that one?

Mr. BOYD. Yes, that pilot project was actually an opportunity for us to put in a very scientific setting the impact of an amalgam separator. It is unusual to have an opportunity to treat just the mercury influent with no other mercury initiative going on and measure quantitatively the reduction of mercury and solids and the production of mercury in their liquid wastes as well.

So we, in a voluntary effort with the local sewer district out there, have provided free separators and we are doing free analyticals as well, which are being backed up by the local agency.

The results aren't all in yet. It is probably going to be about another 6 months before we have definitive results.

We had a similar opportunity in the city of Toronto, where there were no initiatives, but I can't say the science that was behind it was rock solid that showed that the impact of amalgam separators up there was incredibly dramatic. And, rather than argue the point, you know, we sort of go about it in a very scientific fashion saying we will provide the data.

Ms. WATSON. Thank you.

In light of the information reflected in your second graph regarding the deadline dates, what kind of deadline would you recommend to State and local governments considering mandating the use of separators in their State, city or counties?

Mr. BOYD. The experience that we've had is that a, you know, a mandated regulation, again, you will have some plumbers that if you give them a 3- or 4-month mandate, you know, plumbers will wreak havoc on the dental community. However, even with a 2-year, we have found most of the dentists buy in 4 months before the deadline anyway and set their own trap. So, you know, somewhere in between is probably the proper timeframe.

Ms. WATSON. Very good. Thank you.

And can you tell us about your previous experience, specifically in Maine, and what was significant about your participation, and what was the result of the Maine hearings that you had?

Mr. BOYD. Well, in Maine, I probably found myself in a very unusual situation in that I was testifying for folks that wanted amalgam separators and for the Maine Dental Association simulta-

neously. And what we were trying to do was to provide reality, because a lot of the regulation was being passed with what is called an ISO standard of performance, which is a static test run by an international—under an international standards organization protocol that determines the efficiency of a unit in that static test.

And the efficiency of that unit, if you looked at the volume of mercury that you have to remove, whether something is 95 percent or 99 percent efficient, those efficiency numbers are almost invalid in terms of making much of a difference. The standard says you have to meet a 95 percent criteria, and my argument to the folks that wanted amalgam separators was, stay at 95 percent; if you go to 99, you'll limit the market choices the dental community will have, and then people like me could take advantage.

So I argued against my own company's separators on that particular regard and argued for the Maine Dental Association that the 95 percent number would get the folks that wanted mercury reduction, it would get them the same equivalent reduction because the static test was not that representative of what actually occurred in a dental setting. So whether it was 95 or 99 percent statically, you know, when those systems are put into actual use, they still run about 98, 98 to 99 percent efficient.

Ms. WATSON. And I will just close with this.

Mr. Chairman, you have been very kind to give us this time.

As we try to look nationally and make policy, I would like you to take a look from the retail commercial end at my proposed measure, and we'll get you a copy, and suggest what policymakers should really do.

I'd like Dr. Smith to do the same thing, and maybe all four of you, you know, what we should set as a national policy. You heard the attorney before, and rather than go down the wrong path because we're not considering both ends of this, I would like to get some feedback from you who have put what we're trying to do in practicality as pilot projects how we as a Federal Government can design the policy so it will be effective.

Mr. BOYD. It would be my pleasure.

Ms. WATSON. Thank you very much.

And, thank you, Mr. Chairman.

And thank you, Mr. Burton.

Mr. KUCINICH. I thank the gentle lady from California.

This has been a hearing of the Domestic Policy Subcommittee of the Oversight and Government Reform Committee. The title of today's hearing has been, "Assessing State and Local Regulations to Reduce Dental Mercury Emissions." We have had a distinguished group of people here to testify. Panelists have included Michael Bender, the director of the Mercury Policy Project; Dr. Richard Fischer, the former president of the International Academy of Oral Medicine and Toxicology, Dr. Fischer is a dentist; Mr. Curt McCormick, former administrator, EPA Region 8; Mr. William Walsh of counsel to the American Dental Association.

Our second panel, we've had Ms. Patricia Magnuson, the Industrial Waste investigator, King County, Seattle, WA; and Ms. Ann Farrell, the director of the engineering department Central Contra Costa County Sanitary District; Dr. C. Mark Smith, the deputy director and cochair of the Massachusetts Department of EPA and

New England Governors and Eastern Canadian Premiers Task Force; and Mr. Owen Boyd, CEO of Solmetex.

I want to thank these witnesses.

I want to thank my colleagues, Representative Burton and Representative Watson, for their participation in this hearing which has taken over 3 hours, and members of our staff, who have well prepared us for this hearing.

This subcommittee will continue its look at the implications of mercury as an environmental contaminant, the health effects of it, whatever the point source happens to be of that.

I want to, again, thank everyone for their attendance, and this committee stands adjourned. Thank you.

[Whereupon, at 5:44 p.m., the subcommittee was adjourned.]

[Additional information submitted for the hearing record follows:]

TESTIMONY
OF
TIM TUOMINEN
LEAD CHEMIST
WESTERN LAKE SUPERIOR SANITARY DISTRICT

DOMESTIC POLICY SUBCOMMITTEE
OVERSIGHT AND GOVERNMENT REFORM COMMITTEE
Tuesday, July 8, 2008
2154 Rayburn HOB
2:00 p.m.

Assessing State and Local Regulations to Reduce Dental Mercury Emissions

Chairman Kucinich, Mr. Issa and Members of the Subcommittee, my name is Tim Tuominen, and I am the Lead Chemist at the Western Lake Superior Sanitary District (WLSSD), where I have worked in pollution prevention and industrial pretreatment programs for more than 30 years. I appreciate this opportunity write to you about our efforts to reduce the impact of amalgam wastes from dental practices within our service area in Northeastern Minnesota on the shores of Lake Superior. The WLSSD provides award-winning wastewater and solid waste services to roughly 100,000 residents, numerous businesses, and several industries within its 500 square-mile legislatively established service area, and is a nationally recognized leader in pollution prevention.

BACKGROUND

Dental amalgam contributes only a small proportion of all mercury released to the environment; yet is the largest source of mercury discharged to wastewater treatment plants. Due to the high concentrations of mercury in amalgam waste, many wastewater treatment plants have developed programs to improve dental waste management practices. Mercury-containing amalgam wastes may find their way into the sewer system when new fillings are placed or old mercury-containing fillings are drilled out. Waste amalgam is suctioned out of patients' mouths and can enter the

municipal sewerage system directly, or if captured in a filtering device, can enter the solid waste stream. Historically, amalgam particles were captured to recover silver for its monetary value or to protect vacuum pumps from damage; however, it was not specifically done to protect the environment.

WLSSD'S DENTAL WASTE MANAGEMENT PROGRAM

Elevated concentrations of total (acid digested) mercury can be found in the sewer lines below dental clinics. In fact, in 1992, WLSSD determined that sewers below dental clinics in our region had elevated levels of total mercury roughly 50 times that of background levels. In order to better understand why mercury was elevated in those sewers, I met with leadership of the local dental society — specifically the Northeast District Dental Society (NEDDS). I started the dialogue by stating: "WLSSD has a mercury problem and we think you can help us reduce mercury in both solid waste and in the sewer". I made a special point of informing the dental professionals that, through our local sewer ordinance, we had the authority to control the discharge of the wastewater from dental practices even though the responsibility of meeting the effluent discharge limits in our permit was WLSSD's. The NEDDS leadership said they would be willing to work in a collaborative manner to reduce the mercury impact from dental practices.

NEDDS formed an Environmental Committee to meet with WLSSD to develop ideas to improve waste management in dental practices. Through this collaborative process, we determined that we first needed to prevent amalgam disposal through flushing particles down the drain or throwing them in the garbage. Amalgam disposal in the garbage was a concern because, at that time, WLSSD was operating a solid waste / wastewater sludge incinerator and mercury in the amalgam would be released as an air emission in this process. An essential first document co-authored by

WLSSD and the NEDDS Environmental Committee was: *A Guide for Dentists: How to Manage Waste from Your Dental Practice*, which emphasized the need to stop disposing of amalgam through the sewer or the garbage.

In 1995, grants from the Great Lakes Protection Fund and the Great Lakes National Program Office allowed WLSSD to continue its work with waste management in dental practices. The goals were to conduct training, to audit waste management practices, and to install and test improved amalgam separators at selected dental practices. Again, NEDDS worked cooperatively with WLSSD by arranging training sessions by and for dental professionals in both group and office settings.

Through the audits, we estimated that dental offices could reduce discharges of mercury-containing amalgam by more than 75 percent if waste was properly managed, using the chair-side traps and vacuum pump filters that dental practices already had in place. Historically, this 75 percent portion of the waste was simply being flushed down the toilet or thrown in the garbage. We also learned through the audits that amalgam waste disposal practices to the sewer and the garbage had changed since we conducted training sessions with dental office staff. Much of the waste was then being put into infectious waste "red bags" for disposal. Unfortunately, this was also an unacceptable alternative because this waste was subsequently incinerated and mercury released into the air. We tested three types of amalgam separators and found that each would capture between 95-99 percent of the mercury that entered, removing the particles that could end up at our wastewater treatment facility.

As a result of the audit, a mutually acceptable conclusion was reached: we needed to find a way to safely manage amalgam waste. We determined that recycling the mercury was the most practical option. The waste was managed through WLSSD's "Clean Shop", a business hazardous waste management program, and then sent on to a vendor that would recover the silver, mercury and other components from the waste.

Once again, NEDDS and WLSSD collaborated to develop a document for use by dentists in our region: *Recycling Amalgam Waste and Other Best Management Practices for Your Dental Office.* The document listed the dos and don'ts of managing amalgam waste and identified the companies that could properly recycle amalgam waste. It was supported, used, and distributed by all eight of the Great Lakes State's Dental Associations and some additional state-specific dental associations. The basics of this document continue to be used in many states across the nation.

Separators were new at the time of the 1995 grant-funded project and were very expensive. However, we found they were effective and did not have a detrimental economic effect or negative impact on dental practices.

In 2003, WLSSD and NEDDS, as partners, competed for and received a local supplemental environmental improvement grant to purchase a sufficient quantity of amalgam separators for all dental practices in the WLSSD service area. The members of the NEDDS Environmental Committee who had previously volunteered to "pilot test" the new technologies were the greatest advocates and assured that their peers would take advantage of this offer.

Today, not only do all dental offices in the WLSSD service area use the most fundamental best management practices for mercury-containing waste, but they all have advanced to using improved amalgam separators that remove 95-99 percent of the mercury from their wastewater stream. All this was done through a collaborative process where the dentists themselves were often the leaders in this waste management improvement strategy. Because of the success of our collaborative program in the WLSSD region, the Metropolitan Council of Environmental Services (Minneapolis, St. Paul, and surrounding counties in Minnesota), Superior, Wisconsin, and some neighboring communities have implemented programs with similar success stories.

WLSSD has participated in national studies conducted by the Association of Metropolitan Sewerage Agencies (AMSA), now known as the National Association of Clean Water Agencies (NACWA). Two important studies were conducted in the last six years.

- First, a March 2002 study reported that mercury from domestic wastewater and municipal treatment plants accounts for less than one percent of U.S. mercury entering the environment and that amalgam from dental practices appeared to be the largest source of mercury to treatment plants.
- Second, a 2008 report studied the impact of amalgam separators on wastewater treatment plant mercury. The Executive Summary from this study states: *According to the results, separator installation does not generally appear, at least within the timeframe of this study, to significantly reduce effluent mercury concentrations. However, amalgam separator installations do generally appear to result in reductions in biosolids mercury concentrations. Therefore, despite the variability and uncertainties described in this report, the data strongly supports a conclusion that the use of separators can decrease the*

amount of particulate mercury entering POTWs, therefore decreasing the amount of mercury that would be removed by (treatment) plant processes and deposited in the biosolids.

CONCLUSION

In closing, most wastewater treatment plants are committed to understanding and reducing mercury-related risks to citizens and the environment. We use our authority to call for cost-effective reductions of mercury releases that present human health or environmental risks. Publically-owned treatment works (POTWs) have the authority to implement local ordinances to control the wastewater discharges of their non-residential users. At WLSSD, we have found that our collaborative approach with the dentists is highly successful. Other communities may also find it effective to develop collaborative partnerships with the local dental industry to improve dental waste management practices in their areas. Still, other cities may find a regulatory approach works better. Either way, local regulators are in the best position to determine the most effective methods to control dental practice waste in their service areas. Local decision-making can ensure success in controlling the impact of dental amalgam, while identifying and working with each community's unique circumstances.

Mr. Chairman and Members of the Subcommittee thank you for letting me share our success story with you.

For the Record Only

Maria Victoria Peeler
State Mercury Reduction Coordinator
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600
(360) 407-6704
peel461@ecy.wa.gov

Domestic Policy Subcommittee
Oversight and Government Reform Committee

Assessing State and Local Regulations to Reduce Dental Mercury Emissions,

2154 Rayburn HOB
Tuesday, July 8, 2008
2:00 P.M.

Chairman Kucinich, Representative Issa, Members of the Subcommittee, it was a pleasure and honor to be invited to meet with you to discuss the reduction of dental mercury emissions. It is heartening that your committee recognizes the Washington State dental amalgam reduction program as one of the best and most unique in the U.S. I am disappointed that neither I nor one of my colleagues could attend the hearing, but I am sure you understand that our current budget restrictions, as well as the short notice to travel to Washington, D.C. make it difficult for me to testify in person on July 8. It is my hope that the following testimony provides you the information you seek.

Washington State is unique in its ability to require dental waste water controls due to 1990's regulatory language regarding discharge of hazardous waste. Our regulations prevent wastewater discharges that cannot be treated at a municipal wastewater facility. The following language from the primary regulation, WAC 173-303-071(D)[1] states that:

The waste prior to mixing with domestic sewage must not exhibit dangerous waste characteristics for ignitability, corrosivity, reactivity, or toxicity as defined in WAC 173-303-090[2], and must not meet the dangerous waste criteria for toxic dangerous waste or persistent dangerous waste under WAC 173-303-100, ***unless the waste is treatable in the publicly owned treatment works (POTW) where it will be received**** This exclusion does not apply to the generation, treatment, storage, recycling, or other management of dangerous wastes prior to discharge into the sanitary sewage system;

* *Italics and red print were added for emphasis*

Background
Washington State Department of Ecology (Ecology) implemented a Persistent, Bioaccumulative, and Toxic (PBT) Strategy in 2000. Ecology then selected mercury for the first chemical reduction action plan, the Mercury Chemical Action Plan (MCAP). The MCAP, published in 2003, identified amalgam waste from dental offices as one of the largest sources of mercury releases to waters of the state. However, the Mercury Education and Reduction Act (RCW 70.95M), also approved by the legislature in 2003, did not specifically address dental waste because authority already existed.

Prior to Ecology's dental waste actions, King County promulgated an ordinance requiring amalgam separators (2003); and prior to the ordinance, amalgam separator installation was voluntary. Many other counties including Spokane and Thurston have since passed similar ordinances.

Voluntary vs. Mandatory
Based on existing regulations and a pilot project created by King County, Ecology negotiated an MOU with the Washington State Dental Association (WSDA) in August 2003. It allowed dentists two years to implement up-to-date Ecology BMPs regarding mercury, lead and other related dental wastes, including the installation of amalgam separators. Data collected during this period showed that less than 40% of dentists had installed a separator by April 2005. As a result, Ecology notified the WSDA that the MOU would not be extended and notified all state dentists that separators were required as of September 2005.

Extent of Program
Statewide, Ecology requires dental offices discharging to a septic system to install an amalgam separator and obtain a commercial wastewater discharge permit. In 2006, Ecology notified all municipalities that beginning with the largest, delegated municipalities, mercury monitoring using the most sensitive detection available – the microwave digestion with the EPA1631E method -- would be required to meet water quality permit standards.

Performance Criteria
Ecology requires statewide compliance with WAC 173-3-3-071(D) by either:

a) Documented proof by a dental office that the waste water has passed its rigorous method of testing septage waste *at the immediate point of discharge* from the dental office, or

b) Installation and maintenance of an ISO 11143 certified separator with a 95% capture rate.

Regulations
In April 2003, Ecology determined that mercury amalgam waste from dental practices could not be treated as a wastewater effluent. Rather, due to its characteristics, the waste needed to be tested and determined to be compliant with both hazardous waste and water quality standards, or contained prior to entering the combined wastewater from the facility (not at the point of discharge to the sewer). Based on data that showed that even though a wastewater treatment plant could separate mercury to a certain extent, the results were not low enough. Additionally, biosolids from the treatment plants contained rather high levels of mercury, documenting that

treatment prior to intake was not effective. Ecology used existing hazardous waste management rules to require the installation of amalgam separators.

Results
In 2007, the City of Vancouver obtained a national pollution discharge elimination system (NPDES) permit from Ecology that requires implementation oversight of dental amalgam separators. The requirement was based on data collected from several local governments, showing a fairly consistent drop of about 40% in mercury levels in biosolids for those municipalities that had aggressive amalgam separator installation programs. King County realized a 50% reduction in mercury in biosolids after 95% of its dentists installed amalgam separators and followed the required BMPs for amalgam wastes and spent fixer.

Washington State dentists who discharge to a septic system are required to place a separate septic tank system for their dental waste, rather than co-mingling with their residential tank.

The results from a survey conducted immediately prior to the end of the MOU are documented in a September 2005 report provided by Herbert and Associates, under contract to Ecology, but are not available due to an agreement with the WSDA that the report remain confidential, due to the business data collected from the dentists. However, the summary of the report identifies that the Ecology 2004 dentist self-reporting data **showed only 34%** of dentists outside the King and Snohomish County area had installed amalgam separators. The report then summarizes that **94%** of dentists either had or intended to install amalgam separators by November 1, 2005 (Ecology had notified dentists that the MOU ended in November, 2005 when required installation would become effective statewide).

On a statewide level, field visits and phone surveys documented about a 95% installation rate of amalgam separators by April 2006. Also, the most recent statewide fish tissue monitoring data shows a drop in mercury levels in monitored fish populations. However, at this point, the drop is too small and with too little data to call it a trend.

Please note the Washington State Dental Association (WSDA) only represents 60% of dentists in WA, but our data is based on 100% of the dentists with licenses. Also, please be aware that nearly 50% of all Washington dentists practice in the King County and Snohomish County urban and suburban areas, and have been under best management practices by King County ordinance from the local government since 2004 (King County has an agreement with Snohomish County to accept and treat wastewater from certain areas in Snohomish). A majority of WSDA members practice outside of the two above mentioned counties.

Challenges/Successes
The difficulties of obtaining funds, political attention, data and voluntary compliance from dental offices delayed reduction of mercury releases to waters of the state by at least two years. Ecology found that MOUs with professional associations have the potential of not being effective if the association represents less than 90% of the targeted population. Also, funding to maintain technical assistance visits and pursue regulatory violations is needed, but has not been allocated since 2005. Therefore, staff with institutional memory of the project is assigned to other projects and cannot monitor the needs of dental offices easily.

On the positive side, the WSDA tried very hard to obtain voluntary implementation of the BMPs, met with Ecology regularly, and provided presentations side-by-side with Ecology. This helped develop a positive relationship. Environmental groups, such as the Washington Toxics Coalition, amalgam separator manufacturing and marketing services, dental schools, and grassroots local organizations provided data, anecdotes and pressure politically and scientifically to increase public interest and level of understanding of the subject.

Lessons Learned

Once Ecology announced that the best management practices were required statewide to ensure compliance with Washington regulation WAC 173-303-071(D), municipalities also increased their oversight of dentists. However, small and less affluent counties have taken a bit longer to implement. Ecology used $250,000 of funding provided by USEPA under a Pollution Prevention grant to fund some of the statewide outreach materials and activities, as well as to help municipalities visit dentists and provide 2 years of mercury collection events. Additional funding most likely would have increased the participation by smaller local governments. The type of grant used (PPIS) is no longer available through EPA. Ecology recommends this type of grant be once again provided.

Municipalities and Ecology spent more time and resources than expected implementing policies regarding dental office BMPs, including amalgam separator installation. Voluntary agreements do not seem to give dental offices clear direction, even if the list of BMPs is clear. An office-to-office visit program, explaining regulatory requirements might have been more effective, more quickly.

Open Issues

Requiring 100% recycling of the amalgam, as well as preventative procedures at permitted crematoria in the state, have been considered but not pursued further. Below, please find links to Ecology's information regarding our dental amalgam waste management program. You can also find most of this information in the "case studies" provided within the white paper available through the Environmental Council of States (ECOS) Quicksilver Caucus section on dental amalgam, where other web links are provided at the end of this document.

Ultimately, the U.S. may wish to emulate the European Union countries that have slowly shifted universal dental health care from treatment of caries to prevention of caries, reducing both the public medical costs and mercury releases to the environment.

Continued monitoring of biosolids and increasing sensitivity of waste water tests will provide additional information to help us ensure mercury levels are not increasing. This can only happen if EPA and the States are provided funding and authority to increase monitoring of mercury in the environment.

It is rare to see a regulatory program that so successfully cuts half of the mercury historically released to our waters. It is worth mentioning, though, that another 50% of the original historic quantity of mercury remains in effluent and therefore biosolids. These statistics indicate that other sources of mercury must be tracked down and removed. The complete results of the reduction of mercury in biosolids can be found in the reports at http://www.ecy.wa.gov/mercury/mercury_measures_biosolids.html

[Type text]

5

A copy of Ecology's Dental Best Management Practices (BMPs) Poster can be found at http://www.ecy.wa.gov/mercury/documents/bmp-poster.pdf.
This poster was provided to all WA dentists, even for exempted specialty services, such as orthodontists.

http://apps.leg.wa.gov/RCW/default.aspx?cite=70.95M and
http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-071

http://www.ecy.wa.gov/pubs/0604011.pdf
http://www.ecy.wa.gov/mercury/BIOSOLIDS_MERCURY.pdf
http://www.ecy.wa.gov/beyondwaste/pdf/BiosolidsTreatment.pdf
http://www.ecy.wa.gov/biblio/0703043.html and http://www.ecy.wa.gov/biblio/0703030.html

---

[i] http://apps.leg.wa.gov/RCW/default.aspx?cite=70.95M and
http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-071

http://www.ecy.wa.gov/pubs/0604011.pdf
http://www.ecy.wa.gov/mercury/BIOSOLIDS_MERCURY.pdf
http://www.ecy.wa.gov/beyondwaste/pdf/BiosolidsTreatment.pdf
http://www.ecy.wa.gov/biblio/0703043.html and http://www.ecy.wa.gov/biblio/0703030.html

MADISON METROPOLITAN SEWERAGE DISTRICT

1610 Moorland Road
Madison, WI 53713-3398
Telephone (608) 222-1201
Fax (608) 222-2703

Jon W. Schellpfeffer
Chief Engineer & Director

Protecting Public Health and the Environment

COMMISSIONERS

Edward V. Schten
President
Thomas D. Hovel
Vice President
P. Mac Berthouex
Secretary
Caryl E. Terrell
Commissioner
John E. Hendrick
Commissioner

July 7, 2008

Chairman Dennis J. Kucinich
Domestic Policy Subcommittee
Oversight and Government Reform Committee
B-349B Rayburn HOB
Washington, DC 20515-6143

Subject: Assessing State and Local Regulations to Reduce Dental Mercury Emissions

The purpose of this letter is to summarize discussions I've had with Ms. Noura Erakat regarding the District's efforts to control dental amalgam, and to respond to five specific questions related to the above subject area that were conveyed in a July 2, 2008 letter from the Domestic Policy Subcommittee.

Attachment 1 contains a brief summary of the District's efforts to date to control amalgam waste from the dental sector as part of the District's mercury pollution minimization program (PMP). Background information is provided regarding the regulatory driver for implementing the PMP. The development and implementation of efforts specific to controlling dental amalgam wastes are also discussed, as are our experiences to date. Attachment 2 contains responses to the five specific questions contained in the July 2, 2008 letter from the Domestic Policy Subcommittee. Note that there is some overlap between the two attachments.

I hope that this information is sufficient to meet your needs. Mr. Ralph Erickson is the District's Pretreatment and Waste Acceptance Coordinator, and has been leading the District's efforts in the area of controlling amalgam wastes from the dental sector. Please feel free to contact Mr. Erickson directly if you have any additional questions regarding efforts in this area.

Respectfully submitted:

David S. Taylor
Director of Special Projects

Cc: Mr. Ralph Erickson
Ms. Noura Erakat

Attachment 1

Madison (Wisconsin) Metropolitan Sewerage District
Efforts to Control Dental Amalgam

Background
In accordance with Wisconsin Administrative Code Chapter NR 106, the surface water quality criterion for mercury is 1.3 ng/l (ppt). In 2002, the Wisconsin Department of Natural Resources (WDNR) determined that utilizing wastewater treatment technology to achieve discharge concentrations necessary to meet the 1.3 ppt water quality standard would result in substantial and widespread adverse social and economic impacts. WDNR further concluded that appropriate mercury source reduction activities are environmentally preferable to wastewater treatment technology, in many cases. Provisions in NR 106 allow WDNR to establish alternative mercury effluent limitations for a permittee, conditioned in part on the permittee agreeing to develop and implement a mercury pollutant minimization program (PMP). PMPs are subject to review and approval by WDNR

The District's Wisconsin Pollution Discharge Elimination Permit (WPDES) contains a variance to the 1.3 ppt water quality standard, conditioned on development and implementation of a mercury PMP. The District's PMP was developed in 2006 and was subsequently approved by WDNR in January 2007. The PMP draws heavily on a guidance manual developed by WDNR to assist agencies with PMP development. The manual is intended solely as guidance and does not contain any mandatory requirements, except where requirements found in statute or administrative rule are mentioned. The guidance document specifically identifies dental clinics as a potential source of mercury that should be addressed in a PMP, and identifies recommended control strategies, which include use of best management practices for amalgam by the dental sector.

District Efforts to Control Dental Amalgam
The District's PMP controls mercury contributions from the dental sector using four approaches:

1. Dental clinics that place or remove amalgam are required to follow Wisconsin Dental Association (WDA) best management practices for amalgam wastes
2. Dental clinics that place or remove amalgam are required to install and maintain amalgam separators
3. District staff conduct on-site inspections to evaluate BMP implementation and waste handling at dental facilities. Twenty (20) percent of the clinics are inspected each year (100% during the five year WPDES permit cycle)
4. Dental clinics are required to complete and submit an annual form summarizing the status of amalgam separator installation/maintenance and implementation of BMPs.

The requirements to install/maintain amalgam separators and to follow WDA best management practices for amalgam wastes were placed in the District's Sewer Use Ordinance (SUO). A copy

of the relevant portion of the District's Sewer Use Ordinance is included as Appendix A. The SUO also contains a numerical discharge limit for mercury, commonly referred to as a "local limit". The SUO specifically stated that the local limit for mercury does not apply to those clinics meeting conditions 1 and 2 above.

The decision to include mandatory requirements in the SUO to install/maintain amalgam separators and follow WDA best management practices for amalgam wastes was made after evaluating 3 different approaches:

- Voluntary program: dental clinics asked, but not required to install amalgam separators and follow BMPs for management of amalgam wastes.
- Permit driven program: dental clinics required to meet a local limit for Hg, with clinics installing amalgam separators being deemed compliant with the local limit.
- Mandatory program: dental clinics required to install amalgam separators and follow BMPs for management of amalgam wastes.

A decision matrix (Appendix B) was developed by District staff and used as the basis for selecting the current mandatory program approach. A voluntary program would have involved the least amount of effort on the part of the District, but would have likely resulted in the lowest level of participation on the part of dental clinics. The District operated a voluntary program prior to revising its SUO, with approximately 20% of the dental clinics having voluntarily installed amalgam separators. With additional information and education efforts, District staff estimated that, at best, 40% to 60% of the dental clinics would have installed amalgam separators under a voluntary program. Given the anticipated low level of participation, it was unlikely that WDNR would have approved a voluntary program.

A permit driven program was also considered. Under a permit driven program, all dental clinics that placed or removed amalgam would have been issued a permit and been required to meet either the current local limit for mercury or a lower, revised limit. Clinics unable to meet the local limit based on sampling would have been required to install amalgam separators. This approach would have resulted in the highest cost for both dental clinics and the District. It was unlikely that dental clinics could have met either the current local limit for mercury or a substantially lower revised local limit. Therefore, clinics would have shouldered both the cost associated with sampling, and ultimately, the cost for installing and maintaining an amalgam separator. WDNR approval of a permit driven program could have been obtained, but this approach was not preferred by either the District or WDNR. District concerns included the high amount of staff time needed to implement this approach, and the potential for creating adversarial relations with the dental sector. The collecting of representative samples of wastewater containing heavy particles of amalgam from low-flow dental clinics is extremely difficult and costly (nearly impossible outside of the clinic). The likelihood of getting questionable sampling data is very high.

Implementing a mandatory amalgam separator program posed a moderate level of difficulty for both the District and dental clinics. Revisions to the SUO were required to support this approach. The level of participation by the dental clinics would be high since the SUO would require that dental clinics placing/removing amalgam install amalgam separators as a condition of discharging to the collection system.

Implementation of the mandatory program
The District has worked closely with representatives from the Dane County Dental Society (DCDS) and individual dental clinics throughout the implementation process. District led information and education efforts started well before its PMP was formally approved by WDNR, and are on-going. DCDS leadership has been very cooperative in including I&E material prepared by the District in its periodic newsletters.

Approximately 100 clinics were identified by District staff as having reasonable potential to place/remove amalgam. Copies of the proposed revisions to the SUO were sent to both the DCDS and to all of these clinics. Although feedback from the dental sector was limited, taking this proactive step helped the Sewer Use Ordinance revision process to proceed smoothly. Sewer Use Ordinance revisions were formally adopted by the District's commission in February, 2007. Dental clinics that place or remove amalgam are required to install amalgam separators and implement best management practices no later than December 31, 2008. As of July 1, 2008, approximately 70% of the clinics have met these requirements. It is expected that a few extensions to the deadline may need to be granted for just cause (e.g. clinics that are moving to new facilities), but the remaining clinics are on target to meet the compliance date. The District has used a variety of mechanisms to help bring clinics into compliance, including use of physical inspections (20% of the clinics are inspected each year, with 2008 inspections targeting clinics that have not yet installed amalgam separators), sending notification letters via certified mail, maintaining information on the District's web site, etc.

Experiences to date
While the District has adopted a mandatory program, significant effort has been expended by staff to work in partnership with the dental sector in moving forward with this initiative. These proactive efforts have resulted in a high level of compliance over a relatively short period of time. Compliance has been achieved without District, state or federal cost sharing being provided to dental clinics.

Since we are in the early implementation stage of this effort, meaningful evaluations regarding the impact of the amalgam separator program on influent, effluent or biosolids mercury concentrations can not be made. A review of available data from other agencies suggests that significant reservoirs of "legacy" mercury may exist within the collection system, making it unlikely that measurable reductions in influent, effluent or biosolids mercury concentrations would be realized in the short term.

The dental sector as a whole has been very cooperative, although a few clinics have questioned the need to install amalgam separators. Dental clinics, however, are not accustomed to regulation by their local wastewater provider. District staff have devoted considerable time to drive their messages home to the proper staff at the clinics. The WDNR approach of providing flexibility in how individual agencies develop and implement some aspects of their mercury PMP efforts has served the District well.

Attachment 2

Responses to Questions in July 2, 2008 Letter from the Oversight and Government Reform Committee Domestic Policy Subcommittee

1. **Regarding voluntary efforts to control dental mercury contributions, explain what the District tried to do and why it was unsuccessful.**

District staff had established good working relations with both the state (Wisconsin Dental Association) and local (Dane County Dental Society) dental organizations prior to development and implementation of our formal mercury Pollutant Minimization Program (PMP). During the pre-PMP era, District interactions with the dental sector were relatively low key, with a focus on providing information and education materials relative to mercury in general, and contributions from dental amalgam in particular. Approximately 20 percent of the dental clinics that placed or removed amalgam took the voluntary step of installing an amalgam separator.

When developing our formal mercury PMP, the District considered the option of moving forward with a voluntary program, supported by an increased emphasis on information and education activities. However, the American Dental Association (ADA) best management practices for amalgam waste that were in place at that time did not call for the installation of amalgam separators. Absent a strong message from the ADA, District staff estimated that at best, 40-60 percent of the dental clinics would ultimately have installed amalgam separators under a voluntary initiative. While commendable, staff felt that this level of participation would result in the Wisconsin Department of Natural Resources not approving the District's PMP.

Current ADA best management practices (November 2007 revision) call for the installation of amalgam separators, providing a strong message from the industry that was lacking when the District developed its PMP. It is likely that a voluntary program would have a higher level of participation given current ADA best management practices.

2. **District staff indicated that the Wisconsin Dental Association (WDA) was more progressive than the American Dental Association (ADA). How did the WDA's attitude impact the District's work and what do you think the outcome of the District's PMP initiative would have been if they were not as progressive?**

The Wisconsin Dental Association was proactive regarding efforts associated with amalgam waste management. They worked cooperatively with the Wisconsin Department of Natural Resources, the University of Wisconsin Extension and the Milwaukee Metropolitan Sewerage District to develop and disseminate information on amalgam management. This effort culminated in the joint publication of a document titled "Amalgam Management For Dental Offices" (see Appendix C). District staff used this publication as part of its information and education activities with the dental sector. In addition, WDA staff demonstrated a willingness to provide other assistance to the District with regard to information and education activities when

asked. WDA efforts likely impacted the number of local dentists that voluntarily installed amalgam separators prior to District adoption of its PMP.

3. **Why did the District feel it was appropriate to copy Milwaukee's ordinance requiring the installation of amalgam separators in dental offices? In general does the District feel that the language for such an ordinance is interchangeable? How would the District advise local sanitary districts who are considering adopting another District's ordinance? What should they keep in mind?**

District staff determined that the best method to address mercury contributions from the dental sector was to revise the District's Sewer Use Ordinance to require the installation of amalgam separators and the implementation of best management practices for amalgam wastes at dental clinics that placed or removed amalgam. Rather than re-inventing the wheel, staff reviewed ordinances, resolutions, etc. used by other sanitary districts to determine if they could serve as a template for the District's effort. The Milwaukee ordinance was straight forward, streamlined, and appeared to be acceptable to the Wisconsin Department of Natural Resources. Therefore, District staff used the Milwaukee ordinance as a template, with minor modifications being made by staff to further streamline the ordinance (see Appendix A).

District staff believes that the Milwaukee ordinance or the District's further streamlined version could certainly be used as a template by other sanitary districts in Wisconsin who may be considering an ordinance approach. They might also serve as templates for sanitary districts outside of Wisconsin. However, districts outside of Wisconsin would need to carefully consider any applicable state or local regulations/guidance related to management of dental amalgam wastes, and make any modifications to the template needed to be consistent with those regulations/guidance.

4. **In conversations with the staff of Congressman Dennis Kucinich, it was mentioned that the District decided that it would be too expensive to bill the dentists to monitoring and sample wastewater, and that the District decided to pass an ordinance mandating the installation of amalgam separators instead. Can you please elaborate on the costs that you calculated regarding the different programs? What would you advise other local governments making the same consideration that you made?**

When developing our mercury PMP, District staff considered three different approaches (voluntary approach; permit driven approach based on meeting local numeric limits; mandatory amalgam separator approach) to address mercury contributions from the dental sector. A decision matrix (see Appendix B) was developed to assist the District in deciding which approach to ultimately implement.

Briefly, District staff determined that a voluntary approach would result in 40-60 percent of the dental clinics installing amalgam separators, a level of participation that would be unacceptable to the Wisconsin Department of Natural Resources. Under a permit driven approach, wastewater discharged from dental clinics would have needed to meet the numeric local limit for mercury contained in the District's Sewer Use Ordinance. The dental sector would have also been responsible for sampling, analytical, and administrative costs, as well as any fees or penalties incurred for not complying with the numeric limit. Based on available data, District staff did not

feel that clinics would be able to meet the local limit. Clinics not meeting the local limit would then be required to install amalgam separators, and incur the associated costs. Therefore, District staff determined that the least costly approach for the dental sector would be implementation of a mandatory separator program.

The District believes that decisions regarding the best approach to address mercury contributions from the dental sector are best made at the local level, based on local conditions. The mandatory approach used by the District may work well for many sanitary districts, but not for others.

5. Do you believe that a beneficial effect can be made on the environment if every dentist installed a mercury separator? Why or why not?

In general, the largest source of controllable mercury in influent received by wastewater treatment plants comes from the dental sector. Reducing mercury contributions from this source can have a positive effect on environmental quality, although it may take many years to see reductions in effluent quality because residual mercury can exist in the collection system. Mercury reductions in the dental sector can best be accomplished by following best management practices for amalgam waste, which include the installation of amalgam separators **for those clinics that place or remove amalgam.** Provisions would need to be made to exclude de-minimus contributors. It should be recognized that overall, mercury emmissions from coal fired power plants represent the single largest source of controllable environmental mercury, with the contribution being much larger than the contribution from the dental sector.

Appendix A

MMSD Sewer Use Ordinance Language Related to Dental Amalgam Separators and Best Management Practices for Amalgam Wastes

Section 5.1.6. Discharges from Dental Clinics

(a) This section applies to discharges from dental clinics where amalgam is placed or removed. For the purpose of this section, a dental clinic is a non-mobile facility dedicated to the examination and treatment of patients by health care professional specializing in the care of teeth, gums and other oral tissue. This section does not apply to orthodontics, periodontics, oral and maxillo-facial surgery, endodontics, prosthodontics or other practices that do not place or remove amalgam, or which are identified by the District as de-minimus contributors.

(b) Within the shortest reasonable time, but no later than December 31, 2008, dental clinics that place or remove amalgam shall implement best management practices for amalgam as established by the Wisconsin Dental Association.

(c) Within the shortest reasonable time, but no later than December 31, 2008, dental clinics shall install, operate and maintain an amalgam separator meeting the criteria of the International Standards Organization (ISO 11143) for every vacuum system receiving amalgam waste. Amalgam separators shall be installed, operated, and maintained according to instructions provided by the manufacturer. The amalgam separator shall have a design and capacity appropriate for the size and type of vacuum system.

(d) If a dental clinic is implementing the requirements in 5.1.6(b) and 5.1.6(c), then any numerical discharge limit for mercury established in this chapter does not apply.

(e) Starting February 1, 2009 and annually thereafter, dental clinics will submit reporting information to the District using forms provided by the District. Reporting information will include:

1. The date the amalgam separator was installed
2. The manufacturer name and model number of the separator
3. Certification that the amalgam separator was installed and is being operated and maintained in accordance with instructions provided by the manufacturer.
4. Certification that best management practices for amalgam as established by the Wisconsin Dental Association are being implemented.
5. Any other information deemed relevant by the District.

(f) From the contractors used to remove amalgam waste, dental clinics shall obtain records for each shipment showing the volume or mass of amalgam waste shipped, the name and address of the destination, and the name and address of the contractor. Dental clinics shall maintain

these records for a minimum of two years. Dental clinics shall make these records available to the District for inspection and copying upon request by the District.

(g) Dental clinics shall allow the District to inspect the vacuum system, amalgam separator, amalgam waste storage areas, and other areas deemed necessary by the District to determine compliance with this section. Inspections shall occur during the normal operating hours of the dental clinic.

Appendix B: Decision matrix for Hg control approaches within the dental sector

	Voluntary amalgam separator requirement	Permit Program	Mandatory amalgam separator requirement
Option Description	Dentists encouraged, but not required to install amalgam separators	Dentists required to meet either current or revised Hg limit in SUO. Dentists that install and maintain amalgam separators would be deemed compliant with SUO.	Dentists required to install and maintain amalgam separators-deemed compliant with SUO
Precedent	Seattle-King County (subsequently moved to mandatory program)	Not aware of any place where this approach is used	Milwaukee and several other Wisconsin WWTPs, Wichita
Cost-dental clinics	One time costs Separator purchase: $1,450/clinic ($700-$3,300/clinic)[a] Separator installation: $300/clinic ($100-$400/clinic) Total: $1,750/clinic ($800-$3,700/clinic) Annual costs Separator maint: $450/clinic ($300-$600/clinic) (Note-installation and maintenance costs applicable only if dental clinics choose to install amalgam separators)	One time costs Install sampling location: $1,000/clinic ($500-$2,000)[b] Initial inspection and permit: $500/clinic Total: $1,500/clinic ($1,000-$2,500/clinic) Annual costs MMSD annual sample collection: $135/clinic[c] MMSD annual sample analysis: $140/clinic[d] MMSD annual inspection and admin costs? $300/clinic[e] Permittee required sampling reporting and admin costs: $150/clinic[f] Total: $725 (Note-violations of the 0.02 mg/l SUO limit are anticipated for most permit holders, and would result in substantial additional costs being incurred)	One time costs Separator purchase: $1,450/clinic ($700-$3,300/clinic) Separator installation: $300/clinic ($100-$400/clinic) Total: $1,750/clinic ($800-$3,700/clinic) Annual costs Annual maint: $450/clinic ($300-$600/clinic) Annual inspection and MMSD admin costs? $150/clinic[g] Total $600/clinic
Cost-MMSD	Administrative costs: $3,000	Administrative costs: $5,000 (will be significantly higher if permit violations are encountered)	Administrative costs: $3,000
Level of difficulty for dental clinics	Moderate during installation year, low thereafter	High-self inspections, preparation for MMSD inspections, report submittal, sample collection, etc. Anticipate that many/most clinics wouldn't meet Hg limit in SUO, resulting in additional effort and cost.	Moderate-amalgam separator installation, preparation for MMSD inspections, annual separator maintenance, submittal of annual maintenance certification statements, etc.
Level of difficulty for MMSD	Low	High	Moderate Low
Level of participation by dental community	Low to moderate-expect a maximum 40% to 60% participation rate	High-all clinics would be issued permits	High-all clinics that place and/or remove amalgam would install separators
Is approach acceptable to WWDNR	Unlikely, given anticipated low to moderate level of participation	Yes, although this is not the preferred WWDNR approach	Yes-this is WDNR's preferred approach
MMSD concerns	1. Hg PMP may not be viewed as adequate by WDNR 2. Fairness within dental sector 3. Potential public perception issues-MMSD not doing enough	1. Many/most clinics wouldn't meet SUO 2. Time associated with addressing pretreatment permit violations 3. Potential adversarial relationship with dental sector	1. Potential adversarial relationship with dental sector

[a] Estimated range based on multiple data sources
[b] Pretreatment Coordinator's best professional judgment for costs associated with installing internal sampling vessel
[c] Two (2) samples per year, 2 hours per sample, hourly cost of $33.14 (with overhead)-total rounded to $135
[d] Two (2) samples per year @ $70 sample-average of 2005 and 2006 MMSD laboratory Hg analysis cost
[e] Best professional judgment based on review of recent billing for IP customers
[f] Best professional judgment
[g] this cost would be incurred on average once every five years, based on inspecting 20% of clinics per year

Appendix C

Publication titled "Amalgam Management For Dental Offices"

(Note-this is being provided as a line to PDF file)

http://www4.uwm.edu//shwec/publications/cabinet/pdf/DentalAmalgam2.pdf

FOR THE RECORD ONLY
Statement
of
Michael Aucott
New Jersey Department of Environmental Protection

Domestic Policy Subcommittee
Oversight and Government Reform Committee
Tuesday, July 8th, 2008
2154 Rayburn House Office Building
2:00 PM

I am a research scientist for the New Jersey Department of Environmental Protection (DEP), and have been involved in mercury issues for over twenty years. I was co-chair of the Sources Subcommittee of the New Jersey Mercury Task Force. The Task Force was made up of representatives of government, including DEP, industry, academia, environmental groups, trade groups, and the public. It investigated sources of mercury and its impacts, and made a number of recommendations. The Task Force's report was released January, 2002. I have also managed research that gathered information on mercury concentrations in precipitation, and was involved in investigations of the amount of mercury present in switches in discarded motor vehicles. In addition, I have analyzed data and prepared reports on mercury emissions from coal combustion, and am currently participating in analysis of new data on ambient atmospheric concentrations of a variety of forms of mercury. Below are my responses to questions presented in a July 2, 2008 letter to me from Dennis Kucinich, Chairman of the Domestic Policy Subcommittee.

1. I understand that the State of New Jersey did not demonstrate significant mercury emissions from dental offices before it issued a regulation mandating the installation of separators. Why didn't the New Jersey Department of Environmental Protection (NJ DEP) feel the need to conduct this testing? Alternatively, on what findings did the NJ DEP base its regulation?

The New Jersey Department of Environmental Protection (NJDEP) did not conduct its own testing in determining the mercury levels discharged from dental facilities. Rather, the NJDEP relied upon several existing studies in determining the discharge loadings from these sources.

Data available to the NJDEP indicated that dental facilities contribute more than any other sector to the mercury entering Publicly Owned Treatment Works (POTWs). According to the American Dental Association (ADA), 35 to 45 percent of the mercury entering POTWs comes from dental facility sources (see Eichmiller, Statement of the ADA to the Wellness and Human Rights Subcommittee, Government Reform Committee, United States House of Representatives, on The Environmental Impact of Mercury Containing Dental Amalgam, October 8, 2003). Another study estimated that dental facilities contribute approximately half of the estimated total mercury load to POTWs in the U.S. (see Vandeven, Jay and Steven McGinnis, 2005, An assessment of

mercury in the form of amalgam in dental wastewater in the United States, Water, Air, and Soil Pollution, 164, 349-366).

This large contribution is attributable to the use of "dental amalgam" in dental facilities, as a direct filling material used in restoring teeth. Dental amalgam is approximately 50 percent mercury by weight (Vandeven, J.A., and McGinnis, S.L., 2005).

Using the data from Vandeven and McGinnis, 2005, the NJDEP extrapolated that dental facilities in New Jersey release approximately 2,580 pounds per year of mercury. New Jersey was therefore quite certain that dental offices were a significant source of mercury when it issued its mercury amalgam rules. The NJDEP regulations are expected to result in the removal and proper management of in excess of 95 percent of the mercury per year.

The NJDEP has already taken significant steps to reduce mercury emissions to the air by establishing stringent restrictions on mercury emissions from coal-fired power plants, iron and steel melters, and municipal solid waste incinerators. Those rules are expected to reduce in-State mercury emissions by over 1,500 pounds annually.

The NJDEP studied mercury extensively as part of its participation in the New Jersey Mercury Task. In 2002 the Task Force stated in Volume I, Executive Summary, under the recommendation "Ensure the minimization of mercury emissions from other sources", that New Jersey should develop methods to appropriately regulate and otherwise manage the disposal of discarded mercury-containing products, including fluorescent bulbs, dental amalgam waste, thermostats and switches.

2. How did the switch from Method 245.1 to Method 1631 impact the Department's findings of mercury contamination? Would you recommend that other states make a similar switch? Why or why not?

Method 1631, version E, or 1631E, is an analytical method that was approved by the U.S. Environmental Protection Agency (EPA) in 2002. It is capable of measuring mercury at a level 400 times lower than the older method 245.1, and will be useful in better characterizing mercury levels. Method 1631E, however, did not impact the NJDEP's findings regarding mercury contamination because the method had not been required to be utilized at that time. Many earlier data on mercury concentrations in wastewaters and other media are nevertheless valid because the concentrations in these media were high enough to be detected with method 245.1. Method 1631 is approved and EPA has already issued a clarification memorandum as to its use in the National Pollutant Discharge Elimination System permitting program. The NJDEP is now requiring its use to monitor mercury concentrations in treated effluent discharged by the larger wastewater treatment plants in New Jersey. The data obtained through the use of this method will be used as a baseline to determine current mercury effluent concentrations, and will be compared to treatment plant effluent data after the amalgam separator installation date of

October 1, 2009 to determine the reductions in POTW discharges of mercury in treated wastewater.

3. Did the NJ DEP try a voluntary program for the installation of amalgam separators before it proposed regulations for doing so? Why or why not? Would a voluntary program have any chance for success in a state the size of New Jersey? Why or why not?

The NJDEP did not attempt a voluntary amalgam separator installation program. It did not believe that a voluntary program would produce the results intended. Due to the problematic nature of mercury discharges and the extensive evidence that dental offices' discharges were significant, the NJDEP determined that implementation of regulations was the best approach to protect the environment. On adoption, the regulation allowed two years for installation of an amalgam separator, with that date being October 1, 2009.

4. Has the NJ DEP engaged its dental community in its attempt to reduce mercury emissions from dental offices? Why or Why not? In the case that it did, how has this collaboration impacted your program and would you recommend it to other states? Why or why not?

As part of its research prior to proposing the regulation, the NJDEP engaged in frequent communication with the New Jersey Dental Association (NJDA), and hosted several meetings with representatives of the dental community that were assembled by the NJDA to discuss the issue of mercury discharges. These meetings were cordial, and featured frank discussions and the exchange of useful information. Although the NJDA was initially opposed to the regulatory requirement to install an amalgam separator, it did not actively oppose the adoption of the regulation. For the last two years, the NJDEP has, at the request of the NJDA, attended the NJDA annual conference, once as a presenter, and once to disseminate information to its members. Through its own outreach, the NJDA has communicated the regulatory mandates in an effort to help foster compliance with the pending regulations. It is the NJDEP's understanding that many dentists appreciate the importance of controlling mercury discharges. The NJDEP is optimistic that the vast majority of New Jersey dentists who use or remove amalgam filling material will readily achieve significant reductions by installing amalgam separators.

5. Do you believe that a beneficial effect can be made on the environment if every dentist installed a mercury separator? Why or why not?

In my view, for those dental offices where mercury amalgam is used and/or removed from patients, mercury amalgam separators will be effective in significantly reducing mercury discharges. It is my understanding that dentists are increasingly shifting to non-mercury composite restoration materials. A shift to non-mercury filling materials will probably be the most effective long-term solution to the problem of mercury discharges to wastewater (releases of mercury will continue, however, as long as mercury-containing

amalgams are removed by dentists). Further, the ADA has recently amended their best management practices to include the installation of an amalgam separator, which should decrease mercury discharges on a nationwide basis.

Through requiring installation of a separator at a dental facility, the Department can capture pollution at its source in the most economic manner. The annual operating cost for a separator, which includes the cost of recycling the captured material, is estimated at $700.00 to $1,000 per year. The costs of complying with the best management practices (BMPs) and installing, maintaining and operating the amalgam separators would increase the operating cost for a dental facility by 54 to 81 cents per patient per year.

Alternatively, the annual cost for treatment at a POTW would range from $1,280,000 per million gallons per day (MGD) for larger POTWs with flows greater than 100 MGD, to $1,980,000 per MGD for smaller POTWs with flows less than 0.5 MGD (SAIC, Technological Feasibility of Proposed Water Quality Criteria for New Jersey, prepared for USEPA Region 2, March 2005).

The NJDEP evaluated what form of regulation would be the most effective to implement, cost effective for the dental community and bring about statewide compliance. The Department adopted regulations that exempt a dental facility from the requirement to obtain a New Jersey Pollutant Discharge Elimination System (NJPDES) Significant Indirect User (SIU) permit, if it i) implements the dental amalgam best management practices (BMPs) listed in the NJPDES rule, ii) installs and properly operates an amalgam separator, and iii) registers and certifies annually to the Department compliance with this rule. New facilities that begin operating after the effective date of the rules must have the amalgam separator in place when they commence operation.

In addition to my responses to these questions, above, I am attaching the proposal to the dental amalgam rule for further background information, as file 090506a.pdf. Questions specific to the dental amalgam rule should be directed to James Murphy, Bureau of Pretreatment and Residuals, Division of Water Quality at (609) 633-3823.

Sincerely,

Michael Aucott, Ph.D.
Research Scientist
New Jersey Department of Environmental Protection
Division of Science, Research & Technology
P.O. Box 409
Trenton, NJ 08625-0409

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

ENVIRONMENTAL PROTECTION

ENVIRONMENTAL REGULATION

DIVISION OF WATER QUALITY

WATERSHED PERMITTING ELEMENT

Water Pollution Control

Requirements for Indirect Users - Dental Facilities

Proposed New Rules:	**N.J.A.C. 7:14A-21.12**
Proposed Amendments:	**N.J.A.C. 7:14A-1.2**
Authorized By:	Lisa P. Jackson, Commissioner, Department of Environmental Protection.
Authority:	N.J.S.A.58:10A-1 et seq. and 58:11-49 et seq.
Calendar Reference:	See Summary below for explanation of exception to calendar requirement
DEP Docket Number:	11-06-08/563
Proposal Number:	

A **public hearing** concerning this proposal will be held on:

Date: October 11, 2006

Time: 1:30 PM to 4:30 PM (or until the end of comments, whichever comes first)

Location: New Jersey Department of Environmental Protection
401 E. State Street
Hearing Room, First Floor, East Wing
Trenton, New Jersey

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Submit written comments, identified by the DEP Docket Number given above, by (60 days after publication) to:

Alice A. Previte, Esq.

Attn: DEP Docket No. 11-06-08/563

Office of Legal Affairs

New Jersey Department of Environmental Protection

PO Box 402

Trenton, N.J. 08625-0402

The Department of Environmental Protection (Department) requests that commenters submit comments on disk or CD as well as on paper. Submittal of a disk or CD is not a requirement. The Department prefers Microsoft Word 6.0 or above. Macintosh™ formats should not be used. Each comment should be identified by the applicable N.J.A.C. citation, with the commenter's name and affiliation following the comment.

The agency proposal follows:

Summary

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

As the Department has provided a 60-day comment period on this notice of proposal, this notice is excepted from the rulemaking calendar requirement pursuant to N.J.A.C. 1:30-3.3(a)5.

Dental facilities are a substantial source of mercury, a potent neurotoxin. The Department is proposing new rules to curtail the release of mercury from dental facilities into the environment. Dental facilities can eliminate the release of mercury by 95 percent or more by installing and operating amalgam separators, and employing best management practices for the collection and recycling of mercury-containing wastes.

With this proposal, New Jersey joins a growing number of state and local governments in the United States, as well as local and provincial governments in Canada, in requiring dental facilities to use amalgam separators. For example, a 2003 Maine law required dental offices to install amalgam separators by December 31, 2004 (38 M.R.S.A. 1667). New Hampshire rules adopted in May 2005 required amalgam separators to be installed by October 1, 2005 (Env-Ws 905.04). Under a Connecticut statute, dental practitioners and dental schools must install and maintain amalgam separators (C.G.S. chapter 446m, sec. 22a-622; see also http://dep.state.ct.us/wst/mercury/dental_bmp.htm). Massachusetts has proposed rules to require dentists to install amalgam separators and recycle their mercury-containing amalgam waste (proposed new chapter 310 CMR 73.00 and amendments to 310 CMR 30.000 and 310 CMR 70.00). New York and Vermont have also adopted rules to require dental facilities to use an amalgam separator to treat all facility waters likely to come into contact with amalgam waste (6 NYCRR Subpart 374-4 and Associated Revisions to 6 NYCRR Parts 364, 370, and 371).

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Background

Risks from mercury in the environment. Mercury is a toxic heavy metal. Exposure to mercury contamination can cause permanent brain damage to the fetus, infants, and young children. Mercury exposure has been shown to affect the ability of children to pay attention, remember, talk, draw, run, see, and play.

Even exposure to low levels can permanently damage the brain and nervous system and cause behavioral changes. Scientists estimate up to 60,000 children may be born annually in the United States with neurological problems leading to poor school performance because of mercury exposure while in utero.

Human exposure to the most toxic form of mercury comes primarily from eating contaminated fish and shellfish. In aquatic systems, mercury (in the form of methylmercury) is quickly taken up into higher organisms through the food chain, and those organisms retain the mercury in their bodies. Levels of methylmercury in fish are typically 100,000 times those in the water in which they swim.

Mercury reaches its highest levels in large predatory fish and in birds and mammals that consume fish. Accordingly, mercury poses a severe risk not only to human health, but to wildlife as well.

How mercury enters the environment. Mercury enters the aquatic environment through a variety of sources that release mercury to the land, air, and water. For example, much of the mercury that iron and steel melters, incinerators, and coal-fired power plants emit to the air is deposited in surface waters.

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

The Department has already taken significant steps to reduce mercury emissions into the air. In 2004, the Department established stringent new restrictions on mercury emissions from coal-fired power plants, iron and steel melters, and municipal solid waste incinerators. Those rules will reduce in-State mercury emissions by over 1,500 pounds annually, reflecting up to a 90 percent reduction of mercury emissions from the State's ten coal-fired power plants by 2007, a 75 percent reduction from the State's six iron and steel melters by 2009, and a 95 percent reduction below 1990 levels from the State's five municipal solid waste incinerators by 2011. (See 36 N.J.R. 123(a), 36 N.J.R. 5406(a)).

In addition, more than one-third of mercury deposited from the air in New Jersey is emitted from sources in upwind states. Accordingly, the State is challenging recent Federal regulations that would allow mercury emissions from many of these sources to continue unabated.

However, air emissions of mercury from power plants, incinerators, and foundries are not the only source of mercury in New Jersey's waters. New Jersey's wastewater treatment plants, also known as publicly owned treatment works, or POTWs, receive substantial amounts of mercury. While there is a significant amount of incidental removal of mercury at POTWs, this removal is not complete. As a result, POTWs discharge mercury directly to the surface waters of the State. In addition, to the extent that the POTWs' treatment processes remove mercury, much of that mercury is concentrated in the POTWs' sludge. Approximately 27 percent of sewage sludge generated in New Jersey is incinerated, resulting in the atmospheric release of mercury, and ultimately deposition to surface waters.

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Dental facilities (such as private dental practices, as well as other facilities where placing or removing dental amalgams occurs, such as hospitals, dental schools, and community health centers) contribute more than any other sector to the mercury entering POTWs. According to the American Dental Association (ADA), 35 to 45 percent of the mercury entering POTWs comes from dental facility sources (see Eichmiller, Statement of the ADA to the Wellness and Human Rights Subcommittee, Government Reform Committee, United States House of Representatives, on The Environmental Impact of Mercury Containing Dental Amalgam, October 8, 2003). Another study estimated that dental facilities contribute approximately half of the estimated total mercury load to POTWs in the U.S. (see Vandeven, Jay and Steven McGinnis, 2005, An assessment of mercury in the form of amalgam in dental wastewater in the United States, Water, Air, and Soil Pollution, 164, 349-366).

This large contribution is attributable to the use of "dental amalgam" in dental facilities, as a direct filling material used in restoring teeth. Dental amalgam is formed by the reaction of mercury with amalgam alloy containing silver, tin, and copper, and is often called a silver filling because of its appearance. Dental amalgam is approximately 50 percent mercury by weight (McGinnis, S.L., and Vandeven, J.A., 2005).

Dental facilities generate amalgam waste when they create fillings with dental amalgam, and when they place or remove those fillings. Examples of those wastes include non-contact amalgam (scrap), which is the excess mix left over at the end of a dental procedure, amalgam that has been in contact with the patient, such as extracted teeth with amalgam restorations, carving scrap collected at chair-side, and amalgam

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

captured by chair-side traps, filters, or screens; and empty amalgam capsules, which are the individually dosed containers left over after mixing precapsulated dental amalgam.

Dental facilities generate wastewater from restorative procedures. This wastewater flows through a chair-side trap, and in the majority (71 to 88 percent) of facilities, a filter that protects the vacuum pump (McGinnis, S.L., and Vandeven, J.A., 2005). Amalgam waste not captured by these filters, and waste captured but rinsed down the drain in dental facilities, ultimately ends up in the influent to the POTW. Mercury not removed by the POTW's treatment processes is discharged into the surface waters of the State. Mercury that is removed by those treatment processes is concentrated in sludge that may be incinerated. When amalgam waste is not rinsed down the drain, it may be deposited in biomedical waste containers or placed in trash, destined for incineration. That method of disposal challenges the ability of the incinerator to control its mercury emissions, and thus increases the risk that mercury will be released into the environment. If the waste is landfilled rather than incinerated, the mercury may ultimately reach a POTW through the discharge of leachate generated by the landfill, or may be emitted to the air along with other landfill gases. (See Lindberg, Wallschlager, Prestbo, Bloom, Price, and Reinhart, "Methylated mercury species in municipal waste landfill gas sampled in Florida, USA," cited in Savina, "Mercury in Waste Dental Amalgam: Why Is It Still A Problem?")

For these reasons, mercury-containing wastes from a dental facility are difficult to control once it leaves the facility. Conversely, those wastes can be controlled most effectively before they leave the facility.

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Management of mercury-containing wastes from dental facilities. The ADA recommends against disposing of dental amalgam wastes in the trash, in medical waste containers, or down the drain (See American Dental Association, "Best Management Practices for Amalgam Waste," September 2005). The ADA strongly recommends recycling of amalgam waste.

To recycle amalgam waste, the dental facility must first collect the waste. Chair-side traps collect some of the amalgam waste, and can collect more when they are combined with a vacuum filter. In addition, installing and properly operating an amalgam separator (in accordance with standards developed by the International Organization for Standardization specifically for dental amalgam separators) can prevent at least 96 percent of the amalgam waste from entering the office wastewater (see Fan, P.L., Batchu, Hanu, et al. May 2002, Laboratory evaluation of amalgam separators, JADA Vol. 133, 577-589). An amalgam separator is equipment designed to remove waste amalgam contained in rinse or wastewater from chair-side water collection and discharge systems.

The Department agrees with the ADA relative to the concept of recycling mercury amalgam waste. The Department believes that recycling amalgam waste will help substantially reduce the amount of mercury that reaches waters via sewers, and also reduce the amount of mercury that indirectly reaches waters via incineration of medical waste and sewage sludge. Accordingly, the Department is proposing new rules to accomplish those purposes.

Based on ADA data, New Jersey dental facilities discharge approximately 2,580 pounds per year of mercury. The November, 2002 report prepared for the ADA by

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Environ International Corporation estimated that chair-side traps or vacuum filters capture approximately 78 percent, or 2,013 pounds, of this material from the wastewater, with recycling not currently required. The remainder of the mercury is discharged into the sanitary sewer. Further reduction or removal of the mercury from the dental waste streams would be achieved through installation of amalgam separators at dental facilities. Any amalgam separator installed at a dental facility must meet the 95 percent amalgam removal efficiency established under the International Standards Organization (ISO) 11143 protocol. Again based on ADA data, at 95 percent efficiency, these separators would remove approximately 540 pounds per year of mercury from dental facility wastewater prior to discharge to the sanitary sewer. Removal and recycling the 2,550 pounds of all mercury in amalgam waste, including chair-side traps, vacuum filters, and amalgam separators, would cost 54 to 81 cents per New Jersey dental patient per year. Amalgam separators can be readily purchased from at least a dozen manufacturers within the United States.

N.J.A.C. 7:14A-1.2 Definitions

The Department is proposing amendments at N.J.A.C. 7:14A-1.2, Definitions, to provide definitions for new terms used in Subchapter 21.

The Department is proposing a new definition for the term "amalgam separator," which is a device to remove amalgam and its metal constituents from dental office wastewater. The Department is also proposing a definition for the term "amalgam waste," which describes waste products containing amalgam generated by dental facilities, as well as a definition for the term "dental facility," which means any dental

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

clinic, dental office, or dental practice, including hospitals, dental schools, and community health centers. Lastly, the Department is proposing a definition for the term "ISO 11143," which refers to the International Organization for Standardization's standard for amalgam separators.

N.J.A.C. 7:14A-21.12 Requirements for Dental Facilities

The Department is proposing new rules at N.J.A.C. 7:14A-21, Requirements for Indirect Users. Subchapter 21 incorporates the pretreatment program requirements for indirect users as specified under the Federal Water Pollution Control Act, the Federal General Pretreatment Regulations under 40 CFR Part 403, and other applicable State statutes and regulations. The pretreatment program is designed to prevent discharges into POTWs by non-domestic users that will upset, pass through, or interfere with the operations of the treatment works, as well as protect the local agency's workers' health and safety, and protect and/or improve the quality of sludge generated by the POTWs. Protecting the receiving treatment plants will enable the plants to operate in an efficient manner and result in fewer pollutants entering the waters of the State.

The proposed new rules are intended to significantly reduce mercury released to the environment by dental facilities. Taking preventive measures to capture mercury at the source of the pollution is more-effective than having local agencies provide treatment. and is consistent with the recommendation of the New Jersey Mercury Task Force that the State reduce the mercury content in sewage sludge. The Task Force recommended as a goal that no POTW should produce sludge with a mercury concentration higher than 2 ppm within 10 years. In 2003, the New Jersey median sludge value for mercury was 1.47

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

mg/kg (see Statewide Sludge Management Plan, Appendix K, January 2006). However, the 2003 mean sludge value for mercury was 2.5 mg/kg. With the mean value over 2 ppm, source reduction options are still necessary to achieve the 10-year goal noted above.

As indicated in the Economic Impact below, installation of additional treatment units specifically for removal of mercury at the POTW would result in POTWs incurring significant annual costs. In November 2002, the Department proposed to adopt the surface water quality standards based on wildlife criteria for mercury (0.53 parts per trillion). Due to implementation concerns raised during the public comment period, the Department chose not to adopt that criteria, and at that time committed to develop an implementation plan to control the release of mercury into the environment. (See 37 N.J.R. 3481). This proposal to control discharges of mercury from dental facilities is a l step toward the Department's commitment to develop an implementation plan.

Rule requirement. The proposed new rules at N.J.A.C. 7:14A-21.12 establish specific regulatory requirements for dental facilities that discharge wastewater to the sanitary sewer and generate amalgam waste through placement or removal of amalgam fillings. These requirements will affect approximately 3,400 dental facilities in New Jersey.

Under proposed N.J.A.C. 7:14A-21.12(e), a dental facility that discharges to a POTW operated by a Delegated Local Agency (DLA) will be required to apply for a NJPDES significant indirect user (SIU) permit from the DLA, unless an exemption from permitting is available. If the dental facility discharges to a POTW that is not operated by a DLA, it will be required to apply for a NJPDES SIU permit from the Department, unless an exemption from permitting is available. This rule does not address dental

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

facilities that discharge wastewater containing amalgam waste to an onsite wastewater disposal system, such as a septic system. The existing rules require such facilities to hold an individual NJPDES discharge to groundwater permit.

Proposed N.J.A.C. 7:14A-21.12(a) exempts specified types of dental specialties that stand alone and generate little or no amalgam wastes. These specialists include orthodontists, periodontists, endodontists, or oral and maxillofacial surgeons/radiologists/pathologists. Any amalgam waste generated by these specialties would continue to be managed in the current manner, via placement of such wastes into the appropriate regulated medical waste container.

Exemption from permitting. Proposed N.J.A.C. 7:14A-21.12(b) would exempt a dental facility from the requirement to obtain a NJPDES SIU permit, if it i) implements the dental amalgam best management practices (BMPs) listed in the proposed new rule, ii) installs and properly operates an amalgam separator, and iii) registers and certifies to the Department compliance with this rule. Under the proposal, dental facilities are required to implement the BMPs no later than 12 months after the effective date of the regulation, and must install an amalgam separator no later than 24 months after the effective date. New facilities that begin operating after the effective date of the proposed new rules must have the amalgam separator in place when they commence operation.

The BMPs proposed at N.J.A.C. 7:14A-21.12(d) include measures that target pollution prevention, such as the use of mercury-free material, and the elimination of the use of bulk elemental mercury in favor of using precapsulated alloys only. Others target proper collection of mercury-containing wastes, through the proper operation and maintenance of the amalgam separator, chair-side traps, and other equipment. Proper

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

collection is also facilitated by implementing BMPs designed to prevent the improper disposal or release of mercury-containing wastes. The BMPs also call for the recycling of the collected wastes and recordkeeping to document compliance with all of the requirements.

The proposed new rules also require the installation and operation of an amalgam separator. Proposed N.J.A.C. 7:14A-21.12(b)2 includes requirements for the performance of the amalgam separator. The separator must conform to the ISO 11143 protocol. ISO 11143 is the International Organization for Standardization's standard for amalgam separators. The ISO standard requires that the amalgam separator remove at least 95 percent of the amalgam when the separator is subjected to the test methods specified in the standard. The separator must serve every dental chair in the facility, and must be sized adequately for the maximum expected flow rate. The proposed rule also requires the owner of a dental facility to register and certify with the Department compliance with the rule. The Department will make an effort to incorporate the reporting provisions within the annual registration submitted by all dental facilities under the Regulated Medical Waste Generator Registration Program at N.J.A.C. 7:26-3A.8(f).

Those facilities that do not comply with the requirements of proposed N.J.A.C. 7:14A-21.12(b) within the time frame established by the rule will be required to apply for a NJPDES SIU permit from either the Department or a delegated local agency pursuant to N.J.A.C. 7:14A-21.12(e). Those dental facilities that generate amalgam waste and do not comply with the BMPs provisions under N.J.A.C. 7:14A-21.12(b)1 must apply for a NJPDES SIU permit no later than 12 months after the effective date of the proposed rule. Those dental facilities that generate amalgam waste and do not comply with the

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

requirement to install an amalgam separator under N.J.A.C. 7:14A-21.12(b)2 must apply for a NJPDES SIU permit no later than 24 months after the effective date of the proposed rule. As provided in N.J.A.C. 7:14A-21.12(c), the exemption allowed under (b) shall not apply if a local agency conducts a headworks analysis and determines that additional measures are necessary to control mercury and ensure compliance with its NJPDES discharge permit. Treatment plant sampling completed as part of a headworks analysis will enable the local agency to determine its maximum allowable headworks loading (MAHL) for mercury. The local agency will compare its MAHL to its current loading, and will take appropriate action to decrease the incoming mercury loading as necessary. Where additional control measures are necessary, the control authority will seek to identify all sources contributing mercury into the treatment works, and will require that these sources apply for a NJPDES-SIU permit. Dental facilities, being sources of mercury, will also be required to apply for a NJPDES-SIU permit. Based on these permit applications, the control authority will, on a case-by-case basis, either issue a NJPDES-SIU permit, or determine that the applicant is not an SIU pursuant to N.J.A.C. 7:14A-1.2 and does not need a NJPDES-SIU permit.

The Department estimates that if the affected dental facilities implement the BMPs and install amalgam separators, their wastewater discharges of mercury would decrease by about 540 pounds per year. This estimate is based on findings from a number of studies.

For example, the Toronto (Ontario) Sewer District found that, after requiring installation of amalgam separators by dental facilities, the average monthly mass of

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

mercury in the combined sludge of its four treatment plants had been reduced by 58 percent, with plant by plant rates varying from 45 to 74 percent. This decrease was based on a 73 percent (800/1100) compliance rate by dental clinics. Toronto estimated that full compliance would result in an 80 percent reduction in the monthly mass of mercury in the sewage sludge. (See Shaw, Martin, Reduction in Mercury Loading to Four Toronto Area Sewage Treatment Plants Due to Implementation of an Amalgam Separator By-Law.) Similarly, in a study conducted cooperatively between the Minnesota Dental Association and the Metropolitan Council of Environmental Services, installation of amalgam separators in dental offices resulted in mercury levels in wastewater treatment plants influent being lowered by as much as 29 to 44 percent.

Social Impact

The Department expects the proposed new rules and amendments to have a positive social impact for the State's residents, and for those whose work in or visits to the State would be enhanced by reducing the amount of mercury in the waters, air, fish, and wildlife of the State. The proposed new rules and amendments will result in a reduction in the amount of mercury entering POTWs. This reduction will ultimately result in a decrease in mercury releases to the water and air, which will result in less accumulation of mercury in the aquatic food chain. The reduction will serve as an essential part of the State's overall strategy to reduce the number of fish consumption advisories and to mitigate the effect of mercury exposure on the health of fetuses and young children.

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

This regulation will affect approximately 3,400 dental facilities that generate amalgam waste through placement or removal of dental amalgam. The most effective and efficient way to keep mercury from dental amalgam out of the State's environment is for those facilities to effectively collect and recycle their amalgam wastes in compliance with the proposed new rule.

Economic Impact

Impact on dental facilities

Proposed N.J.A.C. 7:14A-21.12 will impact approximately 3,400 dental facilities in New Jersey that generate amalgam waste through placement or removal of mercury amalgam fillings. The rules allow for an exemption from the NJPDES SIU permitting requirements for dental facilities that comply with the BMPs and install an amalgam separator. The proposed rules will have an economic impact on dental facilities that generate amalgam waste, as well as manufacturers and suppliers of amalgam separators, amalgam recycling companies, and possibly licensed plumbers in the State of New Jersey.

As discussed in more detail below, the costs associated with installation of amalgam separators and recycling of all waste amalgam generated by affected dental facilities in New Jersey would be 54 to 81 cents per patient per year. The Department estimates that costs for recycling amalgam waste associated with BMPs (not including amalgam waste generated by separators) would be approximately $300.00 per facility per year, or about 20 cents per patient per year.

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Facilities that forego the permit exemption, and instead choose to obtain a NJPDES SIU permit from either the Department or a delegated local agency, will incur a variety of costs. Those costs are incurred in applying for a permit, complying with permit conditions, paying permit fees, and paying penalties or fines if the permit is not applied for or is violated. Currently, the minimum annual permit fee for a Department issued permit is $5,400. Delegated local agencies have permit fees that range from $50.00 to $11,000 per year. The cost of complying with permit conditions will depend upon the particular conditions that either the Department or the DLA establishes in an individual permit. What conditions will be established in an individual permit cannot be determined at this time, especially because such permits are subject to public comment before they can become final. The cost of paying penalties or fines depends on whether a violation occurs, the nature of the violation, and whether mitigating or aggravating circumstances are present.

Costs related to compliance with the BMPs and installation of an amalgam separator are based largely on the information provided in a November 2002 report prepared for the American Dental Association by Environ International Corporation (Environ report). Based on registrations in the Department's Medical Waste Generator data base, there are approximately 4,400 dental facilities in New Jersey. The New Jersey Dental Association estimates that the dental practices in approximately 1,000 of these facilities are specialists that are exempt from the regulation because they do not place or remove amalgam fillings. As such, about 3,400 facilities would be subject to the regulation, and would need to comply with the BMP and install an amalgam separator. The Environ report notes that the average purchase price for an amalgam separator would

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

typically range from $1,000 to $2,000 per facility. The initial statewide capital costs for 3,400 facilities to purchase separators would therefore range from $3.4 to $6.8 million. With the life of the separator estimated to be 10 years, the annual average cost over this period would be $340,000 to $680,000. The annual operating cost for a separator, which includes the cost of recycling the captured material, is estimated at $700.00 to $1,000 per year. For 3,400 facilities, this totals $2.4 to $3.4 million per year. Thus, the annual costs for purchase, installation, and operation of the amalgam separators would total $2.7 to $4.1 million on a Statewide basis.

Based on the 1999 CDC National Oral Health Surveillance System study (the most recent available), 72 percent of New Jersey residents visited a dentist in 1999. Utilizing the census data closest to that year, the 2000 census data indicated the New Jersey population to be 8,414,350. This would imply that 6.05 million New Jersey residents saw a dentist in 1999. There are approximately 6,000 dentists in New Jersey, including the approximately 1,000 specialists that would be exempt from the proposed new rule. With 5,000 of the 6,000 dentists handling amalgam, and assuming conservatively that visits to dentists are distributed evenly among dentists handling amalgam and exempt dentists, there would be 5.04 million patients who visited a dentist that placed or removed amalgam. Accordingly, the costs of complying with the BMPs and installing, maintaining and operating the amalgam separators would increase the cost 54 to 81 cents per patient per year.

ADA data indicates that chair-side traps and vacuum pump filters remove 40 to 80 percent of the total mass of amalgam particles from dental office wastewater, with the remainder being discharged into the sanitary sewer. Taking into account the fact that

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

some facilities have both a chair-side trap and a vacuum filter, while some have chair-side traps only, the Environ report developed a weighted average of 78 percent as an industry-wide amalgam capture efficiency for dental facilities in the United States. Utilizing this capture efficiency along with ADA data on amalgam placements and removals, and apportioning to New Jersey, indicates that chair-side traps and vacuum filters would remove 1.01 tons (2,013 pounds) per year of mercury from the dental waste stream, assuming proper management and recycling of all amalgam waste.

Installation of the mercury amalgam separator meeting the ISO 11143 standard (minimum 95 percent removal efficiency) shows that an additional 0.27 tons (540 pounds) per year of mercury would be removed from the wastestream prior to discharge into the sanitary sewer. Annual costs per pound of mercury removed ranges from $5,100 to $7,700 (including costs associated with compliance with the BMP and recycling of captured material). In comparison, these cost estimates are far lower than the range of costs estimated by the Department for other types of facilities that are now required to reduce mercury emissions. For example, in the Department's proposal for air pollution control regulations (see 36 N.J.R. 123(a)), which have since been adopted (see 36 N.J.R. 5406(a)), the Department estimated that the costs for the installation or upgrading of mercury emission controls by municipal solid waste incinerators, iron and steel manufacturing facilities, and coal-burning utilities would be in the range of $5,000 to $40,000 per pound of mercury reduced.

In developing the proposed rules, the Department also considered costs associated with mercury removal at the POTW. The preferred treatment technology for mercury at a POTW is reverse osmosis. Annual cost for such treatment would range from

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

$1,280,000 per million gallons per day (MGD) for larger POTWs with flows greater than 100 MGD, to $1,980,000 per MGD for smaller POTWs with flows less than 0.5 MGD (SAIC, Technological Feasibility of Proposed Water Quality Criteria for New Jersey, prepared for USEPA Region 2, March 2005). Assuming New Jersey POTWs treat approximately 1,000 MGD of wastewater, the annual cost for treatment of mercury at the POTW would range from $1.28 to $1.98 billion. These costs would enable POTWs to remove mercury from their effluent, but would not address mercury in the POTW sludge.Compared with dental facility estimated annual costs for purchase, installation, and operation of the amalgam separators of $2.7 to $4.1 million, treating mercury at the source is much more feasible and cost effective.

Reductions in releases of mercury to the environment should have beneficial impacts on healthcare costs due to decreased incidence of illness related to mercury exposure. While these impacts are expected to be positive, their magnitude is difficult to estimate.

Impact on fishing industry

Human exposure to the most toxic forms of mercury comes primarily from eating contaminated fish. Exposure to methylmercury from fish is known to have a potentially profound impact on the developing nervous system, and mercury-contaminated fish in the mother's diet can significantly alter fetal development. Since contamination of fish represents a major health concern, it poses a significant economic threat to New Jersey's commercial and recreational fishing industries.

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

As explained in the Environmental Impact below, a significant reduction in inputs of mercury to New Jersey water bodies will eventually lead to lower levels of mercury in fish. There will be many economic benefits from lower levels of mercury in fish including, potentially, the relaxation of mercury-based fish consumption advisories that may result from the full implementation of the proposed new rules and amendments. Such relaxation could lead to greater attractiveness of sport fishing to recreational fishermen, with a corresponding increase in dollars spent in New Jersey on fishing gear, licenses, and travel and lodging for fishing trips. A recent study in New Jersey indicates that party and charter boat captains believe that fish advisories have some negative effect on their business (J. Burger, B.B. Johnson, S. Shukla, and M. Gochfeld, 2003, Perceptions of Recreational Fishing Boat Captains: Knowledge and Effects of Fish Consumption Advisories, Risk Analysis, 23, 369-378). The over 260,000 licensed anglers in New Jersey have been estimated to spend nearly $500.00 each per year on freshwater fishing, for a total of $130 million per year (NJDEP, DRAFT, Freshwater Fishing in New Jersey 1992: A Survey of License Holders, Division of Fish and Wildlife, Trenton, NJ). Recreational saltwater fishing is estimated to contribute $1.5 billion per year to the State economy. Lower levels of mercury in fish caught for sale could increase the marketability of fish and fish products, which would lead to higher value of commercial fishing activities. Commercial saltwater fishing is estimated to contribute over $590 million to the New Jersey economy (NJDEP, The Economic Impact of Saltwater Fishing in New Jersey during 1996, NJDEP, Division of Fish and Wildlife, Trenton, NJ, 1996).

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Environmental Impact

The Department expects the proposed new rules and amendments to have a positive environmental impact. Mercury is a persistent, bioaccumulative, toxic pollutant. Mercury, in the form of methylmercury, contaminates freshwater fish caught throughout New Jersey. Concentrations exceeding 1.0 ppm have been found in higher trophic level fish, especially largemouth bass and chain pickerel, in about 40 percent of 55 New Jersey water bodies that have been sampled. Contaminated fish have been found in remote areas such as the Pine Barrens, as well as in industrialized areas of the State. Mercury concentrations in lower trophic level fish are also elevated in New Jersey and often are in the range of 0.2 to 0.5 ppm. Many tested water bodies exceed the surface water criterion of 0.3 ppm in fish tissue promulgated by the USEPA (New Jersey Mercury Task Force, Volume II, page 95, NJ Department of Environmental Protection, 2002).

The Department expects the proposed rules to lead to a significant reduction in inputs of mercury to New Jersey POTWs. Wastewater generated by dental facilities that remove or place amalgam fillings can contain significant amounts of mercury. The Environ report indicates that 53 percent of the mercury entering into wastewater treatment plants is from dental offices. Similarly, in testimony to Congress in October, 2003, the ADA noted that 35 to 45 percent of the mercury entering POTWs is from dental office sources. When discharged to a local agency's treatment plant, mercury can accumulate in the biosolids and discharge to the waters of the State with effluent from the local agency's treatment works. Regulating this discharge under a NJPDES SIU permit, a permit from a delegated local agency, or through implementation of BMPs and

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

installation of amalgam separators, will reduce the amount of mercury discharged to a local agency's treatment plant.

Decreasing the mercury in the POTW influent will result in a decrease in the mercury found in the POTW biosolids. The Toronto (Ontario) Sewer District found that, after requiring installation of amalgam separators by dental facilities, the average monthly mass of mercury in the combined sludge of its four treatment plants had been reduced by 58 percent, with plant by plant rates varying from 45 to 74 percent. This decrease was based on a 73 percent (800/1100) compliance rate by dental clinics. Toronto estimated that full compliance would result in 80 percent reduction in the monthly mass of mercury in the sewage sludge.

Implementation of the BMPs and installation of amalgam separators proposed in N.J.A.C. 7:14A-21.12 will reduce mercury released to the environment from dental facilities. The Department estimates that the recycling and proper management requirements in the BMPs will decrease mercury releases to the environment by an estimated 2,550 pounds per year, including mercury captured by separators. The Department estimates that these measures will reduce the mercury loading to the POTW sludge and decrease the amount of mercury discharged to waters of the State through local agency's treatment plants.

Federal Standards Statement

Executive Order No. 27 (1994) and N.J.S.A. 52:14B-1 et seq. (P.L. 1995, c.65), require State agencies that adopt, readopt or amend State regulations that exceed any

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Federal standards or requirements to include in the rulemaking document a Federal standards analysis.

The Federal General Pretreatment Regulations at 40 CFR Part 403 include the requirements for indirect users and the role of the control authority to regulate such users. Subchapter 21 incorporates the requirements from 40 CFR Part 403 relevant to indirect user control mechanisms for implementing the pretreatment program in the State. Proposed N.J.A.C. 7:14A-21.12 establishes specific requirements for dental facilities that discharge to the sanitary sewer and generate amalgam waste through placement or removal of amalgam fillings. The proposed new rules set forth specific requirements for dental amalgam waste collection and management. The proposed rules do not have any Federal counterpart. Accordingly, they are not more stringent than the Federal rules, and a Federal standards analysis is not required.

Jobs Impact

The Department anticipates that the proposed new rules and amendments will have a slight net positive impact on employment in the State.

Proposed N.J.A.C. 7:14A-21.12 will impact dental facilities that generate amalgam waste through placement or removal of dental amalgam. Such facilities will be exempt from the requirement to obtain a NJPDES SIU permit provided they comply with the dental amalgam BMPs and install an amalgam separator. Facilities required to install amalgam separators will need to: i) purchase dental amalgam separator equipment; ii) contract with a waste management and recycling company; and iii) hire licensed

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

plumbers. Sectors supplying the equipment and services may, therefore, see an increase in job and employment opportunities.

Facilities that generate amalgam waste and do not comply with the conditions for exemptions must apply for a NJPDES SIU permit. These facilities will need to contract with Department-certified laboratories for analysis of their wastewater discharge. The Department anticipates that a vast majority of the affected facilities will comply with the BMPs and install amalgam separators, and very few will apply for a NJPDES SIU permit. The Department expects that resources at existing laboratories will be utilized for analytical work and does not anticipate job growth at laboratory facilities as a result of the proposed new rules and amendments.

The Department does not anticipate that any dental facilities will cease operations as a result of these proposed regulations.

Agricultural Industry Impact

One of the primary objectives of the pretreatment program is to protect POTW sludge quality and improve opportunities for POTWs to beneficially re-use biosolids. The proposed new rules and amendments will provide both delegated local agencies and the Department with a tool to protect and/or improve the quality of biosolids generated as a result of wastewater treatment. The proposed new rules and amendments will result in a decrease in the loading of mercury in the influent to the treatment plants. This will result in improved and/or protected biosolids quality and continue to allow for beneficial re-use of this material. As such, the agricultural industry can benefit from the proposed rules because they will result in the availability of sludge whose quality has been improved and/or protected. The agricultural industry can utilize the biosolids to improve

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

the productivity of the land using the soil conditioning properties and nutrient content of the biosolids. Additionally, utilization of biosolids in a beneficial manner reduces dependence on chemical fertilizers.

Regulatory Flexibility Analysis

As required by the New Jersey Regulatory Flexibility Act, N.J.S.A. 52:14B-16 et seq., the Department has evaluated the reporting, recordkeeping and other compliance requirements that the proposed new rules and amendments would impose upon small businesses. The Regulatory Flexibility Act defines the term "small business" as "any business which is a resident in this State, independently owned and operated and not dominant in its field, and which employs fewer than 100 full-time employees." Based upon this definition, the Department has determined that the proposed new rules and amendments will have an affect on the standards, monitoring, reporting or record keeping requirements applicable to small businesses.

Subchapter 21 regulates industrial and non-domestic facilities that discharge process wastewater into the sanitary sewer. Proposed N.J.A.C. 7:14A-21.12 will allow for an exemption from the NJPDES SIU permitting requirements for dental facilities that comply with the BMPs, and install an amalgam separator. The proposed regulation will affect approximately 4,400 dental facilities in New Jersey, many of which are small businesses. However, an estimated 1,000 of these facilities are dental specialists (e.g. orthodontists, endodontists) that do not place or remove amalgam fillings and have been exempted from the requirements under N.J.A.C. 7:14A-21.12.

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Facilities that are exempt from the NJPDES SIU permit due to compliance with the BMPs and installation of an amalgam separator must report only on an annual basis. In an effort to minimize the impact under the annual reporting requirement, the Department will make an effort to incorporate the reporting provisions within the annual registration submitted by all dental facilities under the Regulated Medical Waste Generator Registration Program at N.J.A.C. 7:26-3A.8(f). Record retention for a five-year period, consistent with the existing NJPDES regulations, would be required. Facilities required to install amalgam separators will need to: i) purchase dental amalgam separator equipment; ii) contract with a waste management and recycling company; and iii) hire licensed plumbers.

Any facility obtaining a NJPDES SIU permit from either the Department or a delegated local agency would be subject to reporting, record keeping, and compliance requirements consistent with those established in the federal General Pretreatment Regulations in 40 CFR Part 403 and the New Jersey statutes at N.J.S.A. 58:10A-1 et seq. These facilities must report monthly, and must complete an analysis of their wastewater discharge at least twice per year. Record retention for a five-year period would be required. These facilities will need to contract with Department-certified laboratories for analysis of their wastewater discharge, and may need the services of an existing engineering/environmental firm for proper completion of the NJPDES SIU permit application.

The costs associated with permitting and compliance for small businesses are further elaborated in the Economic Impact above.

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

Proposed N.J.A.C. 7:14A-21.12 provides dental facilities an opportunity to demonstrate compliance with the pretreatment program requirements by implementing the BMPs and installing amalgam separators. This initiative will significantly reduce compliance costs for dental facilities that opt to participate under this exemption. If regulated under an NJPDES SIU permit, dental facilities would be subject to annual permit fees, compliance with the standards by sampling at least once every six months, monthly reporting, and significant penalties under the New Jersey Water Pollution Control Act in cases where non-compliance is demonstrated. Currently, the minimum annual permit fee for a Department issued permit is $5,400. Delegated local agencies have permit fees that range from $50.00 to $11,000 per year. The average purchase price for an amalgam separator would typically range from $1,000 to $2,000 per facility. Annual operating costs for a separator, which includes the cost of recycling the captured material, are estimated at $700.00 to $1,000 per year. The Department estimates that costs for recycling amalgam waste associated with BMPs (not including amalgam waste generated by separators) would be approximately $300.00 per facility per year.

Because the proposed rules and amendments affect small businesses, the requirement to comply with the BMPs and install a separator will be phased in over a 24 month period. Those facilities that do not comply with the BMPs and install a separator will be required to apply for a NJPDES SIU permit from either the Department or a delegated local agency. The Department anticipates that the majority of facilities will comply with the BMPs, including installing an amalgam separator. Allowing 24 months from the effective date of the regulation should allow such facilities the necessary time to comply with the proposed regulations. In comparison, the State of Maine passed

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

legislation (PL 2003, chapter 301) in September 2003, giving affected facilities 15 months (until December 31, 2004) to install an amalgam separator. The State of New Hampshire adopted regulations in May 2005 requiring dental facilities to install amalgam separators no later than October 1, 2005.

Smart Growth Impact

Executive Order 4 (2002) requires State agencies that adopt, amend, or repeal any rule to describe the impact of the proposed rule on the achievement of smart growth and implementation of the New Jersey State Development and Redevelopment Plan (State Plan). The proposed new rules and amendments do not involve land use policies or infrastructure development and therefore will not have an impact on the achievement of smart growth or implementation of the State Plan.

Since the proposed rules implement a program of reducing the amount of mercury discharged from dental facilities, the proposed rules support the State Plan's goal of protecting the environment and preventing pollution by implementing a strategy of reducing pollution at the source.

Full text of the proposal follows (additions indicated in boldface **thus**; deletions indicated in brackets [thus]):

CHAPTER 14A. POLLUTANT DISCHARGE ELIMINATION SYSTEM

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

SUBCHAPTER 1. ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

7:14A-1.2 Definitions

...

"Amalgam separator" is a device to remove amalgam and its metal constituents from dental facility wastewater, installed downstream of the chair-side trap and any vacuum filter.

"Amalgam waste" means and includes non-contact amalgam (amalgam scrap that has not been in contact with patient); contact amalgam (including but not limited to extracted teeth containing amalgam); amalgam sludge captured by chairside traps, vacuum pump filters, screens, and other amalgam trapping devices; used capsules containing amalgam; and leaking or unusable amalgam capsules.

...

"Dental facility" means any dental clinic, dental office, or dental practice, including hospitals, dental schools, and community health centers.

...

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

"ISO 11143" is the International Organization for Standardization's standard for amalgam separators, as supplemented or amended, and incorporated herein. The standard is available from the ISO at http://www.iso.org.

...

SUBCHAPTER 21. REQUIREMENTS FOR INDIRECT USERS

7:14A-21.12 Requirements for Dental Facilities

(a) This section establishes Best Management Practices and regulatory requirements for owners of dental facilities that generate amalgam waste through the removal or placement of amalgams. The requirements of this section do not apply to a dental facility at which no dentistry is practiced other than any of the following specialties:

1. **Orthodontics;**
2. **Periodontics;**
3. **Endodontics;**
4. **Oral and Maxillofacial Surgery;**
5. **Oral and Maxillofacial Radiology; and**
6. **Oral and Maxillofacial Pathology.**

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

(b) Except as provided under (c) below, an owner of any dental facility that generates amalgam waste shall be exempt from the requirement to obtain a NJPDES-SIU permit from the Department or the DLA for the discharge of wastewater into a local agency's treatment works, provided the owner complies with following requirements:

1. The owner of a dental facility shall implement the Best Management Practice described in (d) below no later than (12 months after the effective date of this rule);

2. The owner of the dental facility shall install an amalgam separator to serve every dental chair in the facility where amalgam waste is generated. The amalgam separator must be adequately sized for the maximum expected flow rate. The amalgam separator shall be installed no later than (24 months after the effective date of this rule). The separator shall conform with the ISO 11143 protocol. Each dental facility constructed on or after (the effective date of this section) shall include an installed amalgam separator that conforms with the ISO 11143 protocol; and

3. The owner of a dental facility subject to this section shall register and certify compliance with the requirements of (b)1 and 2 above. This registration and certification shall be submitted annually to the Department on forms or in the format provided by the Department.

(c) If a local agency conducts a headworks analysis pursuant to N.J.A.C. 7:14A-19.7(a) and determines that additional mercury control measures are necessary to

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

ensure compliance with its NJPDES permit, then the control authority shall impose additional mercury control measures on dischargers to the local agency's treatment works, including, as appropriate, dental facilities subject to this section. Where additional mercury control measures are necessary, all dental facilities discharging to such local agency shall apply for an NJPDES-SIU permit.

(d) **Best Management Practices require a dental facility to, at a minimum:**

1. **Use mercury-free material when appropriate;**
2. **Eliminate all use of bulk elemental mercury;**
3. **Use precapsulated alloys only;**
4. **Recycle used disposable capsules containing amalgam;**
5. **Maintain and operate the amalgam separator when installed according to its manufacturer's specifications;**
6. **Install chair-side amalgam traps in both the vacuum system and cuspidor of each operatory where restoration work is done;**
7. **Change and clean chair-side amalgam traps frequently;**
8. **Not rinse traps or vacuum pump filters over drains or in the sinks;**
9. **Not throw or place the disposable trap or sludge from reusable trap with regular garbage;**
10. **Not throw or place the disposable trap or sludge from reusable trap into sharps containers or biohazard bag;**
11. **Not flush amalgam waste down the drain;**
12. **Use only non-bleach, non-chlorine cleaners to clean vacuum system lines;**

NOTE: THIS IS A COURTESY COPY OF THIS RULE PROPOSAL. THE OFFICIAL VERSION WILL BE PUBLISHED IN THE SEPTEMBER 5, 2006 NEW JERSEY REGISTER. SHOULD THERE BE ANY DISCREPANCIES BETWEEN THIS TEXT AND THE OFFICIAL VERSION OF THE PROPOSAL, THE OFFICIAL VERSION WILL GOVERN.

13. Appropriately disinfect and store amalgam pieces from removal and restoration with amalgam waste;

14. Store amalgam waste in airtight containers;

15. Have a licensed recycling contractor, mail-in service or hazardous waste hauler remove amalgam waste;

16. Recycle all amalgam waste containing mercury;

17. Train staff in the proper handling, management, and disposal of mercury containing material; and

18. Keep records to document that the BMP requirements are being met.

(e) Those dental facilities that generate amalgam waste and do not comply with the requirements of (b)1 and 2 above shall apply for a NJPDES-SIU permit from the Department or the DLA in accordance with the following:

1. No later than (12 months after the effective date of this rule), when a dental facility fails to comply with (b)1 above; or

2. No later than (24 months after the effective date of this rule), when a dental facility fails to comply with (b)2 above.

Committee on Oversight and Government Reform
Subcommittee on Domestic Policy
"Assessing State and Local Regulations to Reduce Dental Mercury Emissions"
American Dental Association
Supplemental Statement for the Record
July 29, 2008

Thank you for inviting the American Dental Association to testify on "Assessing State and Local Regulations to Reduce Dental Mercury Emissions" held by the Domestic Policy Subcommittee on July 8th. We ask that the Subcommittee submit this statement for the record.

We greatly appreciate the opportunity to inform the Subcommittee that the 155,000 members of the ADA take seriously any obligations to protect our country's streams and waterways from mercury emissions originating from dental amalgam. Our testimony supported by submitted documents demonstrates that dental amalgam accounts for only about 0.4% of the total amount of mercury entering surface waters.

There are a few issues that were raised during the Subcommittee hearing that we would like to address. It is important to reiterate that the use of dental amalgam is steadily declining. In 1990 dental amalgams constituted 67.6 percent of all dental restorations. By 1999 that figure dropped to 45.3 percent. Our most recent estimate is approximately 30 percent. We expect this trend to continue, driven primarily by patients' preference for tooth-colored composite restorations. In other words, this is an issue shrinking on its own. That said, amalgam remains a valued option for some patients, including those with large cavities in back teeth, for which amalgam's unique durability remains a desirable quality.

Our figures on the decline in use of amalgam were challenged by one witness. The numbers we have cited are based on a peer-reviewed article, which, in turn, based its estimate of the decline in amalgam use on both survey data and insurance claims. See Beazoglou, T., et al., "Economic Impact of Regulating the Use of Amalgam Restorations," *Public Health Reports*, vol. 122, *p.* 657,659 (Sep't-Oct., 2007). The other witness, in contrast, based his challenge on self reports within a single geographic region of the country.

Amalgam separators capture the same amount of mercury in waste water as treatment plants. The ENVIRON study[1] concluded there would be virtually no decrease in the amount of mercury in treatment plant effluent (i.e. entering surface waters) if separators were used as a precedent to treatment by a POTW. It is important to note that this conclusion was recently confirmed by actual field samples, as part of the National Association of Clean Water Agencies (NACWA) study[2] of the impact of amalgam separators. Testimony by other witnesses focused on other sources of mercury in surface waters which would not be affected by amalgam separator uses (e.g. emissions

---

[1] Vandeven JA, McGinnis SL. An Assessment of Mercury in the Form of Amalgam in Dental Wastewater in the United States Water, Air, and Soil Pollution (2005) 164: 349–366.

[2] National Association of Clean Water Agencies. An Examination of Mercury Levels at Clean Water Agencies 2003-2006. January 2008

from human waste or crematoria). In any case, the ADA believes that there can be no reasonable scientific dispute that the amount of mercury discharged from a POTW into surface water is small compared to other sources of mercury entering surface water, primarily air deposition from coal-fired plants.

The ADA does agree that if the amalgam waste is captured in the dental office using a separator, the concentration of mercury in biosolids at the POTW may decrease. However, EPA has set limits for mercury content in biosolids. The limits vary depending on the end-use of the biosolids. It does not appear that POTW biosolid anywhere in the US exceeds even the most stringent EPA biosolid limits.[3] Further, according to studies conducted by the National Academy of Sciences and NACWA, releases of mercury from biosolids, however used, are minor. This is the same response that was provided by career EPA employees when representatives of the ADA met with EPA.

A nationwide separator mandate is the wrong path to take. As several witnesses testified, local authorities (working in cooperation with state and local dental societies) need flexibility to determine what sort of approach works best under their local conditions.

Considerable time was spent at the hearing on a draft guidance in EPA Region 8 and its impact on the City of Laramie, WY. First, ADA has never filed a lawsuit against the City of Laramie. The ADA merely petitioned the City Council to reject perceived pressure from Region 8 to mandate separators. (No water bodies in Wyoming have been designated by the State as impaired by mercury and EPA research data has shown that the concentration of methyl mercury in fish is less than the EPA criterion of 0.3 ppm used to establish water quality standards.) A former Region 8 employee testified in favor of the separator-mandate approach advocated in the Region 8 draft guidance and suggested that there is no question that the Clean Water Act requires such action. This is not true. The DC Court of Appeals ruled that the Clean Water Act does not require the total elimination of mercury and that control strategies must be cost effective. See *American Iron Steel Inst. v. EPA*, 115 F.3d 979, 1001 (D.C. Cir. 1997). No other EPA region has agreed with the proposed Region 8 approach and the EPA national guidance allows the use of voluntary pollutant reduction programs.[4]

Finally, at the request of Rep. Watson, the Association has reviewed legislative language provided by her staff so that we can comment on its impact on the Association's position with respect to the Region 8 guidance. The legislative language dealt with FDA classification of dental amalgam and is not related to the Region 8 issue.

---

[3] Similarly, EPA has limits on mercury levels which can be emitted from incinerators, another topic raised at the hearing.

[4] Contrary to the witness's testimony, the letter from EPA 8 to the ADA explicitly noted that "the majority of POTWs in Region 8 will benefit from voluntary efforts by dentists to reduce mercury discharges and promote recycling" and "a number of of POTWs ... are opting to control mercury through voluntary efforts before it becomes a pollutant of concern requiring mandatory controls ...[and] Region 8 strongly encourages and supports this approach." Letter from Stephen Tuber, EPA Deputy Regional Administrator, Region 8 to the ADA (April 21, 2005). Also, contrary to that witness' testimony, the City of Laramie did not agree with his approach to mandate separators. The Council did not pass that recommendation.

As our testimony states, dentistry is proud of all of its efforts to protect the environment, just as we have always protected the health and well being of our patients. We pledge to continue our efforts.

Thank you for considering this request.

Domestic Policy Subcommittee
Oversight and Government Reform Committee
"Assessing State and Local Regulations to Reduce Dental Mercury Emissions"

Mercury Policy Project/Tides Center
Supplemental Statement for the Record

August 25, 2008

Thank you again for inviting the Mercury Policy Project/Tides Center (MPP) to testify on "Assessing State and Local Regulations to Reduce Dental Mercury Emissions" held by the Domestic Policy Subcommittee on July 8th. We respectfully request that the Subcommittee submit this supplemental statement for the record.

INTRODUCTION

Recent testimony in Congress, and related documents submitted, have raised several issues regarding pollution from mercury-containing dental restorative materials (amalgam fillings) that call for further clarification. In particular, the American Dental Association (ADA) has made the following claims:

- that dental clinics are responsible for only a small amount of mercury entering surface waters;
- that the use of amalgam for dental restorations is declining;
- that publicly owned [wastewater] treatment works (POTWs) collect plenty of mercury; therefore there is no need for mandating amalgam separators;
- that the amount of mercury in POTW biosolids is acceptable; therefore dental clinics do not need to further control their releases;
- that the use of separators by dental clinics releasing mercury should remain a voluntary decision and not be mandated; and
- that EPA Region 8's desire to mandate separators is unjustified and should not be considered an example for other regions of the US.

In case the evidence already provided by MPP may not have covered these issues clearly enough, the following supplemental information is provided.

THE SIGNIFICANCE OF MERCURY RELEASES FROM DENTAL USE

Dental amalgam is widely acknowledged to be a largest source of mercury and mercury waste entering municipal wastewater in the United States today. According to EPA, "Mercury discharges [in wastewater] from dental offices far exceeded all other commercial and residential sources." EPA cited an estimate that 36 percent of mercury reaching municipal sewage treatment plants is released by dental offices. More recent investigations have put the figure closer to 50 percent (NEG-ECP 2007).[11] Mercury levels in sludge from several wastewater treatment plants have decreased by 40-70% following installation of amalgam separators (see discussion below).

One aspect the ADA has failed to acknowledge about dental mercury in water is that thousands of miles of sewer pipelines have become the repository of many tons of mercury that will contribute to sewage treatment plant influent mercury levels for years to come. Amalgam waste in sewer lines will also result in direct discharges of mercury to waterways from combined sewer overflows during high flow storm events.

The ADA also ignores dental mercury contributions to water via human wastes, via runoff from land disposal and landfilling of contaminated POTW sludges, etc. – all covered in our testimony. Nor do they admit to any significant air emissions, which end up contaminating many water bodies, and are described in further detail below.

Mercury from amalgam waste may be converted to methylmercury in sewage lines and septic systems, which is confirmed in a recent study by the U.S. Navy (Mark Stone). Methylmercury is not typically trapped by a sewage treatment process and is therefore discharged with the wastewater effluent or volatilizes, polluting the air. Low levels of methylmercury are extremely toxic and bioaccumulate dangerously in predatory fish.

The point is that when mercury is used for dental purposes, and especially when separators are not installed in clinics, the pathways back to surface waters and into the food we eat are far more diverse and complex than the ADA is willing to admit. Point-of-use treatment, i.e. amalgam separators, in combination with the employment of other Best Management Practices, is the only cost-effective way to keep mercury out of the wastewater stream.

MERCURY RELEASES TO THE ENVIRONMENT

The primary sources of dental mercury waste include amalgam waste generated prior to the placement of a filling; the excess material carved from new amalgam fillings; the removal of old amalgam fillings; the removal of teeth containing amalgam; unused amalgam or other mercury going to solid waste or wastewater; mercury emissions directly to the air; the traps, filters and other devices in dental clinics to remove mercury from the wastewater – and the "downstream" flows of mercury from there.

---

[11] EPA (2006) – Roadmap for Mercury p. 8 (online at http://www.epa.gov/mercury/roadmap/htm).

Most dental mercury waste results not from the placement of new fillings but from the removal of previous fillings from patients' teeth. Together with waste from new fillings, removed teeth, etc., these dental wastes typically follow several main paths. They may be captured for subsequent recycling or disposal, they may be washed down drains that lead to the general municipal wastewater system or into on-site septic systems, they may be placed in special containers as medical waste, or they may be simply discarded as municipal waste.

Dental mercury may pollute the environment through a number of paths. For example, if a mercury-containing item is discarded as municipal waste, some mercury will eventually be released into the atmosphere from landfill gas emissions, or the mercury will vaporize if the waste is incinerated. If mercury passes any filtering devices and enters the wastewater system, most mercury will typically end up in the wastewater sludge, where it has the potential to volatilize and solubilize when the sludge is disposed of or used as fertilizer. When mercury volatilizes, especially as the temperature increases and if exposed to sunlight, some is deposited locally and the rest travels through the atmosphere in a vaporized state (Wisconsin Mercury Sourcebook 1999).

MERCURY RELEASES TO WATER

As POTWs are not designed to remove mercury or other hazardous wastes entering their systems, almost any mercury removed at a POTW is the result of incidental removal – mainly due to mercury being a heavy metal and settling with particulates to the bottom of treatment tanks. IN fact, most of the mercury entering the wastewater stream will concentrate in the sewage sludge or "biosolids," and the rest will be discharged to downstream surface waters along with the treated effluent. If a wastewater treatment plant incinerates its sludge, and operates with a wet scrubber system, mercury from amalgam is likely to be carried back to the headworks of the treatment plant. Therefore, mercury that came into the plant as an amalgam waste may later be discharged to receiving waters or released to the air in another form (i.e., no longer amalgam).

It should be emphasized that various conditions during the wastewater treatment process may be favorable to the conversion of mercury to its even more hazardous methylmercury form. Furthermore, since the majority of sludge waste is disposed of by spreading it on agricultural or other land as a soil amendment, or by incineration, there is the further likelihood for the mercury to follow these pathways especially to methylation, surface water runoff and to the atmosphere (and later deposition, further methylation and uptake in the food chain). Additionally, treatment plants and collection systems in this country have leaks and bypasses where the wastewater in those collection systems escapes collection and/or treatment – getting out into lakes and rivers completely untreated.[2]

[2] Peter Berglund, personal communication.

MERCURY RELEASES TO THE AIR

Mercury from dental amalgams is a significant source of airborne emissions, as described in the MPP testimony of November 14, 2007, demonstrating that some 7.1-9.4 tons of dental mercury were emitted to the atmosphere in 2005 compared to an outdated estimates by the US Environmental Protection Agency (EPA).

Air emissions from cremation

The previous estimates presented in the 2002 EPA National Emissions Inventory failed to include many types of mercury emissions related to the use of dental mercury. One of the most significant emissions occurs during the cremation of the deceased, due to the large amount of mercury in dental fillings. According to the Cremation Association of North America, the demand for cremation for dealing with the remains of loved ones will increase greatly over the coming years. Cain et al. (2007) estimated that about 3.3 tons of mercury were already emitted by crematoria in 2005.

Air emissions from sewage sludge incineration

There is no doubt that the 2002 EPA estimate of 0.6 ton of mercury emissions from sewage sludge incineration (SSI) was a significant underestimate. A report from the Northeast States for Coordinated Air Use Management (NESCAUM 2005) has calculated, based on measurements, that sewage sludge incinerators (SSIs) in the Northeast US release 543 kg, or about 1200 pounds, of mercury per year, and they estimated that half of that quantity is from dental mercury. The NESCAUM region has only 8% of the US population, but a higher per capita concentration of SSIs than the rest of the US, implying that a higher percentage of sewage sludge is incinerated in that region than the US average. After accounting for these differences, if the NESCAUM observations are extrapolated to the rest of the US, they imply SSI air emissions from dental mercury of about 1.5-2.0 tons nationwide.

Air emissions from land application or landfilling of sewage sludge

Carpi et al. (1997) calculated that the 800,000 acres of land amended with municipal sewage sludge may release 15-18 pounds of mercury per day into the atmosphere, especially during the warm summer months. These releases, as well as smaller releases from sludge disposed to landfills, etc., amount to some 0.8-1.2 tons per year released to the atmosphere just from the application of sewage sludge to land, assuming about 50% of the contribution is due to dental mercury. Additional unquantified releases will also occur due to solubilization of mercury from land applied sludge, especially if subject to acid rain, fires and/or landfill leachate and gases.

"If separators are installed, the elimination of mercury from WWTPs [wastewater treatment plants] will prevent potential mercury releases from the sludge incineration (which is airborne mercury) and/or land application of sludge. Currently, not many treatment plants treat their air

emissions for mercury and there is no control, except prevention, that stops mercury emissions from land application of sludge."[3]

Air emissions from disposal of dental wastes

Whether in dental offices or water treatment plants, captured mercury is often not sequestered from the environment. A 2000 study in King County, Washington (USA), found that more than three-quarters of dental offices did not recycle or sequester mercury-bearing waste captured in chairside traps and vacuum pump filters. Rather, they put it in the waste bin, included it with medical waste, stored it on site for eventual disposal or flushed it down the drain (Savina 2003).

Based on the Cain et al. (2007) methodology, 9.5-10 tons of dental mercury likely ends up in the municipal waste stream each year, of which about 20% is assumed to be incinerated, with most of the remainder going to landfill, where volatilization occurs.

Air emissions during procedures in dental offices

Mercury vapors are released before, during and after placement of amalgam restorations. Dental personnel may be exposed to the following sources of mercury vapors: "accidental mercury spills; malfunctioning amalgamators, leaky amalgam capsules or malfunctioning bulk mercury dispensers…; trituration, placement and condensation of amalgam; polishing or removal of amalgam; vaporization of mercury from contaminated instruments; and open storage of amalgam scrap or used capsules" (JADA 2003).

Air emissions from the dental clinic wastewater systems

As already mentioned, dental clinical procedures generate mercury wastes, slurry, and fine particles as well as dissolved matter from mercury amalgam filling materials. Some of these wastes are discharged into the municipal wastewater system via the clinic vacuum pump or a similar system. This system may also discharge large volumes of air, including mercury vapor, either directly to the outside air, or to the outside air via the wastewater system, depending on the type of equipment used (Rubin and Yu 1996).

MERCURY USE IN DENTISTRY HAS NOT DECLINED IN RECENT YEARS

The American Dental Association (ADA) is incorrect in its claim that the use of mercury in new amalgam placement is substantially in decline. While the percentage of amalgam fillings placed appears to be declining slightly, the total amount of new amalgam (and mercury) used is in fact relatively stable. Contrary to the estimates cited by the ADA, this observation is based on actual data for national sales (2001 and 2004) reported by amalgam manufacturers to the Interstate Mercury Educational and Reduction Clearinghouse (IMERC), as shown in the table below (row 2). This reporting is required by mercury-products reduction legislation adopted in many states.

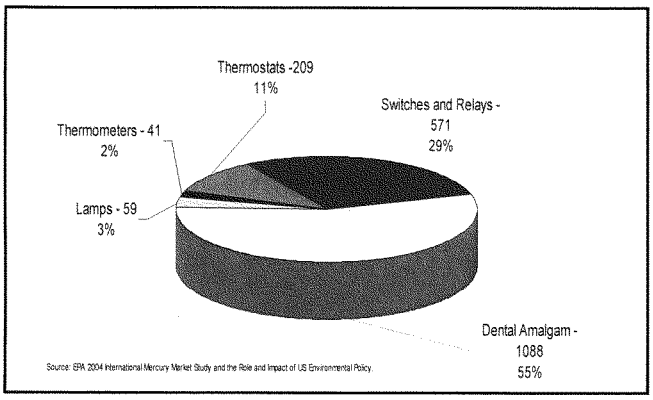
[3] Peter Berglund, personal communication.

As such, the quantity of mercury wastes generated routinely by dental clinics may be expected to continue for many years.

Total Amount of Mercury Sold in Fabricated & Formulated Products
U.S. For Calendar Years 2001 & 2004

Products/Components	Total Mercury (pounds)		Number of Total Manufacturers Reporting	
	2001	2004	2001	2004
Switches & Relays	119,660	102,162	53	46 + 3 nr*
Dental Amalgam	61,537	60,781	5	5
Thermostats	30,971	29,943	9	8 + 1 nr
Lamps	21,438	20,118	177	185 + 8 nr
Miscellaneous	8,505	4,807	12	10 + 2 nr
Batteries	5,914	5,122	40	41
Measuring Devices:				
Sphygmomanometers	4,305	2,219	2	2
Thermometers	5,347	4,524	13	8 + 4 nr
Manometers	1,936	2,545	4	4
Barometers	353	234	1	1
Psychrometers/Other Measuring Equipment	4	3	3	3
Chemicals & Solutions	2,060	1,810	20	20 + 1 nr
Total	**262,030** (131 tons)	**234,268** (117 tons)	**339**	**352**

Moreover, according to EPA, mercury contained in the existing dental fillings of Americans comprises over half of all mercury "circulating in the economy" today, amounting to over 1000 tons (see figure below). This represents enormous potential releases.



If one were to assume that the average life of an amalgam filling is 20 years (which is the extreme end of the range estimated by dental professionals) then, even if the use of mercury in dentistry were discontinued immediately, an average of 40-50 tons/year of mercury would be liberated (removed at dental clinics, incinerated, landfilled or interred) from the fillings of Americans over the next 20 years as the old fillings are gradually replaced by mercury-free fillings. The significance of this 1000 tons of mercury still in service – an amount that is not presently declining – must not be underestimated – given the concerns with mercury consumption of contaminated fish and related impacts on the fishing and tourism industry and the fact that fish is a key source of protein for millions of Americans.

KEEPING MERCURY OUT OF THE ENVIRONMENT

This section reiterates why dental mercury waste removal must be carried out at the dental clinic, why separators are obligatory and why ADA resistance to the mandatory use of amalgam separators is so inconsistent with its stated intentions that their members are good environmental stewards.

Mercury removal at POTWs

While the ADA is correct that a sewage treatment plant is capable of removing a large amount of mercury from the waste stream, as is an amalgam separator, the removal efficiencies may be different in practice from the often cited 95%. For example, Central Contra Costa Sanitary District in Martinez, CA saw 70% reduction in mercury in the influent to its plant when comparing annual average mercury concentration levels before and after a mandatory amalgam separator program went into effect. They saw a 51% reduction in the mercury in the effluent being discharged to San Pablo Bay over the same time period. The mercury removal through the treatment plant was averaging about 90% when the mercury levels were higher (before the mandatory amalgam separator program) and was reduced to 80% after the amalgam separator program went into effect. While it is commonly claimed that there is 95% removal of mercury through a wastewater treatment plant, our data has not shown that. [4]

POTWs are not designed or intended to control mercury

The ADA continues to incorrectly insist that removal of mercury by the wastewater treatment plant obviates the need for dental clinics to use separators."[5] However, it is critical to understand what is meant by "treatment plant removal". At the treatment plant, mercury is removed from the wastewater but is concentrated in the sludge. It does not go away. Subsequently much of the mercury that has been "removed" reenters the environment through the various pathways described above as a result of sludge disposal or land application, and pollute our lakes and streams.

---

[4] A. Farrell, personal communication.

[5] Curt McCormick, personal communication.

As of 2001, approximately 6% of the major publicly owned treatment works (POTWs) in the United States had NPDES permits with mercury effluent limits, and approximately 10% of the major POTWs had monitoring requirements (Morris, 2001). Of the agencies with limits, several (particularly in the Great Lakes region) have limits based on the Great Lakes Initiative (GLI) Wildlife Criteria (i.e., 1.3 ng/liter), and have had difficulty meeting these limits (EPA 2001). This is because sewage treatment plants are designed to treat domestic sewage, not mercury.

As more monitoring for mercury is conducted, the number of agencies with effluent limits imposed is likely to significantly increase. The National Association of Clean Water Agencies (NACWA) attributes this development, in part, to new analytical methods and sampling techniques that enable clean water facilities to measure levels of mercury that were previously undetectable.[6]

Understanding the Clean Water Act

The Clean Water Act places the responsibility to control mercury discharges on the generator, not on the local publicly owned sewage treatment plant.. The ADA maintains that amalgam separators are not needed because sewage treatment plants should treat mercury-contaminated water in lieu of the dentist. This perspective by the ADA demonstrates precisely why a national requirement for amalgam separators is needed. EPA's latest efforts to promote the use of amalgam separators in the Methylmercury Water Quality Criterion document were recently thwarted when OMB removed critical components from the Criterion document.

ADA misleads the Committee regarding Region 8

The ADA has supported its contention that dentists not be regulated for mercury releases by referencing a Ruling by the DC Court of Appeals (*American Iron Steel Inst. v. EPA*, 115 F.3d 979, 1001 (D.C. Cir. 1997)). The ADA has attempted to relate that ruling to the allegation that Region 8 was requiring "the total elimination of mercury." This is clearly a misstatement and appears intended to mislead the Committee. The Region 8 approach supported the use of Best Management Practices (including installation of treatment equipment) for dental facilities and other sources of mercury discharge. The Region 8 Strategy clearly recognized that amalgam separators would not remove mercury to the required numerical limits if these limits were applied. Alternatively, the combined application of BMPs and treatment were judged to be the best reasonable approach. The Region 8 Strategy was clear on these issues.

ADA priority to block mandatory amalgam separators

The use of dental BMPs with treatment were exemplified in the preamble to General Pretreatment Regulations passed by EPA in 2005 (Federal Register: October 14, 2005 (Volume 70, Number 198), pages 60133-60198. Prior to these regulations, the ADA is correct that other EPA regions (except Region 5) were not anxious to take the lead on dental mercury requirements. However, the reason for their hesitation was not because these other regions considered

---

[6] Special Initiatives - NACWA Mercury Initiatives, http://www.nacwa.org/index.php?option=com_content&task=view&id=64&Itemid=72

separators unnecessary, as suggested by the ADA. On the contrary, it was common knowledge that the ADA would expend considerable resources and political capital to fight any attempt to recognize amalgam separators as a necessary component of a BMP. As is clear from the ADA Supplemental Statement dated July 29, 2008, the ADA position has not changed.

ADA misleads the Committee regarding Laramie, Wyoming

The ADA has mentioned that the City of Laramie, Wyoming, City Council did not agree with Region 8 that amalgam separators should be part of an enforceable BMP. Again, the ADA appears to attempt to mislead in their statement. The City of Laramie was not weighing the merits of amalgam separators. Rather, the City was simply adopting specific numerical limits on mercury in wastewater. In order to comply with these limits, many of the Laramie dentists wisely installed amalgam separators.

With regard to EPA Region 8, in its support of amalgam separators it was merely promoting the view that installing amalgam separators and adhering to other BMPs was equivalent to meeting specific and stringent numerical limits. Subsequent to the implementation of BMPs (including installation of amalgam separators) at these dental facilities, the amount of mercury entering the POTW has decreased by more than 50%."[7]

Amalgam separators must be mandatory

In the ADA Supplemental Statement dated July 29, 2008, the ADA has cited the ENVIRON study's finding that there would be virtually no decrease in the amount of mercury in POTW plant effluent (i.e. entering surface waters) if separators were used by dental clinics prior to the wastewater being treated by a POTW.

In order to reach this conclusion, one needs to assume that dental clinic capture of mercury is already quite high, and would not be much increased by using separators. The Environ study makes such a faulty assumption – that 100% of dentists practice BMPs [best management practices], resulting in a mercury removal rate of approximately 78%. In reality, as presented at the congressional hearing, only 33% of mercury is recycled in chair-side traps and 18% gets recycled in vacuum pump filters. These low rates are the result of the fact that voluntary programs are still widespread, and have not achieved good results.

In a study published by the *Journal of the Canadian Dental Association*, Adegbembo et al. (2002) demonstrated that traps and filters remove about 40% of mercury amalgam. Although this is a substantial fraction, it implies that close to 60% of the waste dental mercury was not captured and would thus have entered wastewater discharged from the dental office if secondary pollution controls (amalgam separators) were not in use.

Wastewater quality standards are administratively expensive and unworkable in practice

[7] Curt McCormick, personal communication.

Of the many reasons that mandated amalgam separators are generally preferable to wastewater quality standards, according to the NACWA White Paper on Controlling Mercury in Wastewater from Dental Clinics, implementation of a numerical water quality limit is complicated and expensive. For example, it can be difficult or infeasible to collect a representative compliance sample in the field, and for an analytical laboratory to extract a representative subsample, for the following reasons:

- Dental clinic wastewater is heterogeneous, given the presence of amalgam and other solids (meaning that all of the vacuum system wastewater may need to be collected and processed in order to have a realistic view of the mercury content);
- Compliance sampling may need to be done under vacuum, or if not, then at a location which may include numerous other types of wastes from the same clinic, or at a location that may include wastewater from neighboring businesses (the added volume of such other wastewaters may preclude the ability to collect all of the mercury-bearing wastes, such as the dense amalgam particles, which may lead to unrepresentative sampling);
- Residual mercury from past practices may continue to be present in sewer lines for years to come, contaminating samples to levels not reflective of the current practices; and,
- When sampling the process waste, precautions may be necessary to minimize the exposure to risks associated with blood or pathogens. (Hepatitis B vaccine shots were administered to sampling and laboratory staff at one POTW that collected and analyzed dental clinic wastewater.)

If a sampling program entails issuing permits and reviewing periodic monitoring reports, there will be significant resource demands put on the POTW to administer such a program, especially given the potentially large number of clinics in a given community. Furthermore, compliance with numerical local limits can be technologically and economically infeasible for dental clinics, especially for those clinics discharging to POTWs that are trying to meet extremely stringent water quality criteria. Finally, the various requirements of a typical permitting program would put the responsibilities of wastewater compliance and monitoring on dental professionals, who may not have operated under such a regime before.

At least one community has chosen, in part, a more traditional numerical limit approach. This POTW has given the dental clinics in its service area two choices to deal with mercury in clinic wastewater. Each clinic has the options of either meeting the local mercury limit, or installing an amalgam separator from a list of approved models. If a clinic decides to meet the limit rather than install a separator, rigorous, detailed methods in line with more traditional numerical limit approaches are required by the POTW for clinics sampling their wastewater. In this instance, where the dental clinics were provided a choice, no dentists to date have chosen to sample their own wastewater. Instead, they have all opted to install an amalgam separator.

SEPARATORS HAVE PROVEN HIGHLY EFFECTIVE

Considerable data from the Montreal, Quebec (QC) area and the Boston, MA area indicate that the use of amalgam separators has been associated with significantly decreased mercury levels in

wastewater sludge in large metropolitan areas. Montreal reported mercury reductions in excess of 50% in their treated sludge after dental clinics were required to install amalgam separators. As stated in the July 8, 2008 testimony by MPP, recent data from the Boston area Metropolitan Water Resources Authority (MWRA) demonstrate a 48% reduction in mercury concentration in sludge as amalgam separator use increased.

Data from other Publicly Owned Treatment Works where separator mandates have been required for more than a year have also seen a dramatic decrease in the amount of mercury in sewage sludge. King County, Washington reported almost a 50% decrease in sludge mercury levels between 2000 and 2004. Separators were mandated in King County starting in July 2001, with a required install date no later than July 2003. An estimated 80% of the dentists installed separators by the July 2003 deadline.

In another example, Toronto, Ontario, Canada showed a dramatic 58% average reduction at four treatment plants from 2002 to the first six months of 2003. The only mercury initiative was the installation of amalgam separators required by January 1, 2002. The mandate for installing amalgam separators in Ontario is tied to dental licensing. A dental practice must prove it has an installed separator before it can get is annual license to practice. Additionally an article printed in Victoria's *Times Colonist* on May 5, 2005 states that mercury levels at the sewage treatment plant "have dropped 70%, mostly because dentists now are diverting their waste for recycling." Victoria required dentists to install amalgam separators in 2001.

For the Record Only

Maria Victoria Peeler
State Mercury Reduction Coordinator
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600
(360) 407-6704
peel461@ecy.wa.gov

Domestic Policy Subcommittee
Oversight and Government Reform Committee

Assessing State and Local Regulations to Reduce Dental Mercury Emissions,

2154 Rayburn HOB
Tuesday, July 8, 2008
2:00 P.M.

Chairman Kucinich, Representative Issa, Members of the Subcommittee, it was a pleasure and honor to be invited to meet with you to discuss the reduction of dental mercury emissions. It is heartening that your committee recognizes the Washington State dental amalgam reduction program as one of the best and most unique in the U.S. I am disappointed that neither I nor one of my colleagues could attend the hearing, but I am sure you understand that our current budget restrictions, as well as the short notice to travel to Washington, D.C. make it difficult for me to testify in person on July 8. It is my hope that the following testimony provides you the information you seek.

Washington State is unique in its ability to require dental waste water controls due to 1990's regulatory language regarding discharge of hazardous waste. Our regulations prevent wastewater discharges that cannot be treated at a municipal wastewater facility. The following language from the primary regulation, WAC 173-303-071(D)[1] states that:

The waste prior to mixing with domestic sewage must not exhibit dangerous waste characteristics for ignitability, corrosivity, reactivity, or toxicity as defined in WAC 173-303-090[2], and must not meet the dangerous waste criteria for toxic dangerous waste or persistent dangerous waste under WAC 173-303-100, *unless the waste is treatable in the publicly owned treatment works (POTW) where it will be received** This exclusion does not apply to the generation, treatment, storage, recycling, or other management of dangerous wastes prior to discharge into the sanitary sewage system;

* *Italics and red print were added for emphasis*

Background
Washington State Department of Ecology (Ecology) implemented a Persistent, Bioaccumulative, and Toxic (PBT) Strategy in 2000. Ecology then selected mercury for the first chemical reduction action plan, the Mercury Chemical Action Plan (MCAP). The MCAP, published in 2003, identified amalgam waste from dental offices as one of the largest sources of mercury releases to waters of the state. However, the Mercury Education and Reduction Act (RCW 70.95M), also approved by the legislature in 2003, did not specifically address dental waste because authority already existed.

Prior to Ecology's dental waste actions, King County promulgated an ordinance requiring amalgam separators (2003); and prior to the ordinance, amalgam separator installation was voluntary. Many other counties including Spokane and Thurston have since passed similar ordinances.

Voluntary vs. Mandatory
Based on existing regulations and a pilot project created by King County, Ecology negotiated an MOU with the Washington State Dental Association (WSDA) in August 2003. It allowed dentists two years to implement up-to-date Ecology BMPs regarding mercury, lead and other related dental wastes, including the installation of amalgam separators. Data collected during this period showed that less than 40% of dentists had installed a separator by April 2005. As a result, Ecology notified the WSDA that the MOU would not be extended and notified all state dentists that separators were required as of September 2005.

Extent of Program
Statewide, Ecology requires dental offices discharging to a septic system to install an amalgam separator and obtain a commercial wastewater discharge permit. In 2006, Ecology notified all municipalities that beginning with the largest, delegated municipalities, mercury monitoring using the most sensitive detection available – the microwave digestion with the EPA1631E method -- would be required to meet water quality permit standards.

Performance Criteria
Ecology requires statewide compliance with WAC 173-3-3-071(D) by either:

a) Documented proof by a dental office that the waste water has passed its rigorous method of testing septage waste *at the immediate point of discharge* from the dental office, or

b) Installation and maintenance of an ISO 11143 certified separator with a 95% capture rate.

Regulations
In April 2003, Ecology determined that mercury amalgam waste from dental practices could not be treated as a wastewater effluent. Rather, due to its characteristics, the waste needed to be tested and determined to be compliant with both hazardous waste and water quality standards, or contained prior to entering the combined wastewater from the facility (not at the point of discharge to the sewer). Based on data that showed that even though a wastewater treatment plant could separate mercury to a certain extent, the results were not low enough. Additionally, biosolids from the treatment plants contained rather high levels of mercury, documenting that

treatment prior to intake was not effective. Ecology used existing hazardous waste management rules to require the installation of amalgam separators.

Results
In 2007, the City of Vancouver obtained a national pollution discharge elimination system (NPDES) permit from Ecology that requires implementation oversight of dental amalgam separators. The requirement was based on data collected from several local governments, showing a fairly consistent drop of about 40% in mercury levels in biosolids for those municipalities that had aggressive amalgam separator installation programs. King County realized a 50% reduction in mercury in biosolids after 95% of its dentists installed amalgam separators and followed the required BMPs for amalgam wastes and spent fixer.

Washington State dentists who discharge to a septic system are required to place a separate septic tank system for their dental waste, rather than co-mingling with their residential tank.

The results from a survey conducted immediately prior to the end of the MOU are documented in a September 2005 report provided by Herbert and Associates, under contract to Ecology, but are not available due to an agreement with the WSDA that the report remain confidential, due to the business data collected from the dentists. However, the summary of the report identifies that the Ecology 2004 dentist self-reporting data **showed only 34%** of dentists outside the King and Snohomish County area had installed amalgam separators. The report then summarizes that **94%** of dentists either had or intended to install amalgam separators by November 1, 2005 (Ecology had notified dentists that the MOU ended in November, 2005 when required installation would become effective statewide).

On a statewide level, field visits and phone surveys documented about a 95% installation rate of amalgam separators by April 2006. Also, the most recent statewide fish tissue monitoring data shows a drop in mercury levels in monitored fish populations. However, at this point, the drop is too small and with too little data to call it a trend.

Please note the Washington State Dental Association (WSDA) only represents 60% of dentists in WA, but our data is based on 100% of the dentists with licenses. Also, please be aware that nearly 50% of all Washington dentists practice in the King County and Snohomish County urban and suburban areas, and have been under best management practices by King County ordinance from the local government since 2004 (King County has an agreement with Snohomish County to accept and treat wastewater from certain areas in Snohomish). A majority of WSDA members practice outside of the two above mentioned counties.

Challenges/Successes
The difficulties of obtaining funds, political attention, data and voluntary compliance from dental offices delayed reduction of mercury releases to waters of the state by at least two years. Ecology found that MOUs with professional associations have the potential of not being effective if the association represents less than 90% of the targeted population. Also, funding to maintain technical assistance visits and pursue regulatory violations is needed, but has not been allocated since 2005. Therefore, staff with institutional memory of the project is assigned to other projects and cannot monitor the needs of dental offices easily.

On the positive side, the WSDA tried very hard to obtain voluntary implementation of the BMPs, met with Ecology regularly, and provided presentations side-by-side with Ecology. This helped develop a positive relationship. Environmental groups, such as the Washington Toxics Coalition, amalgam separator manufacturing and marketing services, dental schools, and grassroots local organizations provided data, anecdotes and pressure politically and scientifically to increase public interest and level of understanding of the subject.

Lessons Learned

Once Ecology announced that the best management practices were required statewide to ensure compliance with Washington regulation WAC 173-303-071(D), municipalities also increased their oversight of dentists. However, small and less affluent counties have taken a bit longer to implement. Ecology used $250,000 of funding provided by USEPA under a Pollution Prevention grant to fund some of the statewide outreach materials and activities, as well as to help municipalities visit dentists and provide 2 years of mercury collection events. Additional funding most likely would have increased the participation by smaller local governments. The type of grant used (PPIS) is no longer available through EPA. Ecology recommends this type of grant be once again provided.

Municipalities and Ecology spent more time and resources than expected implementing policies regarding dental office BMPs, including amalgam separator installation. Voluntary agreements do not seem to give dental offices clear direction, even if the list of BMPs is clear. An office-to-office visit program, explaining regulatory requirements might have been more effective, more quickly.

Open Issues

Requiring 100% recycling of the amalgam, as well as preventative procedures at permitted crematoria in the state, have been considered but not pursued further. Below, please find links to Ecology's information regarding our dental amalgam waste management program. You can also find most of this information in the "case studies" provided within the white paper available through the Environmental Council of States (ECOS) Quicksilver Caucus section on dental amalgam, where other web links are provided at the end of this document.

Ultimately, the U.S. may wish to emulate the European Union countries that have slowly shifted universal dental health care from treatment of caries to prevention of caries, reducing both the public medical costs and mercury releases to the environment.

Continued monitoring of biosolids and increasing sensitivity of waste water tests will provide additional information to help us ensure mercury levels are not increasing. This can only happen if EPA and the States are provided funding and authority to increase monitoring of mercury in the environment.

It is rare to see a regulatory program that so successfully cuts half of the mercury historically released to our waters. It is worth mentioning, though, that another 50% of the original historic quantity of mercury remains in effluent and therefore biosolids. These statistics indicate that other sources of mercury must be tracked down and removed. The complete results of the reduction of mercury in biosolids can be found in the reports at http://www.ecy.wa.gov/mercury/mercury_measures_biosolids.html

[Type text]

A copy of Ecology's Dental Best Management Practices (BMPs) Poster can be found at http://www.ecy.wa.gov/mercury/documents/bmp-poster.pdf.
This poster was provided to all WA dentists, even for exempted specialty services, such as orthodontists.

http://apps.leg.wa.gov/RCW/default.aspx?cite=70.95M and
http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-071

http://www.ecy.wa.gov/pubs/0604011.pdf
http://www.ecy.wa.gov/mercury/BIOSOLIDS_MERCURY.pdf
http://www.ecy.wa.gov/beyondwaste/pdf/BiosolidsTreatment.pdf
http://www.ecy.wa.gov/biblio/0703043.html and http://www.ecy.wa.gov/biblio/0703030.html

---

[i] http://apps.leg.wa.gov/RCW/default.aspx?cite=70.95M and
http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303-071

http://www.ecy.wa.gov/pubs/0604011.pdf
http://www.ecy.wa.gov/mercury/BIOSOLIDS_MERCURY.pdf
http://www.ecy.wa.gov/beyondwaste/pdf/BiosolidsTreatment.pdf
http://www.ecy.wa.gov/biblio/0703043.html and http://www.ecy.wa.gov/biblio/0703030.html