THE MERCURY EXPORT BAN ACT OF 2007

HEARING

BEFORE THE

SUBCOMMITTEE ON ENVIRONMENT AND HAZARDOUS MATERIALS

OF THE

COMMITTEE ON ENERGY AND COMMERCE

HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

ON

H.R. 1534

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H.R. 1534, THE MERCURY EXPORT BAN ACT OF 2007

FRIDAY, JUNE 22, 2007

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENVIRONMENT
AND HAZARDOUS MATERIALS,
COMMITTEE ON ENERGY AND COMMERCE,
Washington, DC.

The subcommittee met, pursuant to call, at 10:00 a.m., in room 2322 of the Rayburn House Office Building, Hon. Albert R. Wynn (chairman) presiding.

Members present: Representatives Capps, Allen, Barrow, Green, Schakowsky, Shimkus, and Pitts.

Also present: Representative Gillmor.

Staff present: Karen Torrent, Dick Frandsen, Caroline Ahearn, Ann Strickland, Rachel Bleshman, Jerry Couri, Garrett Golding, Tom Hassenboehler, and Mo Zilly.

OPENING STATEMENT OF HON. ALBERT R. WYNN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MARYLAND

Mr. WYNN. Good morning. I would like to call this meeting to order. Today, we have a hearing on H.R. 1534, the Mercury Export Ban Act of 2007, introduced by one of our distinguished members, Mr. Allen.

For the purposes of making opening statements, the Chair and the ranking member of the subcommittee and the full committee chair will each be recognized for 5 minutes. All other members of the subcommittee will be recognized for 3 minutes, though members may waive the right to make an opening statement and when first recognized to question witnesses, those members would then add 3 minutes to their time for questions. Without objection, all members have 5 legislative days to submit opening statements for the record.

We are here today to hold a hearing on H.R. 1534, the Mercury Export Ban Act of 2007, which, as I indicated, was introduced and sponsored by my esteemed subcommittee colleague, Mr. Tom Allen from Maine. This very important legislation will place an export ban on elemental mercury beginning in year 2010 and prevents Federal agencies from selling, transferring, or distributing elemental mercury.

The availability of surplus elemental mercury on the world market presents a grave risk for our health and environment, as well as the global population and environment. Mercury is a potent

neurotoxin that can cause brain, lung, and kidney damage. Mercury poses the greatest risk to our most vulnerable population, the fetuses, infants, children, and women of childbearing age. Mercury can be transmitted unknowingly by a mother to a fetus in utero and to a nursing infant through breast milk. In developing fetuses and young children, mercury disrupts biological processes critical to brain development.

Mercury is released into the environment through mining and manufacturing processes and leaks or spills of mercury-containing products. Mercury emissions can be transported over long distances and remain airborne for as long as a year. These emissions, through precipitation, deposit into water bodies where they are transformed by bacteria into highly toxic methyl mercury that accumulates in fish and subsequently in humans who eat mercury-contaminated fish. As many as 44 States have issued fish advisories warning residents to limit consumption of mercury-contaminated fish.

Annual mercury use in the United States in the last 20 years has actually decreased from 2,225 to 271 metric tons. The United States has an excess supply of elemental mercury from both private and Federal sources. This excess supply will only increase in future years as the demand for mercury-containing products continues to decline and the eight chloralkali plants that use elemental mercury close or switch to another manufacturing processes.

As of 2010, there are expected to be five remaining mercury chloralkali plants. An estimated surplus of 1,400 to 1,500 metric tons of elemental mercury would be generated if these five plants closed or switched to a non-mercury manufacturing process.

EPA estimates that other mercury-generating sources: gold mining, consumer product recycling, and site remediation programs combine to generate up to 200 metric tons per year.

Today, elemental mercury offered for sale from decommissioned chloralkali plants and the lesser producing sources travels through an unregulated and mysterious chain of brokers and processors. Much of this mercury ends up being used in artisanal or small scale gold mining by people in developing countries, mainly in Africa, Asia, and Latin America. These miners use mercury and heat to separate grains of gold from small bits of sand and rock in pans. This process releases most of the mercury into the environment, exposing people nearby to toxic fumes that can cause tremors, memory loss, and other symptoms of neurological damage. Between 10 and 15 million people, including 4.5 million women and 1 million children, are working at small scale mines. According to the United Nations Environment Program, artisanal mining results in the release of as much as 1,000 tons of mercury per year, accounting for about one-third of all global manmade mercury releases into the environment.

Recall the principle that pollution knows no geographical boundaries, elemental mercury that we export overseas returns back to the United States as toxic pollution contaminating our country's air, soil, water and fish. Congress must take action now to prohibit the export of mercury to reduce this global pollution that imperils

the health of our citizens, and also contributes to the ongoing degradation of the environment, both home and abroad.

H.R. 1534 addresses the problem of global mercury pollution by banning the export of elemental mercury and setting up an advisory committee to advise Congress on how this excess mercury should be stored and handled for the long term. The legislation will also prevent Federal agencies from selling, transferring, or distributing elemental mercury. DOD and DOE combined store close to 6,000 metric tons of mercury. In fact, DOD and DOE's decision to stockpile their mercury grew out of their concerns about the impact that mercury releases may have on human health and the environment.

I applaud Congressman Allen for his dedication and leadership on this issue, and I look forward to the testimony from the panels on this issue.

At this time, I recognize our ranking member, Mr. Shimkus, for an opening statement.

OPENING STATEMENT OF HON. JOHN SHIMKUS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ILLINOIS

Mr. SHIMKUS. Thank you, Mr. Chairman, and it has been a long week, so if we struggle for words, we have actually been working here. It is good to have everybody here on time and moving punctually.

Like you, I am interested in learning more on this subject and exploring the views from our witnesses. I appreciate our witnesses for coming here. In the last week, I think most of our members have learned more about mercury than in the past years that I have been here, because as a lot of us know, mercury is all around us. It is a natural element that appears in every high school classroom's periodic table. However, we know that human exposure to mercury can result in very serious health issues. When these products are mishandled, damaged or broken, we are exposed to vaporized elemental mercury. I even played with mercury in this form as a child, which some may explain why I am the way I am, and we won't go into that detail. Many folks in my era did, and I remember the neighbor down the street who had it. We pulled it out, we smashed it, we wove it together—scary times.

Last night, the Senate passed their energy bill. In both their bill and the bill we marked up on committee on Wednesday, we have encouraged the use of these, compact fluorescent light bulbs. This could place mercury in people's homes, schools, daycare centers, hospitals, and nursing homes. We had this great debate Wednesday night about labeling, which I think we should both be embarrassed about. That is why I said it was kind of stupid, because it mentions mercury on this package. One side didn't want to put it on the package, we said put it on the package, and it is on the package anyway. Versus these types of light bulbs.

Now, the Senate and us are going to expansively move to expand the use of these bulbs throughout not only our country, but we hope the world, which brings out the schizophrenic nature of our public policy debate, and I will highlight some of those when I get a chance.

In our quest to be energy efficient, we must be careful to ensure that people are aware of the risk associated with mercury. My own State of Illinois, like eight other States, has passed a law to take mercury containing products out of schools. We do not know what the safe level of elemental mercury exposure is for our children.

For the record, there are 144 lights in this hearing room filled with at least 8 milligrams, based on the 2002 industry standard. That is at least 1,152 milligrams of mercury, and we were talking about the baseball game, and I was envisioning this in the Wednesday night debate, what if a terrorist came into the room armed with 36 baseballs and started throwing them at the ceiling, busting the lights and spreading vaporized mercury all over the hearing room? Well, when a glass thermometer was dropped outside the attending physician's office, as was stated in the hearing on Wednesday night, they shut down the hallway for 4 hours. And that is less than the mercury involved in these light bulbs up here.

Currently compact fluorescent bulbs are 5 to 6 percent of domestic lighting sales, and bulbs in the United States are made largely in Asia, specifically in China. As we know, the region has lower environmental standards than those in the United States. A lot of people would be surprised to find out that the United States is the only industrialized country that now has standards for mercury emissions. We talk about Europe and we talk about everybody else moving on environmental standards. United States is the only country that has mercury standards, and we will be able to address this in the second panel.

Since mercury is an essential ingredient of bulbs, if the United States and the European Union cut off exports to China, what will that do for the global mercury stocks? Will the price become such that regular Americans who want this technology can't afford it? We are encouraging to buy it, but the light bulbs are exponentially more costly than regular old inefficient light bulbs.

In addition, if we ban mercury exports, we need to figure out what we are going to do with all the mercury we have here. I know that some want essential storage facilities. Given the last three decades of controversy concerning Yucca Mountain, I would urge my colleagues to use caution when pursuing a similar solution to mercury. I have actually joked about let us just add an additional wing to Yucca Mountain. We can have the mercury wing and we can store it there.

Finally, I want to know what the United States is doing from a regulatory and diplomatic perspective to reduce dangerous mercury exposures. Before we legislate, we need to know if there are gaps in existing law and how any of our efforts mesh with existing ones.

Again, Mr. Chairman, I think we are just starting this whole process of informing members. It is a great hearing. I appreciate your time, and I yield back.

Mr. WYNN. I thank the gentleman for his opening statement. I, too, played with mercury, so I know. I thought it was pretty cool, too.

Mr. SHIMKUS. That explains you and me.

Mr. WYNN. Hopefully we have come a long way since then.

At this time, I would like to recognize the sponsor of the legislation, the distinguished gentleman from Maine, Mr. Tom Allen.

OPENING STATEMENT OF HON. TOM ALLEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MAINE

Mr. ALLEN. Thank you, Mr. Chairman. Thank you very much for your concern for this particular area, and for holding this hearing on my bill, H.R. 1534, the Mercury Export Ban Act of 2007. I am pretty sure I played with mercury, too, so that makes three of us, but it was elemental mercury and you know, the waste issue that my friend Mr. Shimkus raised about any products containing mercury is something that needs to be addressed, because fundamentally, once elemental mercury gets into the waste stream and gets up in the atmosphere and comes down, it becomes methyl mercury in bodies of water, and that methyl mercury is the major challenge we have in terms of the effects on wildlife and the threat to human beings.

It is a well-established fact that mercury is a powerful neurotoxin, harmful at even low exposure levels. It is harmful whether it is inhaled, ingested, or absorbed through the skin. Once exposed to water, elemental mercury is transformed to methyl mercury, which is highly toxic and which has a tendency to bioaccumulate in both fish and the humans who eat the fish, and I would add, songbirds and other things as well. Very young children with developing nervous systems are particularly at risk. In addition, pregnant mothers who are exposed to mercury pollution can transmit mercury to their unborn children, increasing the chances of miscarriage and birth defects.

My home State of Maine has been a national leader in educating people about the dangers of mercury and in reducing exposure to mercury through State sources. Maine's 5,800 lakes and ponds and our 32,000 miles of rivers, streams, and brooks have been under a fish consumption advisory since 1994 because of mercury pollution. According to Commissioner David Latell of the Maine Department of Environmental Protection, "In-state controls have reduced mercury emissions over 75 percent since 1990. Seventy-five percent of our State's historic use of mercury in products will be eliminated through a series of sales and disposal bins; yet because mercury remains in widespread use elsewhere in the world, atmospheric transport continues to bring mercury into our States. Maine's actions alone cannot stop ongoing contamination of our environment."

My bill seeks to combat a large source of mercury pollution worldwide, namely the export of elemental mercury from the United States to developing countries. This mercury is used largely for artisanal mining. Exposure occurs when miners handle the mercury. It enters the water when miners pan for gold, and enters the air through the smelting process, which emits mercury vapor.

According to the United Nations Environment Program, approximately 15 million people worldwide, including 4.5 million women and 1 million children, engage in artisanal mining with mercury, exposing them to the poisons that mercury produces. Some of this mercury is exported from the United States, and that should be unacceptable to us as a Nation. Further, this practice harms Americans exposed through the global air transport of mercury pollution or through the consumption of mercury-contaminated fish.

The Departments of Defense and Energy are the two largest holders of mercury in the United States. The EPA has urged DOD

and DOE not to sell its mercury stockpiles, due to the serious human health and environmental risks associated with mercury. DOD and DOE have agreed; however, that ban is not in law, which is why my bill prohibits the Federal Government from exporting mercury. Further, private companies may still export this poisonous and hazardous material, which is why my legislation is necessary.

Finally, I believe we need to develop a long-term solution to the problem of mercury storage and disposal, especially if we are going to ban the international trade in mercury. My bill establishes an advisory committee made up of a wide range of stakeholders that is tasked with reporting back to Congress no later than 1 year after enactment with recommendations for long-term storage options. Long-term storage of mercury is relatively easy and cheap, compared to storage and disposal of other hazardous materials.

Again, thank you, Mr. Chairman, for holding this hearing, and I look forward to the testimony of our witnesses.

Mr. WYNN. Thank you for your opening statement, and again, for your leadership on this issue.

We have actually got a vote on. I would like to see if we can get opening statements in. I would like to recognize the gentleman, Mr. Pitts, for an opening statement.

Mr. PITTS. I will waive.

Mr. WYNN. I would like to recognize the gentleman, Mr. Green of Texas, for an opening statement.

Mr. GREEN. Mr. Chairman, I will waive, but I support my colleague from Maine's bill. I have no problem at all with being able to develop a site to hold mercury. We do that with asbestos and other contaminated items.

Thank you.

Mr. WYNN. Thank you very much. At this point, the subcommittee will recess until the conclusion of votes, and other statements will be accepted for the record.. We will reconvene immediately after the last vote in this series.

[The prepared statement of Mr. Green and H.R. 1534 follows:]

PREPARED STATEMENT OF HON. GENE GREEN, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TEXAS

Mr. Chairman, thank you for holding this hearing today on H.R. 1534, the Mercury Export Ban of 2007. As a member of the Health Subcommittee and the Foreign Affairs Committee I recognize the global and health related benefits of this bill.

Mercury is a neurotoxin that is very harmful to children, fetuses, and pregnant women. Once the true health effects of mercury were realized in the United States its use for manufacturing and products was decreased.

However, we are now burdened with reserves of commercial mercury that is being sold to recyclers who have no mean of disposing of the mercury. The recyclers sell this mercury to brokers who distribute this mercury on the global market.

Once on the global market this mercury is used by small scale gold miners who unknowingly allow their miners to unsafely expose themselves to mercury.

Once this mercury is released into the atmosphere or water we are allowing other countries to contribute to a global mercury contamination problem.

We essentially are selling mercury to other countries in an attempt to get rid of it only to have the mercury come back to us in the form of contamination.

It is time we prohibit the sale of mercury overseas and begin safely stockpiling the mercury we have in this country.

The Department of Defense and the Department of Energy have maintained Government mercury stockpiles for years and we should do the same with commercial mercury.

The EPA has been investigating the issue of mercury in the United States for quite some time, but with no deadline issued by Congress progress on this issue has been slow.

This bill would ban exporting elemental mercury by 2010 and the sale, distribution, or transfer of elemental mercury between State and local government, Federal agency, or private entity except for storage purposes.

It would also require the EPA issue a report to Congress 1 year after the ban to address the issue of mercury in the United States and create an Excess Mercury Storage Committee so that we can address the storage and health issues related to elemental mercury in the United States.

Some of my colleagues on this committee may say that this bill is putting the cart before the horse. To that I say, sometimes we need to set deadlines in order to deal with the issues at hand.

I support this bill and I urge my colleagues to do the same. Thank you Mr. Chairman, I yield back my time.

I

110TH CONGRESS
1ST SESSION

H. R. 1534

To prohibit the sale, distribution, or transfer of mercury, to prohibit the export of mercury, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

MARCH 15, 2007

Mr. ALLEN introduced the following bill; which was referred to the Committee on Energy and Commerce

---

A BILL

To prohibit the sale, distribution, or transfer of mercury, to prohibit the export of mercury, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Mercury Export Ban Act of 2007".

SEC. 2. FINDINGS.

Congress finds that—

(1) mercury is highly toxic to humans, ecosystems, and wildlife;

(2) as many as 10 percent of women in the United States of childbearing age have mercury in the blood at a level that could put a baby at risk;

(3) as many as 630,000 children born annually in the United States are at risk of neurological problems related to mercury;

(4) the most significant source of mercury exposure to people in the United States is ingestion of mercury-contaminated fish;

(5) the Environmental Protection Agency reports that, as of 2004—

(A) 44 States have fish advisories covering over 13,000,000 lake acres and over 750,000 river miles;

(B) in 21 States the freshwater advisories are statewide; and

(C) in 12 States the coastal advisories are statewide;

(6) the long-term solution to mercury pollution is to minimize global mercury use and releases to eventually achieve reduced contamination levels in the environment, rather than reducing fish consumption since uncontaminated fish represents a critical and healthy source of nutrition worldwide;

(7) mercury pollution is a transboundary pollutant, depositing locally, regionally, and globally, and affecting water bodies near industrial sources (including the Great Lakes) and remote areas (including the Arctic Circle);

(8) the free trade of mercury on the world market, at relatively low prices and in ready supply, encourages the continued use of mercury outside of the United States, often involving highly dispersive activities such as artisinal gold mining;

(9) the intentional use of mercury is declining in the United States as a consequence of process changes to manufactured products (including batteries, paints, switches, and measuring devices), but those uses remain substantial in the developing world where releases from the products are extremely likely due to the limited pollution control and waste management infrastructures in those countries;

(10) the member countries of the European Union collectively are the largest source of mercury exports globally;

(11) the European Commission has proposed to the European Parliament and to the Council of the

European Union a regulation to ban exports of mercury from the European Union by 2011;

(12) the United States is a net exporter of mercury and, according to the United States Geological Survey, exported 506 metric tons of mercury more than the United States imported during the period of 2000 through 2004; and

(13) banning exports of mercury from the United States will have a notable affect on the market availability of mercury and switching to affordable mercury alternatives in the developing world.

SEC. 3. PROHIBITION ON SALE, DISTRIBUTION, OR TRANSFER OF MERCURY.

Section 6 of the Toxic Substances Control Act (15 U.S.C. 2605) is amended by adding at the end the following:

"(f) MERCURY.—

"(1) PROHIBITION ON SALE, DISTRIBUTION, OR TRANSFER OF MERCURY BY FEDERAL AGENCIES.—Except as provided in paragraph (2), effective beginning on the date of enactment of this subsection, no Federal agency shall convey, sell, or distribute to any other Federal agency, any State or local government agency, or any private individual or entity any

1 elemental mercury under the control or jurisdiction
2 of the Federal agency.
3 "(2) EXCEPTION.—Paragraph (1) shall not
4 apply to a transfer between Federal agencies of ele-
5 mental mercury for the sole purpose of facilitating
6 storage of mercury to carry out this Act.".

7 **SEC. 4. PROHIBITION ON EXPORT OF MERCURY.**

8 Section 12 of the Toxic Substances Control Act (15
9 U.S.C. 2611) is amended—
10 (1) in subsection (a) by striking "subsection
11 (b)" and inserting "subsections (b) and (c)"; and
12 (2) by adding at the end the following:
13 "(c) PROHIBITION ON EXPORT OF MERCURY.—
14 "(1) PROHIBITION.—Effective January 1,
15 2010, the export of elemental mercury from the
16 United States is prohibited.
17 "(2) INAPPLICABILITY OF SUBSECTION (a).—
18 Subsection (a) shall not apply to this subsection.
19 "(3) REPORT TO CONGRESS ON MERCURY COM-
20 POUNDS.—
21 "(A) REPORT.—Not later than one year
22 after the date of enactment of the Mercury Ex-
23 port Ban Act of 2007, the Administrator shall
24 publish and submit to Congress a report on
25 mercuric chloride, mercurous chloride or cal-

1 omel, mercuric oxide, and other mercury com-
2 pounds, if any, that may currently be used in
3 significant quantities in products or processes.
4 Such report shall include an analysis of—
5 "(i) the sources and amounts of each
6 of the mercury compounds produced annu-
7 ally in the United States or imported into
8 the United States;
9 "(ii) the purposes for which each of
10 these compounds are used domestically, the
11 amount of these compounds currently con-
12 sumed annually for each purpose, and the
13 estimated amounts to be consumed for
14 each purpose in 2010 and beyond;
15 "(iii) the sources and amounts of each
16 mercury compound exported from the
17 United States annually in each of the last
18 three years;
19 "(iv) the potential for these com-
20 pounds to be processed into elemental mer-
21 cury after export from the United States;
22 and
23 "(v) other information that Congress
24 should consider in determining whether to

1 extend the export prohibition to include
2 one or more of these mercury compounds.
3 "(B) PROCEDURE.—For the purpose of
4 preparing the report under this paragraph, the
5 Administrator may utilize the information gath-
6 ering authorities of this title, including sections
7 10 and 11, except that subsection (b)(2) of sec-
8 tion 11 shall not apply to activities under this
9 subparagraph.".

10 **SEC. 5. EXCESS MERCURY STORAGE ADVISORY COM-**
11 **MITTEE.**

12 (a) AMENDMENT.—Title I of the Toxic Substances
13 Control Act is amended by adding at the end the following
14 new section:

15 **"SEC. 32. EXCESS MERCURY STORAGE ADVISORY COM-**
16 **MITTEE.**

17 "(a) ESTABLISHMENT.—There is established an advi-
18 sory committee, to be known as the 'Excess Mercury Stor-
19 age Advisory Committee' (referred to in this section as
20 the 'Committee').

21 "(b) MEMBERSHIP.—

22 "(1) IN GENERAL.—The Committee shall be
23 composed of 9 members, of whom—

"(A) 2 members shall be jointly appointed by the Speaker of the House of Representatives and the Majority Leader of the Senate—

"(i) 1 of whom shall be designated to serve as Chairperson of the Committee; and

"(ii) 1 of whom shall be designated to serve as Vice-Chairperson of the Committee;

"(B) 1 member shall be the Administrator;

"(C) 1 member shall be the Secretary of Defense;

"(D) 1 member shall be a representative of State environmental agencies;

"(E) 1 member shall be a representative of State attorneys general;

"(F) 1 member shall be a representative of the chlorine industry;

"(G) 1 member shall be a representative of the mercury waste treatment industry; and

"(H) 1 member shall be a representative of a nonprofit environmental organization.

"(2) APPOINTMENTS.—Not later than 45 days after the date of enactment of this section, the Administrator, in consultation with the appropriate

1 congressional committees, shall appoint the members
2 of the Committee described in subparagraphs (D)
3 through (H) of paragraph (1).
4 "(c) INITIAL MEETING.—Not later than 30 days
5 after the date on which all members of the Committee
6 have been appointed, the Committee shall hold the initial
7 meeting of the Committee.
8 "(d) MEETINGS.—The Committee shall meet at the
9 call of the Chairperson.
10 "(e) QUORUM.—A majority of the members of the
11 Committee shall constitute a quorum.
12 "(f) REPORT.—Not later than 1 year after the date
13 of enactment of this section, the Committee shall submit
14 to Congress a report describing the findings and rec-
15 ommendations of the Committee, if any, relating to—
16 "(1) the environmental, health, and safety re-
17 quirements necessary to prevent—
18 "(A) the release of elemental mercury into
19 the environment; and
20 "(B) worker exposure from the storage of
21 elemental mercury;
22 "(2) the estimated annual cost of storing ele-
23 mental mercury on a per-pound or per-ton basis;
24 "(3) for the 40-year period beginning on the
25 date of submission of the report, the optimal size,

1 number, and other characteristics of Federal facili-
2 ties required to store elemental mercury under cur-
3 rent and anticipated jurisdictions of each Federal
4 agency;
5 "(4) the estimated quantity of—
6 "(A) elemental mercury that will result
7 from the decommissioning of mercury cell chlor-
8 alkali facilities in the United States; and
9 "(B) any other supplies that may require
10 storage to carry out this Act;
11 "(5) for the 40-year period beginning on the
12 date of submission of the report, the estimated
13 quantity of elemental mercury generated from the
14 recycling of unwanted products and other wastes
15 that will require storage to comply with the export
16 prohibitions under this Act;
17 "(6) any legal, technical, economic, or other
18 barrier that may prevent the private sector from
19 storing elemental mercury produced by the private
20 sector during the 40-year period beginning on the
21 date of submission of the report, including a descrip-
22 tion of measures to address the barriers;
23 "(7) the advantages and disadvantages of con-
24 solidating the storage of mercury produced by public

1 and private sources under the management of the
2 public or private sector;
3 "(8) the optimal plan of the Committee for
4 storing excess mercury produced by public and pri-
5 vate sources; and
6 "(9) additional research, if any, required to de-
7 termine a long-term disposal option for the storage
8 of excess mercury.
9 "(g) COMPENSATION OF MEMBERS.—
10 "(1) IN GENERAL.—
11 "(A) NON-FEDERAL EMPLOYEES.—A
12 member of the Committee who is not an officer
13 or employee of the Federal Government shall be
14 compensated at a rate equal to the daily equiva-
15 lent of the annual rate of basic pay prescribed
16 for level V of the Executive Schedule under sec-
17 tion 5316 of title 5, United States Code, for
18 each day (including travel time) during which
19 the member is engaged in the performance of
20 the duties of the Committee.
21 "(B) FEDERAL EMPLOYEES.—A member
22 of the Committee who is an officer or employee
23 of the Federal Government shall serve without
24 compensation in addition to the compensation

1 received for the services of the member as an
2 officer or employee of the Federal Government.
3 "(2) TRAVEL EXPENSES.—A member of the
4 Committee shall be allowed travel expenses, includ-
5 ing per diem in lieu of subsistence, at rates author-
6 ized for an employee of an agency under subchapter
7 I of chapter 57 of title 5, United States Code, while
8 away from the home or regular place of business of
9 the member in the performance of the duties of the
10 Committee.
11 "(h) STAFF AND FUNDING.—The Administrator
12 shall provide to the Committee such funding and addi-
13 tional personnel as are necessary to enable the Committee
14 to perform the duties of the Committee.
15 "(i) TERMINATION.—The Committee shall terminate
16 180 days after the date on which the Committee submits
17 the report of the Committee under subsection (f).".
18 (b) TABLE OF CONTENTS AMENDMENT.—The table
19 of contents of the Toxic Substances Control Act is amend-
20 ed by adding after the item relating to section 31 the fol-
21 lowing new item:

"Sec. 32. Excess Mercury Storage Advisory Committee.".

○

[Recess.]

Mr. WYNN. The subcommittee will now come to order.

I believe I saw Mr. Barrow here. I was going to inquire if he wanted to make an opening statement, but he apparently stepped out.

That being the case, I believe all opening statements are concluded and we will move to hearing from our distinguished panel. I would like to introduce Ms. Alice Williams, who is Deputy Associate Administrator for Infrastructure and Environment for the National Nuclear Security Administration, U.S. Department of Energy. We also have with us Mr. Cornel Holder, Administrator, National Defense Stockpile Center, U.S. Department of Defense, and also Mr. James Gulliford, Assistant Administrator, Office of Prevention, Pesticides, and Toxic Substances, U.S. Environmental Protection Agency.

Welcome. Thank you for coming, and we would like to hear opening statements for about 5 minutes. Your entire statements, of course, will be included in the record.

Ms. Williams, if you would like to proceed.

STATEMENT OF ALICE C. WILLIAMS, DEPUTY ASSOCIATE ADMINISTRATOR, INFRASTRUCTURE AND ENVIRONMENT, OFFICE OF ENVIRONMENTAL PROJECTS AND OPERATIONS, NATIONAL NUCLEAR SECURITY ADMINISTRATION, U.S. DEPARTMENT OF ENERGY, WASHINGTON, DC

Ms. WILLIAMS. Chairman Wynn, Ranking Member Shimkus, and members of the subcommittee, thank you for the opportunity to discuss the Department of Energy's management of its stockpile of mercury located at the National Nuclear Security Administration, NNSA, and I will refer to it as NNSA throughout the testimony, at the Y–12 National Security Complex at Oak Ridge, Tennessee.

NNSA was established in 2000 as a separate organized agency within the Department of Energy, responsible for enhancing national security through the military application of nuclear energy. NNSA maintains and enhances the safety, security, reliability, and performance of U.S. nuclear weapons stockpile, works to continue to reduce global danger from weapons of mass destruction, provides the United States Navy with safe and effective nuclear propulsion, and responds to nuclear and radiological emergencies in the United States and abroad.

Presently, the stockpile of surplus mercury owned by NNSA is in safe, secure storage at the Y–12 National Security Complex and the Department has no plans to sell it. The mercury in storage was originally acquired by the Atomic Energy Commission in the 1950s and 1960s for the separation of lithium isotopes. The Cold War production of enriched lithium required millions of pounds of mercury. In 1963, the Y–12 lithium separation and enrichment program was shut down, and over the next several years the production process was dismantled and the mercury was recovered. The mercury, some owned by the Department of Defense and some by the Department of Energy, was placed in storage at Y–12. Over time, a significant quantity of the mercury was sold, leaving 1,206 metric tons of the NNSA-owned mercury still in storage. The last time the Department of Energy sold mercury was in 1994. This is the single-

largest inventory of mercury in the DOE complex. The DOD owned mercury stored at Y–12 was transferred to the DOD storage facility in 2005.

In the 1970s, the NNSA mercury inventory was transferred from existing seamed flasks into new seamless flasks, each of which can hold 76 pounds of mercury. Approximately 35,000 of these flasks, which are made of 3L carbon steel and sealed with a threaded pipe plug, are stored in groups of 45 on wooden pallets. The pallets are stored up to three high in a single story solid brick wall constructed building that is used only for mercury storage. The building is approximately 150 feet by 90 feet, and has a concrete floor that is sealed with a leak-proof coating. A 6- to 8-inch dike exists around the outer edge of the building to contain any material that would be released in the event of a spill. In other words, the building is constructed to be environmentally protective. In addition, the building is equipped with an automatic dry pipe fire suppression system and portable fire extinguishers. The building is further located within security fences and boundaries, as well as within the perimeter intrusion detection and assessment system at the Y–12 facility.

Continuous air monitoring and periodic visual inspections of the building are performed on a routine basis. The air monitoring is conducted at two locations near the storage building, and includes monitoring airborne mercury vapor. Measured concentrations are well below the current environmental and occupational health standards for inhalation exposure of the mercury vapor.

The visual inspections are performed on a quarterly basis for fire safety and to observe for leaks or abnormal conditions. There is no history of a flask that has leaked and the condition of the flasks appears to be very good at this time.

Providing for long-term storage of mercury at the Y–12 complex will be costly. It has been estimated that storing the mercury for the next 40 years at Y–12 could cost about $42 million. The costs are related to the maintenance of the building, such as installing a new roof, reflasking, if it is determined that the flasks storing the mercury have deteriorated significantly, air monitoring, visual inspections, and securing the building as well as the management.

Following the decision by Defense Nuclear Stockpile Center in 1994 to halt the sale of mercury, NNSA began to explore its options for the disposition of the surplus mercury at Y–12. One of these options was to sell the surplus mercury, which resulted in the preparation of a draft environmental assessment. The EA, which tiered from the DOD's Final Mercury Management Environmental Impact Statement, analyzed the environmental impacts of several alternatives related to the management of mercury. Before the EA was finalized, NNSA decided in December 2006 to continue to store the surplus stockpile of mercury at the Y–12 site. This decision was based on several factors, but included mercury's known toxicity to living organisms and its mobility in the biosphere, continued global efforts to reduce the use of elemental mercury in the developing countries, and policies of other countries, for example, the countries that make up the European Union support long-term storage of elemental mercury.

At this time, we believe that continuing to store NNSA's stockpile of mercury at our Y–12 complex or identifying an alternate storage location is the right thing to do. It ensures that the mercury will not be released to the global environment, thereby minimizing mercury emissions and reducing contamination levels in the environment of this toxic chemical.

This concludes my statement, and I will be pleased to respond to your questions.

[The prepared statement of Ms. Williams follows:]

STATEMENT OF ALICE C. WILLIAMS

Chairman Wynn, Ranking Member Shimkus, and members of the subcommittee, thank you for the opportunity to discuss the Department of Energy's management of its stockpile of mercury located at the National Nuclear Security Administration Y–12 National Security Complex in Oak Ridge, Tennessee. NNSA was established in 2000 as a separate organized agency within the U.S. Department of Energy responsible for enhancing national security through the military application of nuclear energy. NNSA maintains and enhances the safety, security, reliability and performance of the U.S. nuclear weapons stockpile; works to reduce global danger from weapons of mass destruction; provides the U.S. Navy with safe and effective nuclear propulsion; and responds to nuclear and radiological emergencies in the United States and abroad.

Presently, the stockpile of surplus mercury owned by NNSA is in safe, secure storage at the Y–12 National Security Complex and the Department has no plans to sell it. The mercury in storage was originally acquired by the Atomic Energy Commission in the 1950's and 1960's for the separation of lithium isotopes. The Cold War production of enriched lithium required millions of pounds of mercury. In 1963, the Y–12 lithium separation and enrichment program was shut down, and over the next several years the production process was dismantled and mercury was recovered. The mercury, some owned by the Department of Defense (DOD) and some by the Department of Energy, was placed in storage at Y–12. Over time, a significant quantity of the mercury was sold leaving 1,206 metric tons of the NNSA-owned mercury still in storage; the last time DOE sold mercury was in 1994. This is the single largest inventory of mercury in the DOE complex. The DOD-owned mercury stored at Y–12 was transferred to a DOD storage facility in 2005.

In the 1970s the NNSA mercury inventory was transferred from existing seamed flasks to new seamless flasks, each of which can hold about 76 pounds of mercury. Approximately 35,000 flasks, which are made of 3–L carbon steel and sealed with a threaded pipe plug, are stored in groups of 45 on wooden pallets. The pallets are stored up to three high in a single-story, solid block wall construction building that is used only for mercury storage. The building is approximately 150 feet by 90 feet and has a concrete floor that is sealed with a leak-proof coating. A 6- to 8-inch dike exists around the outer edge of the building to contain any material that could be released in the event of a spill. In other words, the building is constructed to be environmentally protective. In addition, the building is equipped with an automatic dry-pipe (water supply) fire suppression system and portable fire extinguishers. The building is located within security fences and boundaries as well as within the Perimeter Intrusion, Detection, and Assessment System at Y–12.

Continuous air monitoring and periodic visual inspections of the storage building are performed on a routine basis. The air monitoring is conducted at two locations near the storage building and includes monitoring airborne mercury vapor—measured concentrations are well below the current environmental and occupational health standards for inhalation exposure to mercury vapor. The visual inspections are performed on a quarterly basis for fire safety and to observe for leaks or abnormal conditions. There is no history of a flask that has leaked and the condition of the flasks appears good at this time.

Providing for long-term storage of mercury at the Y–12 National Security Complex will be costly. It has been estimated that storing the mercury for the next 40 years at Y–12 could cost about $42 million. The costs are related to maintenance of the building such as installing a new roof; reflasking if it is determined that the flasks storing the mercury have deteriorated significantly; air monitoring; visual inspections; security of the building; and facility management.

Following the decision by the Defense Nuclear Stockpile Center in 1994 to halt the sale of mercury, NNSA began to explore its options for the disposition of the

surplus mercury at Y–12. One of these options was to sell the surplus mercury which resulted in the preparation of a draft Environmental Assessment (EA). The EA, which tiered from DOD's Final Mercury Management Environmental Impact Statement, analyzed the environmental impacts of several alternatives related to the management of mercury. Before the draft EA was finalized, NNSA decided in December 2006, to continue to store the surplus stockpile of mercury at the Y–12 site. This decision was based on several factors which included:

• Mercury's known toxicity to living organisms and its mobility in the biosphere.
• Continued global efforts to reduce the use of elemental mercury in developing countries.
• The policies of other countries (e.g. the countries that make up the European Union) support long-term storage of elemental mercury.

At this time we believe that continuing to store NNSA's stockpile of mercury at our Y–12 National Security Complex or identifying an alternate storage location is the right thing to do. It ensures that the mercury will not be released to the global environment thereby minimizing mercury emissions and reducing contamination levels in the environment of this toxic chemical.

This concludes my statement. I will be pleased to respond to your questions.

Mr. WYNN. Thank you for your testimony.

We now would like to hear from Mr. Holder.

STATEMENT OF CORNEL A. HOLDER, ADMINISTRATOR, DEFENSE NATIONAL STOCKPILE CENTER, DEFENSE LOGISTICS AGENCY, U.S. DEPARTMENT OF DEFENSE, FT. BELVOIR, VA

Mr. HOLDER. Good morning, Mr. Chairman, and distinguished members of the subcommittee. I am Cornel Holder, Administrator of Defense Stockpile Center, a field Activity of Defense Logistics Agency.

The Defense Logistics Agency is the Department's only Logistics Combat Support Agency. The Defense National Stockpile Center is responsible for providing safe, secure, and environmentally sound storage for strategic and critical materials that make up the National Defense Stockpile.

I appreciate the opportunity to appear today to describe the management of the stockpile and discuss the storage of elemental mercury in the inventory.

The National Defense Stockpile was created shortly after World War II to acquire and store critical ores and materials. These supplies were intended to lessen the United States dependency on foreign sources of supply in times of war or national emergency. In 1988, the program was transferred by Executive order to Department of Defense, who assigned the management of the program to Defense Logistics Agency. A change in direction of the stockpile occurred in 1994 when over 99 percent of the inventory was determined to be in excess of Department of Defense needs, and over the next several years Congress authorized its disposal.

Elemental mercury has been in the stockpile inventory since the 1940s. The U.S. Government purchased the mercury inventory from a number of countries, including Spain, India, China, and Italy. Congress has authorized the sale of a small portion of mercury inventory in 1981, and the Defense National Stockpile Center sold mercury to foreign and domestic buyers into the early 1990s. In 1994, the Defense National Stockpile Center suspended the sales of mercury in response to congressional concerns about the potential environmental impact of selling mercury, and requested

the Department to evaluate alternative mercury disposal options or long-term storage.

Currently, there are 4,436 metric tons of mercury stored at depots located in Somerville, NJ; New Haven, IN; and Warren, OH. The mercury inventory is stored in 76-pound steel flasks and overpacked in 30-gallon carbon steel drums. Mercury has been safely stored for over 50 years.

Annual reductions in the number of quantities of stockpile inventory has been occurring since 1994, and has lead to corresponding reductions in Defense National Stockpile Center infrastructure. The reductions led to the need to develop a long-term strategy for continued management of the mercury inventory. An environmental impact statement was initiated in 2001 and completed in 2004. The statement analyzed three alternatives for long-term management of the mercury. One, leaving the mercury at existing storage locations; two, consolidating the mercury storage at one location; and selling the mercury inventory. In the record of decision, the Stockpile chose the long-term storage alternative. The decision was based on a combination of environmental and economic factors, policy consideration, and stakeholder's comments. Consolidated storage also facilitates the National Defense Stockpile long-term closure strategy at the sites in which mercury is removed. The chosen sites for consolidated storage is Hawthorne Army Depot in Hawthorne, Nevada. The Hawthorne Army Depot, a Government-owned contractor-operated facility, will provide storage facilities as well as necessary service and support to maintain the mercury inventory. The Defense National Stockpile Center is working with the State of Nevada and Hawthorne to ensure the mercury is properly prepared for transportation to Nevada and that the facilities are upgraded to meet Stockpile's high standards.

The Defense National Stockpile Center is fully committed to safe, secure, environmentally sound management and storage of the mercury. The decision to consolidate and store mercury is consistent with the H.R. 1534 prohibition on the sale and transfer of mercury by Federal agencies.

I thank you for the opportunity to testify before the subcommittee on this important issue, and I welcome your questions.

[The prepared statement of Mr. Holder follows:]

STATEMENT OF CORNEL A. HOLDER

Good morning, Mr.Chairman, and distinguished members of the subcommittee. I am Cornel Holder, administrator of the Defense National Stockpile Center (DNSC), a field activity of the Defense Logistics Agency (DLA). DLA is the Department of Defense's only Logistics Combat Support Agency. DNSC is responsible for providing safe, secure and environmentally sound stewardship for the strategic and critical materials that make up the National Defense Stockpile. I to describe DNSC's management of the National Defense Stockpile and to specifically discuss the management of the elemental mercury stored in the National Defense Stockpile inventory.

The purpose of the National Defense Stockpile is to ensure that the United States has a sufficient supply of strategic and critical materials to supply military, industrial, and essential civilian needs for national defense. The National Defense Stockpile was created shortly after World War II to acquire and store critical ores and materials to lessen United States dependence on foreign sources of supply in times of war or national emergency. Between 1949 and 1988, the General Services Administration and the Federal Emergency Management Agency were responsible for the program. In 1988, Executive Order 12626 transferred the responsibility for the National Defense Stockpile to the Department of Defense who subsequently assigned

the management of the program to the Defense Logistics Agency. DNSC was established within DLA to manage the strategic and critical materials held in the National Defense Stockpile. Since 1994, over 99 percent of the NDS has been determined to be excess to department needs, and Congress has authorized its disposal. The activities of DNSC are governed by the Strategic and Critical Materials Stock Piling Act, 50 U.S.C. § 98 et seq.

Elemental mercury has been in the National Defense Stockpile inventory since the 1940s. The United States government purchased the mercury inventory from a number of countries including Spain, India, China, and Italy. Congress had authorized the sale of a small portion of the mercury inventory in 1981, and DNSC sold mercury to foreign and domestic buyers into the early 1990s. In 1994, DNSC suspended the sale of mercury in response to congressional concerns regarding the potential environmental impact of selling mercury and the request that the Department evaluate alternative mercury disposal options or long-term storage. The Environmental Protection Agency supported our decision to suspend mercury sales and to develop environmentally sound management options for mercury.

Currently, DNSC has 4,436 metric tons of mercury stored at depots located in Somerville, New Jersey; New Haven, Indiana; and Warren, Ohio. The DNSC inventory of mercury is stored in 76 pound flasks. The mercury in the National Defense Stockpile has been safely stored for over 50 years and DNSC is fully committed to the safe, secure and environmentally sound management and storage of mercury. In 2001, to provide additional levels of protection, DNSC overpacked the mercury flasks into 30 gallon drums. There are six flasks per drum, with the flasks sealed in plastic bags with cardboard inserts to keep the flasks apart, and a mercury-absorbent cushion in the bottom of the drum. Each drum has a one inch rubber gasket in the drum ring that, when tightened, provides a water and air-tight seal. The drums are on pallets (five drums to a pallet) with drip pans underneath the drums for additional protection. Additionally, the warehouse floors where the mercury is stored have been sealed, and entry into each mercury storage access is controlled. Mercury vapor sampling is conducted during routine inspections and every three years private auditing companies conduct an environmental review of all DNSC storage locations.

Reductions in the number and quantity of National Defense Stockpile inventory have led to a corresponding reduction in the DNSC infrastructure. DNSC has reduced its number of operating depots, closed out storage sites, and reduced its workforce. This reduction in footprint necessitated the development of a long-term strategy for the continued management of the mercury inventory. This required the preparation of an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). DNSC analyzed three alternatives in its Environmental Impact Statement: (1) leaving the mercury at the existing storage locations; (2) consolidating mercury storage at one location; and (3) selling the mercury inventory. The EIS, completed in April 2004, indicated all three alternatives would have negligible to minor environmental impacts, and that the human health and ecological risks from all three would be negligible. In the Record of Decision for the Environmental Impact Statement, DNSC made the decision that long-term consolidated storage at one location was the preferable alternative. This decision was based on a combination of environmental and economic factors, policy considerations, and stakeholder comments. Consolidated storage also facilitates DNSC's long-term closure strategy at the sites from which the mercury is removed.

Site selection for the consolidated storage of the mercury then needed to be determined. Hawthorne Army Depot (HWAD) in Hawthorne, Nevada, was considered as a consolidated storage location in the EIS. HWAD is a government-owned, contractor-operated facility whose main mission is the maintenance and storage of conventional ammunition. HWAD includes sufficient warehouse space for the storage of the DNSC mercury inventory, and the EIS concluded that storage there would have minimal environmental impacts with negligible ecological and human health risks. DNSC signed a Memorandum of Agreement with the Army Joint Munitions Command on May 31, 2006, wherein HWAD will provide storage facilities and related support to maintain the DNSC mercury inventory on a reimbursable basis on behalf of DNSC. DNSC is currently working with HWAD and the Nevada Department of Conservation and Natural Resources to facilitate the transfer of mercury to Hawthorne and ensure the facilities are upgraded and safety protocols are in place for the continued safe and secure long-term storage of mercury. The projected transportation costs to move mercury to HWAD is $1.4 million and the estimated annual storage cost at HWAD is $505 thousand. If the Department were authorized to sell its existing stockpile of mercury—the estimated sales receipts would be $83.6 million.

DNSC's decision to consolidate and store mercury allows us to continue to manage the National Defense Stockpile mercury inventory in an environmentally responsible, safe, and secure manner. This decision is consistent with the H.R. 1534, "Mercury Export Ban Act of 2007," prohibition on sale, distribution, or transfer of mercury by Federal Agencies. I thank you for the opportunity to testify before the subcommittee on this important issue.

Mr. WYNN. Thank you very much, Mr. Holder.

We will now hear from Mr. Gulliford.

STATEMENT OF JAMES B. GULLIFORD, ASSISTANT ADMINISTRATOR, OFFICE OF PREVENTION, PESTICIDES, AND TOXIC SUBSTANCES, U.S. ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, DC

Mr. GULLIFORD. Good morning, Chairman Wynn, Congressman Shimkus, and members of the committee. Thank you for inviting me to testify today regarding the export and storage of commodity grade mercury, and H.R. 1534, the Mercury Export Ban Act of 2007.

I have a few opening remarks, but also ask that my written testimony be included for the hearing record.

Mr. WYNN. Without objection.

Mr. GULLIFORD. Thank you.

Let me begin by emphasizing that I share your interest in continuing to advance efforts to reduce global and domestic use of mercury. I am proud of the work that we have done to date to address domestic mercury emissions and use, and to launch a number of international mercury partnerships. We are committed to working domestically and internationally to reduce mercury risk to human health and the environment.

In July 2006, EPA published the Roadmap for Mercury. This document provides the public and all of our stakeholders with a clear statement of EPA's commitment to address mercury in the environment, and continued collaboration with our Federal and State partners is key to addressing the priorities and completing the projects that are outlined in the Roadmap.

With respect to H.R. 1534, the Mercury Export Ban Act of 2007, I think we all agree that the challenge of global mercury is multifaceted and therefore, there are no simple solutions to this complex global problem. However, I believe that efforts to reduce mercury use and demand are the most important next steps.

Programs to address mercury demand, both domestically and globally, and to eliminate the primary mining of mercury are critical. H.R. 1534 would impose a ban on exports of mercury from the United States. The prospect of an export ban raises a number of important questions that would need to be carefully considered. For example, would a ban on U.S. exports lead to new efforts of primary mining of mercury elsewhere in the world to meet global mercury demand? What effect might a U.S. export ban have on efforts to encourage the use of mercury from environmentally preferable sources, such as recycled mercury? Could an export ban be made consistent with U.S. trade obligations, and if such a ban were implemented, what would happen to excess stocks of mercury now in private hands in the United States? As an alternative to an export

ban, the administration believes that the first priority should be given to pursuing demand management strategies.

The proposed legislation also includes the establishment of an expert panel, and we agree that a stakeholder approach is valuable in developing solutions to storage of excess mercury. Earlier this year, EPA, in conjunction with a Federal interagency workgroup, established a stakeholder group to provide the Government with an assessment of options for managing non-Federal supplies of mercury. The stakeholder participants have been selected to represent a balanced mix of academia, industry, States, and nongovernmental organizations, and we have asked them to address how domestic, non-Federal stocks of mercury could be managed in the short and long term.

Finally, we agree that the U.S. Government must exercise its stewardship responsibilities for the mercury stocks under its control, and I applaud both Departments of Defense and Energy, with whom EPA works closely, for their decisions to ensure that their stockpiles will remain safely in storage.

Again, our domestic track record is solid. Demand for elemental mercury in the United States has declined significantly over the past decade, and I expect that trend to continue. However, there is still work to be done domestically and there are significant international needs as well.

At the 2005 UNEP governing council, the United States led efforts to develop global partnerships to reduce risk for mercury internationally. EPA has been instrumental in leading the development and implementation of these partnerships which aim for tangible mercury reductions by leveraging resources, providing technical expertise, technology transfer, and information exchanges in various sectors, and we are committed to ensuring that these partnerships are both productive and effective.

In closing, the administration places great importance on addressing both domestic and international mercury issues. EPA is committed to finding protective and comprehensive solutions, and I look forward to working with the subcommittee and others to achieve this shared goal.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Gulliford follows:]

Testimony of
James B. Gulliford
Assistant Administrator
Office of Prevention, Pesticides and Toxic Substances
U.S. Environmental Protection Agency
before the
Subcommittee on Environment and Hazardous Materials
Committee on Energy and Commerce
U.S. House of Representatives

June 22, 2007

INTRODUCTION

Chairman Wynn, Ranking Member Shimkus, and Members of the Subcommittee, I would like to thank you for inviting me to testify today regarding the export and storage of commodity-grade mercury and the pending legislation, H.R. 1534, the Mercury Export Ban Act of 2007. I am happy to be here to discuss the important mercury work we are undertaking.

Let me begin by emphasizing that I share your interest in continuing to advance efforts to reduce global and domestic use of mercury. I am proud of the work that the United States has done to date, such as reducing mercury emissions from our nation's coal-fired power plants through EPA's Clean Air Mercury Rule and launching a number of international mercury partnerships to focus on key areas. We are committed to working domestically and internationally to reduce mercury risks to human health and the environment.

In July of 2006, EPA published the *Roadmap for Mercury*. This document provided the public and all of our stakeholders with a clear statement of EPA's commitment to address mercury in the environment. Continued collaboration with our federal and state partners is key to completing the projects outlined in the *Roadmap*.

H.R 1534 – THE MERCURY BAN ACT OF 2007

I think we all agree that the challenge of global mercury is multifaceted. There are no simple solutions to this complex global problem but I believe that efforts to reduce use of mercury are the most important next steps. Programs to address mercury demand, both domestically and globally, and to eliminate the primary mining of mercury are critical.

H.R. 1534 would impose a ban on exports of mercury from the United States. The prospect of an export ban raises a number of important questions that would need to be carefully considered. For example, would a ban on U.S. exports lead to new efforts at primary mining of mercury elsewhere in the world to meet the demand in other countries? What effect might a U.S. export ban have on efforts to encourage the use of mercury from environmentally preferable sources, such as recycled mercury? Could an export ban be made consistent with U.S. trade obligations? If such a ban were implemented, what would happen to excess stocks of mercury now in private hands in the United States?

Therefore, the Administration believes that the first priority should be given to pursuing demand management strategies. We believe a better understanding of the consequences of an export ban is needed before such an approach is pursued.

The proposed legislation includes the establishment of an expert panel and we agree that a stakeholder approach is valuable in developing solutions to storage of excess mercury. Earlier this year, EPA, in conjunction with a federal interagency work group, established a diverse and balanced stakeholder group to provide the government with an assessment of options for managing non-federal supplies of mercury. The stakeholder participants have been selected to represent a balanced mix of academia, industry, States, and non-governmental organizations. We have asked them to address how the various non-federal stocks of commodity-grade mercury

could be managed both in the short and long term and how the current and projected supply of and demand for mercury affects this determination. Expertise and information from the stakeholder group is also sought in areas such as sources of mercury, management options, and storage issues. There have been two stakeholder meetings, and additional meetings are scheduled in July and September. All of these meetings provide opportunities for public input and comment.

The federal group includes representatives from Department of Defense, Department of Energy, Department of Commerce, Department of State, Office of Management and Budget, Council on Environmental Quality, Office of the U.S. Trade Representative, Office of Science Technology and Policy, and the U.S. Geological Survey.

H.R. 1534 also proposes that Federal agencies retain control of their elemental mercury stocks. We agree that the U.S. Government must exercise its stewardship responsibilities for the mercury stocks under its control. I applaud both DOD and DOE, with whom EPA works closely, for their decisions to ensure that their stockpiles will remain safely in storage.

Decisions regarding the management of mercury stocks should be made while fully considering international production and use of mercury. Reducing demand and promoting mercury alternatives both domestically and internationally are important solutions. Since primary mining is of particular concern because it introduces new mercury onto the international market, effective strategies must address the impact that supply restrictions may have on increasing primary mining internationally.

DOMESTIC EFFORTS

Our domestic track record is solid. Demand for elemental mercury in the United States has declined significantly over the past decade and I expect that trend to continue. EPA's

Roadmap for Mercury outlines our plan to further reduce and phase out the use of mercury where effective substitutes exist. To that end, EPA is working to reduce risks associated with mercury use in facilities such as hospitals, and in products such as switches and thermostats. Under the Toxic Substances Control Act (TSCA) EPA has also proposed in 2006 a rule that would require notification to the Agency before elemental mercury can be used in vehicle convenience light and anti-lock brake switches, and to prohibit any resumption of use of mercury in these switches. This rule complements an agreement between EPA and automobile dismantlers to remove the mercury-containing light switches from scrap vehicles, cutting mercury air emissions by up to 75 tons over the next 15 years.

Further, EPA is promoting procurement of non-mercury products by Federal agencies, encouraging mercury reduction in schools, and, in March, launched a national Chemical Cleanout and Prevention Campaign for schools. The program will help schools assess and remove mercury and other hazardous chemicals and implement safe chemicals management practices.

INTERNATIONAL EFFORTS

While there is still work to do domestically, there are significant international needs as well. I believe that reducing demand, working on international efforts to curtail demand for primary mining, and ensuring that programs are in place to safely manage excess mercury supplies for the long-term are the critical next steps. The United States is therefore actively engaged in a number of bilateral, regional, and international programs and agreements to reduce mercury uses and releases. For example, at the UN Environment Programme (UNEP) Governing Council in February 2005, the United States led efforts to develop global partnerships

to reduce risks from mercury internationally. EPA has been instrumental in leading the development and implementation of these partnerships.

These UNEP partnerships aim for tangible mercury reductions and effective actions by leveraging resources, technical expertise, technology transfer, and information exchanges in various industry sectors. Their goal is to build capacity to decrease demand and achieve tangible mercury reductions on a global scale. We are committed to ensuring that these partnerships are effective.

The United States leads three of the five UNEP mercury partnerships. The first deals with Mercury Management in Artisanal and Small-Scale Gold Mining, and seeks to reduce damage to human health and environmental impacts associated with the use of mercury in artisanal gold mining by working with mining communities and small-scale gold producers. Demand for mercury use in artisanal or small-scale mining, a major source of mercury emissions to the environment, continues to increase. EPA has funded and secured partners for pilot projects in Senegal and Brazil, working with the UN International Development Organization (UNIDO) and the World Bank's Communities and Small–Scale Mining Program.

The second partnership, Mercury Reduction in the Chlor-alkali Sector, promotes the reduction or elimination of global mercury releases through the adoption of best management practices and through conversion to non-mercury cell technology. To date, this partnership has achieved more than 1,000 kilograms reduction in consumption and release in chlor-alkali facilities in Russia.

The third partnership, Mercury Reduction in Products, seeks to identify and implement successful approaches for reducing or eliminating mercury in products where there are effective substitutes. Our partners on this effort include Ecuador, Chile, Panama, Costa Rica, South

Africa, China, and the Philippines. We are working with China and Health Care Without Harm, an environmental NGO, to reduce and eliminate the use of mercury containing products and waste in China's hospitals. EPA is supporting similar healthcare projects in Mexico and Argentina and will be partnering in India.

The other two partnerships are the Global Partnership for Air Transport and Fate Research and the Global Partnership for Mercury Emissions from Coal-fired Utilities.

CONCLUSION

The Administration places great importance on addressing both the domestic and international mercury issues. EPA believes that our current domestic efforts as well as our international partnership work are critical in reducing mercury demand and use worldwide. We are commited to finding protective and comprehensive solutions, and look forward to working with the Subcommittee and others to achieve this shared goal.

I would like to thank you, Mr. Chairman, Ranking Member, and other members of this Subcommittee, for your interest and concerns about managing mercury stocks, and for allowing me to share EPA's views. I would be happy to answer any questions you have at this time.

Mr. WYNN. Thank you, and I would like to thank all of the witnesses for their testimony.

This concludes the opening statement of our panel of witnesses, and the Chair would like to recognize himself for 5 minutes.

Ms. Williams, the first question I have is: isn't it true that when DOE was deciding what to do with its 1,200 ton stockpile of mercury, that EPA urged NNSA to store the mercury and not to place it on the world market because of the harm that could result?

Ms. WILLIAMS. EPA provided counsel to us, as did DOD, as did other Government agencies, and so we took all of those opinions and positions into account.

Mr. WYNN. Could you describe the environmental and public health consequences that EPA shared with you?

Ms. WILLIAMS. There were many of these that have already been shared in your opening comments. The fact that it is a bioaccumulating element; the fact that it gets into the water system and can microbially be changed into methyl mercury; the fact that it is very dangerous to women and unborn children. All of those were the things that we considered and we also had long discussions about artisanal mining and how artisanal mining is conducted and perhaps some of the impacts of that.

Mr. WYNN. Thank you. Mr. Holder, DOD has also decided to stockpile its mercury and not sell it on the global market. Is it correct that DNSC voluntarily halted mercury sales in 1994 because of the concerns raised by the EPA and others about the effect of mercury on the global environment?

Mr. HOLDER. There were concerns also by Congress and EPA, and yes, we did suspend sales in 1994, based on those concerns about mercury getting into the environment.

Mr. WYNN. Mr. Gulliford, the question I have is if EPA has now advised both DOE and DOD to store rather than sell its elemental mercury, when we talk about the private sector, are we essentially talking about the same kind of mercury?

Mr. GULLIFORD. Yes, we are, same type of mercury.

Mr. WYNN. Would you have similar environmental concerns with respect to this mercury being sold to foreign buyers as you expressed to DOE?

Mr. GULLIFORD. Absolutely, and those concerns are stressed very clearly in both the Mercury Roadmap and in my testimony as well.

Mr. WYNN. Now, you made reference to the possibility that there might be some new primary mining of mercury. Do you have any evidence of that?

Mr. GULLIFORD. The ability to mine mercury exists, obviously, in various places in the world. It is currently very active right now in Kyrgyzstan and also in China, and clearly, the world market responds to the availability and the demand for mercury supplies. And while I don't necessarily have reasons to believe that mercury mining would or wouldn't increase, but I think it is likely, again, given the demand for mercury internationally——

Mr. WYNN. Well, you are saying two things. One you are saying you don't know whether it would or it would not, then you are now saying it is likely.

Can I say that you really don't have any evidence that it would increase, given that there are existing sources?

Mr. GULLIFORD. As I stated in my testimony, I think that that's a very important question that would need to be explored in considerable detail.

Mr. WYNN. What is the cost of these mining operations, if you were to start a primary mine?

Mr. GULLIFORD. I don't know the answer to that question.

Mr. WYNN. Do you know who finances these mining operations?

Mr. GULLIFORD. I don't know the answer to that, but it would either be done through government——

Mr. WYNN. Would someone financing a new mining operation be concerned about liability questions?

Mr. GULLIFORD. I don't know whether they would or they wouldn't. I don't know the condition of actual mining that exists in the places that I have described, either Kyrgyzstan or China.

Mr. WYNN. All right. I don't believe I have any further questions.

I would like to turn to our ranking member, Mr. Shimkus, for questions.

Mr. SHIMKUS. Thank you, Mr. Chairman. Those are really good questions, Kyrgyzstan and China, but we don't have a mining association here. They could probably answer the cost of what a mine costs, what is the commodity return, and the risk assumed and stuff. Maybe we can get them on record. Just a point.

Mr. Gulliford, do you know that an export ban would reduce mercury contamination of air, water, or fish either in the U.S. or abroad?

Mr. GULLIFORD. It would only reduce any types of emissions from mercury sources if it were to result in less actual use of mercury worldwide, and we can't be certain of that unless we know whether or not there are adequate supplies of mercury in the marketplace and other locations, and whether or not there would be additional mining initiated as a result of a ban on domestic export of mercury from the United States.

The reality is the amount of mercury that is exported from the United States is not a great percentage of the world market share.

Mr. SHIMKUS. There has to be a comprehensive approach. I mean, we are talking about China's mining operations. I think the vast majority involved, 99 percent of these are produced in China. Obviously—and I like these bulbs. I like energy efficiency. I think they are great things, but as we expand that, we are sending conflicting signals. We are sending a signal, more mercury, until technology—which I think in the light bulb industry, is 5 to 10 years away, depending upon what type of light bulb it is. I am not picking on it because I have got these in my home now. I am replacing them, and as such, we are purchasing them in the Federal buildings, but we are sending contrary signals if there needs to be a comprehensive approach, we are encouraging more mercury in the worldwide economy by pushing these bulbs, is that correct?

Mr. GULLIFORD. The mercury for those bulbs pretty much is supplied by mining that actually occurs in China. China has the ability to produce mercury that it needs for its domestic purposes and for the development of products that it exports. It also exports traditional mercury containing products, such as thermometers, other measuring tools, and the like. So the Chinese are certainly willing to export mercury and put mercury in the various products.

Mr. SHIMKUS. Yes. Is there a release in just the operation itself of a mine that either is a primary product or a secondary product? Is there a natural emission through the mining of mercury into the atmosphere?

Mr. GULLIFORD. Yes. The mining activities do result in releases of mercury.

Mr. SHIMKUS. Great. Thank you very much.

Ms. Williams, according to your testimony, the DOE was left with 1,200 metric tons of recovered mercury in storage after it decided—Mr. Holder, in storage after it decided to stop its sales. How much was actually sold and what led to the decision to stop selling?

Mr. HOLDER. Between 1980 and 1990s, we sold approximately 50,000 flasks, which equates to about 3.8 million pounds of mercury. We currently have 4,436 metric tons remaining within the inventory.

Mr. SHIMKUS. Who were the main buyers, do you know?

Mr. HOLDER. Main buyers were domestic and international companies. Domestic, B.F. Goldsmith, Bethlehem Apparatus, Asian, Atlantis and international was Beni Mercurio.

Mr. SHIMKUS. Is there any data about what happened to the price of mercury domestically and abroad after NNSA halted sales?

Mr. HOLDER. No, after we basically left the marketplace, we did not continue gathering market intelligence of sales of mercury.

Mr. SHIMKUS. In your verbal statement starting, you mentioned that there was also an economic factor in your decision.

Mr. HOLDER. Yes.

Mr. SHIMKUS. So you are saying that economically, your department decided—that was part of the variable deciding not to sell. Can you tell me about that economic balance——

Mr. HOLDER. When we talk about that, we looked at the economic scale. Since we are basically selling off the entire stockpile inventory, one of the things we had to look at was reduction in sites, and so the consolidation of the mercury fits right in to our economy of scale of trying to find one site in order to move the mercury to one site, which would reduce oversight, and right now, it would cost us about $1 million to store mercury at the three sites. Going to one site, the estimated cost is $500,000 per year.

Mr. SHIMKUS. Ms. Williams, with the chairman's indulgence, any of the questions that I asked Mr. Holder, is there a response you have to some of those?

Ms. WILLIAMS. We have not tracked the economics, and also I cannot tell you who the mercury was purchased by when we last sold it, and if you wish, I could take that for the record.

Mr. WYNN. Gentleman's time is expired.

At this time, I would like to turn to the bill's sponsor, Mr. Allen, for questions.

Mr. ALLEN. Thank you, Mr. Chairman.

Mr. Gulliford, from reading the testimony of those on the second panel, it seems clear we have got a rare consensus among the chloralkali industry, the environmental community, the States, and the medical community that we should stockpile our elemental mercury to prevent the environmental harm and the public health harm that comes from selling large amounts into the global economy. Do you disagree with that consensus?

Mr. GULLIFORD. I believe that the best way to deal with mercury use, as we did domestically and internationally is to work on the demand side of the equation, that way we can provide technical information to developing countries that use mercury, it gives them a reason and it gives them an ability to stop using mercury. And the best way to end the use of mercury is to work again at the demand side, rather than through some type of an action that, again, we can't be certain will lead to the result that we are interested in.

Mr. ALLEN. But if your reservations about a ban could be resolved, and I will come to some of those questions later, but if your reservations about a ban could be resolved, would you have any problem with stockpiling elemental mercury?

Mr. GULLIFORD. I think that it is in our interest to find ways to store mercury that isn't needed, and I certainly agree with that premise. In fact, working with UNEP over the next couple of years, we will be working on examining this overall global situation of what mercury is used, where it is produced, where it is needed, what products still have value of using mercury, as we have discussed. And then ultimately they will look at some type of option.

Mr. ALLEN. OK, thank you.

You have indicated that EPA leads the UNEP partnership dealing with mercury management in artisanal and small scale gold mining, and has participated in the global mercury project. In February 2007, the Global Mercury Project reported its findings, and one of them was "Various locations, specific Global Mercury Project training programs and assessments have demonstrated that when mercury is less available and/or more expensive, less mercury is consumed as miners switch to more efficient practices, sometimes eliminating mercury use entirely." What they are saying in that report is that make it more expensive, make it less available, and you create an incentive to switch to other substances. Do you disagree with that, or do you agree with it?

Mr. GULLIFORD. I would say that we have not seen evidence of mercury use in our gold mining decreasing. In fact, our concern is that more artisanal mining is occurring around the world as people who have the need to generate income for themselves or their families look to mining as a way to generate income that they need to survive. And so we have not seen evidence of reduction in artisanal mining.

Mr. ALLEN. Let me pursue that further. Based on what I understand, artisanal mining is occurring in only two places, the Kyrgyz Republic and China. At the Brussels Conference in October 2006, Kyrgyzstan announced a plan to close its mercury mine and would seek financial assistance to switch to mining of other metals. China, to my understanding, only mines for domestic consumption. I mean, it does make products, but it restricts imports of mercury. So I think you said earlier you are not aware of any new mining operations or any plans for new mining operations. I mean, aren't there things the United States could do to prevent or stop or discourage efforts to expand this kind of mining?

Mr. GULLIFORD. Well, I am not aware that Kyrgyzstan has announced any plans to reduce their mining activities. I am also confident that China is more than willing to mine to produce all of the

mercury that they need for any market, either domestic or international, on their part.

Mr. ALLEN. I just have a few seconds left.

You had a series of reservations, and I just wanted to deal with a couple of them. You asked could an export ban be made consistent with U.S. trade obligations, and we are only talking about $8 million a year here in terms of our exports. I would doubt that that would give rise to a real trade issue. You do properly raise the question if a ban were implemented, what would happen to excess stocks of mercury now in private hands. That is why we have provided for a committee to figure out how to store it. We think that issue is relatively easily resolved.

I see my time is expired. Mr. Chairman, and I thank you.

Mr. WYNN. I thank the gentleman for his line of questioning.

At this time, I would like to recognize the gentleman Mr. Pitts for questioning.

Mr. PITTS. Thank you, Mr. Chairman.

For EPA, some countries like China are not committed to banning exports of mercury. What environmental good is being achieved if the United States bans its exports and other countries for financial reasons fill in the gap of the displaced commodity? Will banning exports have any positive environmental impact on countries that still mine for mercury?

Mr. GULLIFORD. No. In fact, our concern is what will happen from a mining standpoint were there to be a domestic ban on mercury exports from the United States.

Again, we have worked to actually encourage the use of preferable sources of mercury, which is recycled mercury products. Again, mercury is necessary. At the same time, we are very committed—and you can see that in the actions that have occurred domestically, as well as the leadership that we have provided to international efforts, through our partnership projects, to reduce this demand. We believe that ultimately, just as it has occurred in this country, we have reduced our use of elemental mercury by 87 percent in this country since 1980, through education, through technology transfer, and providing alternatives to mercury use, that that is the most appropriate way to address mercury use internationally as well. We have had some success with the initial work of those partnership projects internationally.

Mr. PITTS. Could increasing Federal mandates for energy efficient lighting together with an export ban for mercury contribute to increased mining of mercury in China or elsewhere?

Mr. GULLIFORD. I believe that China has the ability and will mine as much mercury as they need to meet any opportunity that they have to develop industry and to market the products of that industry, including the use of mercury. Because they don't limit their mercury exports only to the compact fluorescent lighting products, they also export other mercury products, even such as the traditional thermometers that are used in hospitals throughout Asia.

Mr. PITTS. Is it cheaper to mine virgin mercury in China or to buy it from the market? What is the mercury that is produced in China being used for?

Mr. GULLIFORD. I think in China there are a lot of uses of mercury in different products. We talk a lot about the uses for artisanal mining, the lighting, and thermometers still being produced. Other devices are being produced such as thermostats and other types of products. So there are still a lot of uses, and all of them I think would need to be factored into a decision as to what the effect of a mercury export ban might be.

Mr. PITTS. And again, what are you doing to address production and use of mercury by China?

Mr. GULLIFORD. We have bilateral negotiations with China on a lot of issues. In fact, I have visited China in Shanghai and we have two projects with hospitals in Shanghai encouraging them to move away from some of the very products that they produce. Again, the use of mercury in hospitals, both in thermometers and in blood pressure cuffs, which are very common, result in spills which are hazardous particularly to the people that work there. They require maintenance because they leak over time, and there is a lot of mercury use and a lot of mercury leakage and problems with mercury exposure in hospitals.

So we are working on issues like that. We are also working through the Asia Pacific Partnership on the challenge of mercury emissions from power plant generation and we are encouraging a responsible action on the part of China. China also is a large economic force that is very willing to market the types of products that are needed or used around the globe, and if they contain mercury, they are willing to export those products.

Mr. PITTS. Now, you said Kyrgyzstan or Kyrgyz Republic is also producing. They don't have a lot of resources. What are you doing as far as their production?

Mr. GULLIFORD. I am not aware that we have any direct partnerships with Kyrgyzstan on mining and use of mercury.

Mr. PITTS. And EPA has a variety of activities underway to reduce mercury demand. Just, again, highlight some of the projects, both domestically and internationally, that explain why it is so important to manage demand as part of an effective solution here.

Mr. GULLIFORD. Yes, consistent with the five UNEP partnership goals that they have set forth, we have demonstrations—and the United States has taken the lead on artisanal mining, and in the case of artisanal mining efforts, we have a project in Senegal where the mining operation there has incorporated the uses of hoods in the smelting process to capture mercury fumes and vapors as they are released, which results in less exposure to workers. It also results in less emissions into the atmosphere. I think the number is roughly 60 of those mines are using that type of an activity to reduce emissions and local exposures.

Another one of the areas of the UNEP partnerships is the chloralkali sector. We have a strong partnership in Russia where they have already transferred to non-mercury processes in a couple of their operations, and they are very substantial. Again, the use of mercury in Russia, is a very positive demonstration partnership project, and one that is repeatable, and Russia tends to continue to move through their domestic chloralkali facilities to transfer out of the mercury technology, as much as we see here in this country.

We also have interests and we are working in the private sector, including our products and processes in our partnership projects. I mentioned the efforts that are in a number of countries to look at the use of mercury products in hospitals where exposure can be very high, particularly to the working staff of those hospitals, doctors and healthcare providers. The actual patients can move through hospitals fairly quickly and not be exposed for a long period of time, but the actual workers are under considerable exposure.

The other two areas where we don't necessarily have the lead, but where we are also providing support internationally is to the issue of mercury emissions from coal-fired power plants and also then to look at the research components appropriate to mercury emissions, international transport of mercury.

Mr. PITTS. And finally, can you speak to any of the recent consumer and retail concerns pertaining to the cleanup and disposal of CFLs?

Mr. GULLIFORD. Yes. On the EPA Web site, we have some very specific instructions for consumers who use these bulbs. Concern is if they are broken, what should you do. If you look at that Web site, it would instruct any homeowner who has, for example, dropped one of these lights that resulted in a spill, first of all, to aerate the area, to vacate it, open all the windows, provide an opportunity to dissipate any emissions that might be from that bulb. Next, it instructs homeowners to clean up carefully, never vacuum because vacuuming only disperses it, but to use some type of a towel or something that will actually absorb the mercury, and put it into plastic containers, plastic bags, double bag it, that type of thing. Obviously, to be careful not to cut yourself when doing that, and then to dispose of it properly. There are disposal sites in many of our communities, or also it can be put into something that would go into a landfill. We would discourage it from going into a process that would ultimately result in incineration.

Mr. PITTS. Thank you, Mr. Chairman.

Mr. WYNN. The gentleman's time is expired.

At this time, the Chair would recognize the gentlelady from Illinois, Ms. Schakowsky.

Ms. SCHAKOWSKY. Thank you, Mr. Chairman. I take this issue of mercury very seriously. Some years ago I actually wrote a chapter in a book called "50 Ways to Improve Women's Lives" about the danger of mercury. My district sits on Lake Michigan and we are concerned about the contamination of fish. I have also been concerned, now that you have mentioned power plants, the decision on the Bush administration to roll back in 2005 Clinton administration decisions requiring that all power plants reduce mercury emissions to the maximum extent possible by 2008.

I wanted to call your attention, Mr. Gulliford, to the Global Mercury Project, the United Nations Global Mercury Project, and it delivered its report in February of this year. It says that it calls on nations around the world to achieve the goal of reducing mercury consumption by reducing mercury supply through export controls and other mechanisms that will encourage the transition to alternative technologies. Do you support the United Nations Global Mercury Project call for a mercury export ban?

Mr. GULLIFORD. We are working very closely with the UNEP Council on their programs for mercury reduction, that is why we have made the effort to sponsor and support the five partnership projects. We are also working with them to support the gathering of the data to look at issues related to the mercury use, mercury demand, mercury supply, and the potential for any type of policy for the future——

Ms. SCHAKOWSKY. Well, it sounds like you think that there are appropriate uses for mercury, and so Mr. Holder, the sites that contain mercury right now, we are not releasing anything from storage since 1996, right?

Mr. HOLDER. Since 1994 we have suspended sales and we have not released any mercury from our warehouses.

Ms. SCHAKOWSKY. So if you think, Mr. Gulliford, that there are legitimate uses, why would the EPA then say none of it could be released from storage?

Mr. GULLIFORD. Clearly, the use of mercury in this country and our goal for the use of mercury internationally is to reduce the use of mercury. That has happened in this country. As I indicated, we have reduced mercury use domestically by 87 percent since 1980, and that is a trend we believe will continue to occur. We don't believe there is need for all of the mercury and we think that it is very good that we have made a decision what to do with Federal sources, and we have convened a stakeholder panel to look at options for, again, what can we do to store properly domestic supplies.

Ms. SCHAKOWSKY. And that is being all consolidated, the storage? Is that part of the plan?

Mr. HOLDER. Part of the plan is to consolidate all the mercury into one storage site.

Ms. SCHAKOWSKY. And also, Mr. Gulliford, you have been talking about efforts to encourage the—wait.

In your testimony, you say the ban on U.S. exports of mercury raises questions such as what effect there might be on "efforts to encourage the use of mercury from environmentally preferable sources, such as recycled mercury." So is the United States engaged in efforts to encourage the use of mercury in those ways in the global market?

Mr. GULLIFORD. I believe that the use of environmentally preferable sources of mercury are preferable to new mining. I don't think we should do anything to encourage the additional mining of mercury anywhere in the world, and rather we ought to use these existing sources of recycled mercury. They are very preferable.

Ms. SCHAKOWSKY. Do we have metrics on this? Are there goals that you want to achieve? I know you mentioned how much mercury has been reduced, but are there specific goals to actually reduce the use of mercury, goals that are achievable and that we are aiming toward and measuring toward?

Mr. GULLIFORD. Yes, there are, in some cases. For example, with respect to mercury switches in autos, when we worked with the auto industry to stop using mercury switches in automobiles and we backed that up and are just completing a rule that will prevent those from coming back into use at any future time. We also then went forward with the scrappers and the recycling industry, trying

to get those mercury switches out of automobiles before they are shredded and then resmelted, and then you would have an air emission associated with that. We expect some very significant reductions in mercury, and so we do have numbers on those which we can get for you. We are also then looking for other products, such as similar devices that——

Ms. SCHAKOWSKY. My time is expired and the chairman is gaveling.

Thank you very much. I thank your indulgence, Mr. Chairman.

Mr. WYNN. Thank the gentlelady for her questions.

Are there other members seeking to ask questions at this time? Seeing none, I would like to thank all the witnesses on this panel for your outstanding testimony, and excuse you at this time, and ask that the second panel would come forward.

Also at this time, the Chair is going to ask unanimous consent that a memo from Thomas D'Agostino, the Deputy Administrator for Defense Programs at DOE, the memo is dated December 13, 2006. In the memo, he states that the decision to store DOE's in NNSA's mercury inventory is based on several factors, including EPA's urging that this mercury be stored and not returned to the economy. I would, at this time, ask unanimous consent that it be included in the record.

Mr. SHIMKUS. Reserving the right to object.

Mr. Chairman, I don't think I will but I think we would like to see that.

Mr. WYNN. I thought you had seen it but I certainly am happy to share it with you.

Mr. SHIMKUS. And also, Mr. Chairman, as part of this opens up for a colloquy, whether there are insertions by the National Electronic Manufacturers Association of Lighting Manufacturers and the mining industry, if we would be allowed to submit a statement from them into the record, and what time we would be allowed to do that?

Mr. WYNN. I don't have a problem with the submission. I would like, of course, to see them if the Democratic side has not seen them, so if you would allow us to see them, then I would——

Mr. SHIMKUS. Yes, if you would just give us a timeframe so we make sure they get it here in an appropriate amount of time, then——

Mr. WYNN. Would 5 days be a sufficient timeframe?

Mr. SHIMKUS. I think that would be fine. That would be very generous, Mr. Chairman.

Mr. WYNN. Probably too generous, but having said that, we will keep the record open for 5 days to receive the letter. I will reserve the right to object, however, pending receipt of that letter.

Mr. SHIMKUS. We are all getting so smart, aren't we?

Mr. WYNN. Give me time.

With respect to the unanimous consent request that I made——

Mr. SHIMKUS. I withdraw my objection, Mr. Chairman.

Mr. WYNN. I thank the gentleman, and the memo will be entered into the record.

I would also, at this time, seek unanimous consent to enter letters of support for H.R. 1534 into the record. I believe the minority does have these letters. They are from the State of Maine, the

American Medical Association, the Nature Conservancy, and the American College of Preventative Medicine.

Mr. SHIMKUS. No objection.

Mr. WYNN. Hearing none, the letters are admitted into the record.

At this time, I would like to welcome our second panel. I would like to introduce them and thank them for appearing.

First, we have Dr. Linda Greer. She is a senior scientist, National Resources Defense Council. We also have Dr. Michael Shannon, chair of the Committee on Environmental Health and American Academy of Pediatrics. We have Mr. Mark Smith, deputy director, Office of Research and Standards, Director, Massachusetts Mercury Program, Massachusetts Department of Environmental Protection. We also have with us Mr. Arthur Dungan, president of the Chlorine Institute, and finally, Mr. Bruce Lawrence, president, Bethlehem Apparatus Company.

Again, welcome, and we will begin with 5-minute opening statements from each of the panelists. The prepared testimony that you submitted in advance will be made a part of the hearing record. And with that, Dr. Greer.

STATEMENT OF LINDA E. GREER, SENIOR SCIENTIST, NATURAL RESOURCES DEFENSE COUNCIL, WASHINGTON, DC

Ms. GREER. Thank you. Well, good morning. Thank you for the opportunity to testify. I direct the Environmental Health Program at the Natural Resources Defense Council, which is an environmental advocacy organization. In that capacity, I focus on the most dangerous chemicals that are in the air, in the water, in the food, or in our houses, and mercury has been on our radar screen as our highest priority pollutant in the food supply for the purposes of protecting health in the United States.

For that reason, I have been working personally and with some of my staff on both global mercury pollution issues and domestic mercury issues here in the United States for about 5 years. In my oral testimony, let me try to simplify this issue for the hearing today and provide my perspective on the need for this legislation.

I think the basic question at hand is: "Why should we care about exporting mercury out of our borders? Why should we care about where it goes?" And there are really two big reasons why we should care about this and why we need this bill. The first reason, which has been covered in several opening statements, is that mercury is a global pollutant, and so the unfortunate fact of the matter is that if we ship mercury abroad and it gets used in polluting ways, that mercury comes right back at us. We don't have the luxury of not caring about mercury outside of our borders. We need to worry about the management of that mercury all along in order to protect our own health and our own food supply.

The second reason is sort of a dollars and cents reason, which is this: States and localities are expending much welcomed effort in collecting and recycling mercury-containing products because it is very dangerous for those products to wind up in municipal trash stream and then get burned in a municipal incinerator or break. It doesn't make any sense, though, for them to collect all that mercury, to take all that time and trouble, just to put it in a bucket,

so to speak, and send it abroad to highly polluting uses. Recycling for reuse in highly polluting industries is not a step in the right direction. Because mercury is a global pollutant, if we take the time and trouble to collect these small sources, we should then not be sending it off to countries in the developing world who are then going to mismanage it. Unfortunately, unless we do something like the export ban we are discussing today, we do not have any control over where this mercury goes.

In its testimony today, EPA expresses concern about the unattended consequences of a mercury export ban on promoting environmentally preferable recycled sources of mercury. My answer to that concern is this: there really is nothing environmentally preferable about collecting mercury just to send it abroad to recycling, and I think the problem would be to the contrary. I think over a longer period of time, as States and localities watch the money and effort they are putting in to collect this mercury go for essentially no big purpose—that is, just collect the mercury in order to send over to Vietnam or India or someplace that will mismanage it—that people will become disillusioned about the value of recycling and they will feel like they should turn their resources to something that makes a bigger contribution in the big picture.

Now let me turn for a minute to an overview of the situation of the global mercury trade, which is a very bleak situation. It is important for people to take stock of this situation, because the magnitude of the problem we have right now is very large. It is important to compare this against the speculative unintended consequences, such as those that have been raised by EPA and others today in their testimony. So much of the detail about this is in my written statement. I will highlight for you only this. We use between 3,000 and 3,500 tons of mercury globally per year. That has gone down enormously over the past 50 years, but it has been stable for the last decade. Usage is not going down fast enough from there. The problem is not just the standing amount of mercury that we are using, but that in the last decade, there has been an enormous shift in where and how that mercury is being used. So that in the older days, we in the United States were still using mercury, the Western European countries were still using lots of mercury. That mercury was, for the most part, much more carefully managed than the mercury being used in the developing world today. In my testimony, I have a figure, figure 2, that shows for one typical year the flow of mercury which is basically from the industrialized world to the developing world, as the industrialized world has gotten rid of its dangerous mercury uses.

The largest percentage of this mercury goes into that practice of artisanal mining that has already been the focus of both opening statements, and also some of our witnesses today, and I just want to emphasize for you how very dangerous that practice is. It is more than roughly a third of the global mercury use. It is being used by the poorest people of the world, people who have no other means of support. They are grossly intoxicating themselves with mercury, such that they usually can't do this work for very many years of their life because they have become intoxicated, and it is throwing 1,000 tons of mercury a year, almost all they use, into the air and into the global food supply. As has already been mentioned

by several representatives, UNIDO, which has been in the lead on this problem, has called for an export ban as the single-most important thing that the world could do in order to reduce this practice.

[The prepared statement of Ms. Greer follows:]

TESTIMONY OF
LINDA E. GREER, Ph. D
SENIOR SCIENTIST
NATURAL RESOURCES DEFENSE COUNCIL

ON BEHALF OF:
NATURAL RESOURCES DEFENSE COUNCIL

BEFORE THE
COMMITTEE ON ENERGY AND COMMERCE
SUBCOMMITTEE ON ENVIRONMENT AND HAZARDOUS MATERIALS

AT HEARING ENTITLED:

H.R. 1534
MERCURY EXPORT BAN ACT OF 2007

JUNE 22, 2007

Good morning and thank you for this opportunity to testify on H.R. 1534, a bill to prohibit the sale, distribution, or transfer of mercury, to prohibit the export of mercury, and for other purposes. I am Linda E. Greer, Ph.D., the Director of the Health Program at the Natural Resources Defense Council (NRDC). I have a Ph.D. in environmental toxicology and have worked at NRDC on environmental health issues for over 15 years. NRDC is a not-for-profit environmental advocacy organization with over 1 million members and activists whose mission is to safeguard the Earth: its people, its plants and animals and the natural systems on which all life depends.

NRDC's Health program focuses on toxic chemical pollutants in air, water, food, and shelter. Over the years, we have focused our particular attention on the "biggest pollutants" in these media, the ones disproportionately responsible for the biggest threats to human health. This has led to successful efforts to substantially reduce diesel air emissions from trucks and buses, for example, and to take a number of dangerous and outdated pesticides off the market. There are more than 70,000 chemicals in commerce, but some are much more toxic than others, and we can make great progress in environmental health protection if we focus on the smaller number of chemicals that have the biggest impact.

Mercury is a top priority for NRDC because it is one of the most serious, if not THE most serious, toxic contaminant in the U.S. food supply. Even in low doses, mercury exposure

may influence a child's neurological development, affecting attention span, fine-motor function, language, visual-spatial abilities (such as drawing) and verbal memory. In adults, chronic mercury poisoning can cause memory loss, tremors, vision loss, and numbness of the fingers and toes and can contribute to heart disease among other problems. EPA and FDA calculations have determined that women of childbearing age/pregnant women should eat no more than 12 ounces of fish per week, which is only two cans of tuna fish or one fish dinner and a tuna fish sandwich per week, to avoid unsafe exposures to this toxic metal. Children should eat much less. This advice is based on an analysis undertaken by the National Academy of Sciences, which issued a report on this issue in 2000.

Of course, the solution to the problem of mercury pollution is not to stop eating fish, an otherwise healthy food. It is to eliminate mercury pollution. And this mission brings us to today's hearing, and the need for H.R. 1534.

As I will explain in my testimony today, scientific experts and motivated governments agree that the way to eliminate mercury pollution is to reduce global supplies and global demand for this toxic metal in commerce.[1] NRDC has participated in a large number of policy deliberations around the world on this issue over the past five years, including those hosted by the United Nations Environment Program and the European Union, and our testimony today is informed by these deliberations.

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[1] There are other sources of mercury releases, such as from coal fired power plants that must be addressed in other ways, but such releases are not the subject of today's hearing, which focuses on intentional uses of mercury in commerce.

The time is ripe for action. As you will hear in more detail this testimony: the United States and most of the rest of the developed world is already well on its way to reducing mercury demand. In our opinion, policies to further reduce demand here in our country are important, but not our highest priority. We need to focus primary attention on the U.S. contribution to global supply. The critical first step – in fact, the single most important thing that the U.S. and other developed nations must do to reduce pollution from the use of mercury in commerce -- is to stockpile the surplus mercury we are accumulating as we remove this toxic chemical from our products and industrial processes. This will stem the tide of mercury flow into the developing world, where demand for this toxic metal in industry remains robust and pollution from its use is rampant.

H.R. 1534 takes this important first step on the global mercury pollution problem. In banning the export of surplus mercury from the U.S., and mandating permanent storage of existing government stockpiles, the bill provides an opportunity for our country to take leadership on reducing mercury in the food supply. We are very pleased to testify this morning in support of this important bill.

Why should we care about U.S. exports of mercury?

Ask most people to identify the sources of mercury pollution, and they will correctly point to coal-fired power plants. Mercury is a naturally-occurring ("unintentional") contaminant of coal released during combustion, and power plants comprise the largest

remaining source of mercury pollution within the U.S., contributing a little less than 50 tons to the global total.

However, there are other large and important sources of mercury pollution in the world that stem from the intentional use of mercury as a commodity metal in products and industrial processes, which are the focus of our hearing today. Specifically, 3000-3500 tons of mercury are consumed each year by various industries around the world -- in chemical manufacturing, mining, battery production, and more. And, because of the highly dispersive nature of most of these uses and the poor degree of environmental control where used, much of the mercury "consumed" in these sectors ultimately winds up as air and water pollution, where it becomes available to enter our food chain.

What's worse, mercury is a global pollutant; when released from a source in one country, it readily disperses around the world, often falling far from its source of release and entering distant food supplies. These characteristics have led to surprisingly and disturbingly high concentrations in places with no significant local mercury pollution sources at all. The Arctic region, in particular, is a global mercury hotspot, acting as a giant "sink" for the pollutant circulating in the Earth's atmosphere. People there are some of the most highly contaminated on Earth. Of more direct relevance to H.R. 1534, scientists have estimated that up to a third of U.S. mercury air pollution has traveled to the U.S. from Asia, where mercury pollution is extensive.[2] [3] And, I'd like to point out,

[2] C. Seigneur et al.2004. "Global Source Attribution for Mercury Deposition in the U.S.". Environmental Science and Technology 38: 555-569.

much of the fish that we eat in the U.S., including tuna fish, is imported from the south Pacific, off the coast of China and other countries, and is highly vulnerable to proximate sources of contamination from immediately adjacent shores.

These facts underscore the need for a global focus on mercury, in order to substantially reduce mercury contamination of the U.S. food supply. Unlike diesel pollution or pesticides applied to cracks and crevices in your home, many of the major sources of mercury contamination in our food come from quite a far distance from our shores.

There is a second, dollars-and-sense reason that we should care about mercury exports: Our states, local governments, and some companies are expending much-welcomed time and money to collect mercury for recycling. But absent a coherent policy for safe storage of this material, many will appropriately question the long-term wisdom of this effort. Let me explain.

An increasing number of states and others, alarmed by the ubiquitous high levels of mercury in their lakes and streams, have initiated collection efforts to retrieve mercury from products such as auto switches, thermometers, and thermostats at the end of their useful lives. This collection and separation from the waste stream is important to prevent mercury releases from the almost inevitable product breakage and/or releases from combustion that would occur during incineration or other disposal.

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[3] U.S. sources of mercury pollution such as from coal fired power plants remain quite important nonetheless, because so much of the mercury emitted from these sources deposits locally and regionally quite heavily.

Mercury collected by state and local authorities is currently consolidated and sent to "recyclers" such as Bethlehem Apparatus, who trade in mercury as a commodity metal, much like silver or zinc or copper. The problem is that recyclers often sell this mercury to buyers in the developing world, or to traders who resell it to the developing world, where mercury demand remains high.

Recycling mercury for re-use in highly polluting industries is not a step in the right direction for environmental or public health protection.The unfortunate fact of the matter is that – because mercury is a global pollutant -- **if we take the time and trouble to collect these multitudinous small sources of mercury, we should not then send it off to a country in the developing world that will use it in poorly controlled industrial applications, spewing the mercury into the air to come right back at us in fish in our grocery stores or in air currents over the Pacific.**

Specifically, let us take a look at where U.S. mercury exports went in 2004, one of the latest years with comprehensive statistics available. USGS statistics show that over 90% of the mercury exported from our country that year went to four countries: Vietnam (79 tonnes), Mexico (64 tonnes), India (63 tonnes) and Peru (47 tonnes).[4],[5] These developing countries have little in the way of environmental control systems, and it is very likely that the mercury was used in highly dispersive applications, particularly such as artisanal mining, described below.

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[4] In 2005, more than half of our mercury went to the Netherlands, but did not stay there; the Netherlands has a booming business in global mercury trade, with large quantities exported to the developing world annually.

[5] USGS Mineral Yearbook 2005. August 2006. Table 2

Fortunately, as a technical matter, it is quite easy to store mercury, which is not reactive explosive, or otherwise difficult to contain. Storage in flasks or stainless steel tanks in a warehouse will do the trick. We will need a very small amount of space for this storage as well; NRDC has calculated that the typical annual U.S. export of mercury could fit comfortably into one U-Haul rental truck.[6] And we are not talking about something with enormous value: our annual shipments are worth roughly $ 6 million on today's trading market -- roughly a quarter of the advertising campaign the tuna industry announced in 2005 to encourage people to eat more of its product.[7]

Global mercury use and trade

The last 40 years have witnessed a significant increase in mercury emissions from coal combustion around the world. This trend has been offset to some degree by a reduction in industrial uses of mercury worldwide, from more than 9000 tons per year in the 1960's to less than 4000 tons per year today. (Figure 1) The overall decline in industrial mercury use has occurred largely because various developed countries including the U.S. have made conscious decisions to decrease mercury use, eliminating it in products such as batteries and paints and converting industrial processes, such as chlor-alkali plants, to mercury-free technology.

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[6] NRDC calculation is as follows: 278 tonnes of mercury at a density of 13.55 g/cubic centimeter requires 724.54 cubic feet of storage space. A 17-foot long box U-Haul truck contains 855 cubic feet.
[7] San Diego Union Tribune, July 27, 2005. "As canned tuna sales dive, companies plan ad blitz to reel buyers in". by Terry Rogers.

However, as Figure 1 indicates, the past 10 years have been stagnant with regards to mercury use reductions; we are hovering at continued consumption of about 3500 tones per year globally. What's worse, **over the past decade, the location and type of demand has shifted to the developing world**, into applications that are highly polluting and dispersive. (Figure 2) As I will detail below, the industrial uses typical of the developing world, such as artisanal and small scale gold mining, pose large local risks to human health and contribute substantially to the total quantities of mercury pollution circulating the globe. Therefore, although we are holding steady in total global use, we are losing the war against mercury pollution, because the types of uses that are occurring are more dispersive than those used in the industrialized world.

Reduction of Mercury in Commerce

Fortunately, economically viable alternatives to mercury are available for nearly every industrial use of mercury. This has been well documented by the United Nations Environment Program, which has been working on mercury as a global priority since 2001. UNEP has recently reported on mercury use around the globe by sector and projected demand reduction under two scenarios: a "status quo" scenario, where no policies change in any country, and a "focused reduction" scenario, where countries undertake feasible policies to discourage and discontinue mercury use.

The news from the UNEP is good; it predicts that even **under the status quo, with no further government attention, mercury demand will decrease by 535 tons by 2015**

(compared against the midpoint estimate of use in 2005). **Applying a "focused reduction scenario", wherein countries take steps to reduce supply and demand, UNEP predicts demand reduction by 1115 tons by 2015.**[8]

These projected decreases in demand should allay concerns we have heard that a ban on U.S. exports of mercury, which currently amount to only about 200-300 tons per year, will cause severe problems in the world mercury market – either by sparking new mining initiatives or by depriving the very small number of critical uses of mercury that have no alternatives. The projections should also motivate countries to reduce supply -- in order to avoid flooding the market with excess mercury as demand goes down, lowering prices, and thereby beckoning new and wasteful uses of the toxic metal.

Table 1 presents details on current uses of mercury in commerce and reductions that are possible in each sector from the United Nations report. [9]

Small scale/artisanal gold mining: The use of mercury for artisanal and small scale gold mining (ASM), the largest use of mercury in the world, and the one growing the most rapidly, is of special concern and deserves the top attention of all those worried about mercury pollution of the globe. Roughly one-third of global mercury consumption is consumed in this sector, a terrible practice for the world's poorest citizens which I describe more fully below. UNEP predicts demand reductions of 175 tonnes per year in this challenging sector (from the midpoint estimate of use in 2005) under the status quo

[8] UNEP Chemicals. Summary of Supply, Trade and Demand Information on Mercury. November 2006.
[9] Table 22. Global mercury demand by sector. 2005. From: UNEP Chemicals. Summary of Supply, Trade and Demand Information on Mercury. November 2006.

and 425 tons reductions under a focused reduction scenario. As discussed below, gold mining experts elsewhere at the United Nations are more optimistic and believe a 50% reduction in global demand by 2017 is achievable with supply side restrictions like export bans in place.[10]

Vinyl chloride manufacturing: Vinyl chloride is manufactured using mercury almost exclusively in China, where it is used as a catalyst in a unique chlorination process.[11] UNEP considers this sector to be a mid- to longer term challenge, with no easy solutions in sight, although mercury releases can likely be greatly reduced with improved management practices. It predicts no reductions by 2015 in this area; in fact, it projects an increase in usage of 300 tonnes. NRDC believes this prediction is unduly pessimistic, but for the purposes of simplicity, we will stick by the UNEP predictions in our testimony today. Increases in use in this sector are more than compensated by large decreases in other sectors in the UNEP projections.

Chlor alkali production: Chlorine and caustic soda are manufactured from brine using several types of production processes. The most outdated process is mercury-based, whereas the others use no mercury at all. In the United States, nearly all our chlor-alkali plants have now converted to non-mercury based production, and the industry has pledged conversions by certain deadlines in both the European Union and India. UNEP

[10] UNIDO Global Mercury Project. Global Impacts of Mercury Supply and Demand in Small Scale Gold Mining. A Report to UNEP Governing Council. February 2007.
[11] China requires mercury as a catalyst in production because it manufactures VCM from acetylene, rather than from ethylene, which is typical of the rest of the world.

predicts reductions of 150 tonnes of demand by 2015 under the status quo in this sector and 250 tonnes under the focused reduction scenario.

Products: UNEP predicts that with no policy interventions whatsoever, demand from battery manufacturing, electrical and measuring device production, dental use, and lighting will be reduced 38% from 1345 tonnes (midpoint estimate of use in 2005) to 830 tonnes by 2015. With a focused reduction scenario, under which countries put policies in place to promote or require substitutions in these low-hanging-fruit areas with readily available alternatives, usage drops 54% to 620 tonnes, and demand is reduced by 725 tonnes.

Use in artisanal and small scale gold mining: a clarion call for the need to restrict supply

The use of mercury in artisanal/small scale gold mining (ASM) is the largest, fastest growing, and surely the most alarming use of this toxic metal around the globe. In this practice, miners with little or no economic capital, who operate often illegally and with little organization, separate trace quantities of gold from soil or sediment by mixing it with elemental mercury. The mercury amalgamates with the gold, and the mixture of mercury and gold is then heated with a blow torch. The heat vaporizes the mercury, which escapes into the atmosphere, leaving a small trace of the gold for collection and sale. (See photos, Attachment 1).

With few exceptions, these miners do not conserve or capture any of the mercury used in their daily operations; the price of mercury is low enough relative to the value of the gold that its loss is economically inconsequential. Virtually one hundred percent of the mercury is lost to the environment.

A resurgence of artisanal and small-scale gold mining began in the early 1980s, accelerated by the rising value of gold, and it is booming. The practice takes place all over the developing world, particularly in China and Indonesia, but also in many countries of South America and Africa. The United Nations Industrial Development Organization (UNIDO) estimates that there are between 10 to 15 million artisanal miners world wide in 55 countries, forty percent of whom are women, and 1 million who are children, involved in this practice.

With nearly 100 percent of the mercury used by these miners dispersed into the environment, the health and environmental impacts of the practice are staggering. Mercury concentrations at the mining sites are often exceedingly high, and many miners themselves exhibit severe mercury-poisoning symptoms such as tremors, vision loss, and the inability to reproduce simple geometric shapes. In addition, air and local waterways are heavily contaminated from these practices, greatly expanding the number of people whose health is affected by these practices.

Notwithstanding focused work by UNIDO and others to address this problem, the scale of the resources available to develop and promote the viable alternatives to mercury for

gold mining and/or effective practices to recapture mercury during retorting has to date not been at all proportional to the scale of the global problem that mercury use and release in this sector represents. Experts in UNIDO have therefore recommended that countries of the world decrease the global supply of mercury, thereby increasing its price, so that miners have a natural reason to capture and reuse this toxic metal or convert to non-mercury based production alternatives.

I attach to this testimony a recent report by the UNIDO Global Mercury Project, which strongly endorses the need for supply restrictions to achieve improvements in these deadly operations and describes the availability and effectiveness of alternative practices that vastly reduce or eliminate the use of mercury in this sector. The UNIDO report concludes that a 50% reduction in use of mercury in this sector is achievable by 2017 with the following statement, in boxed, centered, and highlighted for emphasis to readers:

> **"The Global Mercury Project calls on nations around the world to achieve the [goal of reducing mercury use in ASM] by reducing mercury supply through export controls and other mechanisms that will encourage the transition to alternative technologies."** [12]

Will there be unintended consequences of a U.S. mercury export ban?

[12] UNIDO Global Mercury Project. Global Impacts of Mercury Supply and Demand in Small Scale Gold Mining. A Report to UNEP Governing Council. February 2007.

Since the introduction of H.R. 1534, questions have been raised whether a mercury export ban would be counter-productive, sparking an increase in mercury mining around the world.

There is no evidence to support the allegation that a ban on mercury exports will lead new mercury mining. In fact, there is evidence to the contrary. Over the past seven years, for example, the price of mercury jumped from $140 per flask (in 2000-2003) to roughly $800 per flask (in 2005) before falling back to roughly $550-650 per ton at present.[13] No new mines exporting mercury opened during this period, and there has been no "law of unintended consequences" in evidence to date.

There are at least two reasons why new mining is not likely to be sparked in the coming years either. First, most countries do not have viable mercury deposits; mercury occurs in economically recoverable deposits in only in a handful of countries around the globe. In each case, there is limited remaining capacity within these countries to significantly expand output.

Specifically, mercury mining for export in recent years has been dominated by only three nations with remaining rich mercury deposits: Spain, Algeria, and Kyrgyzstan. Only the mine in Kyrgyzstan remains. (China mines considerable amounts of mercury but uses it only for its own robust home market.)

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[13] Personal Communication with Peter Maxson, Concorde East/Wast Sprl, June 19, 2007. Mr. Maxson is a leading expert in the mercury trade and is responsible for analysis used both by the European Union and UNEP in their mercury deliberations. A flask = 34.5 kg of mercury.

- The world's biggest mercury mine, in Almadén, Spain, stopped all mining and processing of primary mercury ores in 2003, and is not expected to restart. To the contrary, Spain has shuttered this mine as part of the EU's overall initiative to reduce global mercury supplies, which also includes an export ban similar to H.R. 1534.
- Algeria's mine has suffered for years with poor operating conditions and closed at the end of 2004, in light of continuing technical problems, notwithstanding increased mercury prices that year.
- The last major mercury mine still in operation primarily for export is the Khaidarkan mining complex in Kyrgyzstan, which has not produced more than 500 tons of mercury per year since 2002. According to the World Bank, the quality of the deposit is low at this mine, and there are technical problems with the operation; as a result, the mine has historically required state subsidies to operate. Furthermore, the government of Kyrgyzstan has already recognized the desirability of phasing out mercury mining; at an October 2006 European Commission mercury meeting in Brussels, the head of the mine asked the international community for assistance in transitioning to other economic activities in the region.

Virgin mercury mining continues in the world mainly in China, which mines 700 tons or more per year. [14] Significantly, however, China uses all of this mercury for its own

[14] NRDC submission to UNEP in response to March 2006 request for information on mercury supply, demand and trade" Natural Resources Defense Council, Washington, DC, May 2006 http://www.chem.unep.ch/mercury/Trade-information.htm. Note that NRDC has undertaken a comprehensive mercury use inventory with government officials from the Chinese Chemical Registration Center, a branch of the Chinese EPA. This study has also quantified the annual production from virgin mercury mining in the country.

internal market and therefore is not relevant to the supply-and-demand equation for the rest of the world. China has not historically exported much if any mercury into global commerce, and it is not expected to start now. To the contrary, China's largest mine was exhausted several years ago and shuttered. With its remaining deposits, China is mining mercury largely to service its chemical industry there, which uses a unique process to manufacture vinyl chloride for PVC with a mercury catalyst and for a few other smaller volume needs such as for manufacture of measuring equipment[15], and a few other products. In fact, China imports about 200 tons/yr to meet its internal demand for mercury (China law currently limits imports to a maximum of 300 metric tons/yr). It is thus very unlikely that China will begin to export any of its virgin mined mercury to supplement global supplies.

A second reason that the export ban will not lead to new mining is described in detail in my testimony above: mercury demand is on its way down in the world. The EU and other developed countries have a range of national initiatives proposed or in place to help curb mercury demand, including most notably a voluntary commitment from the chlor-alkali sector there to convert its plants to non-mercury production throughout Europe by 2020 at the latest. In the US, a combination of federal legislation, state legislation and industry initiatives will lead to reductions over time in use of mercury in products. India will be phasing out its mercury cell chlor-alkali plants by 2012. It is in light of these and other efforts that UNEP has predicted that the global demand for mercury will decline, even under a "status quo" scenario where governments take no additional steps to

[15] Executive Finding of Mercury Investigation in Guizhou, Global Village of Beijing, Beijing, People's Republic of China, 2006 , http://www.zeromercury.org/projects/Executive_Summary_of_Guizhou_Mercury_Investigation.pdf

encourage the decline. This trend will clearly work against significant new investment in mining for a shrinking commodity sector. Indeed, international efforts to reduce mercury demand have already led Kyrgyzstan to examine alternative economic growth opportunities for its mercury mine area, as discussed above.

Finally, in closing on this topic, I refer members of Congress to Attachment 3, the UNEP Governing Council resolution on mercury from February of this year. Section 19(d) notes consensus on the value of phasing out primary mining in order to control the mercury pollution problem. If the United States government is really worried about this problem, we should work towards a binding international agreement to ban additional primary mining of this deadly and unnecessary commodity.

Mercury pollution is a global problem that requires a global solution

In 2001, the UNEP Governing Council, a group of 58 countries empowered to make environmental decisions related to an international agenda, initiated a comprehensive global assessment of mercury which concluded two years later that concluded that mercury had "caused a variety of documented, significant adverse impacts on human health and the environment throughout the world, and that further international action was required." Subsequently, UNEP has undertaken workshops and focused on capacity building in developing countries and formed voluntary partnerships to address mercury consumption in key industrial sectors where opportunities presented themselves. Most recently, and most importantly for our hearing today, at the February 2007 UNEP

Governing Council meeting, governments including our own unanimously agreed on the need to reduce supply and demand for mercury in commerce to address the mercury pollution problem, (Attachment 3)[16]

Concurrently during the past several years, on a faster track, the European Union has taken stock of the problem of mercury contamination in the food supply and developed its own aggressive mercury reduction strategy that reduces both supply and demand within the EU. Most notably, the EU is well down the path to ban the export of its surplus mercury by 2011, with legislation roughly parallel to H.R. 1534 being discussed here today. The EU has substantially completed this legislative work on this ban and is poised to adopt the final package in the fall of this year. To further reduce supply, they have shuttered the world's largest virgin mercury mine, in Almadén, Spain. To reduce demand, they have procured commitments from the chlor-alkali sector to phase out of mercury-based production and have eliminated mercury for key products in the future.

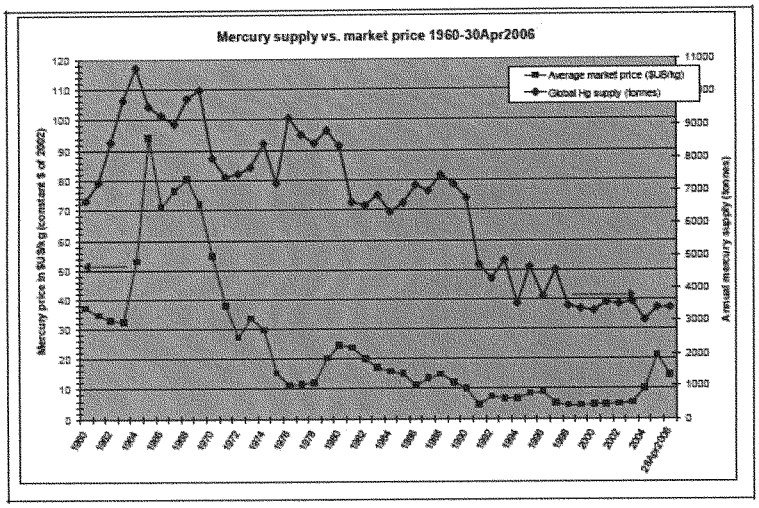
It is time for the U.S. to step up to the plate. U.S. mercury demand within our own country is decreasing on its own. Thus, although the U.S. would benefit from additional regulations and policy to decrease our mercury consumption to zero, this pales in comparison to the benefits of curtailing our contribution to global supply. H.R. 1534 will keep our mercury out of harm's way in the developing world and thereby keep it from coming right back at us from off the coasts of the developing world.

[16] UNEP Decision 24/3: Chemicals Management. Section IV item 19a and 19b.

The single most important role for the U.S. and other developed nations to play in this scheme is to curtail the global supply of mercury, through banning the export of its surplus mercury and maintaining its current federal stockpiles. We strongly support H.R. 1534 for this reason.

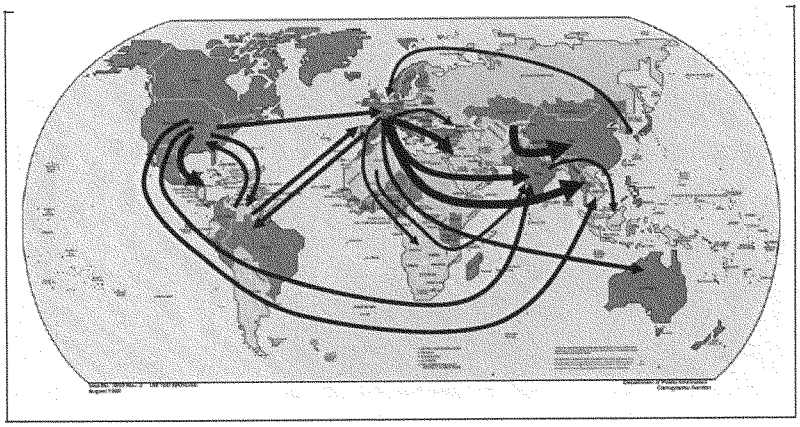
Thank you for the opportunity to testify today.

Figure 1: Global Mercury Supply and spot market price, 1960-2006



Source: UNEP Chemicals. Summary of Supply, Trade and Demand Information on Mercury. November 2006.

Figure 2: Commodity Mercury Shipments among World Regions, 2006.



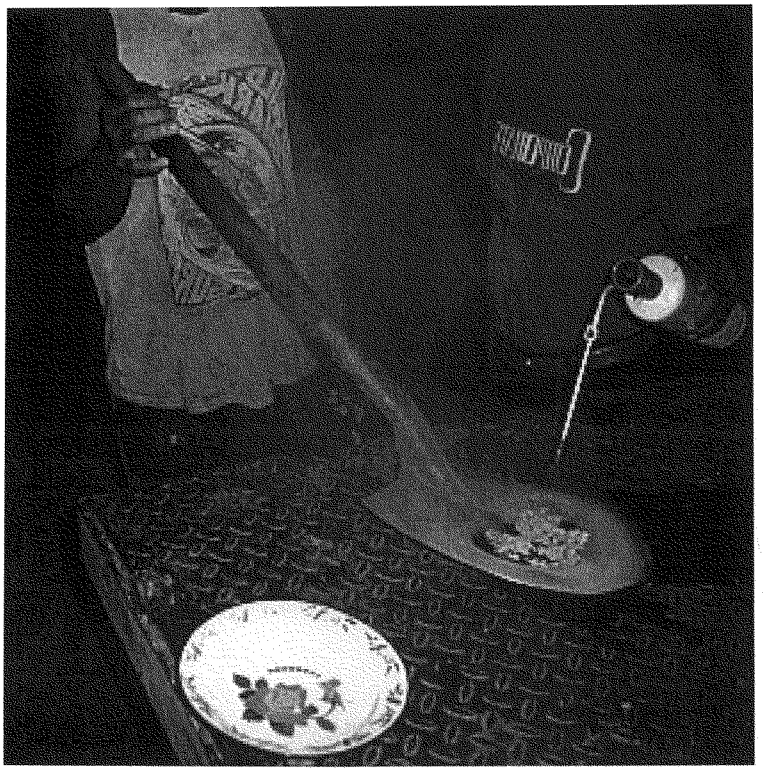
Source: UNEP Chemicals. Summary of Supply, Trade and Demand Information on Mercury. November 2006.

Table 1: Global Mercury Demand by Sector

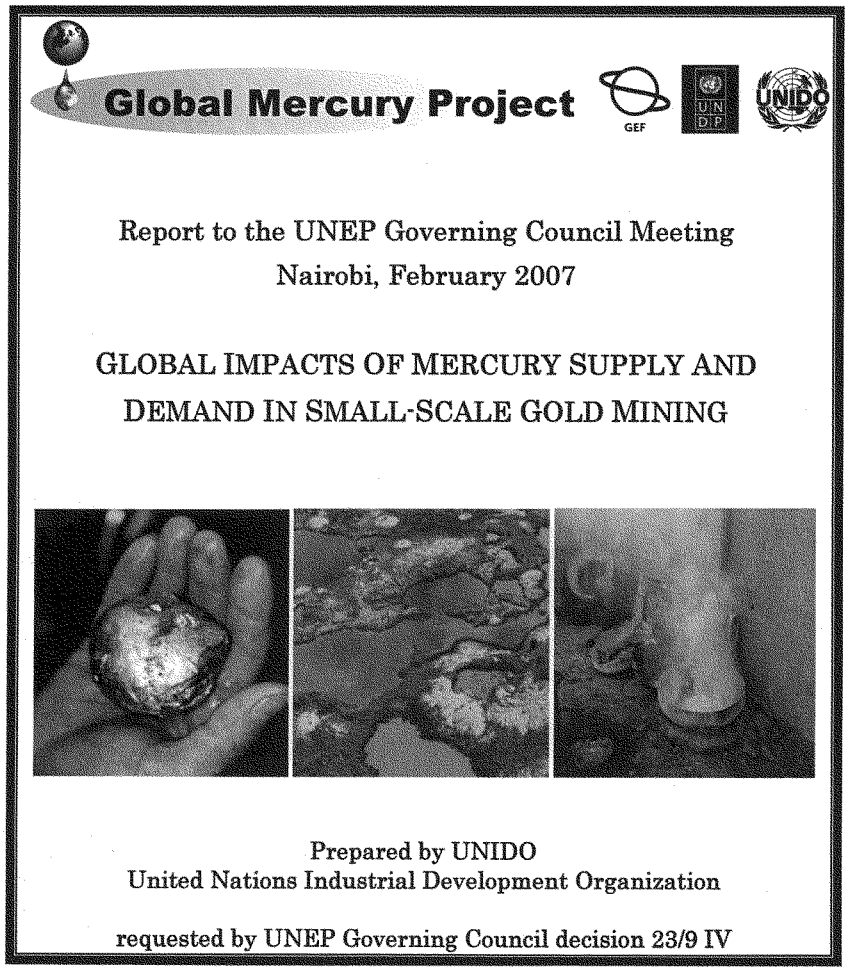
Mercury demand projections, by sector (metric tonnes)	Present (2005)	"Status quo" scenario (2015)	"Focused Hg reduction" scenario (2015)
Small-scale/artisanal gold mining	650-1,000	650	400
Vinyl chloride monomer (VCM) production	600-800	1,000	1,000
Chlor-alkali production	450-550	350	250
Batteries	300-600	200	100
Dental use	240-300	270	230
Measuring and control devices	150-350	125	100
Lighting	100-150	125	100
Electrical and electronic devices	150-350	110	90
Other (paints, laboratory, pharmaceutical, cultural/traditional uses, etc.)	30-60	40	30
Total	**3,000-3,900**	**2,870**	**2,300**

Source: UNEP Chemicals. Summary of Supply, Trade and Demand Information on Mercury. November 2006.

Attachment 1 Photos of the Practice of Artisanal Gold Mining



Attachment 2: UNIDO Global Mercury Project 2007



Global Mercury Project

GEF

Report to the UNEP Governing Council Meeting
Nairobi, February 2007

GLOBAL IMPACTS OF MERCURY SUPPLY AND DEMAND IN SMALL-SCALE GOLD MINING

Prepared by UNIDO
United Nations Industrial Development Organization

requested by UNEP Governing Council decision 23/9 IV

October, 2006

Project EG/GLO/01/G34
Removal of Barriers to the Introduction of Cleaner Artisanal and Small-Scale Gold Mining and Extraction Technologies

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Executive Summary

I. INTRODUCTION

The Global Mercury Project respectfully submits this report in response to the UNEP Governing Council's request (*decision 23/9 IV*) for information on mercury supply, trade and demand in artisanal and small-scale gold mining (ASM). This report highlights some of the Global Mercury Project's findings 2002-2007 and outlines some major policy implications for nations worldwide — particularly nations exporting, importing and/or using mercury, as well as all countries affected by global pollution and/or involved in providing capacity assistance to populations involved in ASM.

The Global Mercury Project (GMP) is an initiative of the U.N. Industrial Development Organization, launched in 2002 with financial support from the U.N. Development Program and the Global Environment Facility, co-financed by partner countries and civil society. The GMP works with governments, NGOs, industry and community stakeholders, building capacity to monitor factors related to mercury use and pollution in ASM and developing policy and institutional capacities to remove barriers to the adoption of cleaner technologies of mineral extraction. Several countries are participating in this pilot program, with primary field activities during the first phase taking place in Brazil, Indonesia, Lao People's Democratic Republic, Sudan, Tanzania and Zimbabwe.

II. GLOBAL MERCURY USE & POLLUTION IN SMALL-SCALE GOLD MINING

At least 100 million people in over 55 countries depend on ASM for their livelihood, mainly in Africa, Asia and South America. ASM produces 20-30% of the world's gold production, or approximately 500-800 tonnes per annum. It involves an estimated 10-15 million miners, including 4.5 million women and 1 million children. This type of mining relies on rudimentary methods

and technologies and is often performed by miners with little or no economic capital who operate in the informal economic sector, often illegally and with little organization. **As mercury amalgamation is an inexpensive, quick and simple way to extract gold particles, it is currently the method most commonly used in ASM.**

As a consequence of poor practices, **mercury amalgamation in ASM results in the discharge of at least 650 to 1000 tonnes of mercury per annum, equivalent to 1/3 (one-third) of all global anthropogenic (human-caused) mercury releases into the environment. This makes ASM the single largest intentional-use source of mercury pollution in the world.** In addition to the severe occupational hazards associated with mercury use, ASM has generated thousands of polluted sites with impacts extending far beyond localized ecological degradation, often presenting serious, long-term environmental health hazards to populations living near and downstream of mining regions. **It is estimated that as much as 300 tonnes of mercury per annum are volatilized directly to the atmosphere, while 700 tonnes are discharged in mine tailings into soil, rivers and lakes. In addition to domestic pollution impacts, both air emissions and tailings discharge contaminate both international waters and air.**

III. ECONOMIC AND SOCIAL DETERMINANTS OF MERCURY CONSUMPTION

Though large-scale gold mine operations have phased out mercury use by adopting alternative technologies, mercury demand in ASM continues to increase. With gold rising from US$260/oz in March 2001 to US$725 in May 2006, a gold rush involving poverty-driven miners is being observed in many countries. This increase in mining activity is compounded by escalating poverty due to factors such the failure of subsistence economies, conflict causing displacement of populations, and diseases such as HIV/AIDS. **Due to the increase in ASM, and based on evidence of mercury use in country-by-country and regional reporting, mercury consumption and demand in ASM may be growing to a historically unprecedented level on the global scale.**

The highest consumption levels are from China (with 200 to 250 tonnes released), followed by Indonesia (100 to 150 tonnes) and between 10 and 30 tonnes in each of Brazil, Bolivia, Colombia, Ecuador, Ghana, Peru, Philippines, Venezuela, Tanzania and Zimbabwe. Mercury may be used in as many as 40 other countries, to varying degrees. Because some mercury used is recycled, the amount of additional mercury demanded is equivalent to the amount of mercury consumed (assuming constant ASM production levels and constant technologies over time). On average, it is conservatively estimated that at least 1 to 3 grams of mercury is lost to the environment for every gram of gold produced by ASM. Mercury releases primarily depend on the nature of mining technology employed, which is influenced by both social and economic factors.

While there are numerous social and economic factors that affect technology use, the focus of this report is on how mercury supply and demand relate with respect to available technologies. Various location-specific GMP training programs and assessments demonstrate that when mercury is less available and/or more expensive, less mercury is consumed due to transfers to more efficient practices, or in some cases, to practices that eliminate mercury use. GMP assessments emphasize these four critical determinants of mercury reduction:

1) *Whole ore amalgamation* is the largest point source of mercury pollution in ASM (contributing more than 50% of mercury lost in ASM). Substantial differences in mercury consumption are observed between whole ore amalgamation (i.e. mercury is added to all ore being processed during crushing, grinding or sluicing) and amalgamation of only heavy mineral concentrates. Although amalgamation of the whole ore is an inexpensive way to quickly extract gold, several cost-efficient alternative mercury-free pre-concentration technologies exist as viable options. However, the practice of whole ore amalgamation often persists in many regions due to factors such as: availability of inexpensive mercury, lack of technical knowledge/expertise, lack of organizational support, and lack of environmental health awareness. GMP assessments in various locations indicate that a rising mercury price is

a significant added incentive to eliminate this hazardous and economically inefficient practice.

2) *Burning amalgam in open air* is the second largest source of mercury loss to the environment (contributing 20-30% of mercury losses in ASM); however it is the main health problem for miners and nearby communities. The price and availability of mercury also influences whether miners use retorts to contain mercury vapor during the burning stage of amalgamation. GMP field assessments found that effective retorts could be made cheaply (e.g. as little as US$3.20 in some cases), and that these retorts could contain mercury vapor in such a way that allows over 95% of the mercury to be recycled and re-used. Numerous community training programs and assessments have concluded that the mercury price and economic benefits of re-using mercury have a significant impact on whether miners will adopt the retorts, in addition to health and environmental considerations.

3) *Loss of mercury in amalgamation of concentrates* has also been identified by the GMP as a source of mercury pollution (10-15% of mercury losses). Amalgamation of only gravity concentrates is an improvement when compared to whole ore amalgamation. However, even amalgamating the gravity concentration, some mercury is lost. Higher prices of mercury could encourage miners to adopt better techniques to prevent these losses.

4) *Complete phase-out of mercury use* in mining may be a viable option for many miners, though such alternative technologies generally require a higher order of economic investment, organization, and technical expertise. Assessments indicate that a high price of mercury, coupled with capacity-building, may contribute to the transfer to such technologies. The most promising technology to replace completely the use of mercury in any type of gold ore is cyanidation, but this is not quite affordable and technically available to all artisanal miners. Cyanidation methods must be carefully assessed so that cyanide and mercury are not used in any way together, which can exacerbate pollution. Other gravity separation methods have great potential to reduce and in some specific situations eliminate the use of

mercury but many of these cannot be adopted worldwide because ores vary significantly. **In approximately 10% of current ASM cases, gold sources are alluvial ore (free gold) and completely mercury-free-alternatives could be locally available at a very low cost.**

IV. GLOBAL SOURCES OF MERCURY

As mercury is readily available in most countries, it tends to be inexpensive and easily accessible to gold miners. Mercury usually enters developing countries legally, i.e., for use in dental amalgams or the chlor-alkali industry. However, evidence indicates that in many developing countries and countries with economies in transition, by far the majority of mercury imported ends up being used in ASM. Estimates have been undertaken concerning the amount of mercury diverted for use in ASM using import statistics and anticipated consumption for legitimate uses, focussing in the 6 GMP pilot countries and neighbouring countries.

GMP assessments reveal that in 2005, Kenya imported almost 14 tonnes of mercury from German, followed by Georgia (9.5 tonnes) and Japan (4.1 tonnes). **Evidence suggests that most of Kenya's imported mercury is then exported, legally and illegally, to Tanzania, Uganda and the Democratic Republic of Congo, where it is primarily used in ASM. In Tanzania, in 2005, the United States exported approximately 30% of Tanzania's official imports of 3 tonnes, followed by the Netherlands with another 30%.** It is unclear how much of this mercury is used in ASM since the price of imported mercury varies from US$0.18/kg to US$31.2/kg. Officials noted that differences could be attributed to mercury quality variance as well as reporting-related problems.

OECD countries are the main source of mercury to Sub-Saharan Africa, where mercury imports increased from 34 metric tons in 2000 to 57 tons in 2002. In 2000, the Netherlands shipped 245 tonnes of mercury to at least 18

countries, most in the Latin American-Caribbean region. Indonesia imported in 2000 24 tonnes from Spain, 17 tonnes from the Netherlands, 3 tonnes from Australia and 3 tonnes from Japan.

In 2005, official import data from Zimbabwe indicated 21.8 tonnes of mercury imported in which South Africa contributes with 13.8 tonnes, the Netherlands with 2.7 tonnes, Switzerland with 4.6 tonnes, and Germany with 0.7 tonnes. However, results from interviewing in 2003 indicated that one single mercury dealer in Zimbabwe unofficially declared importing 20 tonnes of mercury. In the same year, the Zimbabwe official data indicated that the Netherlands accounted for 15.7 tonnes. Given these facts, **it is unlikely that import statistics adequately capture the cross-border trafficking of mercury and the extent of diversion from legal sectors.**

In 2005, Brazil officially imported 43.3 tonnes of mercury, in which 26.9 tonnes came from Spain, 6.9 from UK, 3.4 from Hong Kong, and 3.3 from Kazakhstan, among others. Most of the mercury used in ASM in Brazil is labelled for use in dentistry.

The unregulated trading of mercury from industrialized countries to developing countries makes mercury easily available at the mine sites. **In most countries with ASM, mercury is readily available to miners at ASM sites. In some cases it is given for free, contingent on gold being sold to the mercury provider. Stockpiling of mercury by gold dealers has been identified as a concern. GMP assessments find that monitoring and regulating imports and domestic trade in many developing countries and countries with economies in transition is generally significantly more difficult than regulating mercury supply at the export stage, particularly exports from developed countries.**

V. HEALTH AND ENVIRONMENTAL IMPACTS

The misuse of mercury in ASM produces severe health and environmental hazards. The mobilization of **mercury from mine sites into aquatic systems**

presents a major risk. The major effects of mercury in aquatic life, soils and sediments, were found in Brazil, Zimbabwe and Indonesia. This was attributed to excessive use of mercury (whole ore amalgamation) as well as combined use of mercury with cyanidation. This combined use exacerbates the methylation of mercury. Once methylated, mercury can rapidly move through the food chain, leading to impacts downstream.

Inhalation of mercury during handling, as a result of spills and during amalgamation, which is often undertaken by women and children, also represents a major health concern. Typically, this is conducted with no protection and often takes place in the home. Results of the health surveys have been alarmingly similar across GMP sites. Symptoms of mercury intoxication are widespread, with some people experiencing levels of intoxication that exceed 50 times the WHO maximum public exposure limit. Neurological disturbances such as ataxia, tremors and coordination problems are common. At one project site, almost 50 percent of miners showed an unintentional tremor, which is a typical symptom for mercury-induced damage of the central nervous system. With extremely high mercury concentrations in breast-milk of nursing mothers in GMP communities, infants are especially at risk.

VI. IMPLICATIONS FOR POLICY AND GOVERNANCE

The Global Mercury Project has been working mainly in six countries, and has acquired key lessons in its *Policy and Governance Initiative*. This initiative recognizes that effectively addressing mercury problems in ASM requires an integrated approach that targets capacities of local institutions in the removal of technical, social, economic and political barriers to the improvement in ASM practices. The GMP emphasizes that local participation and locally-driven processes of policy development are of critical value. Since 2005, the GMP has been working with governments and communities on developing and implementing various new policies such as: mercury trade and management laws in Indonesia, national mercury and

mining labour laws in Zimbabwe, policies to legalize and assist indigenous miners in Sudan, and microfinance policy in Tanzania.

In selected sites, the GMP has been focussing on capacity-building pilot programs to remove barriers to the adoption of cleaner technologies. These programs involve mobile training units that can reach miners in rural areas to engage local priorities. This community assistance model is receiving widespread support, and the GMP has already certified teams of local trainers. Yet, the regions benefiting from the GMP constitute only a fraction of the global population impacted by ASM. Further commitment is needed in these and other regions, including additional resources.

Global commitments are critically needed, from community-level issues such as technologies and gender inequities, to broader policies such as international mercury export controls and policies to improve regulation and assistance in the ASM sector. The GMP asserts that it could be possible to achieve at least a 50% reduction of mercury consumption (demand) in ASM by 2017. As called for by the GMP, this goal must be achieved by fostering commitments of diverse stakeholders to development strategies that will empower populations to:

1. eliminate amalgamation of whole ore by replacing by introducing mercury-free concentration process prior to amalgamation
2. reduce mercury use in the amalgamation of concentrates through closed circuit process (mercury is always recycled)
3. eliminate the burning of mercury without the use of a retort to contain emissions and thereby allow recycling
4. introduce completely mercury free techniques where feasible, particularly for ores which preclude the use of mercury.

The 10-year goal of reducing mercury consumption in ASM by over 50% is ambitious but achievable. Given the urgency of the mercury problem in ASM, such an effort cannot be considered a choice – rather it must be seen as a global obligation. The GMP calls on nations around the world to achieve the above goal by reducing mercury supply through export controls and other

mechanisms that will encourage the transition to alternative technologies, as well as by pledging commitments to programs to help build community capacities. Further information on the activities of the Global Mercury Project can be obtained at the project website: www.globalmercuryproject.org

Attachment 3: UNEP Governing Council Resolution 2007

Decision 24/3: Chemicals management

The Governing Council,
Recalling its decisions 18/12 of 26 May 1995, 19/13 of 7 February 1997, 20/23 of 4 February 1999, SS.VII/3 of 15 February 2002, 22/4 of 7 February 2003, 23/9 of 25 February 2005 and SS.IX/1 of 9 February 2006 concerning global policies related to chemicals management and the development of a strategic approach to international chemicals management,
Recalling its decision 23/9 II of 25 February 2005 urging the further development of a strategic approach to international chemicals management and its decision SS.IX/1 of 9 February 2006 endorsing the Strategic Approach to International Chemicals Management as adopted by the International Conference on Chemicals Management in Dubai, United Arab Emirates, on 6 February 2006,
Acknowledging the widespread concerns over the serious adverse effects of mercury on human health and the environment and the urgent need for international action,
Noting the Budapest Statement on Mercury, Lead and Cadmium developed at the fifth session of the Intergovernmental Forum on Chemical Safety held in Budapest, Hungary, from 25 to 29 September 2006,
Expressing appreciation for the activities of the United Nations Industrial Development Organization Global Mercury Project on Small-Scale Gold Mining,
Taking into account the principle of common but differentiated responsibilities as reflected in Principle 7 of the Rio Declaration on Environment and Development[1] in addition to the other relevant Rio Declaration Principles,
Having considered the report of the Executive Director on chemicals management,[2]

I

Cooperation between the United Nations Environment Programme, relevant multilateral environmental agreements and other organizations

1. *Reinforces* the applicability of decision 24/1 to the effective management of chemicals;

II

Strategic Approach to International Chemicals Management

2. *Welcomes* the progress made so far in implementing the Strategic Approach to International Chemicals Management, especially the establishment of the Quick Start Programme to support initial capacity-building activities and the regional meetings held so far or planned, and takes note of the African regional action plan adopted by the participants in the first African regional meeting on the Strategic Approach to International Chemicals Management, which took place from 11 to 14 September 2006;[3]
3. *Also welcomes* the important contributions of the United Nations Environment Programme to the Strategic Approach process;
4. *Expresses appreciation* for the co-responsibility of the World Health Organization in the Strategic Approach secretariat and its belief that such cooperation is of the utmost importance for the success and the intersectoral nature of the Strategic Approach;

[1] *Report of the United Nations Conference on Environment and Development*, Rio de Janeiro, 3-14 June 1992 (United Nations publication, Sales No. E.93.I.8 and corrigenda), (A/CONF.151/26/Rev.1) vol. I: Resolutions adopted by the Conference, resolution 1, annex I.
[2] UNEP/GC/24/7 and UNEP/GC/24/INFs/15, 16, 17 and 21.
[3] SAICM/RM/Afr.1/6, annex V.

5. *Underlines* the importance of the Strategic Approach, its overarching goal and its effective implementation and therefore urges all stakeholders to integrate the Strategic Approach into their activities as a priority;
6. *Urges* Governments, intergovernmental organizations, non-governmental organizations and others in a position to do so to contribute financially and in kind to the Quick Start

Programme and its trust fund;

7. *Takes note of* the United Nations Environment Programme's plan of work in support of the implementation of the Strategic Approach and requests the Executive Director to encourage the full participation of Governments and other stakeholders in that plan of work, including initiatives related to indicators and tools for evaluation, and to report on progress to the Governing Council/Global Ministerial Environment Forum at its twenty-fifth session;

8. *Encourages* the Strategic Approach secretariat to explore ways to make more effective use of the funding provisions of the Overarching Policy Strategy of the Strategic Approach to identify those areas that can support implementation of appropriate and relevant objectives of the Strategic Approach;

9. *Requests* the Executive Director to report to the Governing Council/Global Ministerial Environment Forum at its tenth special session on the results of the activities undertaken in accordance with the preceding paragraph;

10. *Also requests* the Executive Director to continue to make provision for the implementation of the United Nations Environment Programme's responsibilities under the Strategic Approach;

11. *Further requests* the Executive Director to continue the collaboration between the United Nations Environment Programme and other participating organizations of the Inter-Organization Programme for the Sound Management of Chemicals and to prepare a report for consideration by the Governing Council/Global Ministerial Environment Forum at its tenth special session on endeavours by the Inter-Organization Programme for the Sound Management of Chemicals in implementing the Strategic Approach;

III

Lead and cadmium

12. *Acknowledges* the data and information gaps identified in the United Nations Environment Programme Interim Scientific Reviews on Lead and Cadmium[4] and that further action is needed to fill those data and information gaps, taking into account the specific situation of developing countries and countries with economies in transition;

13. *Encourages* efforts by Governments and others to reduce risks to human health and the environment of lead and cadmium throughout the whole life cycle of those substances;

14. *Requests* the Executive Director to provide available information on lead and cadmium to address the data and information gaps identified in the Interim Reviews and to compile an inventory of existing risk management measures;

IV

Mercury

15. *Acknowledges* the progress made within the United Nations Environment Programme mercury programme since 2005, including the establishment of and progress made under partnerships and other initiatives;

16. *Recognizes* that current efforts to reduce risks from mercury are not sufficient to address the global challenges posed by mercury;

17. *Concludes*, therefore, that further long-term international action is required to reduce risks to human health and the environment and that, for this reason, the options of enhanced voluntary measures and new or existing international legal instruments will be reviewed and assessed in order to make progress in addressing this issue;

4 UNEP/GC/24/INF/16.

18. *Recognizes* that a range of activities are required to address the challenges posed by mercury, including substitution of products and technologies; technical assistance and capacity-building; development of national policy and regulation; data collection, research and information provision, bearing in mind the need to provide assistance to developing countries and countries with economies in transition;

19. *Commits* to increased efforts to address the global challenges to reduce risks from releases of mercury, taking into account the following priorities:

(a) To reduce atmospheric mercury emissions from human sources;

(b) To find environmentally sound solutions for the management of waste containing mercury and mercury compounds;

(c) To reduce global mercury demand related to use in products and production

processes;
(d) To reduce the global mercury supply, including considering curbing primary mining and taking into account a hierarchy of sources;
(e) To find environmentally sound storage solutions for mercury;
(f) To address, considering the results of the analysis referred to in paragraph 24 (d) below, the remediation of existing contaminated sites affecting public and environmental health;
(g) To increase knowledge on areas such as inventories, human and environmental exposure, environmental monitoring and socio-economic impacts;
20. *Urges* Governments to gather information on means to reduce risk that may be caused by the supply of mercury, considering:
(a) Reduced reliance on primary mercury mining in favor of environmentally preferable sources of mercury such as recycled mercury ;
(b) Options and solutions for the long-term storage of mercury;
(c) Regional activities to improve data on imports and exports of mercury and enforcement of customs control through, for example, the Green Customs initiative;
(d) The market and socio-economic effects of the activities contemplated above;
21. *Urges* Governments to provide the information referred to in the preceding paragraph to the Executive Director;
22. Also urges Governments to develop and analyse options for addressing the trade and supply of mercury, including considering environmentally sound storage and curbing primary mining, drawing on the United Nations Environment Programme report on mercury supply, trade, and demand, and requests the United Nations Environment Programme, upon request, to assist developing countries in this undertaking through the provision of technical assistance;
23. Urges Governments to provide the information in the preceding paragraph to the Executive Director;
24. *Requests* the Executive Director to prepare a report, drawing on, among other things, ongoing work in other forums addressing:
Atmospheric emission
(a) Best available data on mercury emissions and trends including where possible an analysis by country, region and sector, including a consideration of factors driving such trends and applicable regulatory mechanisms;
(b) Current results from modelling on a global scale and from other information sources on the contribution of regional emissions to deposition which may result in adverse effects and the potential benefits from reducing such emissions, taking into account the efforts of the Fate and Transport partnership established under the United Nations Environment Programme mercury programme;
(c) An overview of sector-based best practices for reducing mercury emissions, including costs where possible and an evaluation of emission reduction scenarios
Site-based contamination
(d) An analysis of information on the extent of contaminated sites, the risks to public and environmental health of mercury compound releases from such sites, environmentally sound mitigation options and associated costs and the contribution of contaminated sites to global releases;
25. *Requests* the Executive Director to continue to facilitate work between the mercury programme of the United Nations Environment Programme and Governments, other international organizations, non-governmental organizations, the private sector and the partnerships established under the mercury programme, as appropriate:
(a) To improve global understanding of international mercury emissions sources, fate and transport;
(b) To promote the development of inventories of mercury uses and emissions;
26. *Urges* Governments and other stakeholders to continue and enhance their support of the UNEP mercury programme partnerships, through the provision of technical and financial resources, as a means to achieve reductions in demand for and releases of mercury and thereby to reduce the risks to human health and the environment from mercury;
27. *Requests* the Executive Director, working in consultation with Governments and other stakeholders, to strengthen the United Nations Environment Programme mercury programme partnerships by:
(a) Developing an overarching framework for the United Nations Environment

Programme Global Mercury Partnership through, among other means, organizing a meeting of partners and other stakeholders, including:
(i) Development of business plans;
(ii) Identification of partnership goals;
(iii) Development of operational guidelines;
(b) Expanding the number and scope of partnerships to include new, growing or related sectors such as vinyl chloride monomer production, non-ferrous metals mining and cement production and waste combustion;
(c) Enhancing the artisanal and small-scale gold mining partnership through, among other things, increased cooperation with the United Nations Industrial Development Organization, exploration of innovative market-based approaches and dissemination of alternative capture and recycling technologies;
(d) Endeavouring to secure adequate funds for the Global Mercury Partnership efforts.
28. *Decides*, further, to establish an ad hoc open-ended working group of Governments, regional economic integration organisations and stakeholder representatives to review and assess options for enhanced voluntary measures and new or existing international legal instruments.
29. *Decides* that the ad hoc open-ended working group will be guided by the priorities set out in paragraph 19;
30. *Adopts* the following terms of reference for the ad hoc open-ended working group:
(a) Consider the reports and information referred to in paragraphs 20, 22 and 24 and a compilation by the Executive Director of other available relevant information;
(b) Examine, for each of the priorities set out in paragraph 19:
(i) The range of available response measures and strategies;
(ii) The feasibility and effectiveness of voluntary and legally binding approaches;
(iii) Implementation options;
(iv) Costs and benefits of response measures and strategies;
(c) Also examine each of these response measures and strategies with respect to, among other things, the following considerations:
(i) The respective capacities and capabilities of developed and developing countries and countries with economies in transition;
(ii) The need for capacity-building, technical assistance, technology transfer and suitable sources of finance;
31. *Invites* Governments to consider convening national and regional preparatory workshops, involving relevant stakeholders;
32. *Decides* that the ad hoc open-ended working group will:
(i) Meet twice: once before the tenth special session of the Governing Council/Global Ministerial Environment Forum and once between that special session and the Council/Forum's twenty-fifth regular session;
(ii) Provide a progress report to the Governing Council/Global Ministerial Environment Forum at its tenth special session and a final report reflecting all views expressed, presenting options and any consensus recommendations to the Council/Forum at its twenty-fifth regular session;
33. *Decides* that the Governing Council/Global Ministerial Environment Forum at its tenth special session may provide further guidance to the ad hoc open-ended working group;
34. *Also decides* to consider the outcomes of the work of the ad hoc open-ended working group at its twenty-fifth regular session, with a view to taking a decision on the final report;
35. *Requests* the Executive Director to compile other available relevant information for consideration by the ad hoc open-ended working group;
36. *Invites* Governments and others in a position to do so to provide extrabudgetary resources for the implementation of the present decision, in particular with regard to the participation of developing countries and countries with economies in transition in the ad hoc working group;
37. *Requests* the Chemicals Branch of the United Nations Environment Programme's Division of Technology, Industry and Economics to serve the Ad Hoc Working Group as secretariat and to prepare the analytical and summary reports necessary for its work;
38. *Requests* the Executive Director to present a report on progress in the implementation

of the present decision to the Governing Council at its twenty-fifth session.
10th meeting
9 February 2007

Attachment II: Strengthening Mercury Partnerships

Mercury partnerships are an important voluntary opportunity that complement and enhance government and stakeholder commitments on mercury.

Partnerships can be an effective and useful mechanism in achieving immediate results and can drive creative solutions. They also provide an opportunity for effective coordination and cooperation on mercury related activities.

Governing Council Decision 24/3 requests the secretariat, working in consultation with Governments and other stakeholders, to strengthen the mercury partnerships programme.

To facilitate the strengthening of the partnerships program, UNEP is planning to hold a small exploratory meeting in June 2007 with key individuals interested in undertaking work on the partnership areas. This meeting will provide opportunity for:

i. Initial scoping and building of the current partnership programme.

ii. Input from possible donors on areas of funding interest within a mercury partnership framework.

iii. Increased momentum and leadership, particularly from those who haven't actively participated in the partnerships programme to date.

Government and stakeholders are invited to express interest in participating in this exploratory meeting as soon as possible. Limited funding may be available to support attendance at this meeting. Updates on the meeting logistics will be posted on the UNEP mercury web-page as they are available at:
http://www.chem.unep.ch/mercury/new_partnership.htm.

Consistent with the recommendation that a meeting of the partners be organised to agree on business plans, goals and operational guidelines and building on the June 2007 exploratory meeting, UNEP plans, subject to available funding, to hold a full Partnership Meeting in the first half of 2008.

The objective of the Partnership Meeting would be to have presentations from the lead for each of the partnership areas, setting out the overall goal, plans and measurable outcomes for each of the partnership areas. The discussion at this meeting would then be able to focus on overarching objectives for the overall partnership programme, and address opportunities for cooperation and synergies between the partnership areas. The results of these discussions would be made available to the second meeting of the ad-hoc open-ended working group that is considering options to address mercury.

The current partnership areas were developed following an invitation to governments in May 2005 to identify priority partnership areas. Following the establishment of the priority partnership areas, governments were invited in a follow-up letter in July 2006 to identify progress in these partnership areas. The current partnership areas and objectives are included on our mercury partnership web-site at:
http://www.chem.unep.ch/mercury/new_partnership.htm.

In strengthening of the mercury partnership programme, the decision calls for a review of the existing partnership areas and the associated objectives as well as to expand the number and scope of partnerships to include new, growing or related sectors such as vinyl chloride monomer production, non-ferrous metals mining and

cement production and waste combustion.
UNEP has also been mandated to enhance the artisanal and small scale gold mining partnership by increased cooperation with UNIDO, exploration of innovative marketbased
approaches and dissemination of alternative capture and recycling techniques.
As a start, I seek initial input from governments and stakeholders on the current partnership areas and objectives as well as input on the expansion of current programme. You are also invited to carefully consider and identify partnership areas in which you have a particular expertise or interest, and indicate that you would be able to either participate in or lead, during this period of work.
As a first step, I invite your comments in response to this Annex by 31 May 2007.
We at UNEP appreciate your interest in mercury partnerships and look forward to working with you in this important area.
Attachment III
Mercury information requested from Governments
The decision:
Urges Governments to gather information on means to reduce risk that may be caused by the supply of mercury, considering:
(a) Reduced reliance on primary mercury mining in favour of environmentally preferable sources of mercury such as recycled mercury;
(b) Options and solutions for the long-term storage of mercury;
(c) Regional activities to improve data on imports and exports of mercury and enforcement of customs control through, for example, the Green Customs initiative;
(d) The market and socio-economic effects of the activities contemplated above.
Urges Governments to develop and analyse options for addressing the trade and supply of mercury, including considering environmentally sound storage and curbing primary mining, drawing on the United Nations Environment Programme report on mercury supply, trade, and demand and, to provide this information to the Executive Director.
Requests the Executive Director to prepare a report, drawing on, among other things, ongoing work in other forums addressing:
Atmospheric emission
(a) Best available data on mercury emissions and trends including where possible an analysis by country, region and sector, including a consideration of factors driving such trends and applicable regulatory mechanisms;
(b) Current results from modeling on a global scale, and from other information sources, the contribution of regional emissions to deposition which may result in adverse effects, and the potential benefits from reducing such emissions, taking into account the efforts of the Fate and Transport partnership established under the United Nations Environment Programme mercury programme;
(c) An overview of sector based best practices for reducing mercury emissions, including costs where possible and an evaluation of emission reduction scenarios
Site based contamination
(d) An analysis of information on the extent of contaminated sites, the

risks to public health and the environment of mercury compound releases from such sites, environmentally sound mitigation options and associated costs and the contribution of contaminated sites to global releases

Information relating to the third report (to be prepared by UNEP) may include indications of work you are aware of in other forums, including national, subregional or regional agreements, or work underway in other multilateral environment agreements. Should you have national emissions or monitoring data, particularly data which demonstrates trends in emissions, please also submit that. UNEP may also take the opportunity to request specific information which may have been referenced in other sources. With regard to the information on contaminated sites, we would appreciate the submission of any relevant information you may have, along with an indication of whether such information is publicly available.

Deadlines for information

The above information is requested to be submitted to UNEP Chemicals NO LATER THAN 15 June 2007. We regret the short timeframe, however this is necessary to make as much information available to the first meeting of the ad-hoc open-ended working group as possible. Should you have additional information which you are not able to provide in this timeframe, please submit a brief statement of the information you are planning to submit, and the approximate date of submission, and this statement will be made available to the working group.

Attachment IV

Lead and Cadmium

Decision:

• acknowledges the data gaps identified in the Interim Scientific Reviews on Lead and Cadmium, and that further action is needed to fill those data and information gaps, taking into account the specific situation of developing countries and countries with economies in transition.

• requests UNEP to work to address these data gaps and also to compile an inventory of existing risk management measures.

Data gaps:

• Exposure assessments and use and release inventories, especially in developing countries

• Modelling for the southern hemisphere (ocean transport)

• Contribution of anthropogenic versus natural sources

• Levels in various media

• Data regarding accidental spills

• Concentration levels in large migrating marine mammals

• Quantities disposed of in the environments, particularly in developing countries

• Level of contamination of drinking water

• Global flow in products

For lead – mechanism of lead toxicity is not well understood, with exposure-response relationship incomplete for many effects.

For cadmium – sources of cadmium contributing to waste are not well investigated. Also, some aspects of consumer exposure and aspects of cadmium toxicity may warrant further investigation.

Plan for further work

Data addressing the above gaps should be submitted to UNEP Chemicals by 30 September 2007

Reports will be amended accordingly and circulated for comment.

Comments will be addressed and reviews finalised to be submitted to GC 25.

Deadline for information

To allow work to progress in a timely fashion, data is requested no later than **30 September 2007.**

Mr. WYNN. Thank you very much, Dr. Greer.

Dr. Shannon.

STATEMENT OF MICHAEL SHANNON, M.D., CHAIR, COMMITTEE ON ENVIRONMENTAL HEALTH, AMERICAN ASSOCIATION OF PEDIATRICS; PROFESSOR AND CHAIR, DIVISION OF EMERGENCY MEDICINE, CHILDREN'S HOSPITAL, BOSTON, MA

Dr. SHANNON. Thank you and good morning. I appreciate the opportunity to testify today before the Energy and Commerce Subcommittee on Environment and Hazardous Materials at this hearing, H.R. 1534, the Mercury Export Ban Act of 2007. My name is Dr. Michael Shannon, and I am proud to represent the American Academy of Pediatrics, a nonprofit professional organization of 60,000 primary care pediatricians, pediatric medical subspecialists, and pediatric surgical subspecialists dedicated to the health, safety, and well-being of infants, children, adolescents, and young adults. I am chair of the Academy's Committee on Environmental Health. I am Chief of Emergency Medicine, and co-director of the Pediatric Environmental Health Program at Children's Hospital, Boston. I am a professor of pediatrics at Harvard Medical School. My Board certifications include pediatrics, emergency medicine, and medical toxicology. I have been a pediatrician for 30 years.

Mercury is a ubiquitous environmental toxin that is capable of causing a wide range of adverse health effects in humans. The AAP's Committee on Environmental Health describes the dangers of mercury in the environment to children in a 2001 technical report of which I was the lead author.

Elemental mercury is one of the three forms of this substance, the other two being organic mercury and inorganic mercury. The elemental form, as you know, is generally liquid at room temperature. When heated, however, elemental mercury becomes a vapor. This vapor has the ability to contaminate large geographic areas, affecting all of those nearby. In the United States, the largest source of atmospheric mercury vapor is from burning fossil fuels, especially high sulfur coal. Other major sources include chloralkali production, a process that uses elemental mercury to produce chlorine, bleach, and other products, mercury mining, and waste incinerators, especially those that incinerate medical waste.

Elemental mercury in liquid form is found in thermometers, barometers, and other medical instruments. Indiscriminate disposal of medical devices is a major source of environmental mercury contamination when they are buried in landfills or burned in waste incinerators, rather than recycled. Fortunately, our efforts to eliminate elemental mercury from medical devices has been successful in reducing human exposure from this source.

As I mentioned, when heated, elemental mercury rapidly vaporizes. Once we inhale it, mercury vapor easily passes through the membranes of our lungs, entering the bloodstream where it is then primarily distributed into the central nervous system and the kidneys. Circulating elemental mercury also crosses the placenta and concentrates in the fetus. In adults, the half life of mercury, that is, the amount it takes for the body to eliminate one-half of the metal, is as long as 90 days.

Elemental mercury poisoning can produce a broad range of effects on the central nervous system, kidneys, skin, and lungs. In children, elemental mercury is particularly deleterious because of its effects on the rapidly developing brain of the child. Children exposed to elemental mercury can develop a range of neurocognitive and behavioral effects ranging from learning disabilities to devastating neurologic problems, including mental retardation, blindness, and spasticity.

History has provided us several important lessons of the consequences of severe mercury exposure to children. One example is the Minamata Bay incident in the 1950s. At that time, a coastal factory discharged large amounts of mercury compound into the bay. That mercury was taken up by local fish, which was routinely eaten by nearby villagers. An epidemic of childhood disease manifested by blindness and spasticity appeared among the offspring of women who ate the contaminated fish while pregnant. Ultimately, there were 41 deaths and at least 30 cases of severe brain damage in these infants.

There also continue to be case reports describing the development of severe mercury poisoning in children and adults as a result of mercury spills and even mercury thermometers breaking with the mercury being vacuumed or spilling into a heating duct. This is rare, but continues to show us how toxic this element can be.

Because elemental mercury that enters the blood, central nervous system, and kidneys is so slowly eliminated, toxicity can be prolonged. Given that treatment options for mercury intoxication are inadequate, prevention of exposure is the cornerstone of avoiding long-term health consequences.

In conclusion, the American Academy of Pediatrics commends you, Mr. Chairman, for holding this hearing today and calling attention to the hazards of elemental mercury. We look forward to working with Congress to minimize the exposure of children and all Americans to potentially toxic levels of mercury. I appreciate this opportunity to testify, and I will be pleased to answer any questions you may have.

[The prepared statement of Dr. Shannon follows:]

TESTIMONY OF MICHAEL SHANNON, MD, MPH, FAAP

Good morning. I appreciate this opportunity to testify today before the Energy and Commerce Subcommittee on Environment and Hazardous Materials at this hearing, H.R. 1534, the Mercury Export Ban Act of 2007. My name is Michael Shannon, MD, MPH, FAAP, and I am proud to represent the American Academy of Pediatrics (AAP), a non-profit professional organization of 60,000 primary care pediatricians, pediatric medical sub-specialists, and pediatric surgical specialists dedicated to the health, safety, and well-being of infants, children, adolescents, and young adults. I am Chair of the AAP's Committee on Environmental Health. I am Chief of the Division of Emergency Medicine and Co-Director of the Pediatric Environmental Health Center at Boston Children's Hospital. I am also a Professor of Pediatrics at Harvard Medical School. My board certifications are in General Pediatrics, Emergency Medicine, Pediatric Emergency Medicine and Medical Toxicology.

ELEMENTAL MERCURY POSES A SERIOUS HEALTH HAZARD TO CHILDREN

Mercury is a ubiquitous environmental toxin that is capable of causing a wide range of adverse health effects in humans. The AAP's Committee on Environmental Health described the dangers of mercury in the environment to children in a 2001 technical report, of which I was a lead author.

Elemental mercury is one of the three forms of this substance, the other two being organic mercury and inorganic mercury. The elemental form is liquid at room temperature. When heated, elemental mercury becomes a vapor; this vapor has the ability to contaminate large geographic areas, affecting all of those nearby. In the United States, the largest source of atmospheric mercury vapor is from burning fossil fuels, especially high-sulfur coal. Other major sources include chloralkali production (a process that uses elemental mercury to produce chlorine, bleach, and other products), mercury mining, and waste incinerators (especially those that incinerate medical wastes). Elemental mercury in liquid form is found in thermometers, barometers, and other medical instruments. Indiscriminate disposal of medical devices is a major source of environmental mercury contamination when they are buried in landfills or burned in waste incinerators rather than recycled. Fortunately, recent efforts to eliminate elemental mercury from medical devices have been successful in reducing human exposure from this source. [1]

Elemental mercury readily vaporizes in the presence of heat. When inhaled, mercury vapor easily passes through the membranes of the lung, entering the bloodstream, where it is then distributed primarily into the central nervous system (CNS), and the kidneys. Circulating elemental mercury also crosses the placenta and concentrates in the fetus. In adults, the half-life of elemental mercury, that is, the amount of time it takes for the body to eliminate one-half of the metal, is as long as 90 days. [2]

Elemental mercury poisoning can produce a broad range of effects on the central nervous system, kidneys, skin and lungs. In children, elemental mercury is particularly deleterious because of its affects on the rapidly developing brain of the child. Children exposed to elemental mercury can develop a range of neurocognitive and behavioral effects, ranging from learning disabilities to devastating neurologic problems including mental retardation, blindness and spasticity. [3]

History has provided us several important lessons of the consequences of severe mercury exposure to children. One example is the Minamata Bay incident which took place in Japan in the 1950's. A coastal factory discharged large quantities of mercury compounds into the bay. That mercury was taken up by local fish which was routinely eaten by nearby villagers. An epidemic of disease, manifested by blindness and spasticity appeared among the offspring of the women who ate the contaminated fish while pregnant. Ultimately, there were 41 deaths and at least 30 cases of severe brain damage in these infants. There also continue to be case reports describing the development of symptomatic mercury poisoning in children and adults as a result of mercury spills and even mercury thermometers breaking, with the mercury bead being vacuumed or spilling into a heating duct. This is rare, but continues to show us how toxic this element can be. [4]

Because the elemental mercury that enters the blood, CNS, and renal tissues and is so slowly eliminated, toxicity can be prolonged. Given that treatment options for mercury intoxication are inadequate, prevention of exposure is the cornerstone of avoiding long-term health consequences.

RECOMMENDATIONS

The American Academy of Pediatrics recognizes that elemental mercury is toxic to the fetus and to children, and recommends that aggressive efforts should be made to reduce exposure for pregnant women and children as well as the general population.

- Efforts should be made to decrease the amount of elemental mercury in the waste stream by continuing the phase-out of mercury-containing devices. Families should be encouraged to remove mercury thermometers from their homes.
- Elemental mercury should not be present in the home or other environments of children. Public health agencies, community organizations, pediatricians, and other child health providers should work together to identify and address the factors that may lead to elemental mercury exposure.

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1 Goldman LR, Shannon MW, and the AAP Committee on Environmental Health. Technical Report: Mercury in the Environment: Implications for Pediatricians. Pediatrics, 2001 108: 197-205.

2 Ibid.

3 Speaking Points for Mercury in the Environment: Implications for Pediatricians, *http://www.aap.org/moc/pressroom/speaking—points/mercury.htm?CFID=1395517&CFTOKEN=64233499.*

4 Ibid.

CONCLUSION

The American Academy of Pediatrics commends you, Mr. Chairman, for holding this hearing today to call attention to the hazards of elemental mercury. We look forward to working with Congress to minimize the exposure of children and all Americans to potentially toxic levels of elemental mercury. I appreciate this opportunity to testify, and I will be pleased to answer any questions you may have.

Mr. WYNN. Thank you very much, Dr. Shannon.

Dr. Smith.

STATEMENT OF C. MARK SMITH, DEPUTY DIRECTOR, OFFICE OF RESEARCH AND STANDARDS; DIRECTOR, MASSACHUSETTS MERCURY PROGRAM; CO-CHAIR, NEW ENGLAND GOVERNORS AND EASTERN CANADIAN PREMIERS MERCURY TASK FORCE; QUICKSILVER CAUCUS, MASSACHUSETTS REPRESENTATIVE, BOSTON, MA

Mr. SMITH. Good afternoon Chairman Wynn and members of the committee. I would like to thank you all for providing the Environmental Council of States and the Quicksilver Caucus with the opportunity to testify today on this important issue.

As you may be aware, the Environmental Council of States is a nonpartisan, nonprofit organization that is comprised of the leaders of the State environmental agencies. It has been involved in dealing with mercury issues for many years. The Quicksilver Caucus is a coalition of interstate organizations dealing specifically with mercury, and the interstate organizations represent air, water, and solid waste pollution prevention organizations from across the country.

My name is Mark Smith and I am testifying today for ECOS and the Quicksilver Caucus on behalf of Arleen O'Donnell, who is the acting commissioner for the Massachusetts Department of Environmental Protection and is the Chair of the ECOS cross media committee. Unfortunately, Arleen could not be here today.

My background, just for a quick review, is that I have a Ph.D. in molecular toxicology and a master's degree in environmental health management. I currently direct the Massachusetts Mercury Reduction Program; was a founding member and currently co-chair the New England Governors and Eastern Canadian Premiers Mercury Task Force. I have also been the Massachusetts representative to the Quicksilver Caucus since its inception.

As you have heard, mercury is a very important issue for the States. We have heard that there are 44 States that have fish consumption advisories in effect. Just to put that in perspective, that amounts to tens of thousands of water bodies across the country, impacting close to 13 million lake acres and 760,000 river miles. This is a really big problem for the States. Monitoring by the Centers for Disease Control also indicates that several hundred thousand newborns each year are being exposed to excessive amounts of mercury, primarily through their mothers' consumption of contaminated fish, fish that have unacceptably high levels of mercury.

As the father of a son who loves to fish, and even likes to eat them on occasion, this is personally an important issue as well. It is really a sad state of affairs when we have to tell our children that the fish they just caught is not safe to eat because it is con-

taminated with mercury, which is something I just had to do last week. We actually did catch a few fish on a trip we were on. It doesn't happen frequently, but sometimes it does.

Because of the extent and seriousness of the problem, over 22 States are developing or implementing State-specific action plans to address mercury. Overall, these efforts have been very successful. For example, in my State, and as we have heard, in the State of Maine, mercury reductions in the order of 70 to 80 percent have occurred over the past decade or so, as we have been implementing State and regional action plans to address mercury. Similar reductions are happening in many other States across the country.

Of significance to this hearing, mercury product legislation is being adopted in many States, which is reducing the demand for mercury, elemental mercury, by reducing unnecessary uses and phasing them out. At the same time, State recycling programs designed to reduce releases of mercury from end-of-life products and to prevent costly spills of mercury are also increasing, resulting in increasing supplies of commodity mercury here in the United States.

Because global sources have been found to contribute significantly to mercury deposition in our States and because many States have these programs to recycle mercury, ECOS and the Quicksilver Caucus have had a longstanding interest in the management of commodity mercury. To minimize the potential for mercury releases on the global scale, ECOS, beginning in 1996, has consistently called for the cessation of sales of U.S. mercury stockpiles and urged those to be permanently stored; has urged nations to end subsidies to mercury mining; and urged U.S. EPA to develop a retirement option for the long-term sequestration of excess mercury. Most recently, the Quicksilver Caucus developed 14 principles that articulate the views of ECOS, the National Governors Association, and the Quicksilver Caucus regarding the use and management of elemental mercury in an environmentally sound manner. These principles include provisions designed to reduce unnecessary uses of mercury, restrict mercury exports, and safely store excess mercury.

Of most relevance to today's discussion, the principles specifically call for a prohibition on the export of elemental mercury to developing countries where the resulting uses can result in unsafe exposures, and also call on the U.S. to cease the export of elemental mercury except for a very limited number of essential uses where it can be demonstrated that the receiving country does not have sufficient domestic sources of its own secondary mercury. The QSC principles would allow for potential exemptions from the suggested export restrictions for essential uses under a quite limited set of circumstances.

It is our position that decisions on these issues should be made by knowledgeable experts using an appropriate and transparent Federal process. The creation of a national committee as called for in the Quicksilver Caucus principles is, I think, the ideal and logical place for decisions to be made as to whether a particular use is essential and whether an exemption should be allowed.

To conclude, I would again like to thank the committee for this opportunity to speak on this issue, and I am available to answer any questions that you may have.

Thank you.

[The prepared statement of Mr. Smith follows:]

TESTIMONY C. MARK SMITH

Thank you, Mr. Chairman and members of the Committee, for providing the Environmental Council of the States (ECOS) the opportunity to present testimony on the States Perspectives on Managing Commodity Grade Elemental Mercury. My name is C. Mark Smith and I am testifying on behalf of Arleen O'Donnell, the Acting Commissioner for Massachusetts Department of Environmental Protection and the Chair of the ECOS Cross-media Committee. I have been involved in mercury policy and research for over 15 years and have been the Massachusetts representative to the Quicksilver Caucus since its inception. Currently I direct my agency's multimedia mercury program and Co-chair the New England Governors and Eastern Canadian Premiers Regional Mercury Task Force.

The Environmental Council of States is the national non-partisan, non-profit association of the leaders of state environmental agencies. Our members are the officials who manage and direct the environmental agencies in the States and territories. They are the state leaders responsible for making certain our Nation's air, water and natural resources are clean, safe and protected.

Today I am here representing not only my own state, but also as a voice for all the environmental agencies in the states belonging to our organization and to the Quicksilver Caucus.

The Quicksilver Caucus, formed in May 2001 by a coalition of State environmental association leaders to collaboratively develop holistic approaches for reducing mercury in the environment. Caucus members who share mercury-related technical and policy information include the Environmental Council of the States (ECOS), the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), the National Association of Clean Air Agencies (NACAA), the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA), the Association of State Drinking Water Administrators (ASDWA) and the National Pollution Prevention Roundtable (NPPR). The Quicksilver Caucus' long-term goal is that State, Federal, and International actions effectively address mercury pollution.

Mercury is a public health and environmental health problem across the country and the globe. Environmental monitoring over the past two decades has demonstrated that mercury levels in fish from states across the United States are too high. As a result, as of 2004, 44 States had fish consumption advisories in effect because of mercury, affecting over 13 million lake acres and 767,000 river miles. National advisories for saltwater fish, such as shark, tuna and swordfish, are also in effect.

Mercury is such a concern because it is a potent brain toxin that adversely affects children and wildlife. Once released into the environment mercury persists and does not break down into harmless components like many other pollutants. It also bioaccumulates, or concentrates, into fish which, when eaten, are the major pathway for human exposures to this toxin. Although mercury is a natural element, due to human activities, the level of this toxin in the environment is much higher today than it was 150 years ago—for example mercury levels in sediments from many New England and Minnesota lakes were found to range from 150 percent - 800 percent higher now compared to pre-industrial times.

The brain and developing neurological system of the fetus and children are particularly sensitive to mercury and can be damaged by fairly low levels of exposure. Of particular concern is the fact that children can be exposed to toxic amounts of this pollutant before birth because mercury in a mothers' diet crosses the placenta and enters the fetus. Based on data from the U.S. Centers for Disease Control, which has measured mercury levels in the blood of women across the country, several hundred thousand newborns each year are at risk of mercury toxicity in the U.S. because of their mother's exposure to mercury. Based on this data over 8,000 newborns are at risk each year in my state alone.

Because of its chemical properties mercury pollution knows no borders as it can be transported long distances in the atmosphere, creating trans-boundary issues that are regional, national and global in scope. Mercury is also a multimedia pollutant that can readily transfer between air, water and soils. Effectively reducing mercury levels in our state environments therefore requires effective multimedia pro-

grams at the regional, national and international level.Because the states are being impacted so significantly by mercury pollution and deposition, reducing sources of mercury releases at the national and international levels is a priority for us.

To minimize the potential for mercury releases, ECOS and the Quicksilver Caucus have had a long-standing interest in the management of commodity mercury. ECOS, beginning in September 1996, has consistently stated its opposition to future U.S. mercury stockpile sales and called for a permanent halt to any such sales; called on the United States Department of Defense, the United States Department of Energy, and the U.S. Environmental Protection Agency to research and evaluate long term management, retirement and substitution options in cooperation with interested parties; urged all nations to end subsidies to mercury mining and sales; and urged USEPA to develop retirement options for mercury so that waste generators and waste treatment facilities may choose recycling or retirement.

In addition many states have adopted mercury products legislation to reduce mercury use and increase the recycling of mercury from remaining uses. Numerous states are also implementing extensive mercury collection and recycling programs, which are contributing to the excess U.S. supply of commodity elemental mercury. Exports of mercury concern the states because poorly regulated uses in other countries can result in direct exposures to their citizens and contribute significantly to overall global mercury releases to the environment and resulting impacts on our states.

The Quicksilver Caucus recently developed 14 principles that encompass the environmental position on elemental commodity mercury of the Environmental Council of States, the National Governor's Association and state associations representing air, water, waste, and pollution prevention. These principles articulate states perspectives for the development of comprehensive and effective management of elemental mercury in an environmentally secure manner at the local, state, national, and international level.

These principles are presented in their entirety below and include a number of provisions to: reduce the unnecessary use of mercury (principles Nos. 1, 2, 3, and 11); restrict mercury export (principles Nos.6, 8 and 9); and safely store excess mercury (principles Nos. 6 and 10). The principles specifically call for a prohibition on the export of elemental mercury to developing countries where the resulting uses can result in unsafe exposures. The principles also call on the U.S. to cease the export of elemental mercury, except for a limited number of essential uses where it can be demonstrated that the receiving country does not have sufficient domestic sources of its own secondary mercury. The QSC could only identify a small number of essential uses, including fluorescent lighting, some dental amalgam applications and, potentially, a select few scientific pieces of equipment. These are noted in principle No. 3. Although other essential uses were not precluded, the QSC believes that these, if they exist, are likely to be very few in number and will likely decrease in the future as mercury-free alternatives are developed. The QSC principles would allow for limited exemptions from the suggested export restrictions for such essential uses provided they meet the other criteria stipulated in principle No. 8. Decisions on these issues should be made by knowledgeable experts using an appropriate and transparent Federal process. The creation of a National Advisory Committee, as called for in principle No. 13 to develop recommendations for action, would provide a logical place for decisions to be made regarding the specific criteria and process to determine which mercury uses are essential and whether exemptions should be allowed in a particular situation.

The complete set of principles state that:

(1) The manufacture and sale of non-essential uses of mercury-added products should be phased out in the long-term. Several mercury-added products can be phased-out in the next three to five years including most uses of thermometers, manometers, thermostats, switches, relays and novelty items.

(2) The best opportunities for achieving this goal will be to aggressively pursue multi-stakeholder partnerships, educate consumers and businesses and leverage Federal and state environmental laws and regulations to accelerate such a reduction.

(3) Reuse of elemental mercury should only be utilized in processes or products deemed essential. Few essential uses remain, but include fluorescent and compact fluorescent lamps, some restorations with dental amalgam, and perhaps a select few scientific pieces of equipment. For those uses of mercury that continue, capture and recycling of mercury-containing products at the end of their useful life should be required.

(a) The United National Environment Programme estimates that globally, use of mercury in lamps and dentistry represent less than 15 percent of total uses, or

even as little as 9 percent. Research should be conducted to determine whether there are any countries that do not have sufficient domestic sources of secondary (recycled) mercury for these purposes.

(b) Federal and state governments should work with manufacturers to ensure adequate nationwide infrastructure exists for safe collection, storage and disposal of used mercury-containing lamps and other products through a product stewardship framework. This infrastructure should provide flexibility for States to maintain and to continue to develop, and implement their own strategies or regulatory programs.

(c) Research should be supported to find safe alternatives to elemental mercury in those products deemed essential.

(4) Research should also be conducted on the use and export of mercury compounds, including such mercury compounds as mercuric chloride and mercuric oxide, and in finding safe alternatives.

(5) States and the Federal Government should continue to work with manufacturing sectors to address current and legacy uses of mercury in the manufacturing process (e.g., working with the chlor-alkali manufacturers to identify alternatives to mercury cell technology and where feasible, phasing out the use of the "mercury cell" manufacturing process).

(6) Following the collection and recycling (retorting) of used mercury-containing products, the mercury should be sequestered and safely stored within the United States.

(7) The United States should support mechanisms to better track international trade of mercury, mercury compounds, and mercury-containing products.

(8) The United States should be a leader in proper use and management of elemental mercury by not exporting any mercury-containing products to other countries unless it is related to an essential use. Exporting surplus elemental mercury to developing countries where it can result in unsafe exposure should be prohibited. Elemental mercury should only be exported to other countries for essential uses where it can be demonstrated that the country does not have sufficient domestic sources of secondary (recycled) mercury.

(9) The United States should prohibit imports of elemental mercury and mercury-containing products, unless the import is for sequestration.

(10) Until a safe disposal technique is developed, temporary storage of elemental mercury should be in a safe, secure, continuously monitored location. Industries that generate significant amounts of elemental mercury should be responsible for the storage of their own mercury until a long-term solution in the United States is identified and implemented. Additionally, long-term Federal research seeking ways to permanently and safely dispose of elemental mercury should be supported.

(11) The United States should assist other countries in phasing out uses and applications of mercury and help them identify safe storage techniques to use for their mercury stockpiles until a long-term solution is identified and implemented.

(12) The USEPA and states need to work together to track changes in the use of mercury-added products to measure the sources and amount of mercury that is collected. This needs to be correlated with (a) monitoring the releases of mercury to air, water, and land and (b) monitoring of fish tissue.

(13) The Congress or the President should establish a National Advisory Committee to develop a comprehensive report that incorporates the principles set forth in this document and make recommendations for action by governments, industry, academia, and citizens and a time table for doing so.

(14) The Federal Government should ensure that there is adequate funding to support the above mercury reduction activities at the Federal, state, and local community levels of government as appropriate.

The QSC states hope that you consider using these principles as you develop the proposed legislation.

In conclusion, the states urge that:

- National elemental mercury stockpiles should not be sold but should continue to be safely stored;
- National and international strategies to address commodity elemental mercury production, use and "retirement" should be developed and implemented;
- Elemental mercury in excess of that needed for essential uses should be sequestered;
- The Federal Government should take responsibility for safely sequestering commodity mercury;
- National strategies/ programs addressing commodity elemental mercury should be developed in consultation with the States.

To end, I would also like to provide an additional perspective on this issue from the standpoint of Massachusetts. The Commonwealth of Massachusetts has been

significantly impacted by mercury pollution and has been very actively engaged in mercury reduction issues. In MA, over 50 percent of the water-bodies tested in the state have one or more species of fish with sufficiently high levels of mercury to warrant a consumption advisory and our state Department of Public Health warns pregnant women, children and nursing mothers to avoid consuming any native freshwater fish caught in the State *(http://www.mass.gov/Eeohhs2/docs/dph/environmental/exposure/fish—mercury—in—ma.pdf; http://db.state.ma.us/dph/fishadvisory/).* In "mercury hotspot" areas like the northeast part of MA and southern New Hampshire, close to 100 percent of the tested water bodies have fish with elevated mercury levels (*http://mass.gov/dep/images/fishmerc.doc*). We have recently estimated that mercury deposition will need to be reduced by 86–98 percent to achieve water quality objectives in relation to mercury levels in freshwater fish in the Northeast states. Such steep reductions cannot be achieved without significant reductions from national and international sources. In fact, mercury deposition modeling results from USEPA and other research groups indicate that a large fraction, ranging from about 60 percent to over 80 percent, of all mercury deposited in the U.S. comes from global sources. A ban on the export of U.S. elemental commodity mercury would be an important step that the U.S. could take to address the international sources of mercury emissions that impact waters of the U.S. Provisions can be added to the legislation to address unlikely but possible scenarios such as the need for essential uses of mercury that cannot be met without tapping U.S. mercury stockpiles.

Thank you for the opportunity to testify.

Mr. WYNN. Thank you very much, Dr. Smith.

We will now hear from Mr. Dungan.

STATEMENT OF ARTHUR E. DUNGAN, PRESIDENT, THE CHLORINE INSTITUTE, INCORPORATED, ARLINGTON, VA

Mr. DUNGAN. Mr. Chairman, Congressman Shimkus, and members of the subcommittee, I am Art Dungan, president of the Chlorine Institute. I appreciate the opportunity to testify before you concerning the Mercury Export Ban Act of 2007, and the advisability of establishing a Federal stockpile for mercury.

In the United States, there are currently seven facilities that produce chlorine using the mercury cell process. All are members of the Chlorine Institute. Two of these facilities have announced their intention to close or to convert to another technology by the end of 2008. We believe the remaining plants can continue to operate until the end of their economic life in a manner that is fully protective of human health and the environment, and in compliance with all regulatory requirements.

The Chlorine Institute and the chloralkali producers using the mercury cell technology have worked aggressively and voluntarily to reduce mercury use and releases to the environment, and have worked cooperatively with all agencies as they set regulatory standards limiting such releases.

In 1996, the Chlorine Institute and the mercury cell producers voluntarily agreed to reduce mercury use by 50 percent. As indicated in our ninth annual report to EPA, the overall reduction in annual mercury usage in the ninth year was 94 percent.

The Mercury Export Ban Act of 2007 has two main provisions. These are the prohibition on export of mercury, and the establishment of an excess mercury storage advisory committee. It is premature to establish a ban on mercury exports until the United States has a program established and in place for the permanent storage of mercury and coordinated with international groups to ensure that the reduced supply of mercury from countries such as

the United States does not result in the expansion of existing or the opening of new primary mercury mines elsewhere in the world to meet the demand. If the goal of the mercury export ban is to reduce mercury use and indirectly mercury releases to the environment, a ban established before international action to reduce mercury use is implemented, will have the opposite effect.

The Institute supports the establishment of an excess mercury storage advisory committee to address issues related to surplus mercury. The Institute was also asked to address the advisability of establishing a Federal stockpile for mercury. For more than 5 years, the Institute has publicly supported the establishment of such a Federal stockpile. The Department of Defense Logistics has safely stored mercury for more than 50 years.

Earlier this decade, the DLA undertook a very public process to examine how the long-term storage of its surplus mercury should be addressed. The conclusion was that mercury could continue to be safely stored for a long-term period by the DLA. The Institute does not believe that any viable alternative exists to the storage program being implemented by the DLA. The Chlorine Institute recognizes that is beyond the current mission of the DLA to manage the long-term storage of all surplus mercury generated in the United States. However, the Institute believes it would be sound public policy for the U.S. Government to manage all the surplus mercury in a safe and environmentally friendly way, as is being done by the DLA.

In conclusion, the Institute is opposed to the prohibition on the export of mercury, because it is premature to establish such a ban until the United States has a program established and in place for the permanent storage of mercury. The Institute supports the establishment of an excess mercury storage advisory committee. The Institute supports the establishment of a Federal stockpile for mercury.

I thank you again for the opportunity to appear before the committee and share the Chlorine Institute's views.

[The prepared statement of Mr. Dungan follows:]

TESTIMONY OF ARTHUR E. DUNGAN

IN BEHALF OF

THE CHLORINE INSTITUTE, INC.
1300 WILSON BOULEVARD
ARLINGTON, VA 22209
703-741-5760

BEFORE THE

SUBCOMMITTEE ON ENVIRONMENT AND HAZARDOUS MATERIALS

COMMITTEE ON ENERGY AND COMMERCE

UNITED STATES

HOUSE OF REPRESENTATIVES

PERTAINING TO THE MERCURY EXPORT BAN ACT OF 2007 (H. R. 1534)

JUNE 22, 2007

Introduction

Mr. Chairman and Members of the Subcommittee:

I am Art Dungan, President of the Chlorine Institute and am here representing the Institute, as well as the Chlorine Chemistry Division of the American Chemistry Council. I appreciate the opportunity to testify before you concerning the Mercury Export Ban Act of 2007 (H. R. 1534) and the advisability of establishing a federal stockpile for mercury.

The Chlorine Institute, Inc., founded in 1924, is a 220-member, not-for-profit trade association of chlor-alkali producers worldwide, as well as packagers, distributors, users, and suppliers. The Institute's mission is the promotion of safety and the protection of human health and the environment in the manufacture, distribution and use of chlorine, sodium hydroxide, potassium hydroxide and sodium hypochlorite, plus the distribution and use of hydrogen chloride. The Institute's North American Producer members account for more than 98 percent of the total chlorine production capacity of the U.S., Canada, and Mexico.

Everyday life would be very different without the benefits of chlorine chemistry. Combined with the power of human innovation, chlorine chemistry plays an essential role in providing the indispensable products of modern life. From providing one of the most basic human needs—clean drinking water—to contributing to the production of high-tech first-responder equipment, sustainable building materials, food protection chemicals, computer microprocessor chips and more than 90 percent of prescription pharmaceuticals, chlorine chemistry is essential to everyday life in America.

In the United States, there are currently seven facilities that produce chlorine using the mercury cell process accounting for approximately 7% of the annual chlorine production. All are members of the Chlorine Institute. Of these seven facilities, two have announced their intention to close or to convert to another technology by the end of 2008. The remaining five plants would be affected by this bill. We believe these plants can continue to operate until the end of their economic life in a manner that is fully protective of human health and the environment and in compliance with all regulatory requirements.

The Chlorine Institute and the Mercury Cell Producers' Commitment to Mercury Reduction

The Chlorine Institute and the chlor-alkali producers using the mercury cell technology have worked diligently to address mercury use and release issues since they first surfaced nearly 40 years ago. In the 1950s and 1960s, the mercury cell technology was the technology of choice because the sodium hydroxide co-product was felt by many customers to be superior in quality. Exhibit 1 provides a brief description of this technology. As a result, mercury cell technology increased from less than 10% of chlorine capacity in the early 1950s to nearly 30% in the 1970s. In the early 1970s there were approximately 30 mercury cell plants in operation. It was at this time that environmental concerns about the effects of mercury releases became an issue. Since that time, no new mercury cell plants have been built in the United States. As these chlor-alkali plants reached the end of their economic life, they have either closed or converted to a different

technology. In the last twenty years, most new chlor-alkali plants constructed throughout the world have utilized the membrane cell technology.

The mercury cell chlor-alkali producers individually and through the Chlorine Institute have worked aggressively and voluntarily to reduce mercury use and releases to the environment and have worked cooperatively with all agencies as they set regulatory standards limiting such releases. The Chlorine Institute established technical teams beginning more than forty years ago to address mercury issues. The first such teams focused on worker protection with the goal to minimize human exposure to mercury.

In the early 1970s, technical teams were established to reduce releases to the environment. Technologies were voluntarily shared between the mercury cell producers. These technologies first addressed emissions to water, then to air, and then to solid wastes. When EPA proposed the land disposal restrictions pertaining to solid wastes in the late 1980s, through the Chlorine Institute, the industry embarked on a nearly $4 million research program that would allow the mercury from these wastes to be recovered, prior to disposal, in a more environmentally friendly manner. The information that was developed enabled many mercury cell producers to utilize new methods to recover mercury from the wastes utilizing equipment that allowed for reduced air emissions when compared with the traditional mercury retorting technology.

In 1996, the Chlorine Institute and the mercury cell producers voluntarily agreed to reduce mercury use by 50 percent by 2005 compared to the base years of 1990-1995. This commitment was made to help the United States achieve its mercury reduction goals as part of the United States - Canadian Binational Toxics Strategy Agreement (BTS). As part of its voluntary

commitment, the Chlorine Institute agreed to issue annual reports highlighting the progress being made. The Ninth Annual Report was issued last year (Exhibit 2), and the tenth report will be issued in the coming weeks. **As indicated in this report, the overall reduction in annual mercury usage in the ninth year was 94%.**

In order to meet this commitment, the Institute established several new technical teams to address a variety of issues. In addition to meeting numerous times, the teams held several workshops and developed additional guidance documents to address mercury issues (Exhibit 3).

When the commitment to the BTS was made, 14 mercury cell plants were operating. Today seven plants continue in operation. Two of these plants are scheduled to close or convert by the end of 2008. The remaining five plants intend to operate until the end of their economic life. Exhibit 4 provides a list of these fourteen plants and their current status.

In addition, the Chlorine Institute and the Chlorine Chemistry Division of the American Chemistry Council are active participants in the World Chlorine Council (WCC). WCC has been an active supporter of the United Nations Environment Programme (UNEP) Global Mercury Program and has made a sustained effort to help mercury-based chlorine producers around the world reduce mercury uses and emissions. As part of this effort, WCC is supporting and contributing to the UNEP Global Mercury Partnership. The Global Mercury Partnership builds upon WCC's long-standing commitment to share best practices globally for reducing the use and release of mercury from mercury cell chlor-alkali facilities. WCC has contributed significant time, expertise and financial resources and has worked with governments, chlor-alkali

producers, and UNEP to help make this partnership a success. (See http://www.chem.unep.ch/mercury/partnerships/progress-reports/WCC%20Submission.pdf).

The Chlorine Institute's Position on H. R. 1534

H. R. 1534 has two main provisions. These are (1) Prohibition on Export of Mercury and (2) Establishment of an Excess Mercury Storage Advisory Committee.

(1) Prohibition on Export of Mercury

The Institute is opposed to the prohibition of export of mercury because it is premature to establish a ban on mercury exports until the United States has a program established and in place for the permanent storage of mercury. Such an export ban must also be coordinated with international groups (e.g., UNIDO and UNEP) to ensure that the reduced supply of mercury from countries such as the United States does not result in the expansion of existing or the opening of new primary mercury mines elsewhere in the world to meet the demand. While most uses of mercury continue to decline, two significant non-domestic uses, artisanal mining for gold and catalysts for chemical plants in China, are growing rapidly. It was reported at a June 14, 2007 meeting of EPA's newly established Advisory Committee on Commodity Mercury that primary mining of mercury results in emissions of at least 10% of the mercury produced. If the goal of the export ban is to reduce mercury use and, indirectly, mercury releases to the environment, a ban established before international action is taken to reduce mercury use will have the opposite effect.

Implementation of the export ban will not only affect the five remaining mercury cell plants, but also other sources of mercury. These five plants are estimated to have approximately 1,400

(short) tons of mercury that will need to be sold or otherwise disposed of when these plants reach the end of their economic life. This figure is large when compared with other domestic mercury supplies when examined in a short time frame. However, over the 40 year horizon described in the bill, it is likely that other domestic sources of mercury (by-product mining and recycling programs) would have a far greater contribution to the US mercury supply. At the same June 14 meeting referred to above, it was stated that the current quantity of net mercury exports is about 300 tons per year. With an export ban in place, this surplus mercury will have to be stored somewhere. The generators might store the mercury, which is a commodity, at various sites in the hope that it could eventually be sold. While most of this mercury would be stored safely and without any adverse effects to the environment, few of the sites would have the safeguards in place that a permanent federally managed storage site would have.

(2) Establishment of an Excess Mercury Storage Advisory Committee

The Institute supports this provision of the bill. This advisory committee would supplement the work of the existing EPA stakeholder panel looking at different approaches for management of non-federal supplies of commodity grade mercury. This stakeholder panel, established by EPA, has a much more limited scope. The panel is limited to individual input on alternative approaches. No consensus is desired or being sought by EPA. The panel will not issue a final report.

The Institute believes the make-up of the excess mercury storage advisory committee membership should be expanded. One significant source of elemental mercury is by-product mercury from mining operations. We believe this industry group should be included on the advisory committee. While the Institute has no additional specific recommendations, there may

be other groups that should be considered for representation. While the Institute agrees with the 40 year time frame described in the bill for considering various aspects of mercury storage, the Institute believes the charge of the advisory committee should be expanded to specifically state that the underlying assumption is that permanent storage (i.e., beyond 40 years) of mercury will be necessary.

Advisability of Establishing a Federal Stockpile for Mercury

In addition to commenting on H. R. 1534, The Chlorine Institute was asked to address the advisability of establishing a federal stockpile for mercury. For more than five years the Institute has publicly supported the establishment of a federal stockpile for mercury. In the spring of 2002, the mercury cell producers through the Chlorine Institute endorsed six key principles pertaining to the retirement of mercury (Exhibit 5). These principles were first presented at a mercury conference co-sponsored by the USEPA and the Northeast Waste Management Officials' Association (NEWMOA). In July 2002, we reiterated our support of such a stockpile in a letter to the Senate's Environment and Public Works Committee (Exhibit 6).

The Institute believes that the principles it endorsed in 2002 are still sound today. We see no viable alternative other than a stockpile under the control of the federal government. We believe the mercury stockpile should be located at as few sites as possible. Because of the relatively small size involved (mercury is more than 13 times denser than water), it is very likely all the surplus mercury could be stored at a single site.

The Department of Defense Logistics (DLA) has stored mercury safely for more than 50 years. This mercury had been acquired as part of the U. S. government's policy to have a strategic

reserve of essential materials, but it is no longer needed. Earlier this decade, the DLA undertook a very public process to examine how the long term storage of its surplus mercury should be addressed. The conclusion was that the mercury could continue to be safely stored for a long term period by the DLA, but that the multiple storage sites should be consolidated to store at a single site. The Institute does not believe that any viable alternative exists to the permanent storage of surplus mercury as being implemented by the DLA. The DLA is currently beginning a process to consolidate all of its nearly 5,000 tons of mercury to a single site. In addition, the Department of Energy has about 500 tons of surplus mercury that is being stored at a single site. Currently, there are no plans to consolidate this mercury to the DLA site.

While the Institute does not have verified data on mercury generated annually from recycling and by-product mining operations, it would appear that the US government would account for about 50% of the mercury which would need to be stored over the next 40 years. [Basis: 5,500 tons of mercury currently owned by the government; 1,400 tons of surplus mercury from the five chlor-alkali plants; and 100 tons per year of surplus mercury generated by the recycling and mining industries.] The contribution of the chlor-alkali industry is less than 15% of the total.

The Chlorine Institute recognizes that it is beyond the current mission of the DLA to manage the long term storage of all the surplus mercury generated in the United States. However, the Institute believes it would be sound public policy for the United States government to manage all the surplus mercury in a safe and environmentally friendly way as is being done by the DLA.

Conclusions

1. The Institute is opposed to the prohibition on the export of mercury because it is premature to establish a ban on mercury exports until the United States has a program established and in place for the permanent storage of mercury. Such an export ban must also be coordinated with international groups to ensure that the reduced supply of mercury from countries such as the United States does not result in the expansion of existing or the opening of new primary mercury mines elsewhere in the world to meet the demand. We believe that consideration of an export ban should not be undertaken until these two necessary steps are in place.

2. The Institute supports the establishment of a federal stockpile for mercury.

3. The Institute supports the establishment of an Excess Mercury Storage Advisory Committee. While the Institute has already reached many conclusions about the permanent storage of mercury, the committee will provide answers to many questions that will enable the establishment of a federal stockpile for mercury.

I thank you again for the opportunity to appear before the Committee and share the Chlorine Institute's views.

Exhibit 1

Chlorine Manufacture

Most chlorine is manufactured electrolytically by the mercury, the diaphragm or the membrane cell process. In each process, a salt (sodium chloride) solution is decomposed by the action of direct electric current in an electrolytic cell which converts the solution to elemental chlorine, and co-products sodium hydroxide and hydrogen. United States chlorine production is approximately 13 million short tons per year or about 30% of the global production.

In the mercury cell process recirculating mercury serves as the cathode. Chlorine is removed from the gas space above the anodes and elemental sodium is formed at the cathode. The sodium amalgamates with the mercury. The sodium-mercury amalgam then flows to a decomposer where it is reacted with purified water to produce sodium hydroxide and hydrogen with the mercury being recirculated. The mercury cell requires a relatively large amount of mercury inventory, but make-up to replenish losses is quite small. The typical mercury cell plant, depending on the size, may have 200 to 400 tons of mercury in inventory. A mercury cell plant may have between 25 and 100 of these electrolytic cells. Typically these cells are located in a cell room whose dimensions approximate a football field.

In the diaphragm cell process, sodium chloride brine is electrolyzed to produce chlorine at the positive electrode (anode) while sodium hydroxide and hydrogen are produced at the negative electrode (cathode). In order to prevent the reaction of sodium hydroxide and hydrogen with the chlorine, the anode and cathode chambers are separated by a porous diaphragm.

The membrane cell process electrolyzes sodium chloride brine to produce chlorine at the positive electrode (anode) while sodium hydroxide and hydrogen are produced at the negative electrode (cathode). An ion selective membrane prevents the reaction of sodium hydroxide and hydrogen with chlorine.

Chlorine is also produced in a number of other ways, for example, by electrolysis of potassium chloride brine in membrane and mercury cells with co-production of potassium hydroxide; by electrolysis of molten sodium or magnesium chloride to make elemental sodium or magnesium metal; by electrolysis of hydrochloric acid; and by non-electrolytic processes. A good reference for additional information is the Kirk-Othmer Encyclopedia of Chemical Technology which contains a section on chlorine and sodium hydroxide.

Exhibit 2

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NINTH ANNUAL REPORT TO EPA
For the Year 2005
May 15, 2006

The Chlorine Institute continues to be a proactive leader in the effort to reduce mercury emissions and use in the United States. This Ninth Annual Report to the U. S. Environmental Protection Agency (EPA) illustrates the chlor-alkali industry's progress in voluntarily reducing mercury use and emissions.

Since 1996, the Chlorine Institute and its members have worked cooperatively with federal and state authorities to voluntarily reduce mercury use by 50 percent by 2005 over the base years of 1990-1995. That goal has been met and exceeded. In addition, the Institute has reported to EPA on projects and initiatives underway to reduce mercury use and emissions. These efforts continue to this day.

In this report we will discuss the following items:

- The decline in the use of mercury in the chlor-alkali industry over the nine years since the commitment was originally made.
- A discussion of mercury use and purchases within the chlor-alkali industry.
- A summary of the current status of the projects being undertaken to improve cell performance by several facilities. Some of these projects involve increasing cell mercury inventory.
- A summary of the status of the new commitments made in 2004.
- A summary of other activities undertaken in the past year.

MERCURY USE AND PURCHASES

The overall mercury usage reduction to date over a nine-year period is 94%. Mercury use in 2005 was 10 tons, a decrease of 4 tons from 2004. Mercury use is detailed in Table 1. After adjusting for shutdown facilities, the reduction in mercury use by the chlor-alkali industry from the base period is 91%.

In 2005, one mercury cell facility closed. Additionally, another facility announced its intention to convert to the membrane cell process in 2007. Last month, a third facility announced that it would close in 2008. Currently there are eight mercury cell plants operating. When the

currently announced changes are implemented, there will be six plants operating. In 1996, when the original commitment was made, there were 14 plants operating. Of the eight facilities that have closed or announced that they will close, two will have converted their process and six would have simply closed resulting in a loss of employment.

Reductions in mercury use in the future will be slow in coming and will not be as significant as in the past. Mercury releases to the environment from the chlor-alkali industry are a very small portion of the global pool of mercury releases and have declined at a greater rate than the overall decline in this pool.

Mercury purchases in 2005 were 32 tons. As explained in past reports, **mercury purchases do not necessarily equal mercury use.** Process changes or different equipment may require more mercury be added to the process. Such mercury additions are required as part of programs to advance the cell room technology that are currently being undertaken at several facilities. Such programs are allowing the facilities to operate longer between cell maintenance and/or allow the facilities to utilize equipment designed to minimize fugitive emissions. These new technology advancements already underway at several facilities were detailed in the last two annual reports. These advancements include the following:

(1) **Enlarging the size of decomposers to reduce the need to open the equipment.**

(2) **Using better electrical current distribution equipment.**

(3) **Upgrading equipment.**

(4) **Improving the reliability of cell room equipment.**

KEY PROJECTS CURRENTLY UNDERWAY

Below is a summary of key projects currently underway at several facilities that are resulting in reduced mercury emissions but that have a short term increase in mercury purchases because they require an increase in mercury process inventories:

Process mercury inventory increased by 57 tons in 2005 at the eight facilities operating at the end of 2005. Nearly all this inventory increased at one facility which replaced 24 decomposers and associated piping accounting for an increase of 52 tons of process inventory.

A second plant replaced three decomposers with larger ones accounting for an additional four tons of process inventory.

A third plant made modifications to its end boxes and associated mercury piping accounting for an increase in process inventory of 10 tons.

Two of the remaining plants allowed their mercury process inventories to decline resulting in the net inventory increase of 57 tons as reported above.

One plant continued its conversion of mercury pumps to a sealless type resulting in less emissions.

In 2005 several plants embarked on programs to enhance the monitoring of cell room emissions. In June of 2005, one of these facilites hosted all the mercury cell producers at a technology session to view the installation and to discuss the system's capabilities.

These process changes allow for reductions of mercury emissions in two ways. First, because much of the newer equipment being installed is larger than the previously installed equipment, operating cycles between maintenance activities are being lengthened. These maintenance activities nearly always require equipment openings. Even though many improvements in techniques to reduce mercury emissions during equipment openings have been made, such emissions can not be totally eliminated. As a result, a lower number of openings results in reduced mercury emissions. Secondly, the newer equipment is better designed to reduce fugitive emissions. Sealless mercury pumps, sealed end boxes, and improved hydrogen cooler design are examples of equipment changes that are resulting in reduced fugitive emissions.

In addition to the above items, facilities have taken other steps to reduce mercury emission. These changes were described in prior reports and include the following:

- Improved collection devices to more effectively capture mercury during cell maintenance activities.
- New decomposer compression system design to improve efficiency of amalgam decomposition.
- New gasket materials to provide better seals on mercury containing equipment.
- The installation of additional collection devices such as weirs to cell room trenches to more efficiently recapture and reuse accumulated mercury.
- Process changes to reduce mercury carry-over with the water exiting the end boxes resulting in less mercury handling.

UPDATE ON 2004 COMMITMENTS

In the 2004 report, we made two new commitments to the Binational Toxics Strategy. Specifically, the Chlorine Institute members committed to:

(1) Enhance Cell Room Air Monitoring

(2) Fully Account for Mercury Inventory

The following summarizes the status of these commitments:

Enhance Cell Room Air Monitoring

Two facilities completed installation of cell room mercury monitoring systems in 2005. A third facility is nearly complete with its installation. The remaining facilities are in various stages of evaluating such systems. EPA has evaluated the data from the two completed installations. It is our understanding that the agency has confirmed that emissions from each of these facilities are below the current NESHAP requirements.

Fully Account for Mercury Inventory

Data presented in our past voluntary annual reports to EPA continue to be misinterpreted or mischaracterized by some groups. In order to further clarify the facts; in 2004 we added a new table, Table 2, to this report. Table 2 is a compilation of data for calendar years 2002 thru 2005 showing the differences between mercury purchases, mercury use, reported toxics release inventory (TRI) emissions, and mercury contained in chlor-alkali products.

We stated then that we were not satisfied with the 30 tons of "unaccounted for inventory" reported in 2002 and 2003 even though this unaccounted inventory represents only one percent of the total mercury inventory for the industry. We committed then to fully account for the mercury we use. In 2005, the "unaccounted for" mercury amounted to three tons, a reduction of nearly 90% from the prior two years. Mercury process inventory is typically measured using the radioactive isotope technique discussed in Chlorine Institute publication, *Guidelines for Conducting a Mercury Balance*, May 1999. The methodology has a variability of between 0.1 and 0.3%. Applying this variability to the 2005 year ending mercury inventory of 2,560 tons, means the measurement is accurate within 2 - 8 tons. We believe we have made significant progress in fully accounting for the mercury we use.

OTHER 2005 ACTIVITIES

While aggressively leading the U.S. industry's voluntary efforts, the Chlorine Institute's mercury cell producers have actively participated in numerous activities to further reduce mercury use and emissions worldwide. A summary of the Institute's mercury task groups and their global activities for 2005 are discussed in Appendices A and B.

Since issuing its Eighth Annual Report to EPA last year, the Chlorine Institute continued to coordinate the chlor-alkali industry's continued efforts to reduce mercury use and emissions. Specifically, CI and its member companies:

- Worked with EPA to assist it in its plan to conduct mercury emissions monitoring studies at two additional chlor-alkali facilities.

- Participated in follow up activities related to technology sharing workshops in Brazil and India addressing global mercury chlor-alkali issues. Participated in the planning for workshops held in Russia in the Fall of 2005 and in Mexico in the spring of 2006. Our sister organization, Euro Chlor led the efforts for the Russian workshop. The United Sates based chlor-alkali industry was a principal driver for the Mexican workshop held in late March.

- Conducted the 13th Annual Mercury Issues Workshop at the April Chlorine Institute Annual Meeting.

SUMMARY OF COMMITMENTS

CI's member companies that use mercury cell technology are safe and perform above and beyond all applicable laws and regulations pertaining to mercury use and emissions.

As an industry, we reaffirm our support for the regulation of mercury by committing to four action steps:

- **Fully account for the mercury we use,**
- **Further reduce the mercury we use,**
- **Continue to improve methods to more accurately measure emissions from the cell rooms at each mercury cell chlor-alkali facility, and**
- **Further reduce air emissions from point sources by as much as 93% by implementing the extensive new work practices standards and fully complying with EPA's new MACT requirements.**

PATH FORWARD

Our commitment to the Binational Toxics Strategy is completed. We believe this voluntary effort has been a success for the chlor-alkali industry and for the Binational Toxics Strategy. We believe we have proactively addressed many of the concerns regarding the use of mercury and the release of mercury into the environment by the mercury cell chlor-alkali industry. We will continue to do so.

Through the World Chlorine Council (WCC), the Chlorine Institute is participating in the United Nations Environmental Program to reduce mercury use and environmental releases in the chlor-alkali partnership sector. Since the UNEP program was established, the WCC has held workshops in Russia and Mexico to discuss ways the industry can reduce both the use of mercury and the release into the environment from the chlor-alkali sector. Prior to the UNEP program being established similar such workshops were held in Brazil and India.

The WCC has committed to providing reports to UNEP discussing activities associated with mercury reduction programs. While the structure of the reports is still under discussion within the WCC, it is expected that the reports will be similar in content to those the Institute has submitted to the BTS. The reports will provide data by region. Initially reports are expected to include the United States, Western Europe, and parts of South American. Over time we would expect to increase the regions being covered with a goal of eventually covering the entire globe. As with the CI current annual reports, individual facilities will not be identified. WCC has also set a criterion that the smallest region must include at least three such facilities.

It is the desire of the Chlorine Institute to substitute the current annual report being provided to the BTS with the planned one for UNEP. We will discuss this matter more fully with BTS officials after we have issued the first report to UNEP. The target date for the first UNEP report is November 2006 covering calendar year 2005 and providing some historical perspective. We would expect to issue subsequent reports to UNEP in the summer following the reporting year.

ABOUT CI

The Chlorine Institute Inc., founded in 1924, is a trade association of companies and other entities that are involved or interested in the safe production, distribution and use of chlorine, sodium and potassium hydroxides, and sodium hypochlorite, and the distribution and use of hydrogen chloride.

Because of chlorine's nature and its widespread and varied use, the promotion of its safe handling has long been an accepted responsibility of its producers, packagers, distributors and users. The Institute is the focal point for their joint efforts.

For more information on CI's mission, go to **www.chlorineinstitute.org**.

Table I

Chlor-Alkali Mercury Cell Process – USA Only

	Average 1990 - 95	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total Mercury purchases, lb.	296,408	242,015	320,460	340,658	214,749	172,885	69,932	259,069	437,434	75,982	63,829
Total Mercury Purchases, tons	148	121	160	170	107	86	35	130	219	38	32
Total Mercury Used, lb.	319,715	273,659	232,056	210,213	177,968	156,403	61,506	71,052	75,309	28,637	20,660
Total Mercury Used, tons	160	137	116	105	89	79	30	36	38	14	10
Annual Chlorine Capacity, 1,000 tons	1,758	1,784	1,801	1,785	1,676	1,589	1436	1355	1,353	1,363	1,221
Total Number of Mercury Cells	762	762	762	762	706	682	646	594	594	594	506
Mercury Used, lb/ton of Chlorine Capacity	0.182	0.153	0.129	0.118	0.106	0.102	0.044	0.052	0.056	0.021	0.017

Notes: 1 ton = 2,000 lb

Data are for those plants operating at the end of the calendar year. In 2005, the Occidental Chemical Company plant in Delaware closed. 2005 data exclude this site.

Table 2

Mercury Purchases and Use Data (In Tons) For the Facilities Operating At Year End In That Calendar Year; Nine Facilities for 2002 -2004
2005 Data for the Eight Facilities Operating At Year End 2005

	2002	2003	2004	2005
Mercury Virgin Inventory as of Jan 1 [1]	67	46	166	90
Mercury Process Inventory as of Jan 1 [2]	2,478	2,593	2,654	2,493
Total Mercury Inventory as of Jan 1 [3] {[3] = [1] + [2]}	2,545	2,639	2,820	2,583
Mercury purchases in the calendar year [4]	130	219	38	32
Total Mercury Available [5] {[5] = [3] + [4]}	2,675	2,858	2,858	2,615
Mercury Virgin Inventory at on site storage (warehouse/room) as of Dec 31 [6]	46	166	96	45
Mercury Process Inventory as of Dec 31 [7]	2,593	2,654	2,748	2,560
Total Mercury Inventory as of Dec 31 [8] {[8] = [6] + [7]}	2,639	2,820	2,844	2,605
Total Mercury Used (Consumed) [9] {[9] = [5] – [8]}	36	38	14	10
Mercury Released to the Environment (TRI) [10]	8.2	8.1	6.8	6.7
Mercury Contained in Products [11]	0.2	0.1	0.1	0.1
Total Mercury Losses to Environment and Products [12]	8	8	7	7
Unaccounted for Mercury [13] {[13] = [9] – [12]}	28	30	7	3

Numbers may not add due to rounding
2005 beginning inventory data adjusted to reflect shutdown of Delaware facility.

APPENDICES

Appendix A - Mission Statements of Various Groups

Mercury Issues Management Steering Committee (MIMSC)

The Mercury Issues Management Steering Committee is dedicated to continuous improvements in the protection of human health and the environment connected with the production of chlorine by mercury cell technology. The committee believes that the industry is in compliance with existing regulations governing releases of mercury to the environment, and that no significant harm to human health or the environment exists as a result of mercury releases from the chlor-alkali industry. However, driven by the industry's commitment to continuous improvement, the committee will strive for further improvements, always guided by sound science, risk management principles, and cost/benefit analysis.

The committee proactively addresses safety, environmental and health issues that will impact the manufacture and use of chlor-alkali products produced by the mercury cell process. The committee will develop and promote practices that will assist the users of this technology in the continued protection of human health and the environment.

Mercury Emissions Measurement (MEM) Task Group

The mission of the task group is to identify methodologies to allow for more accurate measurements of mercury emissions from cell room operations and point sources and to provide guidance to members to help them implement the commitment to more accurately measure mercury emissions from cell room.

Mercury Emissions Measurement and EPA Interaction Task Group

Mission Statement

The mission of the task group is to interact with EPA as the agency develops its plans for cell room and other testing at two additional facilities.

Mercury Data Management Task Group

Mission Statement

The mission of the task group is to develop a management system to assist members in complying with the housekeeping provisions of EPA's Mercury MACT for mercury cell chlor-alkali plants. The team should determine whether a paper system should first be developed prior to consideration of a computerized system.

APPENDIX B - Task Group Progress and Activities Reports for 2005

Mercury Emissions Measurement Task Group

This group continues to focus on the review of the EPA's final MACT rule. It continues to provide guidance concerning how members can best implement the final rule. The team met at a member's plant site in June to discuss that member's installation of a cell room m mercury emissions monitoring system.

Mercury Issues Workshop

Fifty people attended the 13th Annual Mercury Issues Workshop held during the Chlorine Institute's 2006 Annual Meeting held in April in Chicago. Topics discussed included the following:

- Legal, Legislative, and Regulatory Update
- Mercury Cell Technology: A Historical Prospective
- European Mercury Issues Update
- South American Mercury Issues Update
- AIM for Compliance: Mercury MACT Case Study
- MACT Issues Panel Discussion

Coalition Activities

The mercury teams continue to participate in two industry coalitions addressing mercury issues: the Federal Water Quality Coalition and the Coalition for Mercury Management.

Exhibit 3

Documents Developed by the Institute's Technical Teams

- **Guidelines: Medical Surveillance and Hygiene Monitoring Practices for Control of Worker Exposure to Mercury in the Chlor-Alkali Industry**
- **Guidelines for the Handling of Rubber-Lined Cell Parts Potentially Contaminated with Mercury**
- **Guidelines for Conducting a Mercury Balance**
- **Guidelines for Technologies to Reduce Mercury in Sodium Hydroxide**
- **Guidelines for Mercury Cell Chlor-Alkali Plants Emission Control: Practices and Techniques**
- **Guidelines For The Optimization Of Mercury Wastewater Treatment (Sulfide Precipitation Process) Systems**

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Exhibit 4

Mercury Cell Plants Operating in 1996 and Current Status

	Company	Location	Current Status
1	ASHTA Chemicals	Ashtabula, Ohio	In operation
2	ERCO Worldwide	Port Edwards, Wisconsin	In operation
3	Olin Corporation	Augusta, Georgia	In operation
4	Olin Corporation	Charleston, Tennessee	In operation
5	PPG Industries	New Martinsville, West Virginia	In operation
6	Occidental Chemical Corp.	Muscle Shoals, Alabama	In operation; scheduled to close in second half of 2008
7	Pioneer	St. Gabriel, Louisiana	In operation; scheduled to close at the end of 2008
8	PPG Industries	Lake Charles, Louisiana	Conversion in process (mercury cell plant closed earlier this month)
9	Westlake	Calvert City, Kentucky	Converted
10	Georgia Pacific	Bellingham, Washington	Closed
11	Holtra Chem	Orrington, Maine	Closed
12	Holtra Chem	Riegelwood, North Carolina	Closed
13	Occidental Chemical Corp.	Deer Park, Texas	Closed
14	Occidental Chemical Corp.	Delaware City, Delaware	Closed

Exhibit 5

THE CHLORINE INSTITUTE, INC.
1300 Wilson Boulevard, Arlington, VA 22209
Phone: 703-741-5760 Fax: 703-741-6068
http://www.chlorineinstitute.org

Chlor-alkali Industry Principles Concerning the Retirement of Mercury

1. Mercury is a marketable commodity. It is not a hazardous waste. There are numerous beneficial uses for mercury that provide value to our society and which are likely to continue for the foreseeable future.

2. In the United States, the supply of mercury available from facilities (e.g., strategic reserve, converted/shutdown mercury cell plants) that no longer need it or that becomes available through reclamation processes exceeds the demand for such mercury. However, on a world wide basis, a net demand for additional mercury does exist. Currently, there is still at least one mine in operation for the express purpose of supplying virgin elemental mercury to meet this world demand.

3. Improper handling/use of mercury can lead to adverse environmental consequences (especially in countries where sufficient environmental restrictions are not in place). Therefore, it may be prudent for the United States to consider a national policy to identify which worldwide outlets are acceptable vs. the present free market approach. This restriction of outlets recognizes that the mining of fresh mercury will be encouraged to meet the demand for the identified unacceptable outlets outside of the US.

4. Any government policy related to the retirement of mercury must be predicated on the government's taking title to the mercury and assuming full responsibility for the permanent management of such mercury in a manner consistent with safety and environmental regulations and engineering standards.

5. In the event that recovery processes do not provide sufficient mercury to supply future needs, mercury from the permanent storage stockpile should be made available for the legitimate needs of users of mercury rather than the mining of virgin mercury.

6. Assuming that such a government policy regarding the retirement and storage of such mercury is developed, the chlor-alkali industry is willing to discuss options concerning how the chlor-alkali industry can best insure that any surplus mercury from idled or converted sites is placed into that permanent storage and is not allowed to enter poorly managed commercial markets.

Exhibit 6

(Electronic version; letterhead copy of letter unavailable)

June 26, 2002

The Honorable James M. Jeffords, Chairman
Environment and Public Works Committee
410 Dirksen Senate Office Building
Washington, DC 20510-6175

The Honorable Bob Smith, Ranking Member
Environment and Public Works Committee
456 Dirksen Senate Office Building
Washington, DC 20510-6175

Dear Senators Jeffords and Smith:

Reference: S. 351

The Chlorine Institute, Inc. supports Senate Bill 351 as presented in the version dated June 25, 2002 and identified by the file name DEC02.471. While we support the portion of the bill pertaining to fever thermometers, we believe the key part of the bill is that which addresses the retirement of surplus mercury.

The United States government has approximately 6,000 tons of surplus mercury within the Department of Defense and the Department of Energy. In addition, approximately 3,000 tons of surplus mercury may become available over the next several decades from mercury cell chlorine production plants as they reach the end of their economic life. Mercury recycling and recovery programs already make the supply of mercury greater in the USA than the demand. The excess supply will increase in the future, as legitimate mercury needs decline. All of these reasons combine to make it highly desirable for the United States to develop a policy to address the retirement of surplus mercury.

The Institute worked with EPA and the Northeast Waste Management Officials' Association (NEWMOA) in helping to plan the Mercury Workshop held in Boston on May 1 - 3, 2002. At this workshop, the Institute presented its views on issues associated with the retirement of surplus mercury in a formal presentation made by one of our members. Attached is a framework presenting the principles that we support and have provided to the Mercury Policy Project. We believe that the current draft of Senate bill 351 embodies the essence of these principles.

The Chlorine Institute, Inc., founded in 1924, is a 220-member, not-for-profit trade association of chlor-alkali producers worldwide, as well as packagers, distributors, users, and suppliers. The Institute's mission is the promotion of safety and the protection of human health and the environment in the manufacture, distribution and use of chlorine, sodium hydroxide, potassium hydroxide and sodium hypochlorite, plus the distribution and use of hydrogen chloride. The Institute's North American Producer members account for more than 98 percent of the total chlorine production capacity of the U.S., Canada, and Mexico. In the United States, there are ten facilities that produce chlorine using the mercury cell process accounting for 10% of the annual chlorine production. All are members of the Chlorine Institute.

The Chlorine Institute has long worked on a cooperative basis with various federal, state, and local agencies and other groups to address issues associated with mercury use in chlorine production. We believe that production of chlorine with mercury cell technology continues to be a safe, environmentally sound way to manufacture chlorine and chlorine-based products. Mercury cell facilities can be operated in a manner that meets or exceeds environmental standards. However, we remain committed to voluntary mercury reduction strategies. For example, in April of this year, the Institute submitted its fifth annual report to the USEPA concerning the commitment the Institute and the mercury cell chlorine producers made to the Binational Toxics Strategy in 1996 to reduce mercury use by 50% or more by 2005 and to provide the agency with an annual report of progress. In the fifth year of the program, the goal has been achieved. The overall reduction to date is 81%. We will continue to provide these reports to the agency as we strive to make further reductions.

The Institute has worked with EPA and other entities on a variety of other issues. These include issues such as the currently pending MACT standard for further reductions in mercury emissions from mercury cell chlorine production plants and RCRA issues associated with mercury containing materials. The Institute has also worked on international issues such as the United Nations Economic Commission for Europe (UN/ECE) Convention on the Long Range Transboundary Air Pollution Protocol on Heavy Metals (includes mercury). The Institute formally supported this protocol and urged our government to sign it -- which it has.

We have been most privileged to work with your committee staff on this bill.

Very truly yours,

Robert G. Smerko

Mr. WYNN. Thank you very much, Mr. Dungan.

At this time, Mr. Lawrence, we would love to hear from you.

STATEMENT OF BRUCE LAWRENCE, PRESIDENT, BETHLEHEM APPARATUS COMPANY, INCORPORATED, HELLERTOWN, PA

Mr. LAWRENCE. Thank you, Mr. Chairman and members of the committee.

In my opinion, it is not advisable to establish a Federal stockpile for mercury. The result would be that more mercury air emissions will occur by the removal of secondary mercury from the international market.

The world consumes approximately 2,000 tons of mercury per year. Of this, roughly 50 percent or 1,000 tons is provided by virgin mercury mining. Reports indicate that virgin mercury mining will lose approximately 4 percent of their production to air emissions. That makes 40 tons of mercury pollution annually. Virgin mercury mining occurs in China and Kyrgyzstan. The markets in both China and Kyrgyzstan have shown that they will purchase secondary mercury to offset their mining production. If the United States were to encourage the sale of mercury from caustic soda plants and from the U.S. Government stockpiles, then the world would be relieved of the 40 tons of mercury pollution annually.

An export ban on sales of commodity grade mercury will result in an increase in world atmospheric mercury pollution. The increase will be caused by the increase in virgin mercury mining. More troubling is the likelihood that the new mining that will occur will be from what is called artisanal mercury mining. This type of mining is much less efficient because of the small scale and crude equipment. Air emissions could be as much as 50 percent of production. An effect of an export ban of secondary mercury from the United States and from the European Union could result in an increase in global mercury pollution by 500 tons a year. Along with the current mercury mining pollution, the result of the legislation could be up to 540 tons per year.

The argument that the suspension of mercury sales will cause prices to increase and thereby cause less artisanal gold mining is not valid. As indicated by Mr. Ed Wyler, economist for Environmental Protection Agency, "Demand for mercury by miners is insensitive to mercury price. HG cost is very small relative to value of recovered gold, approximately 0.1 percent." Mr. Wyler's report, he indicated that it takes a pound of mercury to produce a pound of gold by artisanal miners. Today's world market price for mercury is about $8 per pound. Today's gold price of $650 per troy ounce is equal then to $9,477 per pound. Therefore, mercury cost is 0.08 percent. If the price of mercury were to increase to $100 per pound because of the removal of supplies from U.S. and Europe, then the mercury cost would become only 1 percent of the value of gold recovered. In my opinion, $100 per pound for mercury would be a sufficient incentive to create enough new artisanal mercury mines. These new mines would not only supply artisanal gold miners with the mercury they want, they will also produce much more atmospheric mercury pollution.

I strongly recommend that H.R. 1534 not be passed. In addition, I strongly encourage the resumption of sales of mercury from Fed-

eral stockpiles. Passage of H.R. 1534 could result in 540 tons of mercury pollution per year. Non-passage of H.R. 1534 with the resumption of sales of stockpiles could result in the elimination of 40 tons of mercury pollution per year.

Thank you. That concludes my statement.

[The prepared statement of Mr. Lawrence follows:]

TESTIMONY OF BRUCE LAWRENCE

It is not advisable to establish a Federal stockpile for mercury. The result would be that more mercury air emissions will occur by the removal of secondary mercury from the international market.

The world consumes approximately 2,000 tons of mercury per year. Of this, roughly 50 percent or 1,000 tons is provided by virgin mercury mining. Reports indicate that virgin mercury mining will lose approximately 4 percent of their production to air emissions. That makes 40 tons of mercury pollution annually. Virgin mercury mining occurs in China and in Kyrgyzstan. [1]

The markets in both China and Kyrgyzstan have shown that they will purchase secondary mercury to offset their mining production. If the United States were to encourage the sale of mercury from caustic soda plants and from the U.S. government stockpiles, then the world would be relieved of the 40 tons of mercury pollution annually.

An export ban on sales of commodity-grade mercury will result in an increase in world atmospheric mercury pollution. The increase will be caused by the increase in virgin mercury mining. More troubling is the likelihood that the new mining that will occur will be from what is called artisanal mercury mining. This type of mining is much less efficient because of the small scale and crude equipment. Air emissions could be as much as 50 percent of production. The net effect of an export ban of secondary mercury from the United States and the European Union could result in an increase in global mercury pollution by 500 tons per year. Along with the current mercury mining pollution, the result of this legislation could be up to 540 tons per year of mercury atmospheric pollution

The argument that the suspension of mercury sales will cause prices to increase and thereby cause less artisanal gold mining is not valid. As indicated by Mr. Edward Weiler, economist for the Environmental Protection Agency, "Demand for mercury by miners is insensitive to mercury price;" "Hg cost is very small relative to value of recovered gold (approximately 0.1 percent)." [2]

In Mr. Weiler's report, he indicated that it takes a pound of mercury to produce a pound of gold by artisanal miners. Today's world market price for mercury is about $8 per pound. Today's gold price of $650 per troy ounce is equivalent to $9,477 per pound. Therefore mercury cost is .08 percent. If the price of mercury were to increase to $100 per pound because of the removal of supplies for the U.S. and Europe, then the mercury cost would become only 1 percent of the value of gold recovered. In my opinion, $100 per pound mercury would be sufficient incentive to create enough new artisanal mercury mines. These new mines would not only supply artisanal gold miners with the mercury they want, they will also produce much more atmospheric mercury pollution.

I strongly recommend that H.R. 1534 not be passed. In addition, I strongly encourage the resumption of sales of mercury from the Federal stockpiles. Passage of H.R. 1534 could result in 540 tons of mercury pollution per year. Non-passage of H.R. 1534 with the resumption of sales from stockpiles could result in the elimination of 40 tons of mercury pollution per year.

Mr. WYNN. Thank you very much, Mr. Lawrence.

I would like to thank all the panelists. At this time, I would like to ask a few questions.

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1 Revich, Boris (1994): "Mercury Levels in the Atmospheric Air of Some of the Former USSR Cities and in Human Blood, Hair and Urine" published from the: International Conference on Mercury as a Global Pollutant. Whistler, British Columbia, Canada, July 10–14, 1994. Note: Mr. Revich indicates that the Khaidarkansky mine in Kirghizia emits 21 tons of mercury per year. With an average production of 500 tons per year the 21 tons represents 4.2 percent.

2 Weiler, E. (2002): "Can the U.S. act alone on mercury?" presented at the US EPA-sponsored conference: Breaking the Mercury Cycle: Long-Term Management of Surplus Mercury & Mercury-Bearing Waste, Boston, Massachusetts, USA, May 1–3, 2002

First of all, Dr. Shannon, thank you very much for coming down from Boston. I certainly appreciate your presence here, and also your testimony.

I want to ask a fairly narrow question with respect to the endorsements of this bill, H.R. 1534, that were made by the American Medical Association and the American College of Preventative Medicine. My question is basically this. I am not sure whether you are in a position to endorse on behalf of the Association of Pediatrics, but would you say that your position is consistent with the endorsements that have been previously made by the American Medical Association and the American College of Preventative Medicine?

Dr. SHANNON. I would say that the Academy's view is absolutely consistent with the principles of this legislation, that is, whatever can be done to reduce the global burden of elemental mercury.

Mr. WYNN. Thank you.

Dr. Greer, the EPA says that—and we have heard this testimony today—the administration's position is that we have to rely on demand management strategies. A couple of questions that are somewhat related. Do you think that just reducing demand and not addressing supply will solve the problem is the first question.

The second question, are these mutually exclusive strategies?

Ms. GREER. Actually, when people have taken a hard look at this they have concluded that the only real way to solve this problem is by ratcheting down supply and demand in a logical kind of hinged fashion. If you only reduce demand, then you get all this excess supply, the price gets lower and lower, and you sort of invite more and more uses. If you reduce supply and you don't reduce demand, then you get the problem that the gentleman from Bethlehem Apparatus was mentioning, that you might spark additional mining of mercury.

So what needs to happen is a coordinated reduction of supply and demand.

The only other comment I would have on EPA's call to lower mercury demand is this. We are on a glide path down of demand here in the United States, so that is really not our highest priority anymore to get us down to zero. We have really done a very good job, and we will be down at the bottom sometime soon. Our higher priority should then be to take steps to reduce demand abroad, and you are hard-pressed to come up with demand reduction strategies for these uses abroad, such as artisanal mining, except by constraining supply and making the price go up.

And so I really don't see a demand reduction strategy without a supply reduction strategy making any sense in the long run.

Mr. WYNN. Thank you very much. Just a follow-up question. Do you agree with the findings of the November 2006 report of the United Nations Environment Program that stated various location-specific global mercury project, training programs, and assessments have demonstrated that when mercury is less available and/or more expensive, less mercury is consumed as miners switch to more efficient practices, sometimes eliminating mercury use entirely.

Ms. GREER. Well, Representative Wynn, these are the experts. That is the agency that has put the experts in the field and those people have thrown themselves at this problem for more than a

decade, and so I think we have to respect their expertise along with the technical assistance and training that they are trying to do, that they feel that the scale of this problem is such that they really need this additional boost from worldwide constraining of supply in order to make a difference. I just think those are the people that have been in the field for more than a decade. We ought to take their conclusions seriously.

Mr. WYNN. Thank you.

Dr. Smith, I believe you indicated that 60 to 80 percent of all the mercury deposited in the U.S. comes from global sources. Can you amplify on the need to stop U.S. mercury exports and how poorly regulated uses overseas come back to impact the resources and public health concerns that we have?

Mr. SMITH. There have been a number of deposition modeling studies that have concluded that a substantial fraction of the mercury depositing in the U.S. and our States is coming from global sources. That may range from 50 to as high as 80, 85 percent, so it is a very significant fraction.

With respect to the export of mercury here, we do know that the distributive uses for artisanal gold mining and other unnecessary uses in third world countries, for example, mercury containing jewelry that can still be bought in Mexico provides an example of that. It is definitely contributing to releases of environmental mercury, which will enter the global circulation and impact the United States.

Mr. WYNN. Thank you.

Mr. Dungan, a couple of quick questions. I think the earliest part of your testimony basically established the fact that there are alternatives to mercury use, which is why there is such a decline in the United States. Is that correct?

Mr. DUNGAN. There are alternatives, yes.

Mr. WYNN. OK, all right. And second, I think you said basically you would support a stockpile, so you are not so much concerned about the new virgin mines. You seem to be saying—and I don't want to put words in your mouth—but you seem to be saying if there is a U.S. stockpile, you are fine with banning exports. Is that——

Mr. DUNGAN. Well, you may put it that way, but our concern is that this bill, as it exists now, really puts the cart ahead of the horse. All you have done is ban exports but there is no policy that the bill sets to handle surplus mercury. So we are concerned about that.

But let me also go back to the first question. Each facility has to look at what its long-term options are, and to say that there are alternatives available is one issue. The other issue, does this alternative make sense for this facility?

Mr. WYNN. Thank you very much. I believe my time has expired.

I will turn to the ranking member, Mr. Shimkus, for questions.

Mr. SHIMKUS. Thank you, Mr. Chairman. Before I take my questions, I just want to welcome Paul Gillmor here, a former chairman of the subcommittee for 6 years. He is on a week leave—not leave of absence, but he has joined us for this week, and he shows his commitment because he is even here at this hearing. Thank you.

Quick question, I only have a short couple minutes. Good or bad, Dr. Greer?

Ms. GREER. Good. Want to know why, or do you want to keep going?

Mr. SHIMKUS. No, no, good or—if broken?

Ms. GREER. If broken, it is a very miniscule amount of mercury. I think——

Mr. SHIMKUS. So it is OK then?

Ms. GREER. It is OK.

Mr. SHIMKUS. All right, good.

Dr. Shannon?

Dr. SHANNON. I would agree that if broken, the vapor would dissipate quickly and not produce a significant health——

Mr. SHIMKUS. Dr. Smith.

Mr. SMITH. Yes, good, but if you break millions and millions and millions of them, it would add up to quite a bit of mercury.

Mr. SHIMKUS. And it goes up in the atmosphere and into the fish?

Mr. SMITH. And ultimately into the fish.

Mr. SHIMKUS. Mr. Dungan.

Mr. DUNGAN. I really am not qualified to answer that.

Mr. SHIMKUS. All right, Mr. Lawrence?

Mr. LAWRENCE. I will say good. The amount of mercury consumed by the lighting industry is a very, very small fraction——

Mr. SHIMKUS. Let me keep going quickly then.

This is labeled mercury. Good or bad? Just go down the line, good or bad, that this is labeled as having mercury in it?

Ms. GREER. I think it is fine that it has a label.

Mr. SHIMKUS. Good. Dr. Shannon?

Dr. SHANNON. Agree.

Mr. SHIMKUS. Dr. Smith.

Mr. SMITH. Agree and it is labeled because of State requirements and legislation that requires it to be.

Mr. SHIMKUS. Not Federal?

Mr. SMITH. No.

Mr. SHIMKUS. We debated that a couple——

Mr. DUNGAN. I agree.

Mr. SHIMKUS. Mr. Lawrence?

Mr. LAWRENCE. I agree.

Mr. SHIMKUS. Ad in today's Hill, exposing the benefits of fluorescent light bulbs, no labeling of mercury, good or bad? Dr. Greer.

Ms. GREER. I really haven't worked on this issue, so I have to say——

Mr. SHIMKUS. Is mercury good or bad?

Ms. GREER. The need for a label, I think it is a good idea to have a label.

Mr. SHIMKUS. All right. Dr. Shannon?

Dr. SHANNON. I don't think it was necessary to put the word "mercury" on that ad.

Mr. SHIMKUS. Dr. Smith?

Mr. SMITH. Not in the ad, but it should be labeled if they are selling them in most of the New England States.

Mr. SHIMKUS. And you all don't care.

OK. Dr. Smith, on March 20, 2007, ECOS approved resolution No. 07–1 entitled "Creating a Partnership for a National Vision for Mercury" which I have right here. This resolution was very clear about not having the States preempted in their attempt to clarify and address mercury. Massachusetts and my State of Illinois have enacted strong legislation and implemented other programs to remove mercury from our schools. In view of ECOS's resolution and our States' efforts to protect public health against elemental mercury exposures, do you and ECOS support Federal preemption that compels schools and daycare centers to install mercury containing energy efficient lighting equipment, even if they do not want to do it, because of health risks from mercury?

Mr. SMITH. Well, as a general rule, the States really do not like Federal preemption on pretty much anything, so we would like to have the alternative of doing what is best in our individual circumstances.

Mr. SHIMKUS. Thank you.

Dr. Greer, should energy efficient lighting with mercury be compelled in schools and daycare centers to reduce electricity use if the school or daycare center does not want to use them out of public health and environmental concerns over exposures to released elemental mercury?

Ms. GREER. Mr. Shimkus, I do appreciate how much you are concerned about the mercury in these bulbs, but I am here to tell you that if you are worried about mercury exposure in schools, you should worry about what is in their thermometers and what is in their chemistry labs.

Mr. SHIMKUS. Well, you are right. That is the whole point, if you——

Ms. GREER. Because if you are talking about—what we are talking about——

Mr. SHIMKUS. Reclaiming my time. If we are talking about the problem of mercury, then we ought to be talking about the problem of mercury.

Ms. GREER. I just think we ought to put our——

Mr. SHIMKUS. It should be a comprehensive approach, and we are promoting thousands of increased light bulbs—and I am not saying I disapprove of them, but——

Ms. GREER. But you are starting at the very smallest use of mercury that everybody——

Mr. SHIMKUS. Do you know where these come from?

Ms. GREER. China.

Mr. SHIMKUS. Do you know who is mining it?

Ms. GREER. China.

Mr. SHIMKUS. What is the problem with mercury in the air, the mining operations that you just promoted? Zero Mercury in international organizations, are you part of that?

Ms. GREER. I am part of that.

Mr. SHIMKUS. And you know in this publication it says what to do about mercury in electronics equipment?

Ms. GREER. Right.

Mr. SHIMKUS. What does it say?

Ms. GREER. But in this case——

Mr. SHIMKUS. No, what does your organization say in this document?

Ms. GREER. It is zero for electronic equipment, but it is——

Mr. SHIMKUS. It says no mercury in electronics. I mean, you are a member of this group.

Ms. GREER. I am.

Mr. SHIMKUS. So your testimony is contradictory. When you say it is not enough to cause any effect, but then internationally you say ban it from all electronic equipment.

Ms. GREER. Excuse me, I would like to set the record straight about my position. This is a big problem of 3,500 tons of mercury a year. Policies should start in the big places and not in the smallest places. It is my opinion that starting on this problem with compact fluorescent light bulbs is starting at the miniscule end of it——

Mr. SHIMKUS. I am starting at China, and I yield back my time.

Mr. WYNN. The Chair recognizes the bill's sponsor, Mr. Allen.

Mr. ALLEN. Thank you.

Dr. Greer, I too think we ought to begin with the major problems. I would just add to this debate with the comment that compact fluorescent light bulbs, among other things, are intended to reduce the demand for new coal-fired power plants, which do emit mercury and which is a significant source of mercury here.

But I want to come back to your testimony. Your written testimony, and really, pages 15 through 19. When Mr. Gulliford was testifying in the first panel, he talked a lot about the fear he had that an export ban on mercury would essentially lead to increased mining. It seems to me in those four pages, you make a very compelling case that it would not do that, and I would like to ask you to address that issue directly.

Ms. GREER. Let me just summarize what I said in that written testimony.

There were two reasons that we don't think that this is at all likely. The first is that most places can't mine mercury in the world. The largest mine in the world in Spain has been intentionally shuttered because the European Union has been constraining supply. The mines in Algeria were closed. They had technical problems for years and are not expected to reopen. This really is leaving only the Kyrgyzstan mine as a mine that is in operation for export, and that mine is suffering from problems itself. It has not been able to produce more than 500 tons a year, and according to the World Bank, its deposits really aren't very rich.

This leaves, of course, China, but as we already said, China is mining a tremendous amount of mercury but not for export. They use it all for their own purposes.

And so when you look at what is really available through more mining, there are just not very many places in the world to imagine that this could really happen.

And then the second reason I put in my testimony is because UNEP has just done a very extensive analysis of global demand, and they predict that between now and 2015, global demand is going to go down. And so as a matter of a financial investment by a company or a country, it doesn't seem like a very attractive in-

vestment to undergo the expense of opening up a new mine in the case that global demand is slowly going down.

Mr. ALLEN. Two other points. Mr. Gulliford was not aware of any steps by Kyrgyzstan, but you mentioned in your testimony that at an October 2006 European Commission Mercury meeting in Brussels, the head of the mine asked the international community for assistance in transitioning through other economic activities in the region.

Ms. GREER. That is right. And NRDC was at that meeting. Kyrgyzstan was invited because they are so important to global supply of mercury, and what we learned at that meeting is that the mine is subsidized by the government. It is not a profit making institution. The government would like very much to find alternative employment opportunities for people in that mine and convert that area to non-mercury mining because it is not a very profitable operation for them anyway. They were seeking international assistance for development that would enable them to close that mine.

Mr. ALLEN. And finally, could you speak to the current activities in the European Union to ban the export of mercury from those countries?

Ms. GREER. Yes, and in fact, I have a small news announcement to make on that. As some of you know, the European Union has also been contemplating an export ban, and they export much more mercury than the United States. Combined, if the European Union and the United States did an export ban, we would take a very nice bite out of the global supply of mercury. The EU is about a year and a half ahead of us in terms of their deliberation, and just on Tuesday their Parliament passed the mercury export ban, which will go into effect in 2010. Now they have the functional equivalent of a conference between the Council of Ministers and the Parliament, but that should be completed by the fall. There are not big differences between the Parliament bill and the Council of Ministers bill, and so as you gentlemen can imagine, it won't take too long, I think, for them to pass this in the fall.

Mr. ALLEN. Thank you.

Finally, Mr. Smith, I have a quick question. Taking your position as you support a ban on the export of mercury, providing there is narrowly tailored exemptions for what you refer to as essential uses, and I am always concerned when you start writing exemptions for essential uses or phrases like that, they can be big enough to drive a pretty big truck through. So I wondered if you could expand on that. Do you mean anything more than dental amalgam and compact fluorescent light bulbs, or do you have any thoughts on how we would make that point?

Mr. SMITH. Yes, the Quicksilver Caucus group that pulled together those principles, when thinking about essential uses, could really only come up with the three that are listed, dental amalgam uses, uses in fluorescent lamps, and some uses for medical equipment where we don't have options that are readily available. Those are the ones we could come up with. We really couldn't preclude that there may be other ones that are out there. We did not have the time to invest a serious research effort into it. Because there may be others, we wanted to leave that as an option to have ex-

emptions for those essential uses that might be identified by a professional committee at some future date.

Mr. ALLEN. Great, thank you.

Mr. WYNN. I thank the gentleman.

At this time, the Chair would recognize the former chairman of this subcommittee, Mr. Gillmor, for questions.

Mr. GILLMOR. Thank you very much, Mr. Chairman. It is good to be back, even if it is for a temporary period.

Let me ask Mr. Dungan, and you proposed a central storage facility. We have had some experience with nuclear waste with a proposal with this Yucca Mountain. That has not been successful. It is not being done. We have nuclear waste stored at about 100 locations around the country. Why do you think we will be any more successful, and you might want to jump in on this also, Mr. Lawrence, why do you think we would be any more successful with this than we have been with Yucca Mountain?

Mr. DUNGAN. Well, mercury waste, in my opinion, is not nuclear waste. The Federal Government does have a successful history of safely storing mercury for 50, 60 years. The concern is if private industry were to store this mercury, under current U.S. regulations we don't have the authority to do it. If you impose an export ban, at some point, there is no market for mercury. It no longer becomes a commodity, and then how is it handled? Is it handled as waste, and how is this controlled, and what are these long-term issues? This mercury is going to be around, not just for 40 years as proposed in the bill, but forever, and someone has to be able to manage it forever. We don't think that there is a private organization that can do that.

Mr. GILLMOR. Let me ask you, if the U.S. and the EU ban mercury exports and China does not—I mean, frankly, I think we know what China's record has been on global warming. They are going to be the largest carbon emitter on the planet. They have no interest exhibited so far of trying to limit that. We are getting food from them that has been poisoned and they don't care much about examining that.

But I guess my question is if the U.S. and EU ban it and China does not, what will be the result in terms of total mercury in the planet under that——

Mr. DUNGAN. Well, I have a hard time believing that China will not supply all its mercury needs, whether that be by importing mercury or starting new mines. I think they will. And while most uses of mercury are declining, mercury use for catalysts in chemical plants in China and artisanal mining throughout the world are increasing, and as Mr. Lawrence pointed out, the economics would appear to indicate that there might be an incentive for new mines to be started up. I am not saying they will, but I think this is a clear issue that needs to be addressed before we impose any kind of export ban.

Mr. GILLMOR. Thank you. Let me ask you another question on that. Forty years, do you think that is a relevant and a necessary timeline? I mean, mercury is basically eternal. Nuclear fuel is not. It does have a finite time, so is 40 years a realistic timeframe?

Mr. DUNGAN. In my opinion, no. I think in a zillion years that nuclear waste may be harmless, and mercury will still be there in

its current form. I believe that any facility, while you might look at a 40-year economic horizon, it ought to be designed that you expect that facility be there forever.

Mr. GILLMOR. Thank you. I yield back, Mr. Chairman.

Mr. WYNN. Thank the gentleman.

At this time the Chair would recognize Mrs. Capps. I am sorry, Ms. Schakowsky.

Ms. SCHAKOWSKY. Thank you, Mr. Chairman.

Mr. Smith, while States I understand—and Illinois would have an interest in this as well—are not interested in preemption, how would you feel about Federal legislation that at least lets the States go beyond the level of the Federal Government, would it meet national standards?

Mr. SMITH. I think the States would probably be comfortable with that, and with respect to the mercury world, there are numerous States, including Illinois and my State, Massachusetts, and many, many others that are already exceeding EPA Federal requirements with respect to pollution controls and pollution prevention activities, so that is certainly consistent with what we are already doing.

Ms. SCHAKOWSKY. Dr. Greer, a lot has been made of the storage issue, and yet, I am looking at your testimony that says as a technical matter, it is quite easy to store mercury. I wondered if you wanted to respond to this notion, both about what an incredible problem it seems to be presented as, and if you could talk about that.

Ms. GREER. Well, in my capacity at NRDC, I work on a lot of different toxic chemicals, and I am here to tell you that mercury is a dream chemical for storage compared to most of the other chemicals that are toxic that are out there. It is not reactive, it is not explosive, if you keep it below 70 degrees it doesn't volatilize, and so it really is a very simple matter to store it in flasks as is going on, or in stainless steel tanks in a monitored warehouse. If all the toxic chemicals I worked on were this easy to store, we wouldn't have the sort of Superfund problems that we have and we wouldn't have the controversies that we have about storage piles for other hazardous materials.

Ms. SCHAKOWSKY. So would you say that this notion that we have to solve the storage problem before we address this export issue is necessary? You would disagree with that?

Ms. GREER. Well, I don't think there is—and probably Mr. Dungan agrees, there isn't really a technical problem about storage. What he is referring to is we need to decide where we want to put it and what happens with the legal liability and other issues.

I think the bill does this by setting up the FACA committee and by asking for a recommendation to Congress well in advance of when the ban actually goes into effect. So from my perspective, that concern is addressed and we do intentionally have in the bill something that lines up a storage solution before it goes into effect.

Ms. SCHAKOWSKY. Thank you.

I am fascinated with your testimony, Mr. Lawrence, because it is so precise. You talk about how the net effect of an export ban could result in global mercury pollution by 500 tons per year. The result of this legislation would be up to 540 tons per year, and you

go on to talk about how much—"Non-passage could result in the elimination of 40 tons of mercury pollution per year." I would be very interested in seeing what all your assumptions are and how you arrived at this calculation of the 540 tons more and the 40 tons less. And if you could just submit that, I would really—if you want to make a comment?

Mr. LAWRENCE. Well, the only thing that I haven't put in what I have submitted already is that the 500 tons is my estimate, that there is 500 tons of mercury used in artisanal mining, so because of the one-to-one relationship with the mercury and gold. So that if we take away the supply sources of the artisanal miners, then it is going to be produced someplace else, and that——

Ms. SCHAKOWSKY. So you discount the historical experience, really, that Dr. Greer referred to that actually decreasing mercury availability has not, in fact, created more. Actually there has been less. Am I saying that correctly, that some of these operations have actually shut down and we haven't seen an expansion of mercury mining? Let me just make sure I have got that right.

Ms. GREER. Yes, we might be getting confused between mining for gold, artisanal mining for gold and mercury mines, could you rephrase the question?

Ms. SCHAKOWSKY. Well, I am trying to understand if the basis for deciding that this bill will result in 540 tons of mercury pollution and that resumption of sales from stockpiles would result in the elimination of 40 tons of mercury pollution. I don't know if what you had said relates to this calculation, but I mean, that is pretty precise.

Mr. LAWRENCE. I took 4 percent of 1,000 tons of virgin mining that I mentioned in here. If we were selling 1,000 tons from the stockpile, it could displace that 1,000 tons of virgin mercury mining.

Ms. GREER. To weigh these two things, if we were to open new mines and we had 40 new tons of mercury pollution out of that, that would—setting everything else aside that would be worse than using recycled mercury. But what we are really comparing is that having an over-supply of mercury in commerce and meeting all of those demands, which is 3,500 tons of mercury a year.

So for the speculative outcome that we might cause more mining that might cause 40 additional tons of releases, against an already existing 3,500 ton demand and consumption every year that we are trying to address. And the way to do that is to ratchet down supply and demand.

Mr. WYNN. The gentlelady's time is expired.

Ms. SCHAKOWSKY. Thank you.

Mr. WYNN. We have got a vote on. I am going to turn it to Mrs. Capps for questions, and I think we will be able to conclude the hearing prior to voting.

Mrs. CAPPS. Thank you very much.

I want to address my questions, or at least some of them, to Dr. Shannon. Can you help us understand the mercury-related symptoms in illnesses that were observed in the small-scale gold mining communities discussed in the UN's Global Mercury Project?

Dr. SHANNON. Well, I will answer in this way and I hope I answer your question. First, the effects of elemental mercury expo-

sure are actually quite subtle until the exposure is severe, truly at an extreme, and at that point, the primary effects are neurologic. That is generally what you will see in children, and as I mentioned in my testimony, it can vary from very subtle neurobehavioral difficulty concentrating types of symptoms to the more severe seizures or life-threatening neurologic events.

Mrs. CAPPS. You are implying that it isn't readily detected perhaps at first, that the intoxication is the end of it?

Dr. SHANNON. That is exactly right. So the point I am hoping to make is that at the point that you are seeing symptoms in children or adults, their exposure is severe. They have an enormous mercury burden.

Mrs. CAPPS. Let me ask you then, what will happen and does happen to the mothers and children who have been working in these gold fields and handling the mercury?

Dr. SHANNON. We believe that most, if not all, of the neurologic consequences of elemental mercury exposure are permanent. Almost as certainly, some of it as it is eliminated from the body, there would be some improvement but there is, we believe, no hope of returning to baseline function.

Mrs. CAPPS. Finally, if mercury exports from the U.S. are banned by 2010, what type of health impact would that have on these small-scale mining towns, and do you think H.R. 1534 would have a positive step in reducing harm from mercury in the environment, not only in these countries, but would it even be important here in the U.S.?

Dr. SHANNON. Again, let me try to answer your question in the following way. Anything that we can do to reduce human exposure to elemental mercury will result in vastly improved health, vastly improved health outcomes, and in the case of children, I am just thinking about the developing brain and being able to reduce, if not eliminate, exposure of this toxic metal to their developing brain will have a great positive impact on health.

Mrs. CAPPS. Dr. Greer, you might want to add something. I have a little more time and I know we are pressing it with votes. If I am allowed, I would ask you to follow on with that, if you care to?

Ms. GREER. I don't have too much to add to that, except to strongly agree that we know that the damage that mercury causes is permanent, particularly to the developing infant, and it is for that reason that it is such a high priority for NRDC, for the Zero Mercury Group, and other international groups to eliminate large sources of mercury exposure.

Mrs. CAPPS. And it would be in the gold mining communities that were described in the project, but in this country as well?

Ms. GREER. In this country as well. Wherever there are large exposures to mercury.

Mrs. CAPPS. That is the end of my questioning. Thank you.

Mr. WYNN. I thank the lady for her questions. I want to thank all the witnesses for coming here today and thank you for your testimony.

I believe this concludes our questions. I want to remind members that they may submit additional questions for the record to be answered by relevant witnesses, the questions should be submitted to the committee clerk in electronic form within the next 10 days. The

clerk will notify your offices of the procedures. I want to thank all the staff for helping us this morning.

Without objection, the subcommittee hearing is now adjourned.

[Whereupon, at 12:40 p.m., the subcommittee was adjourned.]

[Material submitted for inclusion in the record follows:]

Department of Energy
National Nuclear Security Administration
Washington, DC 20585

December 13, 2006

MEMORANDUM TO THE FILE

FROM: Thomas P. D'Agostino
Deputy Administrator
for Defense Programs

SUBJECT: Elemental Mercury Inventory

Presently, there are 1206 metric tons of DOE/NNSA-owned mercury in storage at the Y-12 Nuclear Security Complex. This inventory is not needed at the present time for Defense Programs missions, and there is little likelihood that this material will be needed by DOE/NNSA in the future. At this time (December 2006), it is my decision that this material in storage at Y-12 will remain in storage at Y-12. The basis of my decision is based on several external factors, which include:

1. The Environmental Protection Agency's strong support of storage, vice returning this material to the economy.
2. Other countries' (e.g., European Union) policies supporting long-term storage of elemental mercury.
3. The continued use/need of elemental mercury in developed countries is decreasing (e.g., the U.S. uses about 200 metric tons/year, with projections showing continuing decreases).
4. Mercury's known toxicity to living organisms, and its mobility within the biosphere indicate that safe storage of large quantities of elemental mercury presents the least risk to the world population.

Additionally, the NNSA will pursue alternate long-term storage options consistent with the objective of reducing infrastructure costs at Y-12.

If, sometime in the future, there is a changed situation such that it may be prudent for NNSA to divest itself of some, or all, of its inventory of elemental mercury, this decision would be made only after the necessary NEPA analysis is completed.

This decision applies only to bulk storage of mercury and does not apply to elemental mercury that is part of any NNSA-owned component (e.g., switches, thermometers, light fixtures, etc.). At this time, there is no indication that other NNSA sites have significant inventories of elemental mercury in storage. However, if in the unlikely event there are such inventories, they would continue to remain in storage at the respective sites, until an off-site long-term storage option is available.

cc: NNSA Site Office Managers

Printed with soy ink on recycled paper

JOHN E. BALDACCI
GOVERNOR

DAVID P. LITTELL
COMMISSIONER

June 20, 2007

The Hon. Albert R. Wynn, Chairman
Subcommittee on Environment and Hazardous Materials
2125 Rayburn House Office Building
Washington DC 20515

Dear Chairman Wynn:

As Commissioner of the Maine Department of Environmental Protection (MEDEP), I am writing to express strong support of H. R. 1534, the "Mercury Export Ban Act of 2007."

In Maine, mercury poses a significant public and environmental health problem. Even as we proudly celebrate the quality of our natural resources, we must live with the reality that fish consumption advisories have been posted for Maine's 5,800 lakes and ponds and our 32,000 miles of rivers, streams and brooks. Maine is hardly unique in this regard; 43 other states have issued similar warnings based on mercury contamination. Together we present a compelling call for strong commitment and decisive action at the national level.

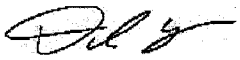
Mercury travels great distances through the atmosphere and readily transfers between air, water and soils. The danger it poses to children and wildlife is intensified by the fact that it does not break down into harmless pollutants once it is released to the environment. Our challenge therefore is to eliminate present and future sources of added contamination even as we attempt to deal with the legacy of past practices.

As you know, Maine has been a leader in this regard. In-state controls have reduced mercury emissions over 75% since 1990. Seventy-five percent of our State's historic use of mercury in products will be eliminated through a series of sales and disposal bans. Recycling and collection programs, including amalgam separators in dentists' offices, are keeping significant amounts of mercury out of Maine's environment. Yet, because mercury remains in widespread use elsewhere in the world, atmospheric transport continues to bring mercury into our state. Maine's actions alone cannot stop ongoing contamination of our environment.

The "Mercury Export Ban Act of 2007" proposes a course of action to address this problem. Mercury is now exported from the United States, frequently to developing countries for activity that has long been illegal in this country. H.R. 1534 would not only impose a ban on such export, it would also establish a commission to study whether a permanent mercury storage reserve should be established. Having had to deal with elemental mercury left behind when a chlor-alkali plant closed in Maine, this state has strongly supported the development of a national repository for some time.

The simple truth is that no one state can solve the problem of mercury contamination. The "Mercury Export Ban Act of 2007" presents the opportunity for targeted, decisive federal action addressing a national environmental and public health problem. I urge your subcommittee's positive endorsement.

Sincerely,



David P. Littell
Commissioner

ACPM
American College of
Preventive Medicine

June 20, 2007

The Honorable Albert Wynn
Chair, Subcommittee on Environment and
Hazardous Materials
2125 Rayburn House Office Building
Washington, DC 20515

Dear Mr. Chairman,

The American College of Preventive Medicine (ACPM) greatly appreciates your leadership in introducing legislation that would control global mercury pollution. We strongly support the "Mercury Export Ban Act of 2007," H.R. 1534, and feel that this bill will improve our ability to protect the global population from exposure to mercury, an extremely toxic chemical.

The scientific evidence strongly indicates that mercury is a significant public health threat to the fetus, infants, and young children. Human exposure to methylmercury, the highly toxic form of organic mercury found in our environment and food, may adversely affect reproduction and a variety of organ systems, in particular, the brain and central nervous system.

Major identified sources of mercury pollution include coal-fired power plants, industrial boilers, municipal and medical waste incinerators, and chlorine manufacturing (chlor-alkali) facilities. Mercury released from industrial sources eventually deposits in water bodies, where it is converted to methylmercury through microbial action and accumulates in edible fish species.

The mercury problem is not limited to the United States alone. Mercury is a transboundary pollutant, depositing locally, regionally, and globally, and affecting water bodies near industrial sources. While there are environmental regulations to mercury usage in the United States, many developing countries can purchase mercury cheaply from us, and this mercury is often misused, creating dangerous pollution, which can ultimately end up in our air, soil, water and fish.

In light of the serious public health threat posed by exposure to methylmercury, ACPM supports action to remediate the threat of mercury exposure. By banning both public and private mercury exportation, H.R. 1534 will aid in decreasing the global use and release of mercury, thereby reducing mercury levels in the environment.

We thank you for demonstrating US global health leadership by working to limit mercury sources in all countries. We offer to you ACPM's strong endorsement of this legislation and look forward to working with you and your staff to realize the successful enactment of this bill.

Sincerely,

Michael D Parkinson, MD

Michael Parkinson, MD, MPH, FACPM
President

June 21, 2007

The Honorable Albert Wynn
Chairman, Subcommittee on Environment and Hazardous Materials
Committee on Energy and Commerce
United States House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Wynn:

On behalf of the American Medical Association, I am pleased to share with you our thoughts on the "Mercury Export Ban Act of 2007" (H.R. 1534). The AMA strongly supports the reduction of mercury use in manufacturing and encourages the United States government to assume a leadership role in reducing the global mercury burden and to work toward promoting binding, health-protective international standards. We are pleased to support the "Mercury Export Ban Act of 2007" and commend the subcommittee for holding this important hearing.

We look forward to working with you and other members of the subcommittee on this and other important issues in the future.

Sincerely,

Chris Bowlin

Christopher Bowlin
Vice President, Government Affairs

American Medical Association 1101 Vermont Avenue, NW Suite 1200 Washington, D.C. 20005
202 789 7400 www.ama-assn.org

Statement

of the

American Medical Association

to the

Environment and Hazardous Materials Subcommittee
Committee on Energy and Commerce
U.S. House of Representatives

RE: Mercury Export Ban

June 22, 2007

The American Medical Association (AMA) appreciates the opportunity to present its views on the need to prohibit the sale, distribution, transfer, and export of mercury, and to create a transparent process for evaluating the environmental, health, and safety issues related to the long-term storage of this toxic substance. The AMA strongly supports the reduction of mercury use in manufacturing and encourages the United States government to assume a leadership role in reducing the global mercury burden and to work toward promoting binding, health-protective international standards. Thus, the AMA is pleased to support H.R. 1534, the "Mercury Export Ban Act of 2007," which would prohibit the sale, distribution, or transfer of mercury by federal agencies, and ban the export of mercury from the United States. We commend the Chairman and members of this Subcommittee for holding this important hearing.

Mercury is a global pollutant cycling in the environment as a result of both natural phenomena (volcanic activity; weathering of mercury-containing ore) and human activities.

Man-made emissions and manufacturing processes account for more than half of the annual global mercury burden, with significant variation among countries and continents of the world. Major man-made sources of elemental mercury include the incineration and burning of fossil fuels, artisanal and small-scale gold mining operations and metal refining, and use as a catalyst in the chemical manufacturing industry (e.g., mercury-based chlorine production facilities). In particular, the use of mercury in small-scale gold mining continues to increase and this trend is significant in the worldwide context. In the United States, the chlor-alkali industry is the largest private-sector source of mercury. Some of these plants continue to manufacture chlorine gas by using large vats of elemental mercury ("mercury cells") as part of the manufacturing process.

Mercury has been used in a variety of consumer products because it is a good conductor of electricity, and reacts precisely to temperature and pressure changes. Many types of mercury-containing products exist, including measuring devices (e.g., thermometers, barometers and vacuum gauges, sphygmanometers, and thermostats), fluorescent and high-powered lights (e.g., floodlights, streetlights, and stadium-lighting), certain batteries, various relays and switches, flow meters or regulators, and older flame sensors.

Accordingly, mercury supplies produced annually in the United States are derived primarily from mining operations, industrial process wastes, and scrap consumer products. Further decommissioning of mercury cells at chlor-alkali plants would represent an additional major source to the domestic mercury supply. In many cases, the use of mercury in manufacturing has been replaced or reduced to a great extent in the United States through the development

of affordable alternative products. However, mercury continues to be used for mining, industrial, and manufacturing purposes worldwide. These processes, as well as the production and disposal of these products, release mercury which is deposited in various terrestrial and aquatic ecosystems. In developing countries, commercial tracking and suitable disposal procedures to minimize mercury entry into the environment may be lacking.

Once in the environment, mercury can be converted from one form to another form, particularly in sediments and bodies of water. Most important is conversion to the most toxic form, methyl mercury, which ends up in bacteria and plankton, eventually accumulating in fish and wildlife through the food chain. Some mercury is also released back into the atmosphere for further deposition and subsequent conversion.

Thus, mercury, particularly methyl mercury, is an established, worldwide environmental pollutant, a major contaminant in the marine food supply, a serious neurotoxin, particularly in the developing fetus, and possibly a promoter of cardiovascular disease in adults. Because mercury is concentrated in the food chain in aquatic systems, vulnerable populations, particularly women of childbearing age, are advised to limit the consumption of certain fish, especially larger predatory fish. However, little information is available on the effectiveness of these fish consumption advisories. Chronic low-dose prenatal methyl mercury exposure from maternal consumption of fish has been associated with various degrees of neurological impairment. While adherence to advisories can minimize mercury exposure in vulnerable populations, long-term solutions to reduce dietary mercury exposure must rely on reducing mercury release into the environment.

On a global basis, there is a net flow of mercury from developed to developing countries. In the United States, the vast majority of mercury stockpiles are housed by the federal government and the remaining mercury-cell chlor-alkali manufacturing plants. If enacted, prohibition on the sale, distribution, or transfer of mercury by United States government agencies sends a positive message to other domestic mercury purveyors, as well as policy makers around the world, about our willingness to assume a leadership role in reducing the global burden of this toxic substance. Additionally, a prohibition by the United States on the export of mercury is important with respect to the market availability of mercury, and is in concert with a similar proposal from the European Commission to ban exports from the European Union by 2011.

AMA policy supports reductions in the amount of mercury used in manufacturing, and in the amount of mercury entering the environment. Specifically, AMA policy:

- encourages reduction in mercury use in manufacturing wherever possible;
- recommends increased vigilance, monitoring, and tracking of mercury use and emissions in chlor-alkali facilities that use mercury in manufacturing processes; and
- encourages the United States government to assume a leadership role in reducing the global mercury burden and to work toward promoting binding, health-protective international standards.

This policy (Policy D-135.992, Mercury Pollution, AMA Policy Database) is based on a 2006 report authored by the AMA's Council on Science and Public Health, a copy of which

is attached. The 2006 report followed an earlier Council report on the medical and public health issues associated with mercury and fish consumption, a copy of which is also attached.

In summary, the AMA supports a prohibition on the federal sale, distribution, or transfer of mercury, and on the export of mercury. Furthermore, we agree with the need to further study other mercury-containing compounds as potential sources of elemental mercury, and for the need to design and implement a scientifically-sound plan for the long-term, safe storage of excess mercury supplies.

Thank you for considering our views.

REPORT 13 OF THE COUNCIL ON SCIENTIFIC AFFAIRS (A-04)
Mercury and Fish Consumption: Medical and Public Health Issues
Resolution 516 (A-03)
(Reference Committee E)

EXECUTIVE SUMMARY

Objective: To provide information on the environmental life cycle and human toxicology of mercury, explain the development of the national joint Food and Drug Administration (FDA)-U.S. Environmental Protection Agency (EPA) consumer fish consumption advisory, briefly review key epidemiological studies of mercury (Hg) exposure and childhood development, and discuss other scientific issues relevant to dietary seafood and freshwater fish consumption.

Methods: This report summarizes the key findings of the April 2004 Conference on Mercury: Medical and Public Health Issues, co-sponsored by the EPA and the U.S. Department of Health and Human Services. Additional information was obtained by direct communication with experts in the field.

Results: Release of Hg from the global crust secondary to mining, burning of fossil fuels, incineration of medical and municipal waste, and other sources resulting from human activity have increased the rate of Hg release into the environment. Once in the environment, interconversion between the different forms of Hg occurs. Inorganic Hg that is deposited is converted to organic Hg by microorganisms or abiotic processes, particularly in aquatic sediment. The predominant organic form, methylmercury, is concentrated in the food chain in aquatic systems, especially in larger predatory fish. Methylmercury is neurotoxic. The level of fish consumption correlates with the body burden of Hg. Although fish consumption provides cardioprotective effects, higher levels of fish consumption also have been associated with subtle neurodevelopmental effects. In response, national consumer fish consumption advisories have been crafted in an effort to protect high-risk populations (pregnant women, women who intend to become pregnant, and young children) from excessive Hg exposure.

Conclusion. Women who might become pregnant, are pregnant, or who are nursing should follow federal, state, and local advisories on fish consumption. Because these advisories may differ, the most protective advisory should be followed. Physicians should assist in educating patients about the relative mercury content of fish and shellfish products, and make them aware of current advisories on fish consumption. Testing of the mercury content of fish should be continued by appropriate agencies and results should be publicly accessible and reported in a consumer-friendly format. Given the limitations of national consumer fish consumption advisories, the FDA also should consider the advisability of requiring that fish consumption advisories and results related to mercury testing be posted where fish, including canned tuna, are sold.

Action of the AMA House of Delegates 2004 Annual Meeting: Council on Scientific Affairs Report 13 Recommendations Adopted and Remainder of Report Filed.

REPORT OF THE COUNCIL ON SCIENTIFIC AFFAIRS

CSA Report 13-A-04

Subject: Mercury and Fish Consumption: Medical and Public Health Issues (Resolution 516, A-03)

Presented by: J. Chris Hawk, III, MD, Chair

Referred to: Reference Committee E (Stuart Gitlow, MD, Chair)

Resolution 516 (A-03), introduced by the California Delegation and referred to the Board of Trustees (BOT) for decision, asked that our American Medical Association (AMA) (1) encourage that testing of mercury content in food, including fish, be continued by appropriate agencies, and laboratory reporting of results of mercury testing be updated and consistent with current Environmental Protection Agency (EPA) and National Academy of Sciences standards; (2) work with the Food and Drug Administration (FDA) to determine the most appropriate means of testing and labeling of all foods, including fish, to determine mercury content and encourage that the results and advisories of any mercury testing of fish should be readily available where fish are sold, including labeling of packaged/canned fish; and (3) encourage physicians to educate their patients about the potential dangers of mercury toxicity in some food and fish products, especially those products that are well documented to contain mercury, and to advise pregnant women to limit, and parents to limit their children's, consumption of such products.

At the time that Resolution 516 (A-03) was referred for decision, the FDA and EPA were in the process of drafting a joint consumer advisory on fish consumption. Accordingly, the BOT agreed that our AMA should monitor the public meeting and progress of the joint advisory, and respond as appropriate. Additionally, the BOT instructed the Council on Scientific Affairs to prepare a report informing the House of Delegates once the advisory was finalized, to assist in educating physicians and consumers on the medical and public health issues related to mercury exposure from fish consumption.

In late April 2004, our AMA, the American Academy of Pediatrics, the American College of Preventive Medicine, and the American Association of Public Health Physicians partnered with the EPA and the U.S. Department of Health and Human Services (DHHS) to develop a state-of-the art conference on mercury. This report reviews the findings of this conference and provides some background information on the environmental life cycle and human toxicology of mercury, explains the development of the national joint FDA-EPA consumer fish consumption advisory, briefly reviews key epidemiological studies of mercury exposure and childhood development, and discusses other scientific issues relevant to dietary seafood and freshwater fish consumption. Finally, the report offers recommendations for AMA policy on this issue.

This report does not address the two other major sources of mercury exposure for the general population, namely ethylmercury from thimerosal-containing vaccines and dental amalgam, nor the ritualistic/religious use of mercury, which may increase mercury exposure in selected populations.[1] The former is discussed in BOT Report 14 (A-04), and is also evaluated in a recent report from the Institute of Medicine.[2] The use of dental amalgam remains an occupational issue for general care dentists who provide mercury-based dental fillings. Dental amalgam emits

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Action of the AMA House of Delegates 2004 Annual Meeting: Council on Scientific Affairs Report 13 Recommendations Adopted and Remainder of Report Filed.

mercury vapor that can be inhaled and absorbed into the blood stream, in particular during installation and/or removal. A correlation exists between the number of dental amalgams and blood mercury concentrations, but the increases are small (approximately doubling the background rate), and do not appear to pose a hazard for most patients.[3] A number of comprehensive evaluations, reports, and reviews have been conducted on this subject over the last 10 years. According to the FDA, "no valid scientific evidence has shown that amalgams cause harm to patients with dental restorations, except in the rare case of allergy."[4] The National Institute of Dental & Craniofacial Research continues to study the issue. The Children's Amalgam Trial, which will evaluate IQ scores, neuropsychological assessments, and renal function in amalgam recipients is ongoing.[5]

Methods

This report summarizes the key findings of the April 2004 Conference on Mercury: Medical and Public Health Issues, co-sponsored by the EPA and DHHS.[6] Additional information was obtained by direct communication with experts in the field.

Background

Sources of Mercury and Mercury Exposure. Mercury exists in the elemental form (Hg^0), and in various inorganic and organic complexes (Hg^{+1},Hg^{+2}), which differ in toxicity. Primary exposure to elemental Hg in the general population is via inhalation of vapors from dental amalgams, which are ~50% Hg. In the absence of fish consumption, body burdens of Hg correlate with the number of amalgam surfaces present. The presence of 10 amalgam surfaces approximately doubles the background mercury concentrations found in the urine.[3] Inhaled Hg is oxidized to Hg^{2+} (mercuric Hg) by catalase in red blood cells. Because Hg is lipophilic, a portion enters the brain prior to oxidation. The half-life of Hg vapor is approximately 60 days. Elemental Hg is excreted as Hg^0 in exhaled air, sweat, and saliva, and as mercuric Hg in feces and urine.

Inorganic Hg is found in disinfectants, vapor lamps, photography supplies, cosmetics, embalming fluids, etc. The soluble inorganic salts (eg, $HgCl_2$) undergo some gastrointestinal absorption, but do not penetrate the central nervous system (CNS) readily in adults. The relative degree of CNS penetration is higher in the fetus and neonate. In adults, the highest concentration of inorganic Hg is generally found in the kidney. The metal is excreted in the urine and feces, with a half-life of 40 to 60 days.

The major organic mercury forms are methylmercury (MeHg) found principally in fish, and ethylmercury (thimerosal), which is still used in various pharmaceutical products as a preservative (antiseptics, influenza vaccine, Rhogam®, immune globulin, injectable testosterone, contact lens solutions and ophthalmic ointments, nasal sprays, and ear drops). A list of medications that contain thimerosal can be found at www.fda.gov/cder/fdama/mercury300.htm. Organic mercurials are lipid soluble, are well absorbed from the gastrointestinal tract, and readily penetrate cell membranes, including the blood-brain and placental barriers. Movement into the CNS may be assisted via the formation and transport of MeHg-cysteine complexes. MeHg slowly demethylates to mercuric Hg, which is only slowly eliminated from the brain. The daily excretion of MeHg is approximately 1% of the body burden, and is accomplished primarily via the biliary-fecal route, with a half-life of approximately 70 days. Elimination from the brain is slower. Based on data obtained from monkeys, the elimination of ethylmercury has been determined to be considerably faster than that of MeHg.[7]

Mercury is a global pollutant that cycles in the environment as a result of both natural phenomena and human activities. Environmental mercury is derived from the weathering or mining of rock containing Hg ore (ie, HgS or cinnabar) and from sources related to human activity, particularly the incineration and burning of fossil fuels. Major man-made sources of elemental Hg include coal-burning utility plants and certain mercury-containing products (eg, thermometers, sphygmomanometers, lamps, batteries, electronic switches and devices). Release of Hg from the global crust secondary to mining, burning of fossil fuels, incineration of medical and municipal waste, and other anthropogenic releases resulting from human activity have increased by a factor of 2 to 5 times the rate of Hg release compared with pre-industrial times. The EPA has estimated that those sources account for 50% to 75% of the total yearly input of Hg into the atmosphere, principally from medical and municipal waster incinerators and coal-fired utility boilers.[8]

Accordingly, on January 30, 2004, the EPA issued a proposed rule to substantially cut mercury emissions from coal-fired power plants.[9] The Utility Mercury Reductions proposal would cut mercury emissions by nearly 70% when fully implemented. This proposal would permanently cap emissions from coal-fired power plants and provide companies with flexibility to achieve early reductions of mercury. The EPA proposed two alternatives for controlling mercury. One approach would require power plants to install controls known as "maximum achievable control technology" under Section 112 of the Clean Air Act. If implemented, this proposal would reduce nationwide mercury by 14 tons or about 30% by early 2008. A second approach proposed by the EPA would create a market-based "cap and trade" program that, if implemented, would reduce nationwide utility emissions of mercury in two phases.[9,10] When fully implemented mercury emissions would be reduced by 33 tons (nearly 70%). States may choose to adopt the cap-and-trade program to achieve and maintain the necessary emission standards.

Once in the environment, interconversion between the different forms of Hg occurs, with sequences of emission, deposition via particles or precipitation, and revolatization. After deposition, conversion of inorganic to organic mercury is accomplished by microorganisms or abiotic processes, particularly in aquatic sediment. Once in its predominant organic form (MeHg), bioaccumulation occurs. Thus, Hg, particularly MeHg, is an established, worldwide environmental pollutant and is concentrated in the food chain in aquatic systems, especially in larger predatory fish. The amount of MeHg in any given seafood or freshwater fish depends on the species, its age/size, and the waters from which it came. An in-depth analysis of the fate and transport of Hg can be found in the U.S. EPA's 1997 Mercury Study Report to Congress.[8]

Human Health Effects of Methylmercury

There is general consensus that the critical organ for MeHg toxicity is the brain.[11] The developing nervous system is more susceptible than the adult nervous system. Clinical poisoning episodes in Japan following the industrial release of MeHg into aquatic systems and in Iraq following consumption of contaminated bread established mercury as a neurotoxic agent.[12-14] Severe effects in humans occur following such poisonings and may cause death or a pattern of neurotoxic effects including paresthesia, ataxia, blurred vision/blindness, tremors, impairment of hearing/deafness, slurred speech, and difficulty walking. More recently, mercury contamination related to gold mining operations in the Amazon river basin has been associated with abnormal motor and visual function.[15]

Fetal exposure to large amounts of MeHg from maternal consumption of fish results in a pattern of severe neurodevelopmental defects and fatalities. Chronic low-dose prenatal MeHg exposure from maternal consumption of fish has been associated with more subtle decrements in several

measures of neurological development, which may resemble a number of learning disabilities present in the overall population of children.[16]

Fish Consumption and Childhood Neurodevelopment. Because of concerns about the range of Hg exposure worldwide, several cross-sectional and longitudinal studies have been done to evaluate the effects of chronic low-dose exposures to MeHg.[17-24] During the past 15 years, results from three prospective epidemiological studies involving populations who had dietary dependence on fish and marine mammals have expanded what is known about the lower range of the dose-response curve for MeHg and effects on the CNS.

A study of 237 children in New Zealand born in the early 1980s and who were tested at ages 4 and 6 years found that scores on the Denver Developmental Screening Test (DDST) were significantly lower in those whose mothers had mercury hair concentrations exceeding 6 ppm.[19,20] The DDST is a standardized test for childhood mental and motor development.

A Faroe Islands cohort of 1022 consecutive births in 1986-1987 was followed up at age 7 and 14 years. Subjects had mixed exposure to polychlorinated biphenyls (PCBs) and MeHg from fish and whale meat consumption. At age 7, cord blood Hg concentrations were correlated with deficits in language, attention, and memory, as well as increased blood pressure, decreased heart rate variability, and decreased auditory-evoked potentials. Additionally, maternal hair Hg was correlated with deficits in the children's fine motor control, and the children's blood and hair Hg correlated with the presence of visuospatial deficits. At the age 14 years follow-up, cord blood Hg was correlated with delayed brainstem auditory-evoked potentials, and decreased heart rate variability.[21-24]

The Seychelles Child Development Study enrolled a cohort of 779 mother-child pairs in 1989-1990. In the Seychelles, women of childbearing age consume fish containing similar concentrations of MeHg to those in the United States (~0.3 ug/g), but with an average of 12 fish meals per week. Prenatal exposure to MeHg was determined by measuring total Hg in maternal hair growing during pregnancy. Children were assessed at 6, 16, 29, and 66 months of age and then again at 9 years of age using tests of global intelligence and developmental milestones.[24] In this study, prenatal Hg exposure was associated with decreased performance on the grooved pegboard test using the nondominant hand in males, and with improved scores in the hyperactivity index of the Conner's teacher rating scale. No differences were observed in other tests, including tests of cognitive function that had previously yielded significant associations in the Faroe Islands study.[25]

Several explanations have been advanced for the differences observed between these cohorts including differences in exposure measurement (ie, cord blood in the Faroe Islands; maternal hair in the Seychelles) and possible interactions with pollutants (such as PCBs) present in whale meat and blubber for Faroe Island subjects. Additionally, protective effects of other factors in fish, such as omega-3 fatty acids (see below), may have been operating in the Seychelles, where the total fish intake was high but Hg fish content was low. Interaction between PCBs and Hg may only occur at higher Hg levels.

Nutritional and Medical Considerations with Fish Consumption

Fish are an excellent source of protein and certain vitamins and minerals. A growing body of literature suggests that diets higher in α-linolenic acid, eicosapentaenoic acid (EPA), and docosohexaenoic acid (DHA) that are found in fatty fish may afford some degree of protection against cardiovascular disease. Fish consumption has been associated with a lower risk of

coronary heart disease (CHD) in some but not all studies. A recent meta-analysis of cohort and case-control studies confirmed that fish consumption is associated with a significantly lower risk of fatal myocardial infarction and total burden of CHD.[26] Additionally, randomized controlled trials have shown that approximately one gram per day of EPA and DHA from a dietary supplement or fish consumption decreases the risk of death from CHD and stroke in patients who have suffered a myocardial infarction.[27-29]

Meanwhile, some data suggest that the Hg body burden may be a risk factor for cardiovascular disease. Even though most studies have suggested an association between high fish intake and reduced mortality from CHD, men in Eastern Finland who have a high fish intake, also have high CHD mortality. In one study, increased hair Hg concentrations were associated with an increased risk of cardiovascular deaths among men aged 42 to 60 years in Finland, in association with increasing consumption of non-fatty fish.[30] In a more recent case control study, toenail Hg concentrations were positively correlated with myocardial infarction rates.[31] However, findings from the Health Professionals' Follow-up Study did not support an association between total mercury exposure (based on toenail Hg) and the risk of CHD, and in another study, there was a strong inverse association between the risk of first myocardial infarction and the biomarkers of fish intake, including erythrocyte Hg concentrations.[32,33] Differences in these studies may involve the relative importance/interaction with contaminants, such as mercury and PCBs, nutrients such as omega-3 fatty acids, and anti-oxidants such as selenium, vitamin C, and vitamin E.

Road to Current National Fish Consumption Advisory

In the late 1990s, the EPA issued two reports on Hg to Congress. One report issued in 1997 evaluated mercury exposures in the United States, potential harmful effects, and the feasibility of control technologies.[8] The second, which was issued in 1998, evaluated the role of utility companies as a source of Hg contamination.[34]

Based on emerging concerns about chronic low-level exposure to Hg and potential adverse effects of MeHg on the adult cardiovascular and central nervous system, the National Research Council under contract from the EPA convened the Committee on Toxicological Effects of MeHg to re-evaluate the issue of mercury exposure. Among other things, the Committee was charged with providing guidance to the EPA on calculating an appropriate exposure reference dose (RfD), which represents an estimated daily intake that is likely to be without appreciable risk of harmful effects. The Committee concluded that neurodevelopmental deficits represented the most sensitive effects, and that the RfD should be derived based on the principle of fetal protection. Furthermore, the Committee recommended that the Faroe Islands study be used for deriving an RfD given that it was a larger study, had more extensive peer review, and used two measures of exposure. Ultimately, the Committee validated the EPA's previous RfD of 0.1 ug/kg/day as a scientifically appropriate value that adequately protects public health. The Committee's report was published in 2000.[35] In 2001 the EPA reconfirmed an RfD of 0.1 μg/kg/day for MeHg; the corresponding blood concentration is 5.8 μg/L.

While the numerical value of the RfD was not modified, the basis for its determination was different in that it was based on a study of fetal MeHg exposure resulting from maternal intake of whale meat and fish for a cohort of children from the Faroe Islands. This derivation used a series of benchmark dose analyses. The primary measure of exposure was umbilical cord blood Hg concentrations. Analyses were performed for a number of endpoints from the Faroe Islands, Seychelles Islands, and New Zealand studies. Derivation of potential RfDs from a number of endpoints from the Faroe Islands study converged on 0.1 ug/kg/day, as did the integrative analysis of all three studies.

Mercury Exposure in U.S. Women and Children

Contemporary data on mercury exposure in U.S. women and children are available from the National Health and Nutrition Examination Survey (NHANES). This cross-sectional national survey conducted by the Centers for Disease Control and Prevention (CDC) is designed to assess the health and nutritional status of adults and children in the United States. A mercury component was added in 1999, which assessed children 1 to 5 years of age, and women aged 16 to 49 years for mercury concentrations and dietary histories related to fish consumption. The objective was to describe the distribution of Hg blood concentrations in U.S. children and women of childbearing age and its association with sociodemographic characteristics and fish consumption.

Based on analysis of these data, measures of Hg exposure in women of childbearing age and children aged 1 to 5 years generally fall below levels of concern.[36] However, approximately 8% of women of childbearing age have blood mercury concentrations exceeding those associated with the EPA's RfD (5.8 ug/L). Values were 4-fold higher in those who had eaten fish in the last 30 days. NHANES could not examine geographic variation, and was not designed to provide estimates for groups that may be at increased risk of exposure. Nevertheless, extrapolating the NHANES data to the overall U.S. population suggests that more than 300,000 newborns each year in the United States will have blood mercury concentrations greater than those associated with the EPA's RfD.

Regional and population variations may be significant. In a one-year survey of an internal medicine practice in San Francisco, a substantial fraction of patients had diets high in fish consumption; of these, a high proportion had blood mercury levels exceeding the maximum level recommended by the EPA. The mean level for women in this survey was 10 times higher than the mercury concentrations found in the CDC population survey; some children were >40 times the national mean.[37]

Joint National Consumer Advisory on Fish Consumption

In 2001, the FDA and EPA issued national consumer advisories on fish consumption. The EPA advisory focused on recreationally caught freshwater fish. The advisory applied to areas where states had not provided specific guidance on untested waters. Consumers were instructed to check with state or local health departments for advice on waters where family and friends fish. Guidances are contained within the National Listing of Fish and Wildlife Advisories database, which includes all available information describing state, tribal, and federally issued fish consumption advisories in the United States for the 50 states, the District of Columbia, and four U.S. Territories, and in Canada for the 12 provinces and territories. The database contains information provided to the EPA; however, the scope of warnings issued by states varies considerably. The EPA's advisory warned women who are pregnant, or may become pregnant, and nursing mothers to limit their fish consumption to just 6 ounces per week (cooked) and to 2 ounces for children. The EPA recommended following the FDA's advice for ocean/commercial fish.

The 2001 FDA advisory addressed pregnant women and women of childbearing age who may become pregnant on the hazard of consuming certain kinds of fish that may contain high levels of MeHg. The FDA advised these women not to eat shark, swordfish, king mackerel, and tilefish. The FDA also recommended that nursing mothers and young children not eat these fish.

Otherwise, consumers should limit consumption of fish to an average of 12 ounces per week and follow the EPA advisory for recreationally caught fish.

In July 2002, the FDA's Food Safety Committee was asked to evaluate whether the FDA consumer advisory was adequate to protect pregnant women and women of childbearing age who may become pregnant. The Committee recommended a series of policy changes that included:

- better define what is meant by "eat a variety of fish" so that consumers can follow this recommendation effectively;
- work with other federal and state agencies to bring commercial and recreational fish under the same umbrella;
- publish a quantitative exposure assessment used to develop the advisory recommendations;
- develop specific recommendations for canned tuna, based on a detailed analysis of what contribution canned tuna makes to overall methylmercury levels in women;
- address children more comprehensively in the advisory to relate dietary recommendations in the advisory to the age/size of the child; and
- increase monitoring of methylmercury to include levels in fish and the use of human biomarkers.

These challenges were met for the most part. New monitoring data for MeHg in fish were compiled by the FDA in 2003 (see Table). In March 2004, the FDA and EPA released their joint advisory entitled: "What You Need to Know about Mercury in Fish and Shellfish-2004 EPA and FDA Advice for: Women who might become pregnant; Women who are pregnant; Nursing mothers; Young children." The joint advisory (see Appendix) has three main elements–a risk message; consumer advice; and additional information in the form of Frequently Asked Questions. This document is available at http://www.cfsan.fda.gov/~dms/admehg3.html.

The advisory is designed to balance the positive benefits of fish consumption with information on how to be confident that exposure to the harmful effects of mercury has been reduced, including information on which fish to choose via a list of lower Hg-containing fish.

Regional Fish Advisories

Advice regarding fish consumption is also relevant for regional advisories that apply to sport fish. The states and various federal programs have measured total Hg in fish and shellfish for several decades. Methylmercury comprises >90% of the mercury in fish tissue. Regional atmospheric sources may influence local water bodies and fish to the extent that commercial guidelines are not a good substitute for local fish advisories. The EPA maintains a Website that links to state fish advisories, making it fairly easy to find state advisories and information on fish from individual waterways within each state (www.epa.gov/ost/fish/states.htm). As new data on Hg in fish and shellfish are collected, and as new human health effects studies are completed, consumption advisories are periodically updated and refined. Regional advisories also have information on other important contaminants such as PCBs and dioxin.

Various means are used to transmit regional fish advisories to the public. Some states post warning signs at boat ramps and public fishing piers located at "hot" spots. The primary means of distributing the state or regional consumption advisories are by Internet Websites, which have the consumption advisories online and available as downloadable brochures. Some states issue their brochures with fishing licenses.

Little information is available on the effectiveness of these fish consumption advisories. It is important to know whether the general population is aware of these advisories and reduces consumption of contaminated fish by reducing its consumption of all fish, which would reduce the nutritional benefits of fish consumption. For example, a 12-state survey conducted in 2001 by the Consortium for Improving the Effectiveness of Mercury Fish Consumption Advisories found that only 20% of women of childbearing age were aware of mercury fish consumption advisories and basic information regarding mercury toxicity.[38] Institution of a new risk communication strategy led to some improvement in overall awareness.

National data on Hg concentration by species may not be applicable on a state or local scale. Different species from different oceans enter the U.S. through different ports and enter a complex distribution network. It is therefore important to compare state and local data on Hg concentrations to the national data.

Summary and Discussion

Divergent data from prospective epidemiological studies of maternal Hg exposure and childhood neurodevelopment, as well as concerns about Hg as a risk factor for both cardiovascular disease and neurodegeneration in adults, have prompted a reexamination of medical and public health issues related to Hg. A number of risk assessments have been conducted to inform government and public health decision-making to protect consumers through regulations on acceptable concentrations of Hg in fish, decisions on the regulation of electric power utilities that release mercury during the burning of fossil fuels, and the creation of fish advisory programs by state and local public health and environmental agencies.

Challenges remain in characterizing population risks, communicating individual risks, addressing adverse health effects, and implementing effective preventive measures. Consumers are confronted with multiple sources of advice and methods for communicating that advice from government agencies, states, local health departments, physicians, other health care providers, environmental advocates, scientific articles, and the media. Because of the complexity of the message, cultural and literacy barriers are formidable. The challenge is to provide information about fish without scaring people away from eating fish altogether.

An additional challenge for physicians is the evaluation of patients whose health problems may be attributed to, or exacerbated by, excessive dietary Hg consumption. Subpopulations at the higher end of the continuum of fish consumption include sport fishermen, commercial fishermen and their families, coastal and regional populations, Asian-Pacific islander and Native American populations, individuals pursuing a more healthy diet, and subsistence populations.

In addition to Hg, fish have variable concentrations of omega-3 fatty acids, as well as contaminants such as PCBs and dioxin. Because fish consumption is promoted as preventing heart disease and as good nutrition, many physicians have been advising their patients to increase fish consumption based on health benefits from omega-3 fatty acids. Consumer fish consumption advisories could be enhanced by making recommendations that emphasize which fish are high in omega-3 fatty acids but low in Hg, such as trout, shrimp, salmon, sardines, anchovies, etc. Additionally, alternatives to fish and shellfish tissue as a source of omega-3 fatty acids include fish oil-based dietary supplements. More comprehensive data are needed on the relative safety of these products with respect to Hg and other contaminants.

Some physicians will see patients who have excess Hg intake that might result in adverse health effects due to contaminants that may be present. The fish that are of most concern for coastal

populations, such as swordfish, shark, tile fish, and ahi and albacore tuna, have Hg levels similar to the Hg levels in the fish eaten by several cohorts where adverse developmental effects were detected. Environmental and dietary histories that encompass fish consumption should become part of a comprehensive health screen to identify those at risk for mercury accumulation. Sample case studies involving occupational and environmental history-taking are available on the Website of the Agency for Toxic Disease Substances Registry.[39]

The testing of mercury content in fish needs to continue. The results and advisories should be readily available where fish are sold to reduce the risk of mercury exposure during a lifetime of fish consumption. This approach needs to be combined with an effective message that serves to reduce consumption in those at risk while preserving consumption in those not at risk.

Questions remain about the long-term sequelae of early Hg exposure, the combined effects of inorganic mercury and MeHg, dose-response curves in adults, and the combined effects of multiple nutrients and neurotoxic substances. Long-term solutions to reduce dietary mercury exposure must rely on improving the quality of the food supply through reduced anthropogenic emissions of mercury that become incorporated into the food chain as MeHg.

RECOMMENDATIONS

The Council on Scientific Affairs recommends that the following recommendations be adopted in lieu of Resolution 516 (A-03) and the remainder of this report be filed:

1. Women who might become pregnant, are pregnant, or who are nursing should follow federal, state, and local advisories on fish consumption. Because these advisories may differ, the most protective advisory should be followed. **(New HOD Policy)**

2. Physicians should (a) assist in educating patients about the relative mercury content of fish and shellfish products; (b) make patients aware of the advice contained in both national and regional consumer fish consumption advisories; and (c) have sample materials available, or direct patients to where they can access information on national and regional fish consumption advisories. **(New HOD Policy)**

3. Testing of the mercury content of fish should be continued by appropriate agencies; results should be publicly accessible and reported in a consumer-friendly format. **(New HOD Policy)**

4. Given the limitations of national consumer fish consumption advisories, the Food and Drug Administration should consider the advisability of requiring that fish consumption advisories and results related to mercury testing be posted where fish, including canned tuna, are sold. **(New HOD Policy)**

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Table. New Data Compiled by the FDA on Methylmercury Concentrations in Fish

Mercury Data in Fish and Shellfish 2003[a]		
Fish	Mean Concentration (μg/g)	Range (μg/g)
Bluefish	0.318	0.139-0.479
Croaker	0.054	0.013-0.096
Grouper	0.569	0.072-1.205
Crawfish	0.028	0.014-0.047
Farm Raised Trout	0.033	0.015-0.110
Orange Roughy	0.485	0.013-0.762
Red Snapper	0.154	0.077-0.395
Trout, Seawater	0.328	0.022-0.744
Golden Tilefish	0.205	0.055-1.123
Whitefish	0.068	0.027-0.137
Black Seabass	0.127	0.058-0.352
Sardine	0.016	0.004-0.035
Albacore/white tuna	0.358	0.030-0.850
Light tuna	0.123	0.000-0.530

[a]Adapted from Schoeny R. The science behind the advisory. Mercury: Medical and Public Health Issues. April 29, 2004. Tampa, Fl.

Appendix

What You Need to Know About Mercury in Fish and Shellfish

2004 EPA and FDA Advice For: Women Who Might Become Pregnant Women Who are Pregnant, Nursing Mothers, Young Children

Fish and shellfish are an important part of a healthy diet. Fish and shellfish contain high-quality protein and other essential nutrients, are low in saturated fat, and contain omega-3 fatty acids. A well-balanced diet that includes a variety of fish and shellfish can contribute to heart health and children's proper growth and development. So, women and young children in particular should include fish or shellfish in their diets due to the many nutritional benefits.

However, nearly all fish and shellfish contain traces of mercury. For most people, the risk from mercury by eating fish and shellfish is not a health concern. Yet, some fish and shellfish contain higher levels of mercury that may harm an unborn baby or young child's developing nervous system. The risks from mercury in fish and shellfish depend on the amount of fish and shellfish eaten and the levels of mercury in the fish and shellfish. Therefore, the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) are advising women who may become pregnant, pregnant women, nursing mothers, and young children to avoid some types of fish and eat fish and shellfish that are lower in mercury.

By following these 3 recommendations for selecting and eating fish or shellfish, women and young children will receive the benefits of eating fish and shellfish and be confident that they have reduced their exposure to the harmful effects of mercury.

1. Do not eat Shark, Swordfish, King Mackerel, or Tilefish because they contain high levels of mercury.
2. Eat up to 12 ounces (2 average meals) a week of a variety of fish and shellfish that are lower in mercury.
    - Five of the most commonly eaten fish that are low in mercury are shrimp, canned light tuna, salmon, pollock, and catfish.
    - Another commonly eaten fish, albacore ("white") tuna has more mercury than canned light tuna. So, when choosing your two meals of fish and shellfish, you may eat up to 6 ounces (one average meal) of albacore tuna per week.
3. Check local advisories about the safety of fish caught by family and friends in your local lakes, rivers, and coastal areas. If no advice is available, eat up to 6 ounces (one average meal) per week of fish you catch from local waters, but don't consume any other fish during that week.

Follow these same recommendations when feeding fish and shellfish to your young child, but serve smaller portions.

Frequently Asked Questions about Mercury in Fish and Shellfish:

1. "What is mercury and methylmercury?"
   Mercury occurs naturally in the environment and can also be released into the air through industrial pollution. Mercury falls from the air and can accumulate in streams and oceans and is turned into methylmercury in the water. It is this type of mercury that can be harmful to your unborn baby and young child. Fish absorb the methylmercury as they feed in these waters and so it builds up in them. It builds up more in some types of fish and shellfish than others, depending on what the fish eat, which is why the levels vary.

2. "I'm a woman who could have children but I'm not pregnant - so why should I be concerned about methylmercury?"
   If you regularly eat types of fish that are high in methylmercury, it can accumulate in your blood stream over time. Methylmercury is removed from the body naturally, but it may take over a year for the levels to drop significantly. Thus, it may be present in a woman even before she becomes pregnant. This is the reason why women who are trying to become pregnant should also avoid eating certain types of fish.

3. "Is there methylmercury in all fish and shellfish?"
   Nearly all fish and shellfish contain traces of methylmercury. However, larger fish that have lived longer have the highest levels of methylmercury because they've had more time to accumulate it. These large fish (swordfish, shark, king mackerel and tilefish) pose the greatest risk. Other types of fish and shellfish may be eaten in the amounts recommended by FDA and EPA.

4. "I don't see the fish I eat in the advisory. What should I do?"
   If you want more information about the levels in the various types of fish you eat, see the FDA food safety website www.cfsan.fda.gov/~frf/sea-mehg.html or the EPA website at www.epa.gov/ost/fish.

5. "What about fish sticks and fast food sandwiches?"
   Fish sticks and "fast-food" sandwiches are commonly made from fish that are low in mercury.

6. "The advice about canned tuna is in the advisory, but what's the advice about tuna steaks?"
   Because tuna steak generally contains higher levels of mercury than canned light tuna, when choosing your two meals of fish and shellfish, you may eat up to 6 ounces (one average meal) of tuna steak per week.

7. "What if I eat more than the recommended amount of fish and shellfish in a week?"
   One week's consumption of fish does not change the level of methylmercury in the body much at all. If you eat a lot of fish one week, you can cut back for the next week or two. Just make sure you average the recommended amount per week.

8. "Where do I get information about the safety of fish caught recreationally by family or friends?"
   Before you go fishing, check your Fishing Regulations Booklet for information about recreationally caught fish. You can also contact your local health department for information about local advisories. You need to check local advisories because some kinds of fish and shellfish caught in your local waters may have higher or much lower than average levels of mercury. This depends on the levels of mercury in the water in which the fish are caught. Those fish with much lower levels may be eaten more frequently and in larger amounts.

For further information about the risks of mercury in fish and shellfish call the U.S. Food and Drug Administration's food information line toll-free at 1-888-SAFEFOOD or visit FDA's Food Safety website www.cfsan.fda.gov/seafood1.html. For further information about the safety of locally caught fish and shellfish, visit the Environmental Protection Agency's Fish Advisory website www.epa.gov/ost/fish or contact your State or Local Health Department. A list of state or local health department contacts is available at www.epa.gov/ost/fish.

REPORT 1 OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH (I-06)
Mercury Pollution
(Resolution 411, A-05)
(Reference Committee J)

EXECUTIVE SUMMARY

Objective: To review the major anthropogenic (human-caused emissions) sources of mercury (Hg) in the United States, the mobility of environmental mercury, and actions taken by the Environmental Protection Agency (EPA) and the U.S. government to address these issues and reduce the population exposure burden.

Methods: English-language reports were selected from a MEDLINE search of the literature from 1995 to 2006 using the search terms "mercury/*analysis," in combination with "air pollutants, environment" or "environmental monitoring," and the text terms "regulation" or "emission." In addition, the Web sites of the EPA, Government Accounting Office, National Resources Defense Council, and the Mercury Policy Project were searched for relevant information.

Results: Release of Hg from the burning of fossil fuels, incineration of medical and municipal waste, chlor-alkali plants, and other sources resulting from human activity have increased the rate of Hg release into the environment. Anthropogenic emission from coal-fired electric power-generating facilities, chlor-alkali production, waste incineration, and other industrial activities now account for approximately 70% of the 5,500 metric tons of Hg that are released into the earth's atmosphere annually. Once in the environment, interconversion between the different forms of Hg occurs. Atmospheric deposition tends to be greater in areas closer to emission sources and in locations with more rainfall, setting up a scenario where local and regional sources can create "hot spots" of relatively high Hg deposition. In an effort to address mercury emissions in this country, the EPA promulgated the Clean Air Mercury Rule (CAMR), which implements a so-called "cap-and-trade" system for power plant emissions of mercury. On March 10, 2005, in a separate but related action, the EPA issued the Clean Air Interstate Rule (CAIR), intended to reduce air pollution that moves across state boundaries. This rule is intended to cap emissions on sulfur dioxide and nitrogen oxides from power plants in 28 eastern states and the District of Columbia. Much of the putative benefits ascribed to CAMR actually derive from control technologies mandated by CAIR. The approach advocated by CAMR could allow hot spots of local deposition to continue unabated.

Conclusion. Mercury is a global pollutant, a major contaminant in the marine food supply, a serious neurotoxin, particularly in the developing fetus, and possibly a promoter of cardiovascular disease. Man-made emissions and manufacturing processes account for more than half of the annual global mercury burden, with significant variation among countries and continents of the world. The United States is the first country to regulate the major remaining source of uncontrolled mercury emissions (ie, coal-fired electricity generating plants), although some states have gone substantially further in moving to reduce Hg emissions. While the market-driven approach taken by the EPA will reduce mercury emissions over the next three decades, more could be done immediately by using existing control technology, thus minimizing the potential for certain local and regional citizenry to continue to bear a disproportionate exposure burden. The United States opposed a binding international treaty on mercury, but is cooperating in a voluntary manner with other countries to address several aspects of the mercury burden. Further progress is needed in reducing the use of mercury in manufacturing and other devices. The development of economically feasible mercury control technologies should help accelerate regulatory-based, as well as voluntary reductions in Hg emissions.

Action of the AMA House of Delegates 2006 Interim Meeting: Council on Science and Public Health Report 1 Recommendations Adopted, and Remainder of Report Filed.

REPORT OF THE COUNCIL ON SCIENCE AND PUBLIC HEALTH

CSAPH Report 1 - I-06

Subject: Mercury Pollution
(Resolution 411, A-05)

Presented by: Mohamed K. Khan, MD, PhD, Chair

Referred to: Reference Committee J
(John H. Vassall, MD, Chair)

Resolution 411 (A-05), introduced by the Illinois Delegation at the 2005 Annual Meeting and referred to the Board of Trustees, asks:

> That our American Medical Association endorse the reduction of mercury usage in manufacturing whenever possible, especially in chlorine manufacturing; and
>
> That our AMA urge the U.S. to lead the development of a binding protocol to reduce mercury pollution worldwide.

Methods

English-language reports were selected from a MEDLINE search of the literature from 1995 to 2006 using the search terms "mercury/*analysis," in combination with "air pollutants, environment" or "environmental monitoring," and the text terms "regulation" or "emission." In addition, the Web sites of the U.S. Environmental Protection Agency (EPA), Government Accounting Office, National Resources Defense Council, and the Mercury Policy Project were searched for relevant information.

Background

The Council previously discussed the human health effects of mercury (Hg) in Council on Scientific Affairs (CSA) Report 13 (A-04). The critical target organ for Hg toxicity is the brain.[1] The developing nervous system is more susceptible than the adult nervous system. Fetal exposure to large amounts of methylmercury (MeHg) from maternal consumption of fish results in a pattern of severe neurodevelopmental defects and fatalities.[2] Chronic low-dose prenatal MeHg exposure from maternal consumption of fish has been associated with more subtle decrements in several measures of neurological development, which may resemble a number of learning disabilities present in the overall population of children.[3] As noted in CSA Report 13 (A-04), contemporary data on mercury exposure in U.S. women and children are available from the National Health and Nutrition Examination Survey (NHANES). This cross-sectional national survey conducted by the Centers for Disease Control and Prevention (CDC) is designed to assess the health and nutritional status of adults and children in the United States. A mercury component was added in 1999, which assessed children 1 to 5 years of age, and women aged 16 to 49 years. Extrapolating the NHANES data to the overall U.S. population suggests that each year in the United States more than 300,000 newborns will have blood mercury concentrations exceeding the EPA's exposure reference dose (ie, the estimated daily intake that is likely to be without appreciable risk of harmful effects. The body burden of Hg also may be a risk factor for cardiovascular disease in adults.[4-6] Thus, reducing the environmental burden of this toxic metal is an important public health issue.

Action of the AMA House of Delegates 2006 Interim Meeting: Council on Science and Public Health Report 1 Recommendations Adopted, and Remainder of Report Filed.

Because CSA Report 13 (A-04) addressed the human health effects of mercury and the genesis of regulatory exposure limits, these issues are not revisited in this report, which focuses on Hg emission and manufacturing sources, and on recent actions intended to reduce the environmental burden of Hg. This report briefly reviews the major anthropogenic (human-caused emissions) sources of mercury in the United States, the mobility of environmental mercury, and actions taken by the EPA and the U.S. government to address these issues.

Relevant AMA Policy

The most relevant AMA policy on this issue supports the "maximum feasible reduction of all forms of air pollution, including particulate, gases, toxicants (such as Hg), irritants, smog formers, and other biologically and chemically active pollutants" and that "governmental control programs should be implemented primarily at those local, regional, or state levels which have jurisdiction over the respective sources of air pollution and the population and areas immediately affected" (Policy H-135.998, AMA Policy Database).

Mercury Emissions

Mercury is a global pollutant that cycles in the environment, exchanging among air, soil, and water, and back again because of both natural phenomena and human activities. Volcanoes and deep sea vents are large natural contributors. Environmental mercury also is derived from the weathering or mining of rock containing Hg ore (ie, HgS or cinnabar) and from the incineration and burning of fossil fuels. Major man-made sources (or uses) of elemental Hg include coal-burning electric power plants; municipal, medical, and hazardous waste incinerators; commercial/industrial boilers; chlor-alkali plants; gold mining; cement production; and mercury-containing products (eg, thermometers, blood pressure monitors, lamps, batteries, electronic switches and devices). Although volcanoes and other natural sources release substantial amounts of elemental Hg into the environment, anthropogenic emission from coal-fired electric power-generating facilities, chlor-alkali production, waste incineration, and other industrial activities now account for approximately 70% of the 5,500 metric tons of Hg that are released into the earth's atmosphere annually.[7-9] Anthropogenic releases of Hg have substantially increased the entry of Hg into the environment; by some estimates by a factor of 3 to 5 times since pre-industrial times, and by another analysis, a 10-fold increase.[10]

In some parts of the world, man-made Hg emissions are increasing, but in this country emissions declined from about 220 tons in 1990 to 115 tons in 1999 because of new requirements on incinerators.[11] Among U.S. industrial sources, coal-fired utility plants account for approximately 40% of this burden. These, and other plants that combust other fossil fuels (ie, petroleum, natural gas), account for about two-thirds of U.S. electricity generation, but are also a major source of air pollutants including Hg, as well as fine particulate matter, sulfur dioxide, and nitrogen oxides, which are regulated under the Clean Air Act. Two other potentially large sources of Hg are not well quantified; namely, mobile sources and chlor-alkali plants.[12] The EPA has now promulgated regulations for all major sources of Hg emissions, although not to the same extent.

Environmental Mobility

Once in the environment, the different forms of Hg interconvert, with sequences of emission, deposition via particles or precipitation, and revolatization. The nature of Hg emissions from coal-fired electric power plants varies depending on the technology and the type of coal used , but roughly 50% is elemental Hg.[13] Atmospheric mercury is mostly elemental Hg; this global pool may remain airborne for extended periods and distances. Particulate and reactive mercury (both organic and

inorganic) deposit more quickly and travel much shorter distances from the point of emission; thus, their relative atmospheric concentrations are much smaller. Atmospheric deposition tends to be greater in areas closer to emission sources and in locations with more rainfall, setting up a scenario where local and regional sources can create "hot spots" of relatively high Hg deposition. According to the EPA, the highest deposition rates occur in the southern Great Lakes, the Ohio Valley, the Northeast, and scattered areas in the Southeast. The link between industrial emission and Hg concentration in the oceans is less well understood.[14,15]

After deposition, conversion of inorganic to organic mercury is accomplished by microorganisms or abiotic processes, particularly in aquatic sediment. Once in its predominant organic form (MeHg), bioaccumulation occurs. Some ecosystems (ie, low-alkaline lakes and streams with dissolved, decomposed plant or bacterial matter) are more active in accelerating this conversion. Thus, Hg, particularly MeHg, is an established, worldwide environmental pollutant and is concentrated in the food chain in aquatic systems, especially in larger predatory fish. The amount of MeHg in any given seafood or freshwater fish depends on the species, its age/size, and the waters from which it came. An in-depth analysis of the fate and transport of Hg can be found in the EPA's 1997 Mercury Study Report to Congress.[16] For further discussion of issues related to mercury and fish consumption see CSA Report 13 (A-04) (http://www.ama-assn.org/ama/pub/category/15842.html). An analysis for clinicians of the relative toxicity of various types of fish, with a summary sheet for patients to use in selecting fish for consumption can be found at http://www.mercuryaction.org/uploads/providers_guide.pdf.

Clean Air Mercury Rule

The path to the Clean Air Mercury Rule was somewhat "hazardous" in its own right. It was triggered by the 1990 Amendments to the Clean Air Act, under which the EPA was to submit to Congress a study on the risks of hazardous air pollutants from power plants. The Agency was sued in 1992 by the Natural Resources Defense Council for not including electric power plants on the initial list of emitting sources to be regulated under Section 112 of the Clean Air Act, and by the Sierra Club in 1994 for missing the deadline for submitting the Utility Air Toxics study to Congress. Under a settlement (consent agreement) reached in 1994, the EPA agreed to complete its Utility Air Toxics Study by November 1995 and determine whether it was "appropriate and necessary" to regulate power plants under Section 112. Subsequently, this deadline was extended until February 1998. In the meantime, the EPA submitted a Mercury Study Report to Congress in 1997. This report analyzed mercury emissions, their potential health and environmental impacts, and the availability of control technologies.[16]

Ultimately, the Utility Air Toxics Study was completed in February 1998.[17] In this report, the EPA provided: (1) a description of the electric utility steam-generating industry; (2) an analysis of emissions data; (3) an assessment of hazards and risks due to inhalation exposures to 67 hazardous air pollutants (HAPs), including mercury; (4) assessments of risks due to multipathway (inhalation plus non-inhalation) exposures to four HAPs (radionuclides, mercury, arsenic, and dioxins); and (5) a discussion of alternative control strategies.

In December 2000, the EPA issued a finding that the regulation of mercury emissions from power plants (using the maximum achievable control technology [MACT] approach) was appropriate and necessary under Section 112 of the Clear Air Act.[18] This finding triggered other provisions of the consent agreement, including a requirement for the Agency to propose MACT standards for electric power plants by December 2003, and finalize them by March 15, 2005. Based on Section 112, for new facilities, the MACT standard must be at least as stringent as the degree of emissions control achieved at the best-controlled similar source (ie, the best-demonstrated technology). For existing

facilities, Section 112 allows a somewhat less stringent standard, in which limits equal to the average performance of the best 12% of comparable sources generally must be achieved. However, at present, no U.S. coal-fired electric power plants have installed equipment specifically designed to control mercury emissions. Thus, data collection has been on existing technologies, and has required extensive analysis to establish potential control levels. However, four full-scale field tests of a technology called "activated carbon injection" (ACI) have been conducted by the Department of Energy, with emission reductions of 60% to 90%, depending on the type of coal and type of auxiliary control equipment utilized. ACI has also proved capable of reducing Hg emissions by more than 90% on incinerators and other facilities.

Finally, on January 30, 2004, the EPA issued a proposed rule to substantially cut mercury emissions from coal-fired power plants.[19] This proposal purported to cap emissions from coal-fired electric power plants and provided companies with flexibility to achieve early reductions of mercury, but offered two alternatives for controlling mercury emissions. One approach would require power plants to install MACT controls under Section 112 of the Clean Air Act. This proposal met the Agency's requirement under the consent agreement by proposing MACT standards that would apply on a facility-by-facility basis, reducing nationwide mercury emissions by 14 tons (or about 30% from the 1999 level) by early 2008. The EPA's analysis and MACT determination were widely criticized.[20]

The second approach used Section 111(d) of the Clean Air Act, with the EPA proposing to unilaterally amend its December 2000 regulatory finding, arguing that while MACT standards were "appropriate," they were not "necessary" since emissions could be controlled under Section 111(d) This approach freed the EPA from the requirement to regulate toxic air emissions under the more health-protective, technology-based MACT standards. The proposal relying on Section 111(d) created a market-based "cap and trade" program that, if implemented, would reduce nationwide utility emissions of mercury in two phases.[19,21] The EPA claimed that when fully implemented, mercury emissions would be reduced by 33 tons (nearly 70%).

Despite substantial opposition among medical and public health organizations, including more than 600,000 comments submitted to the Docket, the Clean Air Mercury Rule (CAMR) was promulgated on March 15, 2005.[22] In it, the EPA concluded that the MACT regulations were neither appropriate nor necessary, and in so doing reversed its previous (December 2003) finding. CAMR does establish the United States as the first country in the world to regulate mercury emissions from coal-fired electric power plants; however, this was accomplished by implementing the cap-and-trade system for power plant emissions of mercury. On March 10, 2005, in a separate but related action, the EPA issued the Clean Air Interstate Rule (CAIR), intended to reduce air pollution that moves across states boundaries.[23] This rule is intended to cap emissions on sulfur dioxide and nitrogen oxides from power plants in 28 eastern states and the District of Columbia.

CAMR establishes national and state rather than facility-specific caps on emissions of Hg. In the rule, the EPA assigned each state and two Native American tribes a total emissions allowance. Each must submit a plan revealing how it will meet the standards. Half of all Hg pollution comes from power plants in eight states (Pennsylvania, Texas, Ohio, Illinois, Indiana, Alabama, West Virginia, and Kentucky).[24] States are free to establish more stringent standards for new or existing units. An intermediate nationwide cap of 38 tons per year becomes effective in 2010, with a final cap of 15 tons per year nationwide in 2018. The intermediate cap reflects the level of emissions resulting from the "co-benefits" of controlling sulfur dioxide (SO_2) and nitrous oxide (NOx) under CAIR (see below). Facilities must demonstrate compliance with the standard by holding one "allowance" for each ounce of Hg emitted in any given year. Allowances are transferable among all regulated facilities. Utilities can either control Hg emissions directly by installing pollution controls or

purchase excess allowances from other plants that have decreased their emissions below the cap. These "early reductions" can also be banked for later use, which raises the specter that plants could delay compliance with the final cap by using up previously earned (and banked) allowances. The EPA asserts that such a cap-and-trade approach to limiting Hg emissions is the most cost-effective way to achieve the reductions in Hg emissions from the power sector.

Overall, this approach relies on coupling CAMR with CAIR.[23] Reductions in Hg emissions depend (initially) to a large extent on the SO_2 and NOx emission caps established under CAIR. This rule establishes a broadly applicable cap-and-trade program that significantly limits SO_2 and NOx emissions from the power sector. Through the expanded use of technologies commonly used to reduce SO_2 and NOx (eg, scrubbers; silicon-controlled rectifiers [SCRs]) to comply with CAIR, secondary benefits will accrue on Hg emissions. Therefore, the EPA believes that significant reduction in Hg emissions, especially oxidized Hg, can and will be achieved by the air pollution controls installed to reduce SO_2 and NOx, thereby reducing Hg emissions in a cost-effective manner. In taking this approach, the Agency relied on so-called "co-reduction" to achieve its Hg reduction targets, and anticipated little or no specific installed Hg control technology for coal-fired utility boilers, despite the large contribution to air pollution from this industry. The cap-and-trade approach is similar to the proposed "Clear Skies" legislation. Clear Skies would create a mandatory market-based program that would significantly reduce power plant emission of SO_2, NOx, and mercury by setting a national cap on each pollutant and permitting trading of allowances. This bill, however, was blocked from advancing to the Senate floor in March 2005, and will not be further considered in this report.

One main criticism of the EPA's approach is that it will not eliminate "hot spots" caused by local or regional polluters who purchase allowances rather than meet cap standards. Accordingly, local populations will still be at increased risk for adverse effects from mercury exposure. The concern over hot spots is exemplified by a study of mercury contamination in the Everglades, which showed a 75% decrease in mercury contamination of fish and wildlife after controls were placed on local incinerators and other sources of Hg.[25]

Additionally, many believe that the caps are too high, that the pace to achieve them is too slow, and that total emissions could be more significantly reduced by forcing individual plant compliance with a MACT-type approach. Field tests have proven the effectiveness of ACI for reducing mercury emission, and according to a report from the U.S. Department of Energy, this technology is suited for use on existing coal-fired boilers. These mercury-specific controls are already used on municipal waste combustors and medical waste incinerator facilities in the United States and Europe. Furthermore, the EPA's own Office of Research and Development estimated that the best level of emissions control at existing plants (which would have implications for a MACT-based strategy) could be achieved fairly simply via expanded use of fabric filters.[26] Combining the two processes has the potential to achieve a 90% reduction in Hg emissions.

Reconsideration of the Clean Air Mercury Rule. In response to petitions filed by states, tribes, industry, and environmental groups, the EPA reopened certain aspects of the final rule for public comment (by December 19, 2005) and reconsideration.[27,28] These included the method used to apportion the national caps to individual states, the definition of "designated pollutant," issues related to New Source Performance Standards, and the definition of covered units as including municipal waste incinerators and some industrial boilers. The EPA took final action on these petitions on May 31, 2006, by: (1) reaffirming its decision regarding interpretation of the Section 112 Rule; (2) amending regulatory language to clarify that CAMR does not apply to municipal waste incinerators (which are controlled under a separate rule); and (3) revising the performance standards for new subbituminous coal-fired units.

In June 2005, the American Academy of Pediatrics, the American Public Health Association, the American Nurses Association, and the Physicians for Social Responsibility jointly moved to intervene in the Hg litigation in federal district court, alleging that CAMR would not protect public health and that the Agency had ignored or failed to ascertain critical evidence about the health effects of its rule on vulnerable populations, especially children. Additionally, 11 states filed suit in opposition to the Mercury Rule alleging it will delay meaningful emission reductions for many years and perpetuate hot spots of local mercury deposition, thus posing a "grave threat" to the health of children (www.state.nj.us/oag/newsreleases05/pr20050518b.html).

Several legislative proposals also have aimed to reduce levels of mercury in the environment in consumer products, solid waste, utility and other emission sources, and in surface water. The legislative and administrative proposals differ on how much and how soon emission reductions would be required.

Manufacturing Sources

As noted above, major man-made sources (or uses) of elemental Hg include coal-burning electricity-generating plants, hazardous medical waste incinerators, institutional boilers, chlor-alkali plants, gold mining, cement production, and certain mercury-containing products (eg, thermometers, blood pressure monitors, lamps, batteries, electronic switches and devices). Considerable progress has been made in eliminating the use of mercury in lamps and thermometers, and in phasing out mercury-containing batteries.[29]

One remaining major concern in the manufacturing sector is the use of Hg in chlor-alkali plants. Some U.S. plants continue to manufacture chlorine by using vats of elemental Hg ("mercury-cells"). Individual cells typically are about 60 feet long and 9 feet wide, and are connected in series with 30 or more cells, each containing an electrolytic cell to generate the chlorine gas, and a separate decomposer, which produces hydrogen gas and caustic solution. A stream of liquid Hg flows in a continuous loop between these two elements. Saturated NaCl or KCl solutions are fed in, and an electric current is applied to the anode of the electrolytic cell, as well as the Hg stream, which functions as the cathode. Chlorine gas, caustic solution, and NaHg (or KHg) amalgam are formed. The chlorine is captured and produced for use in water purification, bleach, and a myriad of plastic, polyvinyl chloride, etc., type compounds.

Nine such plants are currently operating in eight states (Alabama, Delaware, Georgia, Louisiana, Ohio, Tennessee, West Virginia, and Wisconsin). One has committed to converting to mercury-free technology, and another has announced plans for closure. The other 53 U.S. chlorine-generating facilities have converted to mercury-free processes for chlorine generation and production. Companies using mercury-free processes rely on the use of membrane electrolysis technology. The electrolysis cells used in modern chlor-alkali plants employ large ion-exchange membranes and inert diametrically stable electrodes in place of the liquid-film mercury cathodes.

In Hg cell plants, Hg is emitted from the end cell ventilation system, and from the by-product hydrogen system. These plants are required to report their mercury emissions and off-site disposals each year. These self-reported emission figures amounted collectively to about 8 tons in 2003, and another 6 tons are attributable to "fugitive emission."[30] However, there is a huge discrepancy between what the industry reports having consumed and what it reports having released. For example, in 2000, the nine mercury-based chlorine plants in the United States used 79 tons of mercury during the manufacturing process, but only 14 tons were reported as released, leaving 65 tons unaccounted for. In 2003, the EPA issued a final rule intended to reduce mercury emissions from mercury cell chlor-alkali plants.[12] In its analysis, the EPA declared that "the fate of all the

mercury consumed at mercury cell chlor-alkali plants remains somewhat of an enigma."[10] The industry claims the remainder is contained on site within the manufacturing infrastructure and processing equipment.[12]

Global Context

Worldwide, 5000 to 6000 tons of mercury are emitted from all sources annually. On a continental basis, Asia generates more than half of the emissions, followed by Africa and Europe. Although U.S. anthropogenic emissions account for approximately 3% of the world total, significant problems remain with local emissions and deposition.[31]

International Actions for Reducing Mercury Emissions. In June 1998, the Executive Body of the United Nations Economic Commission for Europe Conventions on Long-Range Transboundary Air Pollution adopted the Protocol on Heavy Metals. The United States is a party to this legally binding agreement, which went into effect in December 2003.[32] The protocol targets three heavy metals: cadmium, lead, and mercury emissions from industrial sources (iron and steel industry, non-ferrous metal industry), combustion processes (power generation, road transport), and waste incineration. It largely commits the United States to stabilize emissions, but not reduce them, inasmuch as the reference year for the protocol is 1990, and Hg emissions have declined substantially in this country since that benchmark year.

At the twenty-third session of the United Nations Environment Program (UNEP) Governing Council in February 2005, attempts were made to move toward a legally binding global treaty to reduce mercury pollution. This approach was opposed by the United States, which instead advocated that governments agree to develop and implement partnerships as the preferred approach to reducing the risks to human health and the environment from the release of mercury and its compounds.[33] This approach was eventually agreed upon. Subsequently, the United States has been involved with four global partnerships, three of which have begun joint activities, including: (1) mercury reductions in the chlor-alkali sector; (2) mercury reductions in products; and (3) mercury management in artisanal and small-scale gold mining. A fourth initiative is intended to generate research to achieve a better understanding of the global cycling of mercury. The estimated amount of mercury coming into, and being transported from, individual countries is uncertain. This factor, together with a limited number of country-specific release inventories, and lack of standard measurement methods, limits the accuracy of modeling predictions and, therefore, the ability to quantify the effects of emission and use reductions.

Summary and Conclusion

Mercury is a global pollutant, a major contaminant in the marine food supply, a serious neurotoxin, particularly in the developing fetus, and possibly a promoter of cardiovascular disease. Man-made emissions and manufacturing processes account for more than half of the annual global mercury burden, with significant variation among countries and continents of the world. The United States is the first country to regulate the major remaining source of uncontrolled mercury emissions; namely, coal-fired electricity-generating plants, although some states have gone substantially further in moving to reduce Hg emissions.

While the market-driven approach taken by the EPA will significantly reduce mercury emission over the next three decades, there is general agreement that more could be done sooner by using existing control technology, and without the potential for local and regional citizenry to continue to bear a disproportionate exposure burden (ie, generation of hot spots) that may continue to occur under a national cap-and-trade approach. The United States opposed a binding international treaty on

mercury, but is cooperating in a voluntary manner with other countries to address several aspects of the mercury burden. It is also a member of one binding agreement intended to reduce mercury emissions on an international basis, although this agreement will not affect U.S. emissions.

Further progress is needed in reducing the use of mercury in manufacturing and other devices, using the alternatives that are already available. Furthermore, the development of economically feasible mercury control technologies should help accelerate regulatory and voluntary reductions in sources of Hg emissions.

RECOMMENDATIONS

The Council on Science and Public Health recommends that the following statements be adopted in lieu of Resolution 411 (A-05) and the remainder of this report be filed:

1. That our American Medical Association (AMA) recognize that the trading of air pollutants is potentially harmful for vulnerable populations, and that the Clean Air Mercury Rule is inconsistent with our AMA's health-protective approach to air pollution. **(New HOD Policy)**

2. That our AMA encourage state governments to be proactive in protecting citizens from harmful mercury emissions. **(Directive to Take Action)**

3. That our AMA encourage reduction in mercury use in manufacturing wherever possible, and recognize that more must be done using available and emerging technology to reduce mercury emissions. **(Directive to Take Action)**

4. That our AMA recommends increased vigilance, monitoring and tracking of mercury use and emissions in chlor-alkali facilities that use mercury in manufacturing processes. **(Directive to Take Action)**

5. That our AMA encourage the U.S. government to assume a leadership role in reducing the global mercury burden and work toward promoting binding, health-protective international standards. **(Directive to Take Action)**

No Significant Fiscal Impact

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July 6, 2007

The Honorable Albert R. Wynn, Chairman
The Honorable John Shimkus, Ranking Member
Energy and Commerce Committee
Subcommittee Environment and Hazardous Materials
United States House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

Dear Chairman and Ranking Member:

The National Mining Association (NMA) appreciates you holding the hearing record open to allow NMA the opportunity to submit its views on the Mercury Export Ban Act of 2007 (H.R. 1534) to the Environment and Hazardous Materials Subcommittee. NMA is a national trade association that represents the producers of most of America's coal, metals, industrial and agricultural minerals; the manufacturers of mining and mineral processing machinery, equipment and supplies; and engineering, transportation, financial and other businesses that serve the mining industry.

NMA has a particular interest in H.R. 1534 given the potential impact a mercury export ban would have on our members in the precious metals mining sector. NMA is not opposed in principle to a mercury export ban, but strongly believes that a system addressing long-term and/or permanent storage and liability issues must be developed before a ban is implemented. One of the unavoidable consequences of the production of precious metals is the production of mercury. Thus, NMA has a vital interest in ensuring that disposal and management issues are first resolved. Further, we believe there could be unintended consequences on human health and the environment that are contradictory to the essential purpose of the bill.

I. Mercury Produced In The Precious Metals Mining Sector

Mercury occurs naturally in various mineral forms, primarily cinnabar or mercury sulfide, which is recovered along with precious metals from ores during the mining process. During beneficiation and mineral processing, ores and mineral concentrates can be heated to high temperatures that release mercury from the solid state into a gaseous state. This mercury is captured and recovered.

It is common to find mercury minerals deposited with gold and silver. NMA's members, however, do not engage in primary mercury mining and processing. In

fact, some of NMA's members have pledged through the International Council on Mining and Metals, to never open a primary mercury mine. Furthermore, the U.S. precious metals mining industry does not use mercury in any form to recover precious metals at any of its operations in the U.S. or elsewhere.

Currently, major U.S. precious metals mining companies sell mercury as a commodity to facilities in the United States that further refine the mercury and sell it both domestically and internationally. One prominent mercury processor with which several mining companies do business is Bethlehem Apparatus, operated by Bruce Lawrence who provided testimony to the subcommittee at a June 22, 2007, hearing.

II. Position of the National Mining Association on H.R. 1534

The U.S. precious metals mining industry is not opposed, in principle, to a mercury export ban, especially if it can be determined that an export ban would result in reduced global mercury emissions, less primary mercury mining and less global use of mercury. The industry recognizes that mercury emissions pose an important global environmental challenge that should be addressed. U.S. mining companies are actively engaged in reducing their own emissions. Furthermore, mining companies strive to implement mercury stewardship practices that enhance control over mercury inventories and the downstream supply chain to the extent possible. However, it is widely recognized that the supply chain surrounding the transport and sale of mercury into least-developed countries and to the artisanal mining sector is not well understood and lacks international transparency. We believe this lack of transparency needs to be corrected.

NMA, however, has three principal concerns with H.R. 1534:

- **A ban alone may not achieve reduced emissions**

  While NMA can support an export ban in concept, we believe that an export ban is only one avenue of several that must be employed to: (1) reduce environmental and human health impacts associated with illicit and irresponsible uses; (2) promote conversion from mercury to non-mercury technologies and products; and (3) raise awareness of the risks of mercury. While NMA cannot predict all impacts of a ban, it is safe to say that global mercury prices will rise in the short term. Sustained high prices may stimulate resumption of primary mercury mining abroad by artisanal and small/medium mining concerns. It is not difficult to extract mercury from ore as it requires no special technology or expertise.

- **Higher mercury prices may not stop use in artisanal mining**

  The largest and currently most uncontrollable source of global mercury emissions is artisanal mining in developing nations. Millions of the world's

poor are involved in this subsistence mining, and mercury has been the reagent of choice for generations. Even if mercury prices increase substantially, we believe there may not be a widespread switch to a safer reagent without significant resources devoted to educating subsistence miners about the severe health problems caused by mercury, providing low to no-mercury alternatives and enabling technology transfer. Moreover, the high market prices for precious metals produced by these miners likely would more than offset any increase in production costs attendant to higher mercury prices. Compared to other artisanal mining methods, mercury amalgamation is cheap (even with higher mercury prices), easy, and traditional for millions of poor miners in developing countries.

Even if mercury prices were forced high enough so that mercury would be out of artisanal miners' reach, there is no assurance that miners would choose *safer* technology. One possibility is that artisanal miners would mine the mercury directly. Another possibility of concern is the use of cyanide by artisanal miners who do not have the expertise to handle it in an environmentally sound manner. In Indonesia, the use of mercury-cyanide extraction has already been observed in artisanal mining camps.

- **NMA opposes a ban before resolving long-term and/or permanent storage and liability issues**

H.R. 1534 would first impose a ban and then create an advisory committee to develop a solution for long-term storage/disposal issues. NMA believes that this approach is backwards. A more logical sequence would be to first establish a legal, cost effective, limited liability mechanism for the long-term and/or permanent storage and/or disposal of any excess mercury that will be generated by an export ban before any such ban goes into effect. NMA believes that the federal government is the ideal party to assume responsibility for the safe, long-term and/or permanent storage of elemental mercury. Federal agencies, such as the Departments of Energy and Defense, have demonstrated the capability of long-term safe storage of mercury.

NMA feels strongly that long-term/permanent storage and its attendant costs should not be borne entirely by the industries that generate or use mercury. Mining companies cannot simply stop producing mercury as a co-product of their operations. Once an export ban takes effect, however, mining companies will be barred from selling mercury, which is currently a viable commodity. The export ban will thus force mining companies to treat a marketable commodity as a waste management and disposal matter. NMA disagrees that the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6901 *et seq.*) contains the appropriate management standards for mercury. Under current RCRA standards, substantial issues exist as to whether and how the mercury produced by companies, if deemed a "waste," could be treated so as to render it non-hazardous.

In the end, an export ban would outlaw a revenue-producing activity, now legally engaged in by these companies, with no compensation or other redress. While the use of mercury in artisanal mining certainly is a major concern, there are legitimate uses of mercury (e.g., compact fluorescent light bulbs), including some that likely will expand in the future. While NMA understands the policy reasons for implementing an export ban, the cost of its implementation and the long-term liability associated with the ban should not be borne solely by the mining industry.

III. Congress Should Not Duplicate the EPA Stakeholder Process Already Underway

As other witnesses have already noted, the U.S. Environmental Protection Agency currently is coordinating a stakeholder process intended to develop data and recommendations to consider regarding long-term management of elemental mercury. In many respects, the stakeholder panel is charged with considering many of the issues that are contemplated to be taken up by the advisory panel that H.R. 1534 would create. Congress need not duplicate this process, which is already underway and that includes a representative slate of stakeholders.

If Congress proceeds with the creation of the Excess Mercury Storage Advisory Committee, Congress must amend H.R. 1534 to ensure a representative of the precious metals mining industry is included on the committee. As described in detail above, this industry would be uniquely and significantly impacted by the export ban. For that reason, the precious metals mining industry should be given the opportunity to participate in the committee as it develops a strategy for the long-term management of elemental mercury.

In conclusion, NMA strongly urges Congress to first establish a legal, cost-effective, limited liability mechanism for the long-term and/or permanent storage of elemental mercury prior to a ban going into effect. NMA also urges Congress to amend H.R. 1534 to allow a representative from the precious metals mining industry to participate on the advisory committee.

Again, we appreciate the opportunity to be heard on this issue and to submit these views to the subcommittee. If you have any questions please contact NMA Vice President of Government Affairs Rich Nolan at rnolan@nma.org or NMA Assistant General Counsel Tawny Bridgeford at tbridgeford@nma.org.

Sincerely yours,

Rich Nolan
Vice President, Government Affairs

The Nature Conservancy in Maine
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web nature.org/maine

June 20, 2007

The Honorable Tom Allen
U.S. House of Representatives
1127 Longworth House Office Building
Washington, DC 20515

Dear Representative Allen:

Thank you for sponsoring H.R. 1534, the Mercury Export Ban Act of 2007 and for co-sponsoring H.R. 1533, the Comprehensive National Mercury Monitoring Program Establishment Act. These bills would discourage the global mercury supply chain by banning its export from the United States and create a system to monitor mercury in soil, water, and living organisms and ensure that mercury regulation addresses hotspots.

Over the last half century, The Nature Conservancy has been known primarily for buying land - wildlife habitat – throughout Maine and throughout the United States. We now work with governments and partners in more than 30 countries around the globe as well. Our goal over these 50-plus years has been to make sure that the whole suite of plant and animal diversity that now populates our world - that we now enjoy and benefit from – will survive and similarly enrich the lives of future generations. Reducing the threat of mercury contamination stands as a high priority for The Nature Conservancy, especially in our Eastern United States region where it presents significant threats to a broad range of wildlife species.

The Conservancy encourages the United States to join several international actors, including the European Union, to ban on mercury exports and we urge federal agencies to stockpile mercury for safe disposition. We are also actively engaged in the research of the impact of mercury on biodiversity. These bills, if successfully implemented, will have a significant impact on the effort to reduce the effects of mercury throughout the world. We are grateful to attention to this very important issue.

The Conservancy looks forward to supporting your efforts to further these bills in the 110th Congress.

Sincerely,

Michael Tetreault
Executive Director

June 15, 2007

Representative Thomas Allen
1127 Longworth Office Building
Washington, DC 20515

Dear Representative Allen,

On behalf of Physicians for Social Responsibility's more than 21,000 members and activists, I wish to express our support for your legislation to protect human health from mercury pollution. Despite declining use of mercury in U.S. manufacturing, mercury pollution continues to pose a significant health threat to the American public. The Mercury Export Ban Act of 2007, HR 1534, would reduce this threat by banning the export of elemental mercury from the United States, thereby decreasing both the global availability and use of mercury.

As you know mercury is a potent neurotoxin that poses particular risks to children, infants and the developing fetus. The well-documented health effects of pre and post-natal exposure to mercury include: low birth weight, severe mental retardation, cerebral palsy, deafness, blindness and reduced cognitive abilities throughout life. Across the United States, millions of women possess blood mercury levels that present considerable risk of adverse birth outcomes. I commend you for your effort to reduce the threat to maternal and child health posed by mercury pollution.

While many uses of mercury for industrial processes have been banned or severely restricted in the United States, mercury pollution knows no international boundaries and mercury remains widely used in many countries around the world. As a transboundary pollutant, mercury released to the air can travel long distances before being deposited. Therefore, by allowing the export of mercury to countries lacking similar use restrictions, the United States risks having that mercury return to the country to be deposited in the soil or in water bodies where it can accumulate in fish and other wildlife and threaten those who eat these contaminated species.

The ban on United States exports of mercury required by your bill would close this gap in mercury pollution reduction efforts. Combined with similar legislation already passed in the European Union, your bill would significantly curtail mercury use worldwide.

HR 1534 also addresses the critical need for a plan for the long-term storage of mercury produced in the United States. By establishing a committee to determine the safest and most effective means for permanently storing elemental mercury produced by public and private entities, your legislation would mark a vital step toward preventing the release of mercury into the environment and better protecting American workers from exposure to mercury in the workplace.

Thank you again for your effort to protect public health by promoting legislation to reduce the availability and use of mercury worldwide.

Sincerely,

Michael McCally, MD
Executive Director
Physicians for Social Responsibility

Cc: Rep. John Dingell
Rep. Joe Barton

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The Honorable Albert Wynn
Chairman
Environment and Hazardous
Materials Subcommittee
U.S. House of Representatives
Washington, DC 20515

The Honorable John Shimkus
Ranking Member
Environment and Hazardous
Materials Subcommittee
U.S. House of Representatives
Washington, DC 20515

June 21, 2007

RE: SUPPORT H.R. 1534, MERCURY EXPORT BAN ACT OF 2007

Dear Congressman:

On behalf of our members, Oceana encourages your support of H.R. 1534, Mercury Export Ban Act of 2007. Mercury is a neurotoxin that is not only harmful to the ecosystems and wildlife, but also humans. The Mercury Export Ban Act of 2007 is a step in the right direction in reducing the amount of harmful mercury in the environment.

Mercury is primarily a neurotoxin, which means it attacks the central nervous system. Its effects are often subtle enough not to be recognized immediately, but more and more people are learning that their health problems could be due to mercury exposure. Nervous system problems can include impaired coordination, tremors, irritability, memory loss, depression, blurred vision and a tingling sensation in the skin. Other symptoms include fatigue, headache, decreased concentration and muscle or joint pain.

An EPA scientist estimated that one in six pregnant women has enough mercury in her blood to pose neurological risks to her developing baby. This means that hundreds of thousands of newborns each year in the United States may be exposed to enough mercury to hinder nervous system development.

Oceana believes that HR 1534, the Mercury Export Ban Act of 2007, is a positive step in reducing harmful mercury in our environment.

HR 1534 would:

- Prohibit the sale, distribution or transfer of mercury by Federal agencies unless the transfer is for storage only.

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- Create an "Excess Mercury Storage Advisory Committee" to develop environmental and health requirements to safely store mercury; to estimate of the amount of mercury that will need to be properly stored; and to suggest various storage and disposal options.

- Prohibit the export of mercury from the United States by January 1, 2010.

Oceana urges you to support H.R. 1534 and we look forward to working with you and your staff to find additional opportunities to reduce the amount of mercury in our environment.

Very truly yours,

Michael F. Hirshfield, Ph. D.
Senior Vice President for North America and Chief Scientist

National Electrical Manufacturers Association
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June 29, 2007

Honorable Albert R. Wynn, MD, Chairman
Subcommittee on Environment and Hazardous Materials
Committee on Energy and Commerce
2125 Rayburn House Office
Building, Washington, DC 20515

RE: Comments Regarding "H.R. 1534, the Mercury Export Ban Act of 2007"

Dear Chairman Wynn:

The National Electrical Manufacturers Association (NEMA) is the primary trade organization representing the interests of the electrical manufacturing industry in the U.S. Our approximately 450 member companies manufacture products used in the generation, transmission and distribution, control, and end-use of electricity. NEMA's Lamp Section encompasses the world's leading producers of lamps used in the commercial, industrial, institutional, residential, automotive, and specialty lighting markets.

Attached for your consideration are comments submitted on behalf of the NEMA lamp section concerning "H.R. 1534, the Mercury Export Ban Act of 2007." In short, our members fear that, if enacted, this legislation would seriously threaten the viability of recycling operations and hinder the growing use of energy efficient lamps in the US. If you have questions or wish to discuss our position in further detail, feel free to contact me at 703-841-3249 or mar_kohorst@nema.org.

Sincerely yours,

Mark A. Kohorst
Senior Manager - Environment, Health & Safety
National Electrical Manufacturers Association

CC Members - Subcommittee on Environment and Hazardous Materials

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National Electrical Manufacturers Association
Statement for the Record of the June 22, 2007 Hearing
Subcommittee on Environment and Hazardous Materials
House Committee on Energy and Commerce on the
"H.R. 1534, the Mercury Export Ban Act of 2007"

Chairman Wynn, Ranking Member Shimkus, Members of the Subcommittee,

Thank you for the opportunity to provide this Statement for the Record of this important hearing.

The National Electrical Manufacturers Association (NEMA) is the trade association of choice for the electrical manufacturing industry. Our approximately 450 member companies manufacture products used in the generation, transmission and distribution, control, and end-use of electricity. These products are used in utility, medical imaging, industrial, commercial, institutional, and residential applications. Domestic production of electrical products sold worldwide exceeds $120 billion. In addition to our headquarters in Rosslyn, Virginia, NEMA also has offices in Beijing, São Paulo, and Mexico City.

NEMA's Lamp Section represents manufacturers of lamps used in the commercial, industrial, institutional, residential, automotive, and specialty lighting markets. The members of the NEMA Lamp Section have a comprehensive product stewardship effort designed to produce better lighting products and systems, in a five-part program: minimize mercury content of lamps, increase product life, improve lighting efficiency, label products and encourage recycling.

Mercury is an essential element in the operation of fluorescent lamps and, although research is ongoing, the most advanced lighting companies in the world have not developed commercially viable zero-mercury technology.

However, fluorescent lamp manufacturers have made significant strides in recent years to reduce the mercury used in their products. For example, the lamp industry has reduced its use of mercury in lamps from 23.6 tons in 1990 to 7 tons in 2003 while sales increased. The mercury used in a 4-foot T8 lamp has declined from 30 milligrams (mg) in 1994 to 8 mg and lower in 2007.

In addition, in March NEMA manufacturers of compact fluorescent lamps (CFLs) committed to cap the amount of mercury in their models at 5 mg for low-wattage lamps and 6 mg for lamps 26-40 watts. More information about this commitment, which is open to all CFL companies and

is being converted into a NEMA technical standard that will be submitted to the American National Standards Institute for approval as an American National Standard, is available at http://www.cfl-mercury.org.

In 2003, NEMA lamp manufacturers initiated a nationwide program to label fluorescent and high-intensity discharge (HID) lamps that contain mercury and their packaging. This harmonized national approach allows for the efficient and economic distribution of energy efficient lighting. In addition, this labeling is now required in ten U.S. states (Vermont, New Hampshire, Maine, Connecticut, Massachusetts, Rhode Island, New York, North Carolina, Minnesota and Washington). A standardized label on lamp packaging informs the user if the product contains mercury, and encourages the user to visit the http://www.lamprecycle.org website or call an 800 phone number for lamp recycling information that applies to their jurisdiction. Since the mercury label is also present whenever someone purchases a replacement lamp, users are constantly reminded of their disposal obligations, without the necessity of retaining the existing packaging.

The aforementioned website, http://www.lamprecycle.org, established and maintained by the member companies of the NEMA Lamp Section, provides a one-stop source for lamp recycling information nationwide. The website contains a list of recyclers as well as links to all state websites with information about spent lamp management. Lamp recyclers and others actively promote the use of this website. NEMA also partnered with the Alliance of Lighting and Mercury Recyclers (ALMR) and the Solid Waste Association of North America (SWANA) to receive an $800,000 grant from EPA to undertake lamp-recycling promotion for businesses on a nationwide scale. That program is underway and spent lamps from businesses are already collected and recycled through an efficient and effective third-party network. Lighting manufacturers have been working with major national retailers on development of take-back programs for CFLs, primarily, and have not been able to overcome the existing barriers. Each manufacturer staffs their own 800 phone number so that users without access to the web can also obtain the same information provided on the website.

With the prospects for growth of collection and recycling of mercury-containing lamps, the NEMA Lamp Section is concerned about the possible unintended consequences of H.R. 1534 on the mercury lamp recycling industry and on the lamp industry. If mercury lamp recyclers do not have an alternative to export of the mercury they reclaim from spent lamps, we are concerned that this could have a knock-on effect for their capacity to deal with what we expect will be a growing pool of collected spent mercury-containing lamps, including CFLs from households. Other consequences for mandatory or voluntary collection programs and the purchase of these lamps could follow. We do not want H.R 1534 to become a barrier to the recycling of lamps and as such also become a barrier to the consumer adoption of energy efficient fluorescent lamps, including CFLs.

Thank you very much for the opportunity to provide these comments for the record. Please feel free to contact Kyle Pitsor, Vice President, Government Relations or Mark Kohorst, Senior Manager, Environmental Health and Safety, should you have questions. We look forward to continuing to work with you on matters of importance to our industry.

Contact Information:

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ONE HUNDRED TENTH CONGRESS

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July 30, 2007

Michael Shannon, M.D., M.P.H.
Professor of Pediatrics
Harvard Medical School
Children's Hospital Boston
300 Longwood Avenue
Boston, MA 02115

Dear Dr. Shannon:

Thank you for appearing before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007, at the hearing entitled "H.R.1534, the Mercury Export Ban Act of 2007." We appreciate the time and effort you gave as a witness before the Subcommittee.

Under the Rules of the Committee on Energy and Commerce, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you from certain Members of the Committee. In preparing your answers to these questions, please address your response to the Member who has submitted the questions and include the text of the Member's question along with your response.

To facilitate the printing of the hearing record, your responses to these questions should be received no later than the close of business on **Monday, August 13, 2007**. Your written responses should be delivered to **2125 Rayburn House Office Building** and faxed to **(202) 225-2899** to the attention of Rachel Bleshman. An electronic version of your response should also be sent by e-mail to Ms. Bleshman at **rachel.bleshman@mail.house.gov**. Please send your response in a single Word formatted document.

Thank you for your prompt attention to this request. If you need additional information or have other questions, please contact Caroline Ahearn at (202) 225-2927.

Sincerely,

JOHN D. DINGELL
CHAIRMAN

Attachment

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Albert R. Wynn, Chairman
Subcommittee on Environment and Hazardous Materials

The Honorable John Shimkus, Ranking Member
Subcommittee on Environment and Hazardous Materials

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

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August 14, 2007

Rachel Bleshman
Legislative Clerk
House Committee on Energy and Commerce
2322 Rayburn House Office Building
Washington, DC 20515

Dear Ms. Bleshman,

Attached please find responses to the additional questions submitted by the subcommittee members to Michael Shannon, MD MPH FAAP in the wake of the July 22 hearing on a ban on elemental mercury exports.

Please do not hesitate to contact me if the American Academy of Pediatrics may be of further assistance. Thank you!

Sincerely,

Cynthia Pellegrini
Assistant Director, Federal Affairs

Responses to Questions from the Honorable Albert R. Wynn

1. **The United Nations' Global Mercury Project has conducted health assessments in a number of artisanal and small-scale gold mining areas and has published its findings. At a number of these areas, health researchers discovered that the miners and their families were suffering from symptoms of mercury exposure. Could you explain what mercury-related symptoms and conditions were documented in the health assessments? Could you explain what treatments there are for mercury exposure and whether these treatments might be available in the artisanal and small-scale gold mining area.**

According to the Global Mercury Project's Environmental and Health Assessment Report, the symptoms included, "tremors, poor balance, ataxia, and concentration problems,"[1] "sleep disturbance, excessive salivation, and metallic taste," and "fine tremor of eyelids, lips and fingers, ataxia, dysdiadochokinesis [inability to perform rapid, alternating movements] and altered tendon reflexes."[2]

Few treatments are available for acute mercury poisoning; those that do exist tend to have a high risk of complications and variable efficacy. It is highly unlikely that any treatment for acute mercury poisoning would be available in the remote and poverty-stricken areas in which artisanal gold mining usually occurs.

2. **What impact will mercury exposures, such as the ones described in the United Nations Health assessments, have on the children living in these communities? What medical and societal problems might they face in the future?**

A substantial body of literature demonstrates that exposure to high levels of elemental mercury can produce a range of health effects in children. For example, pregnant women exposed to mercury may produce children with mental retardation, blindness and spasticity. Children who have been exposed may experience future medical consequences such as movement disorders, as well as societal problems associated with learning disabilities and reduced employment and earning capacity.

3. **What impact will mercury exposures, such as the ones described in the United Nations health assessments, have on the children who may be born to women who have been living and working in these communities? What medical and societal problems might they face in the future?**

Circulating elemental mercury crosses the placenta and concentrates in the fetus. Children exposed to elemental mercury in utero can develop a range of neurocognitive, behavioral, and motor effects. As noted above, these can cause a wide range of medical and societal consequences.

---

[1] Environmental and Health Assessment Report. Global Mercury Project, July 2006, p. 8, available at http://web.uvic.ca/~gmp/documents/non_country%20specific/GMP-E&HA-Final_Report-July24-06.pdf.
[2] Ibid, p. 17.

Responses to Questions from the Honorable John Shimkus and the Honorable Joe Barton

1. **Since the Department of Energy stopped selling recovered mercury in the mid 1990s, has there been a change in the level of mercury related illness domestically, worldwide?**

The American Academy of Pediatrics is unaware of any systematic tracking of domestic or worldwide mercury-related illness that would allow for a meaningful analysis of illness levels before and after the Department of Energy halted such sales.

2. **Do drugs and immunizations that are used to treat life-threatening illnesses in children and adults rely on mercury in their manufacture? If so, would the limiting of exports have any effect on the availability of critical medicines to people in the U.S. and around the world?**

The American Academy of Pediatrics would defer to the expertise of the manufacturers to discuss the content of elemental mercury in drugs or immunizations. Therefore we would not be able to assess the impact, if any, on the limitation of the export of elemental mercury on medicines to people in the U.S. and globally.

3. **What is the proper amount or dose of mercury that is harmful cases serious harm to a child, a fetus, a grown adult?**

Various federal agencies have set recommended upper levels of mercury intake designed to prevent damage caused by long-term exposure (as opposed to acute toxicity.) These range from 0.1 mcg/kg/day (as recommended by the Environmental Protection Agency), to 0.4 mcg/kg/day (as recommended by the Food and Drug Administration). Other safe ranges have been proposed by the Centers for Disease Control's Agency for Toxic Substances and Disease Registry (ATSDR), and the World Health Organization.

4. **Do you believe a ban on elemental mercury exports to be among the most effective means of lessening the risk of exposure to Americans? What other actions might government take to efficiently reduce exposure to the vulnerable persons you mention in your testimony?**

The American Academy of Pediatrics strongly supports the reduction of methylmercury exposure through the more aggressive regulation of coal-fired power plants. Coal-fired power plants are the single greatest source of mercury exposure in the United States. Based on the serious health threat this source of mercury poses to child health and development, the AAP is currently participating in litigation against the U.S. Environmental Protection Agency regarding the insufficiency of its Clean Air Mercury Rule. The AAP firmly supports strict controls on mercury emissions from power plants to reduce both airborne mercury and methylmercury levels in water and fish.

5. **What health risks might be associated with storage sites of elemental mercury? How should elemental mercury be properly and safely stored?**

Precautions should be taken to ensure that elemental mercury does not come into contact with the skin and is not exposed to levels of heat that could cause vaporization, which could lead to inhalation. The American Academy of Pediatrics would defer to the superior expertise of other entities, such as the Occupational Safety and Health Administration, on further details of the appropriate storage of elemental mercury.

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July 30, 2007

Ms. Alice C. Williams
Deputy Associate Administrator for
Infrastructure and Environment
Office of Environmental Projects and Operations
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Ms. Williams:

Thank you for appearing before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007, at the hearing entitled "H.R.1534, the Mercury Export Ban Act of 2007." We appreciate the time and effort you gave as a witness before the Subcommittee.

Under the Rules of the Committee on Energy and Commerce, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you from certain Members of the Committee. In preparing your answers to these questions, please address your response to the Member who has submitted the questions and include the text of the Member's question along with your response.

To facilitate the printing of the hearing record, your responses to these questions should be received no later than the close of business on **Monday, August 13, 2007**. Your written responses should be delivered to **2125 Rayburn House Office Building** and faxed to **(202) 225-2899** to the attention of Rachel Bleshman. An electronic version of your response should also be sent by e-mail to Ms. Bleshman at **rachel.bleshman@mail.house.gov**. Please send your response in a single Word formatted document.

Thank you for your prompt attention to this request. If you need additional information or have other questions, please contact Caroline Ahearn at (202) 225-2927.

Sincerely,

JOHN D. DINGELL
CHAIRMAN

Attachment

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Albert R. Wynn, Chairman
Subcommittee on Environment and Hazardous Materials

The Honorable John Shimkus, Ranking Member
Subcommittee on Environment and Hazardous Materials

The Honorable Gene Green, Member
Subcommittee on Environment and Hazardous Materials

Department of Energy
National Nuclear Security Administration
Washington, DC 20585

August 13, 2007

The Honorable Albert R. Wynn
Chairman
Subcommittee on Environment and Hazardous Materials
Committee on Energy and Commerce
House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

On June 22, 2007, Alice C. Williams, Deputy Associate Administrator for Infrastructure and Environment, Office of Environmental Projects and Operations, National Nuclear Security Administration, testified regarding the stockpile of mercury located at the Y-12 National Security Complex at Oakridge National Laboratory.

Enclosed are the answers to questions for the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Renee Wilhite, on (202) 586-7597.

Sincerely,

David A. Campbell
Director
Office of Congressional, Intergovernmental
and Public Affairs

Enclosures

Printed with soy ink on recycled paper

QUESTIONS FROM CONGRESSMEN SHIMKUS AND BARTON

Q1. Are there any estimates into the likelihood of the 3-L carbon steel flasks needing to be replaced? More broadly, has the Department, in its estimates of possible storage costs, come up with any estimates on the probabilities of flasks needing to be replaced or other contingencies that relate to storage costs?

A1. The Department has no way of calculating probabilities for the likelihood of needing to reflask mercury. There is no history of a seamless flask leaking, and the current condition of theY-12 flasks appear to be good. However, the Department chose, for planning purposes, to assume that sometime during the next 40 years, the mercury would need to be reflasked, and this was factored into our 40-year estimate for mercury storage. During the same period of time, there is a probability of 100% that the roof will need to be replaced. The cost of roof replacement was also factored into the 40-year cost estimate.

QUESTIONS FROM CONGRESSMEN SHIMKUS AND BARTON

Q2. What is the estimated cost of a clean up if a mercury leak were to occur?

A2. The Department has not developed detailed cost estimates for a mercury spill, but rather has developed storage methods which minimize the probability of a mercury spill. Because of the construction of the building (i.e., a "dike" around the inside perimeter and sealed concrete flooring) a leak would be contained, and the mercury would not be released to the environment. Therefore, the cost of mitigating the leak would be relatively low, and would consist of costs for personal protective equipment for the workers, retrieval of the spilled mercury, and repackaging.

QUESTIONS FROM CONGRESSMEN SHIMKUS AND BARTON

Q3. You estimate that cost of mercury storage at the Y-12 facility could be close to $1 million per year. Can this be extrapolated into the long term future? Is the Department exploring alternative storage measures that could be employed now and in the future? Would there be a cost savings?

A3. The annual estimate of "storage only" costs is approximately $400,000 per year. These costs include general facility maintenance; utility costs; facility/project management; monitoring and inspections; and safety evaluation. However, additional significant costs would be incurred if reflasking were necessary. This cost would constitute a significant portion of the 40-year estimate of $42 million. At this time, the Department is not actively pursuing alternative storage measures. The Department works closely with the Defense Logistics Agency to share "lessons learned" regarding mercury storage, so that Y-12 can be assured that the "best practices" that support both safe and cost effective storage are being used.

QUESTIONS FROM CONGRESSMEN SHIMKUS AND BARTON

Q4. Are there less expensive procedures for mercury storage available? What are the methods in Europe for mercury storage and what are the costs associated there?

A4. The storage facilities and practices used at Y-12 were initiated in the 1960's following the shutdown of the lithium enrichment process which required large quantities of elemental mercury. It is possible that a lower yearly cost of storage could be achieved, utilizing a new building design, which might allow for decreased surveillance costs, and less maintenance. However, at this time, it is not in the best interests of the Department to proceed with designing and building a new facility.

The Department is following the policy debates that are ongoing in the European Union, in an effort to be aware of all potential storage/disposal options. At this time, it appears that many policy makers in the European Union would prefer permanent disposal of elemental mercury. Since this is not yet technically viable, the European Union supports interim storage in above ground facilities that appear to be similar to what is at Y-12 until a safe solution is found for permanent storage.

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July 30, 2007

Mr. Mark Smith
Deputy Director
Office of Research and Standards
Massachusetts Department of
Environmental Protection
One Winter Street
Boston, MA 02108

Dear Mr. Smith:

Thank you for appearing before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007, at the hearing entitled "H.R.1534, the Mercury Export Ban Act of 2007." We appreciate the time and effort you gave as a witness before the Subcommittee.

Under the Rules of the Committee on Energy and Commerce, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you from certain Members of the Committee. In preparing your answers to these questions, please address your response to the Member who has submitted the questions and include the text of the Member's question along with your response.

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Sincerely,

JOHN D. DINGELL
CHAIRMAN

Attachment

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Albert R. Wynn, Chairman
Subcommittee on Environment and Hazardous Materials

The Honorable John Shimkus, Ranking Member
Subcommittee on Environment and Hazardous Materials

Questions for Dr. C. Mark Smith by the Honorable Albert R. Wynn

1. At the June 22, 2007, hearing before the Subcommittee on Environment and Hazardous Materials, you testified on behalf of the Environmental Council of the States (ECOS), that 50 percent of Massachusetts water-bodies tested positive for one or more species of fish with sufficiently high levels of mercury and that ECOS has estimated that mercury deposition will need to be reduced by 86 to 98 percent to achieve the water quality objectives of the Northeast states. Does ECOS agree that it does not make sense for States, citizens, and industry to use government and private resources to recover mercury, only to then sell it on the global market where it will come back to harm our health and pollute our environment?

Answer: Chairman Wynn, ECOS agrees that it does not make sense to recover and recycle elemental mercury if it is subsequently used in ways that result in releases that pollute the environment and ultimately returns to impact our states via atmospheric transport and deposition or in fish that our citizens consume. However, ECOS does believe that provisions should be made to accommodate recycling and reuse for a limited number of essential uses where non-mercury alternatives are not available, provided certain criteria are met. These criteria can be found in the Quicksilver Caucus (QSC) Principles for Management of Commodity Grade Mercury, principles #3 and #8. The QSC also identified a very limited set of such uses in its Principles, including use in energy efficient florescent lighting, amalgam for certain dental health applications and some scientific pieces of equipment.

2. The Quicksilver Caucus of ECOS has developed a set of principles for the management of commodity grade mercury. Pursuant to these principles, exporting surplus elemental mercury to developing countries where it can result in unsafe exposures should be prohibited, and it should be exported to other countries only if the importing country does not have sufficient domestic supplies of mercury; and if the export is for essential uses.

    a. Given the human exposure to elemental mercury that has been documented at artisanal and small scale gold mining operations, as well as the environmental contamination, would export of elemental mercury from the United States for this purpose fit within the ECOS principles?

Answer: Chairman Wynn, you are correct in noting that the export of elemental mercury for artisanal and small-scale gold mining applications that result in unsafe exposures would be inconsistent with principle #8 of the QSC Principles for Management of Commodity Grade Elemental Mercury.

    b. ECOS has identified only a few remaining "essential uses" for elemental mercury, specifically: dental amalgam; fluorescent light bulb manufacturing; and in certain scientific devices. Isn't it correct that these items account for only a very small percentage of the global use of elemental mercury?

Answer: Chairman Wynn, yes it is correct that the identified essential uses account for a small fraction of global uses of mercury. ECOS does, however, believe that it is appropriate and important to ensure that adequate supplies are available for these uses.

c. The European Union, Japan, China and a number of other countries have their own supplies of elemental mercury and do not need to depend on sales of surplus mercury from the United States for their needs. Isn't it correct that countries that have sufficient domestic supplies of mercury would not meet the criteria set out in the ECOS principles?

Answer: Chairman Wynn, the QSC Principles for Management of Commodity Grade Elemental Mercury do state, in principle #8, that mercury should only be exported to other countries for essential uses where it can be demonstrated that the country does not have sufficient domestic sources of secondary mercury.

Questions for Dr. C. Mark Smith by the Honorable John Shimkus and the Honorable Joe Barton

1. You state a principle of the Quicksilver Caucus is to have the United States: "cease the export of elemental mercury, except for a limited number of essential uses where it can be demonstrated that the receiving country does not have sufficient domestic sources of its own secondary mercury." As you know, H.R. 1534 makes no exceptions for these exports. Please explain why this exception is necessary?

Answer: Honarable Representatives Shimkus and Barton, ECOS believes that it is appropriate and important that adequate supplies of elemental mercury be available for a limited number of essential uses where mercury-free alternatives are not available. The QSC identified a very limited number of such uses in its Principles for Managing Commodity Grade Elemental Mercury. These include use in florescent lights, which provide environmental benefits attributable to their energy efficiency; dental amalgam, needed for certain dental health applications; and some scientific equipment. An exemption process for exports for such essential uses, provided the additional criteria articulated in the QSC Principles for Managing Commodity Grade Elemental Mercury (principles #3 and #8) would ensure this.

2. Some of your fellow panelists have suggested that the Federal government needs to take title to and store excess elemental mercury. You also call for the mercury to be sequestered and safely stored within the United States, but you reference the role that the private sector can play. Do you support a Federally-owned and operated central storage facility? If so, does ECOS support using Yucca Mountain as a nuclear waste repository? If not, what are the appropriate public-private roles?

Answer: ECOS believes that sequestration of excess commodity mercury is appropriate and necessary to protect public health and the environment. At this time ECOS does not favor any specific set of public-private roles. A federally-owned and operated central

storage facility is one among many potential options that could be developed and effectively implemented. Whatever the management structure, the states are very concerned that the storage of excess elemental mercury be implemented in a manner that provides long-term safeguards to protect public health and the environment; limits potential state financial liabilities; and is responsive to state and local concerns regarding siting, operational and monitoring issues. As I have not been involved in nuclear waste storage issues I am unaware of ECOS positions, if any, regarding the use of Yucca Mountain as a nuclear waste repository.

3. ECOS approved resolution 07-1 states: "ECOS urges the federal government and other interested and affected parties to develop recommendations to eliminate mercury stockpiles in excess of essential national needs through the development of a safe long term storage plan." I understand from the testimony of EPA on the first panel, that EPA's Office of Pollution Prevention and Toxics created a commodity-grade mercury stakeholder panel to assess options for managing non-federal supplies of mercury. The stakeholder participants, including you and state environmental representatives from California and Wisconsin are providing individual advice on the charge questions, not collective advice. I assume this is what ECOS called for in its resolution and that you and your colleagues can appropriately advise EPA of your concerns and help it make sound judgments on future action by EPA regarding long-term storage issues. Is this correct?

Answer: I and the other ECOS and the QSC representatives are honored to be participants in the USEPA Stakeholder panel on Managing Commodity Elemental Mercury. We are all doing our best to inform USEPA about state positions and concerns on this issue and to provide helpful advice. To their credit the USEPA participants are knowledgeable about the issue and have been receptive to stakeholder input. This panel provides an excellent first step towards the development of a management strategy for excess commodity mercury. To provide ongoing input and to address additional issues beyond the scope of the current stakeholder panel (e.g. essential use criteria) ECOS suggests that opportunities for state, public and expert input should continue.

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MARSHA BLACKBURN, TENNESSEE

July 30, 2007

Mr. Bruce Lawrence
President
Bethlehem Apparatus Company, Inc.
P.O. Box Y
Hellertown, PA 18055

Dear Mr. Lawrence:

Thank you for appearing before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007, at the hearing entitled "H.R.1534, the Mercury Export Ban Act of 2007." We appreciate the time and effort you gave as a witness before the Subcommittee.

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Sincerely,

JOHN D. DINGELL
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Committee on Energy and Commerce

The Honorable Albert R. Wynn, Chairman
Subcommittee on Environment and Hazardous Materials

The Honorable John Shimkus, Ranking Member
Subcommittee on Environment and Hazardous Materials

Responses to Questions from Certain Members of the Committee
Bruce J. Lawrence
President of Bethlehem Apparatus Company, Inc.

for the Subcommittee on Environment and Hazardous Materials
of the House Committee on Energy and Commerce
Hearing on "H.R. 1534, the Mercury Export Ban Act of 2007" held June 22, 2007

August 9, 2007

The following is in response to the Honorable John D. Dingell's July 30, 2007 letter transmitting questions from the Honorable John Shimkus and the Honorable Joe Barton regarding my testimony before the Subcommittee on Environment and Hazardous Materials at the hearing on "H.R. 1534, the Mercury Export Ban Act of 2007" held on June 22, 2007. I have listed each question verbatim, followed by my answer.

1. **Do you have any evidence or insight into an increase in mercury mining in China or elsewhere with the pending EU ban in the export of mercury? How would this likely intensify with a corresponding ban in the U.S.?**

Answer:

I believe it is too early for a response to be measured. Since the export ban is to go into effect at the end of 2010, I do not believe there will be a significant response until we are closer to that date. I believe a response should show by the end of 2008.

For the past three years, the market price for mercury has increased substantially. This increase was caused by the announced closing of mercury mining in both Spain and Algeria during 2004. During this period, the world mercury price increased from $150.00 per 76 pound flask to over $800.00 per flask. Excess stocks from the former Soviet Union were released to the market last year which caused the price to drop to around $500.00 per flask. During the period

where world prices were over $600.00 per flask, the response from China was to decrease imports of mercury and rely on their domestic production to meet demand for mercury.

Should the U.S. join the EU in banning mercury exports, I would expect world mercury prices to climb to well above $1,000.00 per flask. At this high price level, I also would expect China to maximize its domestic production of mercury to take advantage of the high profit potential.

2. Is it cheaper to mine virgin mercury in China or to buy it from the market? What is the mercury that is produced in China being used for?

Answer:

Companies who are involved in mercury mining in China also import mercury depending on world mercury prices. They have shown that they will import mercury when the price is below $500.00 per flask. I therefore believe that the profitable sale price for mercury produced in China is somewhere over $500.00 per flask.

According to Natural Resources Defense Council (NRDC), the principal uses of mercury in China for the year 2004 were:

Batteries	153 MT
Vinyl Chloride Monomer (VCM)	610 MT
Lamps	55 MT
Measuring Devices	292 MT
Small Scale Gold Mining (estimated)	200 MT
Total	1310 MT

Of particular note is China's use of mercury in the production of vinyl chloride monomer (VCM). VCM is a feed stock for the production of polyvinyl chloride (PVC) plastic pipes.

China's building and construction boom is driving increasing demand for PVC pipes, and in turn, increasing demand for VCM. As a result, the use of mercury for VCM production in China is growing and projected to increase to 1,000 tons per year. This particular use of mercury is required because China uses coal as the source material for VCM production. Mercury acts as a catalyst for the production of VCM from coal. In contrast, the U.S. and Western Europe use oil as the source material from VCM production. Oil-based VCM production does not require mercury.

3. How much "artisanal" mercury mining is there currently?

Answer:

My best guess is that artisanal miners use about 600 tons of mercury to produce about 600 tons of gold per year.

4. You quote that passage of H.R. 1534 would result in 540 tons of mercury pollution per year. You also encourage the resumption of sales from Federal stockpiles. Wouldn't at some point, with all of the reserves having been sold, there be a greater reliance on newly produced the use of mercury in manufacturing and then an even greater environmental impact?

Answer:

I believe that the world demand for mercury will decrease significantly by the time all mercury stocks are sold from both government and industry supplies because of increasing restrictions on mercury uses. Newly mined mercury used to supply this smaller world demand would also cause an environmental impact, but this impact should be proportionally smaller

because of the smaller demand. If we supply the higher current demand with mercury that has already been mined, then the overall environmental impact will be minimized.

5. How would Bethlehem Apparatus Company react to the release for sale of Federal mercury stockpiles and the ostensible fall in price? Would the plant increase production of goods that use mercury?

Answer:

In general, production of goods that use mercury would not increase if prices were to fall. Over the past 40 years, the cost of mercury has been relatively low. In this time period, the use of mercury by manufacturing has decreased substantially. In the U.S. alone, the consumption of mercury has dropped over 90%. The cause of the drop in use had nothing to do with the price of mercury and everything to do with the pressure from governmental and environmental organizations to discourage mercury use. Recent economical analysis of mercury use has recognized that mercury price has little effect on mercury use. Therefore, the ostensible fall in mercury price from the sale of mercury in stockpiles will have little effect in the production of goods that use mercury.

With respect to Bethlehem Apparatus Company, we do not produce goods that use mercury. We purify mercury and then sell the pure mercury to companies who produce goods that use mercury. If the Federal stockpiles were sold, we would expect that we would have to bid for that mercury along with other companies who supply mercury to manufacturers. The stockpile sales would allow companies who use virgin mercury (mercury produced from mercury mines) to substitute stockpile mercury for virgin mercury.

6. Is there a homeland security reason to store all of the commodity grade mercury used and imported into the United States?

Answer:

I do not believe there are any valid homeland security issues regarding mercury storage. Mercury is not ignitable or explosive and it is not highly toxic. There are many other chemicals that would yield a much greater human health and environmental health problem were they the target of an attack.

7. What do you think of a publicly sponsored, but privately contracted mercury storage facility to be used to store mercury long term? Do you think the price of mercury could sustain such an enterprise in view of the costs of storage?

Answer:

I have given a great deal of thought to how my company could store mercury in the long term. I frankly believe that it is not difficult to store mercury. The major problem has to do with current EPA regulations. If mercury storage is publicly sponsored then the issues of insurance and closure bonds would be solved. My guess is that is would cost about $300 per ton per year to store mercury properly.

I am not sure how the price of mercury can contribute to the cost of long term mercury storage. Long term storage is a multi-year ongoing expense. Mercury sales are a one time short term activity. I have no idea how you can combine the two.

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U.S. House of Representatives
Committee on Energy and Commerce
Washington, DC 20515–6115

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July 30, 2007

Mr. Cornel Holder
Administrator of the Defense National Stockpile Center
Defense Logistics Agency
Department of Defense
8725 John J. Kingman, Suite 2545
Ft. Belvoir, VA 22060

Dear Mr. Holder:

Thank you for appearing before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007, at the hearing entitled "H.R.1534, the Mercury Export Ban Act of 2007." We appreciate the time and effort you gave as a witness before the Subcommittee.

Under the Rules of the Committee on Energy and Commerce, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you from certain Members of the Committee. In preparing your answers to these questions, please address your response to the Member who has submitted the questions and include the text of the Member's question along with your response.

To facilitate the printing of the hearing record, your responses to these questions should be received no later than the close of business on **Monday, August 13, 2007**. Your written responses should be delivered to **2125 Rayburn House Office Building** and faxed to **(202) 225-2899** to the attention of Rachel Bleshman. An electronic version of your response should also be sent by e-mail to Ms. Bleshman at **rachel.bleshman@mail.house.gov**. Please send your response in a single Word formatted document.

Mr. Cornel Holder
Page 2

Thank you for your prompt attention to this request. If you need additional information or have other questions, please contact Caroline Ahearn at (202) 225-2927.

Sincerely,

JOHN D. DINGELL
CHAIRMAN

Attachment

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Albert R. Wynn, Chairman
Subcommittee on Environment and Hazardous Materials

The Honorable John Shimkus, Ranking Member
Subcommittee on Environment and Hazardous Materials

House Energy and Commerce Committee
Subcommittee on Environment and Hazardous Materials
Hearing Date: July 22, 2007
Hearing: H.R. 1534 Mercury Export Ban Act of 2007
Member: Rep Wynn
Witness: Cornel Holder

Question 1: With respect to Department of Defense's (DOD) consolidation of its mercury stockpile

a. How does this consolidation help protect human health and the environment?

b. What is the annual cost savings to DoD of managing its mercury at one site versus three sites? Please specify the cost savings in terms of staffing and personnel, building construction and maintenance, security, air monitoring, inspections, and overall facility management.

Response:

a. With mercury consolidation, the Department of Defense will be able to continue its oversight and positive control over the material it is charged to keep in the National Defense Stockpile (NDS), thus protecting human health and the environment. The material will be managed by employees who are trained and experienced with the handling of hazardous materials at a location where emergency preparedness plans are already in place. Additionally, having all the material in one place affords an ease of surveillance to ensure continued safe storage.

b. Mercury consolidation at the Hawthorne Army Depot (HWAD) will generate annual cost savings of approximately $500,000. Those savings take into consideration current versus future costs for staffing, rent, facility upkeep, security, air monitoring, and inspections. We expect to incur one-time costs of approximately $7.2 million to prepare HWAD warehouses for mercury storage. Those preparations include installation of fire and intrusion alarms and fire suppression systems. The one-time construction costs will be recouped within 15 years.

Question 2: What is estimated to be the incremental cost for managing a 76 pound flask of mercury at the Hawthorne facility?

Response: Annual mercury storage cost per pound at the Hawthorne Army Depot is computed to be $0.0516. The cost per flask would be $3.92 (76 pounds * $0.0516).

Question 3: At the June 22, 2007, hearing before the Subcommittee on Environment and Hazardous Materials, you testified that DNSC halted sales of mercury in 1994 due to concerns raised by EPA about mercury contamination of the environment. What specific concerns were raised by EPA?

Response: In 1994, EPA representatives met with the DNSC Administrator and voiced concerns about DNSC sales of mercury in light of worldwide mercury contamination issues. They were particularly concerned about mercury in the Great Lakes Basin and were engaged in a study of mercury contamination in the nation's waterways and fisheries. In 1995, EPA recommended that DNSC continue to suspend sales of mercury in consideration of the pending development of a comprehensive national strategy on the use of mercury in commercial products and the management of mercury-containing waste streams from the manufacture, use, and disposal of affected products. EPA's 1997 Mercury study Report to Congress addressed the links between human activities that release mercury from industrial and combustion sources and methyl mercury concentrations in humans and wildlife.

House Energy and Commerce Committee
Subcommittee on Environment and Hazardous Materials
Hearing Date: July 22, 2007
Hearing: H.R. 1534 Mercury Export Ban Act of 2007
Member: Rep Shimkus and Rep Barton
Witness: Cornel Holder

Question 1: Does DOD use any of the elemental mercury stored in the National Defense Stockpile? When is the last time it used any and what was it used for? Do you have any estimate of how much may be attributable to DOD that is not accounted for in the Stockpile?

Response:

a. No.

b. There have been no withdrawals of mercury from the NDS for DOD use.

c. There is no Department of Defense storage of elemental mercury other than the mercury stored in the NDS.

Question 2: Why was the Hawthorne Army Depot in Hawthorne, Nevada selected as the ideal location for consolidated storage of elemental mercury? Has any of the mercury from the three current sites been transported to the Hawthorne Army Depot? What kind of safety measures go into the $1.4 estimated transportation cost?

Response:

a. The Hawthorne Army Depot was selected primarily because it was a government-owned facility that could insure positive control of the mercury metal. For instance, the installation has a staff that is trained and experienced with the handling of hazardous materials and emergency preparedness plans are already in place.

b. No. We plan to begin shipments in late August or early September 2007.

c. The Surface Deployment Distribution Command (SDDC), the DoD expert on transportation, will help arrange for carriers that have appropriate insurance and licenses. Shipping procedures will be in accordance with U.S. Department of Transportation (DOT) guidelines and hazardous materials transportation regulations. Additionally, the mercury will be transported in closed tractor-trailers with tamper-proof seals and drivers will be trained and certified in handling hazardous materials. While not required by DOT, all trucks will be monitored throughout duration of each shipment by Global Positioning Satellite.

Question 3: Will EPA have any oversight authority over the Hawthorne Army Depot site?

Response: No. However, EPA is welcome to visit at any time.

Question 4: You state in your testimony all three options explored in the DNSC's Environmental Impact Statement would have "negligible to minor environmental impacts". The option of leaving the mercury in existing storage locations would not fit with your agency's long-term facility closure strategy. Considering consolidating the mercury in one location costs taxpayers an initial $1.4 million plus an annual $505,000 and selling the mercury brings in $83.6 million to the U.S. Treasury, why did the EIS recommend storing all mercury supplies in the Nevada facility and not selling it if both options appear to have "negligible to minor environmental impacts"?

Response: EPA, the Environmental Council of States, and others expressed concerns that mercury sales might lead to overall increased usage of mercury and hinder efforts to seek alternatives. In view of those concerns, it was determined that long term storage was in the best interest of the Department of Defense and the environment. With consolidation, the Department would have positive control over the material and the decision would be consistent with sound environmental stewardship.

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July 30, 2007

Mr. Arthur Dungan
President
The Chlorine Institute
1300 Wilson Boulevard
Arlington, VA 22209

Dear Mr. Dungan:

Thank you for appearing before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007, at the hearing entitled "H.R.1534, the Mercury Export Ban Act of 2007." We appreciate the time and effort you gave as a witness before the Subcommittee.

Under the Rules of the Committee on Energy and Commerce, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you from certain Members of the Committee. In preparing your answers to these questions, please address your response to the Member who has submitted the questions and include the text of the Member's question along with your response.

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Mr. Arthur Dungan
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Sincerely,

JOHN D. DINGELL
CHAIRMAN

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cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Albert R. Wynn, Chairman
Subcommittee on Environment and Hazardous Materials

The Honorable John Shimkus, Ranking Member
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August 13, 2007

The Honorable Albert R. Wynn
U.S. House of Representatives
Committee on Energy and Commerce
Washington, DC 20515-6115

Dear Congressman Wynn:

Thank you for the opportunity to appear before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007 at the hearing entitled "H.R. 1534, the Mercury Export Ban Act of 2007". Below are my responses to your questions.

1. *According to the Global Mercury Project's February 2007 report to UNEP, entitled "Global Impacts of Mercury Supply and Demand in Small-Scale Gold Mining," mercury emissions from artisanal and small scale gold mining operations contaminate international waters and air.*

   > *It is estimated that as much as 300 tonnes of mercury per annum are volatilized directly to the atmosphere, while 700 tonnes are discharged in mine tailings into soil, rivers and lakes. In addition to domestic pollution impacts, both air emissions and tailings discharge contaminate both international waters and air. (Annex 3, UNEP report: "Summary of Supply, Trade and Demand Information on Mercury" (November 2006) page 72)*

   Given this information, do Chlorine Institute member companies, such as Olin and PPG Industries that own the majority of the United States plants that continue to use mercury-cell technology, intend to sell 1,400 tons of mercury on the global market after 2010 when we know it presents serious long-term environmental and health hazards to millions of artisanal miners and their families, and can end up back in United States waters and in our environment through long range transport?

The Chlorine Institute can not speak directly for individual members. However, we can speak for the chlor-alkali industry as a whole. For more than five years, the Chlorine Institute and its mercury cell chlor-alkali producers have publicly supported that the U.S. government establish a policy for the retirement of mercury. The principles behind this support were provided in Exhibit 5 (Chlor-alkali Industry Principles) of our written testimony provided to the Subcommittee. The Institute first presented these principles at a NEWMOA-EPA workshop in Boston in May of 2002. During the conference, industry and environmental NGO officials met informally. While we did not reach a consensus on the retirement of mercury, I believe it is fair to state that there was general agreement that (1) the U.S. needs to establish a program to allow for the long-term management of surplus mercury, that (2) the government needs to play a significant role in managing this retirement program, and that (3) the government needs to bear

some of the costs. However, reluctance by the affected government agencies and Congress to move on this activity allowed it to die.

We believe it is unreasonable government policy to ban the export of the commodity mercury without the government first addressing the issue of how surplus mercury can be safely and securely permanently stored.

I participate as a member of the Commodity-Grade Mercury Stakeholder Panel convened by EPA. At the panel's third meeting in Denver on July 24-25, 2007, Dr. Kevin Telmer, of the University of Victoria, presented some of his research findings on artisanal mining. Some of the photos were quite graphic. One of the points made by Dr. Telmer was that artisanal miners were paying as much as $40/kilogram for mercury to extract gold. Because of the value of gold derived, small scale artisanal miners are willing to pay virtually whatever cost they have to obtain mercury.

Depriving world markets of the approximately 1,400 short tons (1,300 metric tons) of mercury potentially available from the chlor-alkali industry will have no impact on artisanal mining. Other sources of mercury will be found to meet the demand for gold. It is likely that a direct result of an export ban of commodity mercury from the United States will be an increase in primary mercury mining around the globe. Most agree that the release of mercury to the environment from primary mining is greater than that released from recycled mercury.

2. *In its testimony at the June 22, 2007, hearing before the Subcommittee on Environment and Hazardous Materials, the Chlorine Institute suggests that it supports international action to prevent the expansion of existing mercury mines or the opening of new mercury mines.*

    a. *Does the Chlorine Institute support the negotiation of a legally binding international mercury agreement as was proposed by a number of European countries several years ago?*

We believe the voluntary programs endorsed by UNEP are the best vehicles to reduce the use and emissions of mercury. The Partnership Programs have had success in reducing mercury use and emissions. The Chlorine Institute and its partners within the World Chlorine Council have been active participants in the Mercury Cell Chlor-alkali Sector Partnership. Dr. Telmer's work on artisanal mining also has had some success in at least using mercury more efficiently in this activity.

International treaties have had limited success in reducing emission and use of commodities such as mercury. They take at least five years and, more likely as much as ten years, to go into force. One recent such treaty is the UNECE Heavy Metals Protocol which includes mercury. This treaty, affecting mostly Europe, the United States, and Canada was negotiated for several years prior to its signing in 1998. The treaty did not go into force until December 29, 2003. Canada ratified the treaty in 1998 and the U.S. followed in 2001. Due to inaction by several member

states of the European Union, which were the strong proponents for the Heavy Metals Protocol, it did not go into effect until more than two years after the U.S. ratified it.

More importantly, it is clear that mercury use and emissions in most industrial applications are declining with the voluntary efforts already in place. In our written testimony, we provided the Subcommittee with a copy of our Ninth Annual Report to EPA which showed a decline in mercury use in the U.S. chlor-alkali industry of 94% in 2005 compared to the use in 1996. The two uses of mercury which are increasing are (1) industrial uses in China and (2) artisanal mining. We fail to see how an international treaty would affect these uses. China will continue to set a course that best represents its economic interests. For the foreseeable future, China's demand for mercury will continue to be large. Thus it appears to us that China would neither support nor implement such a treaty. Artisanal mining is practiced on a large scale in only a handful of counties. These countries are already empowered to better control these practices, but they choose not to do so. Again it is difficult for us to understand how an international treaty would change such practices.

b. *What specific legally binding international actions do you support to reduce the use of elemental mercury and prevent the opening of new mercury mines and expansion of existing mercury mines?*

As stated above, we fail to see how legally binding international actions would reduce the use and emissions of mercury in those geographic areas where use is increasing. We believe the voluntary actions that are in place in the various sectors, including chlor-alkali, have contributed to reductions in mercury use and emissions. Until we see an increased willingness to reduce mercury use and emissions by those involved in activities that are currently increasing, we see no likelihood of negotiating a meaningful treaty.

c. *Does the Chlorine Institute support making elemental mercury subject to the procedures of the Prior Informed Consent (PIC) Convention?*

The chemical industry has long supported the Rotterdam Convention on Prior Informed Consent (PIC), which currently addresses "mercury compounds", defined as "including inorganic mercury compounds, alkyl mercury compounds and alkyloxyalkyl and aryl mercury compounds." If it is ultimately determined that other forms of mercury should be included in the Convention, the Chlorine Institute would welcome review of all relevant background documents and scientific findings before providing a formal Institute position.

3. *Does the Chlorine Institute agree that surplus mercury resulting from the decommissioning of the 5 remaining chlor-alkali plants in future years after 2010, estimated to be between 1400 - 1500 metric tons, is the same material as the stockpiled excess mercury held by the Department of Energy and the Department of Defense?*

Any surplus mercury resulting from the decommissioning of any chlor-alkali plants is of the same quality as the stockpiled excess mercury held by the Department of Energy and the Department of Defense. This mercury could be used for the same purposes as mercury owned by the Department of Defense. The chlor-alkali plant mercury is commodity-grade mercury. Note that our estimate is that there are about 1,400 short tons (1,300 metric tons) of mercury in the five facilities potentially affected by this bill

Very truly yours,

Arthur E. Dungan

Arthur E. Dungan
President

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August 13, 2007

The Honorable Joe Barton
The Honorable John Shimkus
U.S. House of Representatives
Committee on Energy and Commerce
Washington, DC 20515-6115

Dear Congressmen Barton and Shimkus:

Thank you for the opportunity to appear before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007 at the hearing entitled "H.R. 1534, the Mercury Export Ban Act of 2007". Below are my responses to your questions.

1. *You state that mining interests, because they are a source of elemental mercury, need to be represented on the EPA Advisory Panel. Aren't stakeholders from the Colorado School of Mines, Newmont Mines on behalf of the International Council on Metals and Mining, as well as other academics with relevant background serving on this panel with you?*

My testimony refers to H.R. 1534. The provision in the bill that discusses the Excess Mercury Storage Advisory Committee does not have a provision for a representative of the mining industry. You are correct that the mining industry is represented on the Commodity-Grade Mercury Stakeholder Panel convened by EPA on which I serve. However, you should be aware, that the Commodity-Grade Mercury Stakeholder Panel is dramatically different from the Excess Mercury Storage Advisory Committee as described in the bill. The Commodity-Grade Mercury Stakeholder Panel exists to share information with EPA and other government officials. You should be aware that there will be no report of any recommendations from the panel at the end of the process. In addition, the panel has been repeatedly cautioned that its scope does not include reaching consensus on various aspects of storage of commodity-grade mercury. In my view, the Commodity-Grade Mercury Stakeholder Panel meetings should be considered a series of technical workshops to share expert opinions among both government agencies and affected constituencies. It is certainly not an advisory committee empowered to issue formal recommendations.

2. *You support a single permanent storage site for excess mercury that will be owned and operated by the Federal government. Does this site have to be federally owned or could it be a joint public-private partnership? Do you support the creation of a new site or the use of an existing DLA site? What would you recommend be the costs borne by industry for such storage and would you accept such storage if you still were liable under all Federal and state laws for environmental damages caused by releases of mercury either at the repository or its previous location?*

The Institute and its members believe that the permanent storage of mercury is a shared responsibility of both the industries owning or otherwise producing or recovering elemental mercury and the government. As noted in Exhibit 5 (Chlor-alkali Industry Principles) of our written testimony provided to the Subcommittee, the chlor-alkali industry is willing to discuss options concerning how the chlor-alkali industry can best insure that any surplus mercury from idled or converted sites is placed into that permanent storage and is not allowed to enter poorly managed commercial markets. We do believe that the government must take title to any mercury and provide oversight responsibility to insure that the mercury is safely and securely stored on a permanent basis. We believe the government must bear some of the costs in managing this mercury.

The U.S. government owns more than 5,000 metric tons of mercury. The chlor-alkali industry would have about 1,400 short tons (1,300 metric tons) of mercury that would be potentially affected by any export ban. Mercury from recycling processes, estimated at about 50 metric tons per year, and mercury from mining operations, estimated in excess of 100 metric tons per year, amount to about 6,000 metric tons over the next 40 years. Forty years is the basis for the actions taken by the Department of Defense Logistics in evaluating its long term plan. Mercury demand in the United States is estimated at 50 metric tons per year for a variety of needs (does not include chlor-alkali). If there were not any other sources of domestic supply, the mercury from chlor-alkali plants could readily be absorbed by the U.S. demand well within the 40 year time frame examined by DLA. Accordingly, we believe it is unreasonable for the chlor-alkali industry to bear the full costs of permanent storage of its mercury which could otherwise be sold.

During the most recent meeting of the Commodity-Grade Mercury Stakeholder Panel (July 24-25, 2007), I asked the question about the potential capacity of the DLA site in Hawthorne, Nevada to handle mercury beyond that being placed there by the DLA. The DLA was unwilling to share that information. At an earlier meeting, I suggested that instead of having the third meeting in Denver as proposed by EPA, the panel meet near the Hawthorne site and visit the site. The suggestion was rejected. For these reasons, I cannot fully answer your question about the capability of the DLA site to handle other surplus mercury. However, it is my belief that there is sufficient land capacity at the DLA site to handle all the nation's needs for permanent storage of mercury. Possibly additional warehouses need to be built. We believe it is in the nation's interest for all the mercury to be stored at as few sites as possible. Assuming my assumption about land availability is correct, we believe that the DLA site should be the preferred site for all surplus mercury.

Current law is unclear how surplus mercury would be regulated under a permanent storage scenario. Mercury is a commodity. However, if exports from the U.S. are banned, there clearly would be a surplus of mercury supply. Even so, we question whether such a surplus would make the storage of mercury fall under RCRA, which regulates discarded material, and arguably not that which remains a commodity on a domestic market. Whether RCRA or another regulation, including potentially a new one from state or local authorities, is the defining statute, the liability issue would continue for however long the mercury is stored. The current expectation is that the mercury would be stored forever so the liability would exist forever.

Our proposal is for the owners to contribute surplus mercury to the repository site (permanent stockpile site) free of cost to the repository and to pay a portion of the annuity cost for permanently storing the mercury. The estimated market value of this commodity grade mercury from the chlor-alkali industry is $14,000,000 [basis: 1,400 short tons at $5/pound]. We are not prepared to say how much of the annuity cost we would be prepared to pay until we could see what that cost would be. We would be unwilling to bear any greater cost than other groups who contribute to the excess mercury supply. Without some sharing of the costs by the government, and without the government assuming title to the mercury and responsibility for its safe and secure permanent storage, the chlor-alkali industry is unwilling to voluntarily enter into a permanent mercury retirement program.

Several years ago, I had the opportunity to visit the depot in New Jersey that is being closed. From what I have observed, I believe the DLA does an excellent job in safely and securely storing mercury. I do believe industry could be of help in reducing the costs in managing the facility. We believe the long term maintenance of storing the mercury in 76 pound flasks is not cost effective. Significantly larger containers, appropriately designed, should be considered for new sources of mercury entering the site. We would not re-flask any mercury when the integrity of the container is questioned, but would instead utilize significantly larger, appropriately designed containers. Another possible cost reduction is the elimination of all combustibles in the storage warehouses. Such elimination would then eliminate the need for a fire suppression system. Not only are such systems costly and a maintenance burden, but it is our understanding that issues related to fire suppression systems are a significant factor in delaying the relocation of existing stockpiles to the permanent site in Hawthorne, Nevada.

Either the DLA should be mandated to manage all the nation's surplus mercury or a separate small government agency should be established with the sole function of managing the mercury surplus stockpile, including the existing DLA and DOE mercury. Much of the work for operating the facility could be assigned to private contractors. An advisory committee could be set up to provide guidance to the government agency. This committee would be unpaid and would be comprised of interested industry groups, environmental groups, academia, government officials, and representative(s) of the area near to the storage site. The committee would meet not more than two times a year to review how safely and securely the responsible government agency is managing the site. The committee's role is advisory only, but they would be allowed to issue their recommendations to the public.

Very truly yours,

Arthur E. Dungan

Arthur E. Dungan
President

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U.S. House of Representatives
Committee on Energy and Commerce
Washington, DC 20515–6115

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July 30, 2007

Linda Greer, Ph.D.
Senior Scientist
Natural Resources Defense Council
1200 New York Avenue, N.W., Suite 400
Washington, D.C. 20005

Dear Dr. Greer:

Thank you for appearing before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007, at the hearing entitled "H.R.1534, the Mercury Export Ban Act of 2007." We appreciate the time and effort you gave as a witness before the Subcommittee.

Under the Rules of the Committee on Energy and Commerce, the hearing record remains open to permit Members to submit additional questions to the witnesses. Attached are questions directed to you from certain Members of the Committee. In preparing your answers to these questions, please address your response to the Member who has submitted the questions and include the text of the Member's question along with your response.

To facilitate the printing of the hearing record, your responses to these questions should be received no later than the close of business on **Monday, August 13, 2007**. Your written responses should be delivered to **2125 Rayburn House Office Building** and faxed to **(202) 225-2899** to the attention of Rachel Bleshman. An electronic version of your response should also be sent by e-mail to Ms. Bleshman at **rachel.bleshman@mail.house.gov**. Please send your response in a single Word formatted document.

Thank you for your prompt attention to this request. If you need additional information or have other questions, please contact Caroline Ahearn at (202) 225-2927.

Sincerely,

JOHN D. DINGELL
CHAIRMAN

Attachment

cc: The Honorable Joe Barton, Ranking Member
Committee on Energy and Commerce

The Honorable Albert R. Wynn, Chairman
Subcommittee on Environment and Hazardous Materials

The Honorable John Shimkus, Ranking Member
Subcommittee on Environment and Hazardous Materials

The Honorable Gene Green, Member
Subcommittee on Environment and Hazardous Materials

Linda Greer of National Resources Defense Council's Responses to Questions for the Record from House Committee on Energy and Commerce

From Rep. Wynn:

1. If the United States bans mercury exports, the price of mercury may go up in the global market. If the price of mercury rises, what impact would you expect to see on artisanal and small scale mining gold mining operations?

Mercury miners are sensitive to the price of mercury; therefore, if the price rises, we expect artisanal and small scale mining (ASM) operations to reduce their use of mercury, via a change in mining methods, an increase their recycling of mercury, and/or a transition to mercury-free gold extraction processes where possible. The United Nations Industrial Development Organization (UNIDO), which addresses ASM in its Global Mercury Project, agrees with this assessment. Recently UNIDO identified whole ore amalgamation of gold ore with mercury as the largest source of mercury pollution in ASM operations, and stated that "a rising mercury price is a significant added incentive to eliminate this hazardous and economically inefficient practice." [1] UNIDO also called on nations around the world to reduce "mercury supply through export controls"[2] in order to help reduce the use of mercury in ASM operations. Furthermore at the July 25th meeting of the EPA-sponsored Mercury Stocks Stakeholder Panel, Dr. Kevin Telmer, consultant to the Global Mercury Project, presented three case studies from his field experience in artisanal and small scale mining that demonstrated how the miners reduce mercury use in response to higher prices. The presentation is available at

http://www.epa.gov/mercury/stocks/Export%20Bans%20and%20Reducing%20Mercury%20Consumption%20in%20Artisanal%20and%20Small%20Scale%20Gold%20Mining.pdf

2. If the price of mercury were to go up in the global market, do you expect to see primary mercury mining to increase?

No, we do not expect to see primary mercury mining increase, for several reasons.

1. <u>There is limited ability of the few remaining mercury-producing countries to significantly expand their output</u>[3]. Global mercury mining in recent decades has been dominated by three nations mining mercury for export (Spain, Kyrgyzstan and Algeria). China mines a tremendous amount of mercury but it does not export this mercury into the world market, preferring instead to use it all domestically.

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[1] UNEP. 2006. Summary of Supply, Trade and Demand Information on Mercury. Requested by UNEP Governing Council Decision 23/9 IV. November. Annex 3, pg. 73.

[2] UNEP. 2006. Summary of Supply, Trade and Demand Information on Mercury. Requested by UNEP Governing Council Decision 23/9 IV. November. Annex 3, pg. 76.

[3] COM (2005) 20 final - Extended Impact Assessment, on the Community Strategy on Mercury, pg. 25-26 and http://www.mem-algeria.org.

- The world's biggest mercury mine, in Almadén, Spain, stopped all mining and processing of primary mercury ores in 2003, and is not expected to restart in large part due to the anticipated EU mercury export ban.
- Algeria apparently closed its mercury mine at the end of 2004, in light of continuing technical problems, notwithstanding increased mercury prices.[4]
- The last major mercury mine still in operation primarily for export is the Khaidarkan mining complex in Kyrgyzstan. According to the World Bank, the quality of the deposit is low and there are technical problems with the operation; as a result, the mine has historically required state subsidies to operate. The government of Kyrgyzstan recognizes that the need to phase out mercury mining, and at the October 2006 European Commission mercury meeting in Brussels, the a Kyrgyz mining representative asked the international community for assistance in transitioning to other economic activities in the region.
- During the last several years, the People's Republic of China has increased domestic production of mercury. Significantly, China has a substantial internal market for mercury, has not historically exported much mercury, and is not expected to start now because the mined mercury is needed to meet China's economic needs, particularly in the production of vinyl chloride monomer (VCM)[5] (for PVC production) and measuring equipment.[6] In fact, China still imports about 200 tons/yr to meet an internal demand that exceeds internal supplies.

2. Global demand for mercury will continue to decline[7], thereby discouraging significant new investment in a shrinking commodity sector. The EU and other developed countries have a range of national initiatives proposed or in place to help curb mercury demand. In the US, a combination of federal legislation, state legislation and industry initiatives will lead to similar reductions over time. Indeed, the international efforts to reduce mercury demand have led Kyrgyzstan to examine alternative economic growth opportunities for the mercury mine area, as discussed above.

3. There are other, environmentally preferable sources of mercury that could be used cost-effectively to supply the few remaining demands for mercury. These include byproduct mercury, captured from processing of other ores such as gold and zinc, as well as mercury recovered from recycled products and wastes. The cost to capture mercury as byproduct or from recycled products is competitive with, and is likely less expensive than, the cost of mining mercury.[8] Therefore, restricting supply through the export ban would provide an incentive for additional recovery of mercury from

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[4] Summary of Supply, Trade and Demand information on mercury, requested by UNEP GC Decision 23/9, November 2006, p.26

[5] NRDC submission to UNEP in response to March 2006 request for information on mercury supply, demand and trade" Natural Resources Defense Council, Washington, DC, May 2006 http://www.chem.unep,ch/mercury/Trade-information.htm

[6] Executive Finding of Mercury Investigation in Guizhou, Global Village of Beijing, Beijing, People's Republic of China, 2006 , http://www.zeromercury.org/projects/Executive_Summary_of_Guizhou_Mercury_Investigation.pdf

[7] Summary of Supply, Trade and Demand information on mercury, requested by UNEP GC Decision 23/9, November 2006, p.55

[8] See Table 24 of *Mercury Flows in Europe and the World.* http://ec.europa.eu/environment/chemicals/mercury/pdf/report.pdf

byproduct capture and waste recycling, which would yield substantial health and environmental benefits.

If there remain any concerns about the export ban causing increased mining, the USG can take steps to actively prevent this outcome:

- The US could provide technical assistance to Kyrgyzstan to help phase out the primary mining of mercury and transition to alternative development strategies, as the Kyrgyz requested at the EC meeting in October 2006; and
- The US can support a global, legally binding instrument which could include controls on mining.

3. Over the past few years, has primary mercury mining increased or decreased worldwide?

According to the UNEP trade report[9] overall global primary mercury mining has decreased substantially since 1990, but has remained roughly flat over the last decade. However, the picture varies regionally. As described above, mining has recently ceased in two countries, Spain and Algeria, that have historically dominated production of mercury for the global market, while there has been an increase in primary mining in China, as China has increased production to serve its own internal industrial needs.

4. In February 2007, a number of leading international mining and metals companies that are members of the International Council for Metals and Mining pledged to reduce mercury emissions from their metals mining operations due to human health and environmental concerns. These companies also pledged to "Commit not to open any new mines designed to produce mercury as the primary product." Are you familiar with these pledges? Do these mining organizations and pledges represent the most significant mining concerns in the United States and abroad?

We are familiar with the ICMM pledge, which was publicized internationally at the United Nations Environment Program (UNEP) 24th Governing Council meeting in February 2007. According to their website, ICMM "represents the leading international mining and metals companies" and also represents national mining companies and global commodities associations worldwide. We are not knowledgeable and not able to comment on the effectiveness of this voluntary initiative in reducing mercury impacts from mining.

5. Mining companies are currently selling the mercury that is recovered as part of their United States based mining operations and may also be importing mercury to the United States from some foreign mines. Is your organization aware of any United States mining companies that are currently importing mercury to this

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[9] UNEP. 2006. Summary of Supply, Trade and Demand Information on Mercury. Requested by UNEP Governing Council Decision 23/9 IV. November

country? Do you have an estimate of the amount of mercury imported, and what revenue these sales might be generating?

To our knowledge, Newmont Mining Company has a program to import mercury recovered from its mines in Yanacocha, Peru to the US. At the June 24th Mercury Stocks Stakeholder Panel, Mr. Joseph Pollara, Chief Environmental Engineer of Newmont Mining Company, presented details about Newmont's program. His presentation is available on the web at http://www.epa.gov/mercury/stocks/Pollara-International-Mining.pdf.

According to the USGS Mercury Mining Yearbook for 2006 (found at http://minerals.usgs.gov/minerals/pubs/commodity/mercury/myb1-2006-mercu.pdf), the US imported 128 tons of mercury, valued at $1.28 million, from Peru in 2005 and 22 tons, valued at $209,000, in 2006 (see Table 2). We do not know if all of the material is from the Yanacocha mine, but these figures are very roughly consistent with the mercury production figures presented by Mr. Pollara (see Slide 7 of his presentation, and also note from Slide 8 that shipments began in 2005, so that mercury produced in 2004 may have been shipped in 2005).

From Shimkus/ Barton:

1. At any Energy and Air Quality Subcommittee markup on Wednesday June 20, 2007, one of the members of the Subcommittee said that ¾ a ton of mercury is nothing to worry about. Do you agree? Why or why not?

Given a global market of roughly 3500 tons per year of mercury trades, 3/4 of a ton of mercury is not significant. Given that mercury travels as a global pollutant, the mercury used in quantities more than 100x this amount abroad likely pose a bigger threat to health in the United States than this. Although we agree that there is no "safe" levels of exposure to mercury, we also believe that mercury reduction efforts should start with the biggest sources of exposure that can be readily reduced, rather than starting on tiny sources of exposure for which there are no readily available alternatives.

2. Who should be liable for the costs of the long-term storage of mercury? Who should be liable in the event of a release? Should it be the government or the government and the mercury producer?

Companies that produce, buy, or use mercury should be liable for the costs of long term storage.

3. You state that international trade...Wouldn't a better solution be a technology transfer solution so that other countries use mercury safely?

We fully support efforts to transfer knowledge about low-mercury and mercury-free technologies to developing countries. However, absent a strong economic incentive (i.e., a higher price for mercury), it is unlikely that these alternative technologies will be readily adopted, because users can continue to use mercury technologies legally, cheaply, and easily. Only by restricting supply, in conjunction with dissemination of information on low-mercury techniques, recycling and mercury-free technologies, will users have a sufficient incentive to transition to these alternatives.

4. **Should the U.S. government take title to mercury for long-term sequestration? If so, where should it be sequestered?**

Companies that produce, buy, or use mercury should remain "owners" of the mercury. Because mercury is not difficult to store safely, either private sector long-term storage initiatives or storage at existing federal stockpile sites is equally acceptable to us.

Questions from Rep. Green

1. **In your testimony you state that resources available to educate and reduce the use of mercury worldwide are not proportionate to mercury use. You also state that UNIDO experts suggest the best way to immediately reduce global mercury use in mining would be to remove mercury from the global market. Do you agree that the US should implement a mercury export ban in order to reduce the mercury available to these countries?**

Yes. We believe that the single most important thing the United States could do to reduce the problem of global mercury pollution is to ban the export of surplus mercury. We are a large source of global supply, and so our initiative will make a real difference. In contrast, the U.S. is a relatively small source of global demand. Domestic demand reduction is a good idea because it will lead to much-welcomed reductions in hot spots of mercury contamination within our borders. Globally, however, reduction in US demand will have a relatively small impact.

2. **Do you believe that if we remove the mercury available to other countries that they will begin mining elsewhere?**

No, we do not expect to see primary mercury mining increase, for several reasons.

1. There is limited ability of the few remaining mercury-producing countries to significantly expand their output[10]. Global mercury mining in recent decades has been dominated by three nations mining mercury for export (Spain, Kyrgyzstan and Algeria). China mines a tremendous amount of mercury but it does not export this mercury into the world market, preferring instead to use it all domestically.

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5. Global demand for mercury will continue to decline[14], thereby discouraging significant new investment in a shrinking commodity sector. The EU and other developed countries have a range of national initiatives proposed or in place to help curb mercury demand. In the US, a combination of federal legislation, state legislation and industry initiatives will lead to similar reductions over time. Indeed, the international efforts to reduce mercury demand have led Kyrgyzstan to examine alternative economic growth opportunities for the mercury mine area, as discussed above.

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[13] Executive Finding of Mercury Investigation in Guizhou, Global Village of Beijing, Beijing, People's Republic of China, 2006 , http://www.zeromercury.org/projects/Executive_Summary_of_Guizhou_Mercury_Investigation.pdf

[14] Summary of Supply, Trade and Demand information on mercury, requested by UNEP GC Decision 23/9, November 2006, p.55

[15] See Table 24 of *Mercury Flows in Europe and the World.* http://ec.europa.eu/environment/chemicals/mercury/pdf/report.pdf

byproduct capture and waste recycling, which would yield substantial health and environmental benefits.

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MARSHA BLACKBURN, TENNESSEE

July 30, 2007

The Honorable James B. Gulliford
Assistant Administrator
Office of Prevention, Pesticides and Toxic Substances
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Dear Mr. Gulliford:

Thank you for appearing before the Subcommittee on Environment and Hazardous Materials on Friday, June 22, 2007, at the hearing entitled "H.R.1534, the Mercury Export Ban Act of 2007." We appreciate the time and effort you gave as a witness before the Subcommittee.

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Thank you for your prompt attention to this request. If you need additional information or have other questions, please contact Caroline Ahearn at (202) 225-2927.

Sincerely,

JOHN D. DINGELL
CHAIRMAN

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cc: The Honorable Joe Barton, Ranking Member
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The Honorable Albert R. Wynn, Chairman
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The Honorable Gene Green, Member
Subcommittee on Environment and Hazardous Materials

ENCLOSURE

United States Department of State

Bureau of Oceans and International Environmental and Scientific Affairs

Washington, D.C. 20520

September 1, 2006

Dr. Maged Younes
Head,
Chemicals Branch DTIE
United Nations Environment Programme
11-13 Chemin de Anémones
CH-1219 Châtelaine, Geneva, Switzerland
Email: mercury@unepchemicals.ch

Dear Dr. Younes,

In reference to your letter dated July 1, 2006, regarding progress on implementation of mercury partnerships pursuant to the Governing Council Decision 23/9, we are submitting the attached report on U.S. activity and contributions to the partnerships.

Since GC Decision 23/9 in 2005, five partnerships have been initiated, including global partnerships for mercury reduction in the chlor-alkali sector, products, coal-fired utilities, artisanal and small-scale gold mining, and mercury air transport and fate research. Although less than two years have passed since the GC decision on partnerships, much progress has been made on these partnerships and a number of additional activities have been planned. The U.S. has taken a leading role in coordinating and developing the partnerships and has provided significant financial contributions to the partnerships. In addition to staff time, in-kind support, and technical expertise, the United States has provided approximately $4.7 million in support of the UNEP Mercury Programme and Partnerships. At least $1.7 million has been directed specifically to partnerships.

We look forward to additional work on partnerships and progress in mercury reductions.

Sincerely,

John E. Thompson
Division Director
Office of Environmental Policy

Global Partnership for Mercury Reduction in the Chlor-Alkali Sector

Goals and Objectives of the Partnership

This Partnership makes information available on public policy and industry experiences for improving the environmental performance of mercury cell chlor-alkali facilities, and makes available operational information on non-mercury cell technologies. The Partnership promotes the reduction or elimination of global mercury releases in the chlor-alkali sector through the adoption of best management practices or through conversion to non-mercury cell technology. Work under this partnership also improves the availability of public information regarding the global consumption of mercury used in and released by the chlor-alkali production process.

The Work and Progress of the Partnership

On May 25 of 2005, an informal consultation was held in Portland, Maine, involving participants from Argentina, Brazil, Burkina Faso, Canada, China, the European Commission, India, Mexico, and the United States, as well as industry and non-governmental stakeholders to discuss ideas for the Partnership. A number of actions were developed for the partnership following the consultation, including:

Russian Pilot Demonstration Project. The United States, the Russian Chlorine Association, RusChlor, Volgograd "Caustic" Facility, the Russian Cleaner Production and Sustainable Development Center (RNCPC), the Volgograd Regional Environmental Authority (Rostechnadzor), Canada, Norway, and the World Chlorine Council (WCC) worked through the Partnership to develop and implement technical projects to reduce use and release of mercury. Activities completed to date include: (1) Conducted a workshop in Volgograd with the participation of experts from EuroChlor, RusChlor, RNCPC, donor-countries and all three Russian chlor-alkali facilities to share experiences and best practices; (2) Completed a technical exchange visit of six Russian experts to representative chlor-alkali facilities in Germany, Spain, and Italy; (3) Completed Cleaner Production Training at Volgograd "Caustic"; (4) Volgograd "Caustic" developed an "Action Plan for 2006-2010" to reduce uses and releases of mercury; and (5) Volgograd "Caustic" implemented three cleaner production projects resulting in reductions of approximately 150 kg of mercury releases per year.

The Partnership expects to have measurable reductions of both mercury consumption and releases, measured in tons per year. Within one year, Volgograd "Caustic" plans to achieve a 20-25 percent reduction in mercury use and releases, and it has already achieved a reduction of 150 kilograms per year of mercury releases just months after inception of the project. For each facility which chooses to work with the Partnership to implement best practices, a reduction of least one ton of mercury consumption and releases can be expected within a 1-3 year period.

Mercury Stewardship Workshop. The United States, the World Chlorine Council, the Chlorine Institute, Clorosur, Eurochlor, ANIQ, Mexichem, the Research Foundation for Health and Environmental Effects, UNEP Chemicals, and the UNEP Regional Office for Latin America and the Caribbean conducted a mercury stewardship workshop in Veracruz, Mexico. The

workshop shared methods and guidelines for calculating mercury releases and consumption, shared best practices for reducing releases, and encouraged adoption of best management practices to facilitate reductions in consumption. Following the workshop, the Partnership provided the Mexican facilities with a technology mentor for six months in order to help identify process improvements. The facilities are now considering demonstration projects at their facilities. The Partnership is currently scoping other mercury reduction projects in the chlor-alkali sector.

In addition, by 2007 the Partnership expects improved regional estimates of mercury consumption in the sector on a global scale thanks to a voluntary offer by chlorine industry associations to assist with the data collection. Combined with facility-specific baseline studies done with facilities working with the Partnership, this information will provide comparable and more complete data on global consumption and releases in the sector.

Resources Needed to Execute the Partnership

The Chlor-alkali Partnership was initiated with financial contributions from the United States, Canada, and Norway. The World Chlorine Council and the U.S. Chlorine Institute contributed in-kind support. UNEP Chemicals provided travel funding for participants from developing countries to attend the initial Partnership consultation.

The Partnership has benefited to date from the strong support of industry associations, the effort and contribution of ACAP member countries in the Russia demonstration project, and from the WCC in helping to coordinate the workshop and select a facility mentor in Mexico. In order to implement best practices, technical exchange must be combined with prioritization of actual process changes, in some cases requiring modest investments in equipment or tools. While these investments pay for themselves over time in terms of efficiency and other benefits, they nonetheless require some capital. The Partnership has ongoing financial needs for technical assistance work.

The United States has contributed at least $345,000 directly towards efforts relating to the Chlor-Alkali Partnership.

Looking Towards the Future

Industry-to-industry exchanges are a valuable way to encourage process changes and bring about mercury reductions in the sector. The Partnership faces an ongoing challenge in raising enough funding to implement process changes and best practices identified through the technical exchange. The Partnership will also potentially look into issues related to conversion to non-mercury technology.

Additionally, the Partnership would benefit from improved coordination between interest in the partnerships and technical capabilities in industry, government or financial institutions, so that multiple projects could be addressed simultaneously.

Both the facility mentor model and the cleaner production audit/training model have proven to be successful and efficient (in terms of cost and time) ways to achieve a list of facility-specific

mercury reduction options. This model should be expanded to all mercury-cell facilities expected to be in operation for more than three years. The models are likely to be useful to other mercury-consuming industrial processes. The Partnership would benefit significantly from involvement by public and private financial institutions which might provide information on low-cost financing for modest process improvements and for plant conversions, and assist with the calculation of pay-back periods. Energy efficiency financing is an interesting concept here, given that non-mercury-cell facilities now being built are much more energy efficient than mercury-cell facilities.

Partnership for Mercury Reduction in Products

Goals and Objectives of the Partnership

This Partnership enhances country-specific knowledge of mercury use and emissions and transfers of mercury, and uses this knowledge to identify measures for reducing releases from the manufacture, use, and disposal of mercury-containing products. This Partnership identifies and implements successful approaches for reducing or eliminating mercury in products where there are effective substitutes. Another Partnership goal is providing technical assistance to assess and understand individual country markets for products containing mercury, including the quantities used, the quantities of mercury released associated with the manufacturing, use, and disposal of these mercury-containing products, and how to identify opportunities for achieving additional mercury reductions.

Work under this partnership includes examining and prioritizing efforts to reduce or eliminate mercury use in products through the exchange of information and expertise, transfer and application of best management practices, development and improvement of mercury use and emission inventories, provision of technical assistance, public awareness improvement, improved characterization of the amount of mercury used in products nationally and globally, and development of pilot projects.

The Work and Progress of the Partnership

On May 25 of 2005, an informal consultation was held in Portland, Maine for all interested parties to discuss ideas for the Partnership. The consultations were attended by participants from the United States, Argentina, Brazil, Burkina Faso, Canada, China, India, Mexico, the European Commission, the North American Commission for Environmental Cooperation (CEC), NGOs, and U.S. industry. Electronics manufacturers and manufacturers of medical supplies have also been engaged in discussions with the United States to help implement Partnership activities in developing countries. Since the 2005 meeting, the Partnership has developed a number of specific projects to pursue mercury reductions in products around the globe. The Partnership has ongoing work in the following areas:

CEC Americas Workshop. In February of 2006, the United States partnered with the Governments of Canada and Mexico and the North American Commission for Environmental Cooperation (CEC) through the CEC Mercury Task Force to fund and host a capacity-building workshop on reducing mercury use in products where there are effective substitutes in the Americas. Funding for the workshop and travel for country representatives from Argentina, Brazil, Chile, Costa Rica, Ecuador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Peru, Panama, Trinidad and Tobago, and some U.S. state governments, academia, and environmental non-governmental organizations in North America was provided by the U.S. contribution to UNEP for mercury partnerships and the CEC. The workshop was successful in sharing information on tools and best practices for reducing mercury use in products and in

identifying developing country needs in the Americas. The workshop also served to elicit interest in the UNEP Partnerships and provided a basis for future partnership activities.

Health Care Pilot Projects. Beginning in August of 2006, the United States will work with China's State Environmental Protection Administration (SEPA), China's Health Ministry, and the Beijing City Government under the Partnership on healthcare projects at two hospitals in Beijing, China. Through a bilateral agreement and funding support from the United States, the United States and China will initiate work to significantly reduce mercury containing products where there are effective substitutes and waste throughout these hospitals in one year. The United States hopes that SEPA will use the pilot to create a similar training program for hospitals throughout the country at the end of 2007.

Since mid-2006, the United States and UNEP have been working through the Partnership to launch a hospitals pilot program in the City of Buenos Aires, Argentina, building upon current efforts by the City of Buenos Aires and Healthcare Without Harm. The pilot, which will begin in the fall of 2006, will include training for all 33 city-run hospitals, and complete mercury elimination for two hospitals.

Through the CEC, the United States is working to fund a partnership healthcare project in Mexico aimed at reducing mercury use and wastes from hospitals in Mexico. This project, slated for the fall of 2006, will involve both Mexico's health agency (Salud) and environment agency (SEMARNAT).

The United States is discussing potential health care projects, similar to those developed under the Partnership in Mexico and Argentina, with officials in other Central and South American countries, and with regional organizations such as the Pan-American Health Organization. Experience gained in the reduction or elimination of mercury in hospitals as a result of the Partnership activities in Mexico and Argentina will provide a sound foundation for additional partnership activities with other countries in the region.

For all of the hospital pilot projects, the overarching goal is to reduce mercury where there are effective substitutes and report the pounds of mercury eliminated per hospital pilot project under the Partnership. Prior to the start of each project, a facility assessment will establish a baseline number of pounds of mercury-containing products used, and a mercury use reduction goal for the elimination of pounds of mercury-containing products will be established.

Burkina Faso Mercury Life Cycle Assessment. The United States has partnered with Burkina Faso and UNEP to conduct an initial mercury life cycle assessment for products as a first step in that country's efforts to characterize and reduce mercury use where there are effective substitutes. The assessment will begin shortly and will include a mercury use inventory as well as the identification of country needs and priorities. The assessment is expected to be completed and an assessment report issued in June 2007. Once completed, the Government of Burkina Faso will determine what steps should be taken, if needed, to promote the reduction and substitution of mercury in products where there are effective substitutes. It is hoped that this assessment of mercury in products may be useful and relevant to other countries in the West African region.

Mercury Products and Emissions Inventories. The United States is establishing a cooperative agreement with the United Nations Institute for Training and Research (UNITAR) to support training and capacity-building programs which encourage sound environmental management and sustainable development. The agreement is expected to be completed in September of 2006 and, in particular, will enable UNITAR to assist in the implementation of Partnership activities.

UNITAR will be assisting three countries through the Partnership in the Latin American and Caribbean Regions with the development of mercury product inventories and ultimately Pollutant Release and Transfer Registries (PRTR) for mercury. The intention is to develop a comprehensive inventory of mercury-based products in a large country in South America and issue an inventory report that is available to the public by December of 2007. By December 2008, the Partnership plans to support the development of a national mercury releases inventory in a large country in South America that will track and report all major releases of mercury from point sources in that country. We expect this work to result in 20% of the point sources reporting mercury releases in that country by 2007, and 100% by 2008.

Pollutant Release and Transfer Registries are important tools that can assist countries in identifying emissions and transfers of mercury and this knowledge of mercury emission patterns and their magnitude can serve as a sound basis for identifying measures for reducing mercury emissions. The Partnership expects to train 15 countries on mercury use in products and successful strategies and tools to reduce and eliminate mercury use in products in 2006. Canada has expressed its interest in being a lead partner in PRTR efforts and the Mexican Government has expressed interest in updating their mercury products inventory.

The United States will be working with UNITAR to explore other possible Partnership activities, with an initial focus on South Africa.

Mercury in Schools Case Study. The United States is conducting discussions with the Philippines to create a Partnership activity on mercury in schools, specifically a case study on the March, 2006, mercury spill and cleanup at a school in Manila. Lessons learned from this spill could then be provided to other countries and serve as an educational tool on this issue. This Partnership activity would allow interested parties to share and benefit from best practice information and experiences with the prevention, management and mitigation of mercury risks in schools.

Resources Needed to Execute the Partnership

The United States has contributed at least $575,000 directly towards efforts relating to the Products Partnership.

Looking Towards the Future

The Products Partnership will continue to encourage and benefit from global support for this effort and more involvement from countries and stakeholders who are experienced in addressing

mercury pollution. The Partnership has made significant progress in a short amount of time, and it is important for UNEP to promote and advertise the work and successes of the Partnership, as well as the availability of small grants for activities under this and other mercury partnerships to facilitate national, regional, and global reductions in the use and release of mercury.

One practical way to promote the Partnership work would be to develop more fully the UNEP mercury clearinghouse and capacity-building function as discussed in UNEP's workplan by creating and maintaining separate web pages for each mercury partnership. The information developed under each partnership (e.g., workshop presentations, reports, inventories, etc) could then serve as an educational and capacity-building tool for interested countries and stakeholders, which may not have had the opportunity to participate in that partnership activity. Another practical step is a direct link from the partnership page to the UNEP mercury small grants information.

One challenge faced by the United States in this Partnership is the ability to mobilize funding quickly when there is no existing agreement between the United States Government and an international organization or country.

Global Partnership for Mercury Management in Artisanal and Small-Scale Gold Mining

Goals and Objectives of the Partnership

This Partnership reduces the human health and environmental impacts associated with the use of mercury in artisanal gold mining and refining by working with mining communities and small-scale gold producers to develop and implement options, suited to local circumstances, to reduce mercury use and exposure. This Partnership supports existing international efforts in this area, in particular the UNIDO Global Mercury Project.

Work under this partnership promotes: cleaner artisanal mining practices and technologies, such as recapture for reuse or use of low- or non-mercury technologies as appropriate to the community; improving data on mercury use and emissions in the sector collected through mercury reduction projects; and improving access to information at the local level through community outreach programs and through the development and dissemination of information on mercury health risks and occupational exposure risk management options in a variety of media.

The Work and Progress of the Partnership

On June 15 of 2005, an informal consultation was co-sponsored by the United States, the World Bank's Communities and Small-Scale Mining (CASM) Program, and UNEP to discuss ideas for the Partnership. The consultation took place in Washington, DC and was attended by participants from Brazil, Burkina Faso, Canada, Ghana, Nigeria, Peru, South Africa, Switzerland, Tanzania, the European Commission, NGOs, technical and research institutes, and industry.

The Partnership has increased understanding of this extremely complicated topic among policymakers and has taken steps to improve the quantification of mercury use and emissions in this sector, which may rival coal combustion as the largest source of mercury emissions globally. Several organizations have pledged their support to the Partnership. Following the informal consultation, the Partnership initiated broad discussions with the United Nations Development Program, the United Nations Industrial Development Organization, industry, NGOs, and other stakeholders and identified a number of areas for partnership work.

Brazil Partnership Efforts. The Partnership engaged with the Government of Brazil and other stakeholders on a project to reduce mercury emissions from gold refining shops in the Amazon. In September of 2006, the Partnership will field a mission to the Amazon to verify baselines, take speciated measurements, and develop options for locally-manufactured appropriate technology solutions for the capture of mercury vapors in the gold shops. UNEP will provide travel funding for a pro-bono mercury monitoring expert from the United States for this mission.

Senegal Partnership Efforts. Also in September of 2006, the Partnership plans to conduct an initial assessment mission to a large gold-producing region in Senegal in order to get baseline data and a detailed program plan for a project to train community-based NGOs and health

workers on appropriate technologies for mercury capture and reuse, and safe mercury management techniques. Partners in this project include the United States' Argonne National Laboratory, the Blacksmith Institute, local NGOs, and the Senegal Ministry of Environment and Protection of Nature. The Partnership hopes to regionalize this project through the Basel Convention Regional Center for Francophone Africa to other African countries facing similar risks in the mining sector. Other partners whom have expressed such interest include the Burkina Faso Ministry of Environment.

The Partnership expects to have measurable improvements in mercury consumption and releases in Brazil and Senegal by mid-2007 or earlier, as an initial improvement in areas where continued adoption of best practices throughout the mining and refining communities and other communities in these regions will magnify results over time. By measuring baseline and post-project ambient air mercury levels at projects' mining and refining sites, and by estimating the amounts of replenishment mercury used annually by miners at these sites both pre- and post-project, the Partnership will show cumulative tons per year of mercury consumption and release reductions.

The Partnership has also had discussions with the Ministry of Environment in Mongolia and its NGO partners about their proposal for mercury management in their rapidly-growing artisanal mining sector.

The Partnership is working closely with the CASM Program, a network of small-scale miners, NGOs, and professionals working with and in the sector. In order to reach those stakeholders who use CASM's impressive array of services but who may not be aware of solutions to the mercury issue, the Partnership expects to have a mercury internet page on the CASM website by the end of 2006, with links to UNIDO, UNEP and other resources.

Resources Needed to Execute the Partnership

The United States has contributed at least $180,000 directly towards efforts relating to the Mining Partnership.

The Mining Partnership would benefit from the participation or funding from other industrialized countries home to large industrial mining companies because the artisanal operations often are co-located with industrial mining sites. Additionally, the Partnership seeks funding for the expected work in Mongolia for mercury management in their artisanal mining sector.

Looking Towards the Future

The Mining Partnership will continue to encourage and benefit from global support for this effort and more involvement from countries and stakeholders who are experienced in addressing mercury pollution. The Partnership has made significant progress in a small amount of time, and it is important for UNEP to promote and advertise the work and successes of the Partnership, as well as the availability of small grants for activities under this and other mercury partnerships to facilitate national, regional, and global reductions in the use and release of mercury.

One practical way to promote the Partnership work would be to develop more fully the UNEP mercury clearinghouse and capacity-building function (as discussed in UNEP's workplan) by creating and maintaining separate web pages for each mercury partnership. The information developed under each partnership (e.g., workshop presentations, reports, inventories, etc) could then serve as an educational and capacity-building tool for interested countries and stakeholders, which may not have had the opportunity to participate in that partnership activity. Another practical step is a direct link from the partnership page to the UNEP mercury small grants information.

Greater involvement by additional governments and industry partners could provide important support to this partnership.

Partnership for Reduction of Mercury Emissions from Coal Fired Utilities

Goals and Objectives of the Partnership

This Partnership aims to improve the understanding of mercury as a pollutant of concern from the coal fired power (utility) sector and provides information on control strategies and options. The coal fired power sector is among the largest anthropogenic contributors to worldwide mercury emissions leading to mercury deposition domestically, regionally and globally. With growing economies, increasing energy demands, and strong reliance on coal as an energy source in much of the world, global mercury emissions from the power sector are likely to increase.

The growing recognition that coal combustion is a major source of "conventional" air pollution has led to increased interest and action in developing countries to address utility emissions. Supporting these country efforts will improve the overall environmental performance of the power sector, as well as accelerate and enhance the level of mercury control achieved.

Opportunities to address the coal fired power sector are illustrated by EPA's Clean Air Mercury Rule (CAMR). When fully implemented, this rule, together with a rule to control conventional pollutants, will reduce electric utility mercury emissions in the US by nearly 70 percent from 1999 levels. It uses a market-based cap-and-trade program that caps utility mercury emissions in phases ensuring that mercury reduction requirements are achieved and sustained.

The cap-and-trade system creates incentives for continued development and testing of promising mercury control technologies that are efficient and effective. In addition, by making mercury emissions a tradable commodity, the system provides a strong motivation for some utilities to make early emission reductions and for continuous improvements in control technologies. This approach to mercury control could be highly effective in developed countries.

The Work and Progress of the Partnership

Cooperative efforts under this Partnership have focused mainly on China and India, both of which have large and expanding coal fired power sectors. These efforts have built on existing cooperative work in the area of environment science and technology between the United States and these countries.

Much has been learned in recent years about the effectiveness and cost of various control options and the extent to which coal type and compositional characteristics affect emissions of multiple pollutants, including mercury. This information promotes the understanding that taking a multi-pollutant approach to controlling emissions from the power sector will allow for increased effectiveness of control for conventional pollutants and mercury at the same time.

Asia Pacific Partnership. The Asia Pacific Partnership on Clean Development and Climate is a broad program that includes Australia, China, India, Japan, South Korea and the United States. The Partnership focuses on voluntary practical measures to build local capacity, and remove

barriers to and create new investment opportunities for the introduction of cleaner, more efficient technologies. A major focus of the Partnership is improving the energy efficiency and environmental performance of coal-fired power generation in Partner countries. Progress made under this umbrella Partnership will reduce greenhouse gas emissions and emissions of conventional air pollutants and mercury.

A key element of the Partnership is the strong role of the private sector as active partners. As an important first step in support of the Partnership goals, a major U.S. power company, American Electric Power (AEP), will sponsor a one week site visit at several U.S. power plants for 40-50 experts directly involved in operations of the power sector in APP countries. The visit will highlight APP country experiences in efficiency improvements and multi-pollutant emissions reductions from coal fired power plants. The visit will also include the examination of integrated gasification combined-cycle (IGCC) facilities to exchange information on environmental benefits (including mercury emission reductions) and other aspects of this technology.

Partnership Efforts with China. In November of 2005, the United States partnered with China, Canada, and Japan to hold a workshop in Beijing, China on the measurement and control of mercury from coal fired power plants. The workshop agenda and participation was planned jointly by the sponsors and included experts from both the environment and energy sectors.

The workshop was attended by experts from China's Federal and Provincial Governments, academic, and other research institutions. The workshop increased awareness of the magnitude of mercury emissions from the coal fired power sector, examined the limited data currently available on the level of mercury exposure in China, and provided information on control approaches at this critical time when China is in the process of planning and constructing major new coal fired power plants. Information exchanged at such workshops supports the integration of environmental considerations in plant design and operation.

In order to broaden participation and highlight the regional and global impact of mercury emissions from the power sector, participants from Russia, South Korea and South Africa also attended the workshop. Additionally, the workshop brought together researchers from the Chinese academic and research communities in order to examine further the potential role of mercury as a pollutant of concern as well as the level of mercury reductions that can be achieved by well designed multi-pollutant control approaches.

The United States is planning a follow-on workshop in China in the spring of 2007 to focus on multi-pollutant (NOx, SOx, PM, and mercury) control of coal fired power plants. The purpose is to provide more in depth, up-to-date information on ways to control several pollutants simultaneously using existing technology. This workshop is being developed in close collaboration with the Chinese Government and is designed to further assist China as it evaluates the most cost effective approach to control multiple pollutants from its coal fired utilities. A report on the workshop will be placed on the UNEP web site so that others can benefit from the presentations.

Partnership Efforts with India. Through a Bilateral agreement between the United States and India, the United States is providing India with information and other support to increase the effectiveness of pollution controls on coal fired power plants. Indian coal has relatively low sulfur content but a high ash content. As such, Indian air pollution control efforts for coal fired power plants have had a significant focus on control of particulate emissions. Proposed NOx emission standards are also being considered by the Central Pollution Control Board (CPCB). Because control of particulate emissions has the effect of reducing emissions of particulate bound mercury, cooperation between the United States and India has focused on two primary efforts: (1) sharing expertise on the use of low cost approaches to improve the performance of electrostatic precipitator (ESP) performance, thus achieving greater particulate control in Indian power plants (with co-benefit mercury capture); and (2) training and technology transfer of a mercury monitoring technology that can be used to assist the government of India and power plant operators determine stack emissions, including evaluating co-benefit mercury capture achievable through efforts to control particulate matter.

In December of 2005, a team of U.S. experts provided seminars on the application of control technologies for mercury and other pollutants and a training seminar on low-cost approaches to improving ESP performance, again hosted by the National Thermal Power Corporation. In July 2006, a U.S. expert conducted training on the use of mercury stack emissions testing equipment in Mumbai, and transferred a set of the equipment to the National Environmental Engineering Research Institute.

Resources Needed to Execute the Partnership

The United States has contributed at least $255,000 directly towards efforts relating to the Coal Combustion Partnership.

Looking Towards the Future

The Partnership will continue to encourage and benefit from global support for this effort and more involvement from countries and stakeholders who are experienced in addressing mercury pollution. A number of useful perspectives have emerged from this Partnership's activities to date and will be useful to consider when moving forward. Growing recognition of the contribution coal fired power plants make to national and regional air pollution has led to increased efforts on the part of many developing countries to improve the environmental performance of this sector. Partnership efforts present an opportunity to assist these countries in developing cost-effective multi-pollutant approaches to control power sector emissions. Additionally, because the energy sector is important to economic development, the involvement of both energy and environment Ministries in Partnership efforts is important to support the integration of environmental considerations in plant design and operation.

New technologies for the cost-effective control of mercury are emerging. Information sharing on the effectiveness and cost of these technologies should occur on a timely basis so that

opportunities for future mercury reductions can be considered. The proper operation and establishment of best practices are also important factors in ensuring multi-pollutant emission reductions are achieved.

While all current control approaches can result in the reduction of mercury emissions, the opportunity for mercury control is greatest in countries with "high sulfur" coal. Coal washing has multiple benefits but more data are needed on its effectiveness in mercury removal.

Global Partnership for Mercury
Air Transport and Fate Research

Goals and Objectives of the Partnership

This Partnership plans to accelerate the development of atmospheric mercury research and enhance communication and information sharing between scientists and policymakers. Work under this partnership will include: the establishment and recognition of regional air transport and fate collaborative research projects and programs; coordination and conduct of research on national, regional, and global scales; development of related data sets and tools; and coordination and training among organizations and countries to achieve methods and modeling harmonization.

The Work and Progress of the Partnership

Italy, Japan, Canada, China, and the United States are the current members of the Partnership. As a first step in developing this Partnership, a discussion paper entitled "Global Partnership for Mercury Air Transport and Fate Research" was prepared by the United States and posted on the UNEP web site in October of 2005. At the beginning of 2006, Italy agreed to become the Partnership lead, and under its guidance the partners developed an outline regarding the contributions of the various countries to the Partnership.

In August of 2005, under the UNEP framework, the United States and Italy undertook a joint trip to China to explore with Chinese scientists and policymakers a joint mercury modeling and monitoring project in Suzhou, China. The Partnership project focuses on providing the Chinese with the capability of collecting and analyzing data in Suzhou in order to characterize mercury levels in the atmosphere and attribute contributions of various local sources to those levels. The Partnership expects to train Chinese scientists on the operation of ambient air quality monitoring equipment. The training and consultation will be undertaken in coordination with collaborative measurement programs being conducted by Italy in partnership with others in that city. A non-technical summary of the project plan (and later progress reports) will be placed on the UNEP web site as a model collaborative research program. References to the availability of the published results will be provided on the website as the project progresses.

As a further contribution to the work the Partnership is doing in Suzhou, the United States plans to collect additional data on atmospheric speciated mercury concentrations (together with particulate matter and other pollutants) for two more years at the National Oceanic and Atmospheric Administration's (NOAA) high altitude laboratory at Mauna Loa, Hawaii. These data will contribute to the communication and information sharing goal of the Partnership between scientists and policymakers and can be used to better understand the transformation and fate of globally cycling mercury by providing support for a long-term record of various mercury species. The United States will share these data in a timely fashion and post a notice of data availability on the UNEP web site.

In August of 2006, within the framework of the 8th International Conference on Mercury as a Global Pollutant, the United States assisted Italy in conducting a half-day Partnership meeting in cooperation with Japan and Canada to exchange information among participating and potential

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 10 2007

OFFICE OF CONGRESSIONAL AND
INTERGOVERNMENTAL RELATIONS

The Honorable John Dingell
Chairman
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

Thank you for the opportunity to respond to questions for the record that followed the June 22, 2007 hearing on HR 1534, Mercury Export Ban Act of 2007. I hope this information will be useful to you and the members of the Subcommittee.

If you have any further questions, please contact me or your staff may contact Christina J. Moody in my office at 202.564.0260.

Sincerely,

Christopher P. Bliley
Associate Administrator

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 10 2007

OFFICE OF CONGRESSIONAL AND
INTERGOVERNMENTAL RELATIONS

The Honorable Albert Wynn
Chairman
Subcommittee on Environment
and Hazardous Materials
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

Thank you for the opportunity to respond to questions for the record that followed the June 22, 2007 hearing on HR 1534, Mercury Export Ban Act of 2007. I hope this information will be useful to you and the members of the Subcommittee.

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Sincerely,

Christopher P. Bliley
Associate Administrator

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 10 2007

OFFICE OF CONGRESSIONAL AND
INTERGOVERNMENTAL RELATIONS

The Honorable John Shimkus
Ranking Member
Subcommittee on Environment
and Hazardous Materials
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Shimkus:

Thank you for the opportunity to respond to questions for the record that followed the June 22, 2007 hearing on HR 1534, Mercury Export Ban Act of 2007. I hope this information will be useful to you and the members of the Subcommittee.

If you have any further questions, please contact me or your staff may contact Christina J. Moody in my office at 202.564.0260.

Sincerely,

Christopher P. Bliley
Associate Administrator

Enclosure

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 10 2007

OFFICE OF CONGRESSIONAL AND
INTERGOVERNMENTAL RELATIONS

The Honorable Joe Barton
Ranking Member
Committee on Energy and Commerce
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Barton:

Thank you for the opportunity to respond to questions for the record that followed the June 22, 2007 hearing on HR 1534, Mercury Export Ban Act of 2007. I hope this information will be useful to you and the members of the Subcommittee.

If you have any further questions, please contact me or your staff may contact Christina J. Moody in my office at 202.564.0260.

Sincerely,

Christopher P. Bliley
Associate Administrator

Enclosure

Questions for the Honorable James G. Gulliford by the Honorable Albert R. Wynn

1. **According to a State Department letter to the United Nations Environment Programme (UNEP) dated September 1, 2006, (see Enclosure) the United States has spent approximately $4.7 million on 5 partnerships designed to reduce mercury uses and releases since the Governing Council Decision 23/9 in 2005. In your written testimony for the June 22, 2007 hearing before the Subcommittee on Environment and Hazardous Materials, you state that the United States leads three of the partnerships that concern mercury management in artisanal mining, mercury reduction in the chlor-alkali sector, and mercury reduction in products. The United States participates in the other two partnerships on mercury air transport that are global partnerships on mercury air transport and fate research, and mercury emissions from coal-fired utilities.**

   Is it true that the Environmental Protection Agency's (EPA's) accomplishments with respect to these partnerships have consisted of: attending meetings and conferences, funding pilot projects related to artisanal and small-scale mining, reducing mercury releases from a chlor-alkali plant in Russia by approximately one ton, and encouraging China to reduce the use of mercury-containing products at two hospitals?

   In the two years since their inception, we believe that each of the partnerships has made progress to address the complex and interrelated issues presented by global mercury. Further, we believe that each partnership has been successful in making progress within the applicable technical, geographic, and socioeconomic context of individual projects.

   We are mindful that the partnerships and individual pilot projects are in various stages of implementation. We are careful, therefore, to view the partnerships through a proper lens when measuring their performance. Where efforts to reduce mercury demand in the United States and Europe have been in place for more than two decades, the UNEP partnerships have had little more than two years to develop. Further, efforts to reduce mercury demand in the United States, Europe, and the developed world remain ongoing; thus, it is difficult to estimate start and end points against which to chart the progress of efforts in the developing world. Various cultural and socioeconomic factors that are not present in the developed world also must be taken into consideration when evaluating programs that are just starting to take root in developing nations. For example, in the case of artisanal mining, the choices faced by miners are not simply matters of convenience or environmental consciousness, but rather the ability to provide food for themselves and their families. Therefore, we believe that projects that provide an array of practical education and training to the people most affected by global mercury, as well as introduce feasible alternatives to mercury-added products and processes, are essential to the success of all of the partnerships.

   The United States has taken a multifaceted approach to reducing releases and exposure from mercury through the partnerships. For example, activities under the Product Partnerships include awareness building, information development, substitution of mercury containing products, and management of the waste of these products. Development of effective programs to reduce and eliminate mercury from products can only occur when the use of mercury in products is understood, and what has become very clear over the past decade is that information on mercury in products in the developing world is limited. We have therefore sponsored information-sharing workshops in Mexico and Bangkok, which focused on Latin America and the Caribbean and the Asia-Pacific Region, respectively, and developed mercury inventories in four Latin American countries and South Africa.

The Products Partnership is also focusing on eliminating mercury containing products in hospitals in Central and South America, as well as in China. In fact, one of the projects under this partnership is the elimination of all mercury products in fourteen neo-natal hospitals in Argentina. To address the resulting mercury waste from the removed hospital products, the United States is working with the Products Partnership to involve the Basel Convention Secretariat in pilot projects to manage properly the recovered mercury. All future hospital projects, including one in development with Costa Rica, will include both the removal of mercury containing products and appropriate management of the resulting waste. A key component of all these activities is capacity building so that these countries can expand on these activities and share their new knowledge and expertise with their neighbors.

The Chlor-alklai Partnership has collaborated with a number of the larger chlor-alkali producing countries to address their use and releases. For example, the Partnership has worked with the Russian chlor-alkali industry to develop action plans for mercury consumption and release reductions. One large facility, Volgograd Caustic, has already implemented priority actions and has already achieved about a ton and a half reduction. A second Russian facility is completing its action plan, and Mexican facilities are currently considering priority actions. We are in discussions with India about ways to support their voluntary industrial chlor-alkali program. We plan to use the important contacts and trust we have built with these industries to begin work on the vinyl chloride sector, identified by the Natural Resources Defense Council in its study of China's mercury demand as one of the world's largest mercury consumption sectors. The Partnership has also improved global reporting through close cooperation with the World Chlorine Council.

In the area of artisanal mining, we are working closely with UNIDO and other players to develop a strategic approach to a problem which is spread across more than 50 countries. We have made important strides in addressing high mercury emissions from small-scale gold shops which purchase amalgamated gold from artisanal miners, an issue largely ignored in artisanal mining programs. We are also taking UNIDO's approach of encouraging the use of hand-held, locally fabricated retorts and finding ways to disseminate the knowledge and application of these techniques in many more countries. We hope that Partnership discussions will continue to focus on strategic approaches to reduce mercury demand and release reductions in this sector.

These partnerships, when fully implemented, will lead to less usage of mercury. In considering the work of the various partnerships, there have been relatively few meetings and workshops associated with these programs. We have placed priority for funding on actual projects which will build capacity to achieve reductions in mercury demand, releases, and exposures. Initial meetings of interested countries and stakeholders were held when the partnerships were first formed, and these meetings provided important direction in terms of goals and objectives of the partnerships. We are pleased to be at the point now where new projects are being added continuously to the partnerships.

2. **For each of the UNEP partnerships, with the exception of the mercury emission from coal fired utilities partnership, please provide the following information for each fiscal year:**

   a. A list of all studies, pilot projects, demonstration projects, and reports produced or directed through these partnerships.

b. A list of all EPA costs related to the partnerships, including: contributions to studies, monies spent on pilot/demonstration projects, contact support, and number of EPA employees working on these partnerships.

c. The amount of mercury use eliminated, reduced or prevented (in tons) by each of these partnerships, along with citations to sources for the information and any verification data.

Please refer to "Exhibit 1: Summary of Partnership Progress (2005-2008)".

3. **EPA's Roadmap for Mercury (2006) states that EPA has provided funding and technical expertise for the United Nations Industrial Development Organization's (UNIDO's) Global Mercury Project to reduce: occupational exposures, emissions, and the use of mercury in small-scale "artisanal" gold and silver mining. In February 2007, the Global Mercury Project reported its findings to the United Nations Environment Programme (UNEP) in a report entitled "Global Impacts of Mercury Supply and Demand in Small-Scale Gold Mining." The report calls on nations around the world to reduce the global mercury supply through export controls and other mechanisms that will encourage the transition to alternative technologies.**

a. How much funding has EPA provided for this UNIDO project to date?

EPA does not provide funding to UNIDO since the United States is not a UNIDO member. Our contributions to the UNIDO Global Mercury Project from 2003 to 2005 were in the form of technical support and in-kind expertise. Once the Artisanal Mining Partnership was initiated under UNEP, we funded partnership projects directly, while coordinating closely with UNIDO. Nonetheless, EPA supports UNIDO's commitment to reduce the human health and environmental effects of mercury used in artisanal mining through integrated capacity-building strategies that emphasize community education and participation in policy development.

b. Does the EPA agree with UNIDO's position that export controls will reduce mercury use and encourage the development of mercury alternatives?

We agree with UNIDO that complete elimination of mercury use in the artisanal mining sector is not feasible in the short term, but is the desired long term goal. Accordingly, we believe that a multifaceted approach is essential to alleviate the use of mercury in artisanal mining. We would agree that more work by the international community needs to be done on non-mercury alternatives for artisanal miners, taking into account the miners' need for non-capital intensive means to earn a livelihood as well as the significant health and environmental implications of the most likely non-mercury artisanal mining practice, cyanidation.

As UNIDO has stated, higher prices for mercury do provide an incentive for finding other alternatives to the very high-volume use of mercury in whole ore amalgamation, and that "mercury price and benefits of re-using mercury have a significant impact on whether miners will adopt retorts." The use of low-cost, locally fabricated hand-held retorts is an effective way to reduce mercury emissions and exposures among artisanal mining communities. However, UNIDO also has stated that "effectively addressing mercury problems in [artisanal mining] requires an integrated approach that targets capacities of local institutions in the removal of technical, social, economic and political barriers to the improvement in [artisanal mining] practices. The [Global Mercury Project] emphasizes that local participation and locally-driven processes of policy development are of critical value." We believe that this statement reflects the importance of the

comprehensive and multifaceted approach the mercury partnerships are able to provide in addressing mercury demand reduction in artisanal mining communities.

c. Does EPA agree with the report's conclusion that global commitments are critically needed such as international mercury export controls to address the severe health and environmental hazards from artisanal mining?

The United States has already committed to increase efforts to address the global challenges to reduce risks from releases of mercury. In fact, mercury emissions, such as those released during the mining process, are a priority area for global reductions. Artisanal mining is a significant source of income to millions of people, and as such may continue at close to present levels for the foreseeable future. On the one hand, international export controls on mercury may increase the price of mercury and thereby reduce the amount of mercury miners use including by encouraging them to use more efficient processes and recovery techniques. On the other hand, such controls may simply reduce the amount of mercury that is available from legal sources which may result in miners seeking out illegal sources of mercury. High levels of mercury consumption are more likely to be reduced should prices for mercury sold to miners rise, but in the short and medium terms, it is unlikely that export controls will eliminate the use of mercury in artisanal mining. Therefore, EPA believes that global commitments to addressing mercury demand, via feasible non-mercury alternatives and efforts to provide practical education and training in the use of such alternatives, should be the first priority.

We believe that no one has demonstrated a deeper commitment to mercury partnership efforts than the United States. To that end, the United States has committed further funding to the Artisanal Mining Partnership, which, until recently, was led by the United States, in close coordination with UNIDO. UNIDO has now agreed to assume a leadership role for the UNEP partnership, which is appropriate given UNIDO's expertise in this area and its 10-year goal to reduce mercury consumption in artisanal mining by 50 percent by 2017.

4. **Does EPA agree with the following conclusion of the Global Mercury Project?**

Various location-specific Global Mercury Project (GMP) training programs and assessments have demonstrated that when mercury is less available and/or more expensive, less mercury is consumed as miners switch to more efficient practices, sometimes eliminating mercury use entirely. (Finding 49, page 14, UNEP Report: Summary of Supply Trade and Demand Information on Mercury, November 2006)

UNIDO estimates that only 10 percent of current artisanal mining practices could convert to mercury-free alternatives that are locally available at low cost, making complete mercury elimination, in most cases, currently unobtainable. We are not aware of any GMP project sites where mercury use has been eliminated. We believe that because of the large number of miners and their families that currently depend upon mercury amalgamation for their livelihood, the practice of mercury amalgamation will continue in the foreseeable future. Therefore, the focus of both the UNIDO GMP and the Artisanal Mining Partnership has been to work to reduce mercury consumption and releases through the dissemination of accessible and affordable technologies and best practices.

5. **At the International Conference in Brussels, Belgium, (October 2006) Dr. Maria Doa, EPA, gave a presentation on mercury supply and demand. In her presentation, Dr. Doa stated that as demand**

decreases in developed countries, it appears that mercury flows from developed countries to developing countries. Do you disagree with Dr. Doa?

As part of her presentation in Brussels, Dr. Doa provided data on mercury demand for 2000 and 2005. Her statements on the flow of mercury were based on decreases in the use of mercury in the developed world, increases in the use of mercury in the developing world, decreasing or static primary mercury mining, and decommissioning of chlor-alkali plants. These factors all indicate a flow of mercury from the developed world.

What has been the amount of increase in mercury flows to developing countries in each of the past five years?

The exact numbers for mercury flows are difficult to assess. For the United States, the most reliable import and export data comes from the U.S. International Trade Commission (U.S. ITC). In 2006, the United States exported 390 metric tons of mercury. Total quantities of mercury imported and exported from the United States by country are indicated in "Exhibit 2: U.S. Imports and Exports by Country (2001-2006)." Developing countries are shaded in grey.

Data for European exports of elemental mercury are available in the report entitled "Summary of Supply, Trade and Demand Information on Mercury," submitted to the United Nations. Figure 8 from that report is included in "Exhibit 3: European Mercury Exports to Various Regions of the Globe from the United Nations Environment Program Report".

6. **At the June 22, 2007 hearing before the Subcommittee on Environment and Hazardous Materials, you testified that if the United States banned exports of mercury... "I don't necessarily have reasons to believe that mercury mining would or wouldn't increase, but I think that it is likely, again, given the demand for mercury internationally."**

a. Is EPA aware of any country or private company that has announced plans to open a primary mercury mine?

No.

b. Is EPA aware of any country or private company that is seeking financing to open a primary mercury mine?

No, although in the 1990s the World Bank provided Kyrgyzstan with funding to support its existing operation.

c. Specifically, what is the factual basis for your belief that an export ban is likely to lead to increase mercury mining? Please identify any country where increased mercury mining will likely occur.

It remains uncertain how an export ban might affect the global supply and demand for elemental mercury.

7. **At the June 22, 2007 hearing, you testified that programs to address mercury demand, both domestically and globally, and to eliminate primary mining of mercury are critical.**

a. Please list the critical international programs that you were referring to.

In saying that, "programs to address mercury demand, both domestically and internationally, and to eliminate primary mining of mercury are critical," the testimony refers to the UNEP partnerships that help eliminate mercury from products and processes, which in turn, reduces demand. These are discussed above in the response to Question 1. Such programs include the Chlor-alkali Partnership, which promotes a range of options to reduce mercury use, from the use of best management practices to conversion to non-mercury cell technologies, and the Products Partnership, which, among other activities, is developing market assessments and product inventories so that countries can identify where mercury is being used in their country so that alternatives to mercury products can be identified. Also, a key Partnership that will result in decreases in demand is the UNEP Artisanal Mining Partnership led by UNIDO, which promotes more efficient uses of mercury in mining as well as non-mercury techniques to help reduce overall global mercury demand.

It is also important to eliminate primary mercury mining. The United States does not have primary mercury mines and we believe that it is preferable to use other sources of mercury, where necessary, rather than mercury from primary mines to meet global demand.

b. For each of these critical international programs, please provide the following information:

i. A list of all the studies, pilot projects, demonstration projects, and reports produced or directed through these programs.

Please refer to "Exhibit 1: Summary of Partnership Progress (2005-2008)".

ii. A list of all EPA costs related to the programs, including: contributions to studies, monies spent on pilot/demonstration projects, contract support, and number of EPA employees working on these programs.

Please refer to "Exhibit 1: Summary of Partnership Progress (2005-2008)".

8. The European Union (EU) is in the process of adopting a mercury export ban. Does the EPA object to, or disagree with, the EU's plan to adopt an export ban?

Our general concern with an export ban is that it is unclear how it would affect the global supply and demand for elemental mercury.

We are also concerned that if the ban is implemented as it is currently proposed, it could be inconsistent with obligations under the WTO agreements. The General Agreement on Tariffs and Trade 1994 (GATT 1994) prohibits quantitative restrictions (including prohibitions) on the export of goods from the territories of WTO Members. The GATT also creates exceptions to this prohibition for measures necessary to protect human, animal or plant life or health and for measures relating to the conservation of exhaustible natural resources (e.g., clean water and clean air). However, GATT rules permit these exceptions only if the measure is not applied in a manner that would constitute a "means of arbitrary or unjustifiable discrimination" or a "disguised restriction on international trade." It is not clear to us at this time that the export ban, as currently proposed, would meet this standard, particularly if the domestic sale and use of mercury by the EU Member States is not similarly restricted or exceptions to the export ban do not reflect how mercury is used or regulated domestically.

9. At the June 22, 2007 hearing, you testified that, as an alternative to an export ban, the Administration believes that the first priority should be given to pursuing "demand management strategies."

a. What specific international demand strategies is EPA referring to?

We believe that the most effective tool to address the risks posed by mercury is through reducing the demand for, and hence the use and/or release of, mercury. The UNEP partnership approach, which is open to all stakeholders, is transparent and global in nature. The United States has been very supportive of the partnerships and their ability to disseminate approaches which dramatically reduce or eliminate the demand for mercury. The Artisanal Mining Partnership, for example, is providing a targeted, concerted effort to educate miners on alternative approaches.

b. What specific international demand strategies have been implemented by EPA internationally?

Through the UNEP Partnerships, demand reductions can be achieved within a particular country by building domestic mercury product inventories that identify where mercury products are being manufactured, identifying mercury-free alternative products and processes, and by transferring success stories to other products and sectors. A specific example under the Products Partnership is reducing demand for mercury in the Chinese health care sector, following the model of the Hospitals for a Healthy Environment program that has been operating in the United States for over a decade. The same kind of demand reduction strategies have been undertaken by the Chlor-Alkali Partnership, in which Russia has followed the lead of other countries in reducing both its mercury demand and releases. One of the other demand strategies of the partnerships is to expand to additional sectors, which we have also seen. Much of the work that has been done in the hospital sector to identify and inventory the sources and uses of mercury, for example, is now being applied in schools. Under the Chlor-alkali Partnership, there is discussion of including vinyl chloride monomer production.

c. What specific results have been achieved and what amount of mercury use has been reduced internationally?

Results from the partnerships are expected at the end of the year, although there have been a few early action items. For example, the first part of the Russian chlor-alkali project has already reported a one and one half ton reduction in their annual mercury consumption and two Chinese hospitals have already shown significant mercury reductions. Jishuitan Hospital in Beijing reported that mercury spills were down by 50 percent over the course of the last year as a result of the Partnership's strong mercury awareness education campaign and staff training. At the Beijing Tiantan hospital, an initial goal of 30 percent reductions for blood pressure gauges was set. However, during the course of the year, due to the significant public awareness campaign, posters, booklets, and training courses for the hospital staff and its patients, the hospital achieved a 50 percent reduction. Further, Tiantan has made a financial commitment of 500,000 RMB to replace its mercury containing thermometers and is looking for a supplier in China for the mercury-free equipment.

The Artisanal Mining Partnership has also experienced excellent preliminary results, including in Senegal, where three mining communities have been fully trained on retort technology. The Kedougou Health Administration Director has reported that a number of the miners have already adopted the less-emitting retorts, which will reduce their mercury consumption over time; although there is no solid data regarding how much mercury was originally consumed and emitted by the individual miners, making results hard to quantify. In Brazil we are also seeing great results of a pilot project to reduce mercury emissions from

small-scale gold refining shops, where emissions are directly vented to city streets, with significant exposures to citizens and gold shop workers. We have developed a low-cost, locally fabricated technology that has been field tested at over 95 percent efficiency in mercury vapor capture.

10. **What is the benefit of recovering mercury out of products through recycling programs so it is then placed on the global market and returns to this country to pollute our water, ending up in fish, and creating risks to human health, particularly in expectant women, fetuses, and nursing infants?**

The benefits of recycling mercury out of products include removing it from the waste stream so that it isn't introduced into the environment through incineration or other methods of disposal. It can also reduce the amount of mercury derived from primary mining activities.

Notwithstanding such benefits, we share your concerns associated with environmental and human health risks – especially risks associated with expectant women, fetuses, and nursing infants. The recovery of elemental mercury from mercury-added products is an important step in reducing the release of elemental mercury into the environment, as well as a means of exercising stewardship and containment over a toxic substance. We are also pleased that the Basel Convention Secretariat is now drafting guidelines for mercury waste.

11. **At the June 22, 2007 hearing, you testified that "the amount of mercury that is exported from the United States is not a great percentage of the world market share."**

By way of example, in 2005 the global market demand for mercury was approximately 3,450 metric tons. For that year, the United States imported 212 metric tons and exported 319 metric tons. U.S. exports constituted less than 10% of the global demand and our net export contribution was 107 metric tons.

a. How much mercury has the United States exported each year for the past five years?

Using data provided by the U.S. ITC, the United States exported:

2006: 390 metric tons (gross) and 296 metric tons (net)
2005: 319 metric tons (gross) and 107 metric tons (net)
2004: 279 metric tons (gross) and 186 metric tons (net)
2003: 287 metric tons (gross) and 242 metric tons (net)
2002: 324 metric tons (gross) and 114 metric tons (net)

b. What is the source of the mercury exported by the United States each year? Please list each year's export numbers by source, i.e., mining, chlor-alkali industry, etc.

Those data are not available. In general, however, elemental mercury that is recycled has been recovered from the following sources: imported mercury ores and mercury compounds, by product from non-mercury mining activities in the United States, hazardous industrial waste, contaminated soil and debris, and discarded consumer and commercial products.

c. To what countries does the United States export mercury? Please list each year's export numbers by country.

Please refer to "Exhibit 2: U.S. Imports and Exports by Country (2001-2006)".

d. How is the mercury from the United States used once it is exported? Please list each year's amount by country exported to, and use.

The amounts exported, and to whom, are listed in Exhibit 2, as noted above. In terms of what each country does with their imports, that information is not available to us, but is estimated in the UNEP Summary of Supply, Trade and Demand Information on Mercury, 2006.

12. **Since the EPA thought it was very important for DOE and DOD to prevent mercury sales from their stockpiles, why isn't it equally important to prevent the same sales and exports on hundreds of tons from the chlor-alkali industry?**

We were very pleased with the actions taken by the Departments of Energy and Defense to store the mercury stocks under Federal control, which represent at least 70 percent of U.S. stocks. While we believe that it is important to address the privately-held stocks, there are a number of issues associated with these stocks that need to be considered. The stakeholder process we have initiated is an important step in determining how to manage the non-Federal stocks.

13. **Is it EPA's position that recovered elemental mercury from mercury-containing products or decommissioned mercury-cell chlor-alkali plants is less toxic to artisanal miners than elemental mercury primary mercury mining?**

No. The toxicity of elemental mercury is independent of its source but primary mining increases the total pool of global mercury while recovered mercury does not.

14. **What data does EPA have, if any, to support the position that recovered elemental mercury is any less harmful to the environment when used in artisanal and small-scale gold mining areas than virgin mercury?**

As discussed above, primary mining increases the total pool of global mercury, while recovered mercury does not. The source of elemental mercury used in artisanal mining activities is not likely to affect its relative toxicity.

15. **The Toxic Substances Control Act (TSCA) authorizes EPA to request information from individuals, corporations and organizations. Has EPA issued any TSCA information requests to individuals, corporations or organizations related to mercury imports and exports since 2000?**

Under section 8(a) of the Toxic Substances Control Act (TSCA), EPA may require persons who manufacture (including import) chemical substances to maintain records and report information to EPA concerning the manufacture or processing of chemical substances. Under section 8(a), EPA promulgated the Inventory Update Reporting Rule, 40 CFR 710, Subpart C, which requires persons manufacturing or importing 25,000 pounds or more of a chemical substance at a site to report certain information concerning their activities (see also 68 FR 848, January 7, 2003; 70 FR 57059, December 19, 2005). The most recent reports were submitted for calendar year 2005 (see 71 FR 53335, September 11, 2006). The data submitted include the specific chemical name and identifying number, the name of the company manufacturing or importing the chemical, the location of the site manufacturing or importing the chemical, the total volume manufactured

(including imported) at the site, the physical form and maximum concentration at which the chemical is manufactured (including imported), and an indication whether the chemical is manufactured or imported or both. Information is also collected on the number of workers reasonably likely to be exposed to the chemical and if the chemical is consumed at the site where it is manufactured. Information is not collected on the amount exported.

The information collected in 2006 and 2007 for the 2005 calendar year is being entered into a data base, after which it will be verified and any Confidential Business Information removed before it is released to the public. Information on inorganic substances, including mercury, was reported for the first time for the 2005 reporting year. Although the 2005 IUR information is not yet available, the number of reports of importation of mercury is likely to be small. The U.S. Geological Survey reported that a total of 92 metric tons (203,000 lbs) of mercury were imported in 2004 (see Mercury Statistics – U.S. Geological Survey, available at http://minerals.usgs.gov/ds/2005/140/mercury.pdf).

If so:

a. Please provide a list of all such requests for information, including the name of the individual, corporation or organization to which the request was sent, the date of the request and a summary of the information requested; and

See above.

b. Please provide a list of all responses to such requests, including the name of the individual, corporation or organization providing a response, the date of the response and a summary of the information provided.

See above.

16. Please provide specific information, including citations, regarding international obligations of the United States under bilateral or multilateral agreements to reduce the use, supply, or release of mercury. (For example, the Great Lakes Water Quality Agreement between Canada and the United States).

The United States has agreed to a number of instruments to address mercury, many of which are voluntary, bilateral, or part of environmental capacity-building or cooperation commitments, such as the trilateral mercury action plan associated with the environmental side agreement to the North American Free Trade Agreement or in our environmental memoranda of understanding with such countries as China and India. As noted in your question, within North America there is also the Great Lakes Water Quality Agreement. The United States and Canada use the Great Lakes Binational Toxic Strategy, which flows from the Great Lakes Water Quality Agreement, to address mercury in the Great Lakes. The Strategy is available at www.epa.gov.

In terms of "obligations," under the United Nations Economic Commission for Europe (UNECE), there is the Long-Range Transboundary Air Pollution (LRTAP) Convention, 1998 Protocol on Heavy Metals, which includes limitations and deadlines for emissions for new and existing stationary sources for various industry sectors as well as mandatory mercury concentrations limits for certain types of batteries. The Protocol also encourages Parties to consider actions to address other mercury-containing products (such as electrical components, measuring devices, lamps, dental amalgams, pesticides, paint, and other batteries). Many

Parties, including the United States, have implemented actions to address some of these products. The Protocol and related information are available at www.unece.org.

Globally, the United States has been the catalyst for developing the multilateral Global Mercury Partnerships called for in the UNEP Governing Council decision of 2005, available at www.unep.org.

17. **In your written testimony for the June 22, 2007 hearing, you raised the question as to whether a mercury export ban could "be made consistent with U.S. trade obligations." Are there any binding adjudicatory or judicial decisions stating that a ban on the export of elemental mercury from the United States would be inconsistent with this country's trade obligations? If so, please provide a copy of any such decision.**

We are not aware of any adjudicatory or judicial matter in which the question has been squarely presented. However, Article XI of the GATT 1994 generally prohibits restrictions on exports (including export bans). There are exceptions to this rule but certain criteria must be satisfied. A number of WTO dispute settlement reports have addressed GATT exceptions for measures asserted to be necessary to protect human, plant or animal health or related to the conservation of exhaustible natural resources, e.g., the WTO reports in U.S.-Shrimp (WT/DS/58) and U.S.-Gasoline (WT/DS/2). Based upon those reports and other factors, we are concerned that an export ban on mercury in the absence of sufficient restrictions on domestic commerce in mercury or appropriate exceptions to such an export ban could be seen as discriminatory and thus incompatible with our obligations under the GATT 1994 and under our other trade agreements which contain similar requirements.

18. **Please list and identify all of the lakes, rivers and streams in the United States that have fish advisories due to mercury contamination.**

According to the National Listing of Fish Advisories, the total number of advisories for mercury was 2,436 in 2004, 2,682 in 2005, and 3,080 in 2006. Forty-eight states, one territory, and two tribes have issued mercury advisories. Eighty percent of all advisories have been issued, at least in part, because of mercury. The increase in the number of mercury advisories in 2005 and 2006 can be attributed to the issuance of new mercury advisories by 25 states, and American Samoa. Most of the new mercury advisories issued in 2005 and 2006 were in Wisconsin (293), Michigan (46), New York (36), and Minnesota (32). In 2005, American Samoa, Kansas, Oklahoma, and Utah issued mercury advisories for the first time, and Iowa did the same in 2006.

Currently, twenty-three states (Connecticut, Florida, Illinois, Indiana, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, Vermont, Washington, Wisconsin, and West Virginia) have issued statewide advisories for mercury in freshwater lakes and/or rivers. Twelve states (Alabama, Florida, Georgia, Louisiana, Maine, Massachusetts, Mississippi, New Hampshire, North Carolina, Rhode Island, South Carolina, and Texas) have statewide advisories for mercury in their coastal waters. Hawaii has a statewide advisory for mercury in marine fish. The Micmac tribe of Maine has two reservation-wide advisories in effect for mercury in freshwater and marine fish (including lobster). In addition, the Cheyenne River Sioux Tribe has one reservation-wide advisory for mercury in rivers, lakes, and stock ponds.

A searchable database of all U.S. bodies of water currently under fish advisories can be found at the EPA's National Listing of Fish Advisories at http://oaspub.epa.gov.

19. In February 2007, a number of leading international mining and metals companies that are the members of the International Council on Mining and Metals (ICMM) pledged to reduce mercury emissions from their metals mining operations due to human health and environmental concerns. These companies also pledged to: "Commit not to open any new mines designed to produce mercury as the primary product." Are you familiar with these pledges? Do these mining organizations and pledges represent the most significant and/or largest mining concerns in the United States and abroad?

I am familiar with these pledges and applaud ICMM for such a forward-looking statement. A representative from the International Council on Mining and Metals is a member of the Commodity Mercury Stakeholder Panel. The ICMM pledge concerning efforts to curb primary mercury mining was discussed at the most recent meeting of the Panel on July 23, 2007, in Denver, Colorado. While the ICMM is an important organization, it does not represent all of the entities that currently mine or could pursue primary mercury mining in the future.

20. The Quicksilver Caucus, of the Environmental Coalition of the States (ECOS), has developed a set of principles that articulate the States' perspectives for the development of comprehensive and effective management of elemental mercury in an environmentally secure manner at the local, State, national, and international level. ECOS principle 9 states: "The United States should prohibit imports of elemental mercury and mercury-containing products, unless the import is for sequestration." Does the EPA support the principle set forth by ECOS that mercury should not be imported?

At this time, the federal government process is not addressing issues pertaining to the prohibition of elemental mercury imports and does not have a position on the aforementioned principle set forth by ECOS. We note that the GATT 1994 generally prohibits import restrictions although if certain criteria are met there may be exceptions for measures necessary to protect human, animal or plant life or health or related to the conservation of exhaustible natural resources.

According to a January 2007 United States Geological Survey Mineral Commodity Summary, the United States is exporting mercury and is also importing mercury from foreign countries, including Peru and Chile. Please specify the amounts of mercury that were imported in the U.S. in 2006, the identity of the exporting country, and the company that imported the mercury.

U.S. imports are indicated by country in "Exhibit 5: U.S. Mercury Imports for the Year 2006 by Country". Company information is not readily available at this time.

Questions for the Honorable James B. Gulliford by the Honorable John Shimkus and the Honorable Joe Barton

1. **A ban on mercury exports sounds simple. But this legislation does not address unintended consequences, like an increase in mining, which adds to the amount of mercury in the environment. It also does not address the important issue of managing the demand for mercury. Do you agree that any solution to this problem needs to be more comprehensive, including addressing demand and better understanding the consequences of an export ban?**

   The challenge of addressing global mercury supply and demand is multifaceted because this is a complex global issue without a simple, singular solution. Comprehensive, global strategies are needed to reduce effectively domestic and international demand for mercury, and an export ban alone is not likely to do so. Comprehensive strategies can also work to curb existing and prevent new primary mining of mercury. In addition, we need to carefully consider all of the trade implications associated with an export ban.

2. **We understand that EPA worked with DOD and DOE when decisions were made to place their mercury surplus in storage. Do the federal stocks of mercury represent the majority of mercury stocks in the U.S.? If that is true, doesn't this U.S. policy go a long ways toward addressing the problem without addressing the unintended consequences that might result from a legislative ban, such as an increase in mercury mining?**

   Yes. Federal stocks compose more than two-thirds of U.S. mercury stocks – roughly 5,600 metric tons of an estimated 8,010 metric tons in total – so a large majority of the commodity-grade mercury is already off the market and being safely managed. The U.S. Government is exercising its stewardship responsibilities for stocks under its control, as evidenced by the decisions by Department of Defense and Department of Energy to safely store their mercury stockpiles. Reducing demand and promoting mercury-free alternatives in products and industrial processes are also important components to addressing the risks posed by mercury use and release.

3. **EPA has established an expert stakeholder panel to find answers to tough questions on this issue. And many of the experts in the EPA panel are the same ones testifying here today. This expert group just held a meeting last week and additional meetings are scheduled. Given that this group is being productive and includes all the right players, is a legislative export on mercury premature at this time? Isn't the fact gathering process critical to effective policy making?**

   The Commodity Mercury Stakeholder Workgroup is discussing many of the issues relating to various potential mercury storage solutions and their deliberations could be useful to the policy making process. Therefore, we believe that a legislative export ban would be premature at this time. The stakeholder process that is in place involves a diverse and balanced group of experts from states, industry, environmental groups, and academia, and also invites public participation. The process is a valuable way to analyze the market drivers that are in place and to develop options for the government to consider. The panel members are assessing how non-Federal stocks of commodity-grade mercury should be managed in the short and long term, and how current and projected supply and demand will affect this determination. The panel has met three times and will meet once more. The federal government will summarize the panel's proceedings in a report after the final meeting in September.

4. **How can we as a committee be assured that EPA intends to follow through and address mercury related issues?**

All of the Agencies involved in the process place great importance on addressing both domestic and international mercury issues and our track record on domestic and international efforts on mercury is solid. With respect to EPA in particular, my office published EPA's *Roadmap for Mercury* in July 2006 as a clear statement of EPA's commitment to address mercury in the environment for the public and its stakeholders. The follow-through on the commitments made in the *Roapmap* include using regulatory authority to prevent new uses of elemental mercury in certain motor vehicle switches and providing strong leadership to the mercury partnerships under the auspices of the United Nations Environment Program. Those actions, as well as the convening of the Commodity Mercury Stakeholder Workgroup, demonstrate a solid commitment to address mercury-related issues.

Questions for the Honorable James B. Gulliford by the Honorable Gene Green

1. **In your testimony, you state that the EPA believes the first priority with regard to mercury should be pursuing demand management strategies in the global community and if we remove our mercury from the global market we need to reduce demand and promote mercury alternatives.**

   The U.S. already contributes a substantial amount of monetary funding to the United Nations Environment Programme and already leads three global partnerships to decrease demand for mercury and to educate countries on mercury alternatives.

   The mercury export ban will not go into effect until 2010. Your testimony seems to imply that we cannot convince other countries to come up with mercury alternative by that time. This seems like a do nothing philosophy.

   Approximately, how long has the EPA been working on the domestic and global mercury problem?

   As summarized in EPA's *Roadmap for Mercury*, EPA has a long history of addressing mercury. Between 1970 and 1990, there was increasing scientific evidence of mercury pollution problems in the United States. This evidence included risks from low-level exposure to mercury, increasing amounts of mercury pollution in air, water, and waste, and the significant problem of local, regional, national and global transport of mercury pollution.

   To address a number of these problems, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) was enacted in 1980, providing authority to clean up past waste. Section 103 of CERCLA required reporting of releases or spills of inorganic (elemental) mercury greater than one pound per day. Following that, the Clean Air Act of 1990 provided authority to address mercury air emissions at key sources. In 1995, the Great Lakes Water Quality Guidance provided water quality standards to address mercury in that media. The 1996 Battery Act followed soon after, introducing mercury regulations in the area of products and manufacturing. Since that time, EPA has helped to shape and enforce mercury-pertinent provisions of environmental statutes, as well as spearhead domestic initiatives to study and reduce the harmful effects of mercury in environment.

   Internationally, significant regional efforts were undertaken in 1998 by the United Nations Economic Convention for Europe on Long-Range Transboundary Air Pollution Protocol on Heavy Metals, which includes limitations and deadlines for emissions for new and existing stationary sources as well as mandatory mercury concentrations limits for certain types of batteries. The United States also undertook international efforts to address mercury reduction efforts in 2001- 2002 by contributing scientific expertise, leadership, and funding to UNEP's 2002 *Global Mercury* Assessment. The UNEP Mercury Program was mandated by the 2003 Decision of the UNEP Governing Council. The United States urged members of the United Nations Environment Programme to focus on reducing mercury pollution, developing regulatory capacity on an international scale, and facilitating the exchange of knowledge, research, and technology. Since that time, the United States has participated in biennial Governing Council Meetings and has taken an active leadership role in three of the five global partnerships to reduce mercury supply and demand. The United States has provided the majority of the funding to the UNEP Mercury Program, which includes the Partnerships, since its inception.

2. **Don't you agree that as a global leader we have a responsibility to stop contributing to a pollution and health issue when we know the consequences?**

No other country has been more successful in reducing mercury emissions than the United States. In all cases the reductions were accomplished through domestic regulatory programs and demand reduction strategies. The United States has taken a number of significant actions to reduce our contribution to the global mercury pool. Our demand, use, and release of mercury have been steadily declining. For example, the United States has decreased its emissions from waste incineration by about 90 percent, and reduced total emissions by about 45 percent, since 1990. Mercury use by the U.S. chlor-alkali production industry has been reduced by about 94 percent since 1995. Also, the technology-based air emission standard for the chlor-alkali industry that went into effect in December of 2006 has reduced mercury air emissions from this sector by over 90 percent. These types of reductions can also be seen in products, where the result of our efforts has been a dramatic drop in mercury use between 1980 and 2001, from almost 2,000 metric tons to 245 metric tons. U.S. progress is continuing, for example, with the elimination of mercury in button-cell batteries by 2011. Further, EPA helped to found and foster Hospitals for a Healthy Environment, a program that has led to the development of best management and virtual elimination plans for mercury instruments and wastes in hospitals domestically and is being demonstrated in Argentina, China, and Mexico.

The United States also has the Clean Air Mercury Rule (promulgated in 2005), which is the first federal rule in the world to cap and reduce mercury emissions from coal-fired power plants – the largest current source of anthropogenic mercury emissions in the country. When fully implemented, the Environmental Protection Agency anticipates this rule, which builds on the Clean Air Interstate Rule, will reduce emissions of mercury from power plants from 48 tons a year to 15 tons, a reduction of nearly 70 percent. We have also promoted the long-term storage of federal mercury stockpiles and initiated a Commodity Mercury Stakeholder Panel, which convenes and draws upon the expertise of industry, academic, non-profit, and federal representatives. The stakeholder panel members will provide valuable input on domestic and global mercury issues, including supply and demand, long-term storage, and the range of solutions that might be undertaken by the United States to fulfill stewardship responsibilities now and in the future.

Notwithstanding these successes, the mercury challenge is multifaceted and without simple solutions. Given this need, no country has provided greater leadership to the international partnership projects. And we will continue to provide global leadership through our ongoing efforts to address domestic and global mercury demand as a means to reduce risks to human health and the environment.

3. **How long are we going to work to educate and train other countries before we stop allowing our mercury to contaminate the air and cause serious health effects?**

We take very seriously our commitments, both domestic and foreign, to reduce U.S. mercury use and release. We are proud of our domestic reductions in mercury emissions. The increases over the last decade in mercury consumption and emissions in developing countries, particularly in Asia, have led us to examine carefully the best available data on the end-uses and sources of these emissions, leading to our championing of partnership work in sectors which account for over 80 percent of total global anthropogenic mercury emissions. Educating other global mercury emitters, sharing our successes, and building the technical capacity in other countries to address mercury is one of the most important ways we can reduce the global mercury pool.

Globally, coal-fired power plants are estimated to be the biggest contributor to mercury pollution, with artisanal gold mining, which is not practiced in the United States, being the second biggest contributor. Educating other global mercury emitters, sharing our successes such as the Clean Air Mercury Rule referenced above, and building the technical capacity in other countries to address mercury are among the most important ways we can reduce the global mercury pool.

Exhibit 1: Summary of Partnership Progress (2005-2008)

UNEP Mercury Partnership	a. Studies, Demonstration Pilots, Reports, etc. Conducted	b. Funding[1]	c. Amount of Mercury Use Eliminated, Reduced, or Prevented (tons)
Mercury Products Partnership	Asian Toolkit and Mercury Inventory Pilot Project Buenos Aires Hospitals Project Burkina Faso Mercury Use Assessment Chile Mercury Inventory China Hospitals Project Costa Rica Hospitals Project Ecuador Market Assessment and Mercury Inventory India Hospitals Project Mexico Healthcare Project Mexico Products Inventory Update Panama Assessment and Mercury Inventory	$400K (FY 05/06) $235K (FY 06/07) $260K (FY 07/08) *Three EPA staff work part-time on this Partnership.	To be determined.
Air Transport and Fate Research Partnership	Held two meetings for international stakeholders to develop partnership business plan. By 2009, the Partnership plans to provide UNEP information on global emissions, air monitoring, and modeling that will update the 2002 UNEP Global Mercury Assessment	$375K (FY 05-07) *Two EPA staff work part-time on this Partnership.	The goal of the Air Transport and Fate Research Partnership is to improve global understanding of mercury sources, fate and transport.
Chlor-alkali Partnership	India Chlor-alkali Project Mexico Chlor-alkali project Russian Chlor-alkali Project World Chlorine Council Facility Reporting Project	$600K (FY 05-08) *Two EPA staff work part-time on this Partnership.	>1.5 tons to date in mercury releases from one Russian facility. Similar reductions are expected at

[1] Data represents funds given by EPA to UNEP and certain cooperative agreements (e.g., UNITAR), which are then allocated per the scope of particular partnerships and projects (e.g., capacity-building and training activities, facility audits, and education on alternative products and processes).
[2] While no actual mercury reduction achieved to date, an action plan for the Mexico project, which prioritizes release reduction opportunities, is completed.

			two more facilities.[2]
ARTISANAL AND SMALL-SCALE MINING PARTNERSHIP	Amazon Gold Shops Project World Bank CASM Web Page Development Senegal Mining Project	$369K (FY 05-08) *One EPA staff work part-time on this Partnership.	To be determined.[3]
COAL COMBUSTION PARTNERSHIP	China Coal-Washing Project China Emissions Inventory Project India ESP (Electrostatic Precipitator) Technology Transfer Project Russia Scrubber and ESP Project[4] South Africa Coal Combustion Project	$911K (FY 05-08) *Two EPA staff work part-time on this Partnership.	To be determined.[5]

[3] Low-cost, locally fabricated mercury vapor control system for gold shops were developed and installed in four gold shops in the Brazilian Amazon, which tested at an average of 96 percent efficiency. Also, 140 Senegalese miners have been trained in mercury risks and use of retorts.
[4] This project emphasizes co-control and will address substances including, but not limited to mercury.
[5] The efforts under this Partnership (e.g., workshops, raising awareness, information sharing, pilot projects, etc.), are directed at assisting developing countries (especially China, Russia, India) to address multi-pollutant emissions from this sector. These efforts have reduced significant quantities of mercury emissions and will continue to achieve reductions. However, no quantitative estimates of mercury reductions are available at this time.

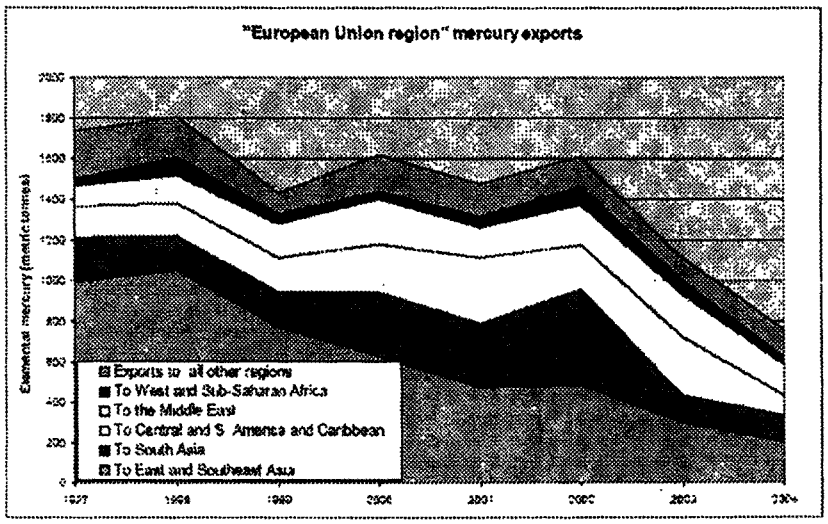
Exhibit 2: U.S. Imports and Exports by Country (2001-2006)

ALL VALUES IN METRIC TONS	2001		2002		2003		2004		2005		2006	
COUNTRY	IMPORT	EXPORT	IMPORT	EXPORT	IMPORT	EXPORT	IMPORT	EXPORT	IMPORT	EXPORT	IMPORT	EXPORT
ARGENTINA	-	-	-	-	-	-	-	-	-	-	-	3
AUSTRALIA	-	-	107	6	-	<1	-	-	-	5	-	3
BANGLADESH	-	-	-	-	-	-	-	-	-	<1	-	-
BELGIUM	-	5	<1	4	-	-	<1	2	-	-	-	-
BELIZE	-	-	-	-	-	-	-	-	-	<1	-	-
BOLIVIA	-	-	-	-	-	-	-	-	-	<1	-	31
BRAZIL	-	4	-	4	-	7	-	1	-	-	-	4
CANADA	8	3	11	4	6	5	2	4	13	11	8	12
CHILE	41	-	75	-	-	-	40	3	21	4	-	-
CHINA	-	-	-	-	-	-	-	<1	<1	-	<1	-
COLOMBIA	-	<1	-	6	-	-	-	-	-	6	-	4
DENMARK	-	<1	-	-	-	-	-	-	-	-	-	-
DOMINICAN REP	-	-	-	<1	-	-	-	-	-	-	-	-
ECUADOR	-	-	-	<1	-	2	-	-	-	-	-	-
EL SALVADOR	-	-	-	-	-	-	-	<1	-	-	-	-
FRANCE	-	3	-	8	-	3	-	-	-	<1	-	2
GERMANY	22	5	15	21	19	4	24	4	11	<1	14	<1
GREECE	-	-	-	-	-	-	-	<1	-	-	-	-
GUATEMALA	-	-	-	3	-	-	-	-	-	<1	-	-
GUYANA	-	-	-	-	-	6	-	-	-	19	-	-
HONDURAS	-	-	-	-	-	-	-	<1	-	<1	-	<1
HONG KONG	-	<1	-	18	-	17	-	-	-	17	-	-
HUNGARY	-	-	-	-	-	-	-	<1	-	-	-	-
INDIA	-	19	-	21	<1	25	-	63	-	19	-	80
IRAQ	-	-	-	-	-	-	-	-	-	-	-	19
ISRAEL	-	-	-	-	-	-	5	<1	29	4	-	4
ITALY	<1	-	-	-	-	-	-	-	-	-	-	-
JAPAN	-	3	-	2	-	<1	-	<1	-	<1	-	<1
KOREA	-	2	-	7	-	<1	-	<1	-	1	-	<1
LATVIA	-	-	-	-	-	-	-	-	-	-	-	<1
MALAYSIA	-	2	-	<1	-	2	-	1	-	<1	-	1
MEXICO	-	12	<1	33	-	35	-	64	-	25	-	8
NETHERLANDS	-	17	-	73	-	57	-	-	-	156	-	118
NEW ZEALAND	-	<1	-	-	-	<1	-	-	-	-	-	-
PERU	29	4	-	4	19	51	-	47	548	-	24	51
PHILIPPINES	-	-	-	<1	-	-	-	-	-	4	-	3
RUSSIA	-	-	-	-	-	-	-	-	-	<1	51	-
SAUDI ARABIA	-	-	-	<1	-	<1	-	2	-	3	-	-
SINGAPORE	-	1	-	18	-	22	-	<1	-	<1	-	25
SPAIN	-	18	<1	-	-	<1	<1	-	-	21	-	21
SWEDEN	-	-	-	<1	-	<1	-	-	-	-	-	-
SWITZERLAND	-	-	-	-	-	-	-	<1	-	-	-	<1
TAIWAN	-	2	-	<1	-	-	-	4	-	-	-	-
TANZANIA	-	-	-	-	-	-	-	-	-	-	-	-
THAILAND	-	-	-	-	-	6	-	-	-	-	-	-
TURKEY	-	-	-	-	-	-	-	-	-	<1	-	-
UNITED ARAB EM	-	-	-	<1	-	-	-	-	-	14	-	-
UNITED KINGDOM	<1	4	<1	<1	<1	2	<1	<1	<1	<1	<1	2
VIETNAM	-	4	-	<1	-	46	-	46	-	-	-	14
Total (All Countries)	99	109	210	324	46	287	92	279	212	319	94	390
Total Net Export		10		114		242		186		107		296
Total (Developing Countries)	69	14	75	106	19	116	40	133	189	21	22	114
Total Net Export		-55		31		96		93		-120		92

Note: All values are in metric tons. Shaded countries are considered developing countries in this analysis.
Source: U.S. International Trade Commission. U.S. Imports for Consumption and Total Exports; HTS Code 2805400000

Exhibit 3: European Mercury Exports to Various Regions of the Globe from the United Nations Environment Program Report

Figure 6 Mercury exports to the world from the European Union (25 member countries)



Source: UNSD Comtrade statistics, as of April 2006.

Exhibit 4: U.S. Mercury Exports for the Year 2006 by Country (Metric Tons)

U.S. MERCURY EXPORTS FOR THE YEAR 2006 BY COUNTRY (METRIC TONS)	
Country of Destination	Quantity Exported (metric tons)
Argentina	3
Australia	3
Brazil	4
Canada	12
Colombia	4
France	2
Germany	1
Guyana	7
Honduras	1
India	80
Iraq	15
Israel	4
Japan	1
Korea	1
Malaysia	1
Mexico	8
Netherlands	118
Philippines	3
Singapore	25
Spain	21
Switzerland	1
United Kingdom	2
Vietnam	74
Source: U.S. International Trade Commission U.S. Total Exports; HTS Code 2805400000	

Exhibit 5: U.S. Mercury Imports for the Year 2006 by Country (Metric Tons)

U.S. MERCURY IMPORTS FOR THE YEAR 2006 BY COUNTRY (METRIC TONS)	
Country of Origin	**Total Imports**
Canada	8
Germany	14
Peru	22
Russia	51
Source: U.S. International Trade Commission U.S. Imports for Consumption; HTS Code 2805400000	