Children's Health Protection Advisory Committee

January 4, 2005

Michael Leavitt, Administrator
United States Environmental Protection Agency
1200 Pennsylvania Ave, NW
Washington, D.C. 20640

Reference: Docket ID No. OAR-2002-0056 (Notice of Data Availability)

Dear Administrator Leavitt:

Thank you for the opportunity to provide input to your decision-making process on the Clean Air Mercury Rule. We hope that your possible departure to become the Secretary of the Department of Health and Human Services (HHS) does not delay action on this important issue for our nation's children. In addition, since the regulation of mercury emissions is so closely linked with reductions of other air toxics from power plants, we are concerned that the new delay of the Clear Air Interstate Rule (CAIR) will impact EPA's ability to achieve a sufficiently protective mercury rule.

In our October 25, 2004 meeting with Deputy Administrator Steve Johnson, he asked us to review the Notice of Data Availability (NODA) and the five principles you have developed to guide your decision-making process and to provide you with guidance from a children's health perspective. As you know, the Clean Air Mercury Rule is of great importance to the Children's Health Protection Advisory Committee (CHPAC) as demonstrated in our letters of January 26, 2004, June 8, 2004, and November 8, 2004. After review of the NODA, we remain convinced that our findings stated in our letter of November 8, 2004, are still appropriate:

- Controls are available to reduce mercury emissions by up to 90 percent in a short timeframe and should be reflected in a national standard.
- A more stringent national standard could begin to address the concerns about regional, local and downwind mercury deposition.

- Moreover, quicker and deeper reductions in mercury emissions will provide important health benefits in a cost effective manner.

While we are pleased to see that EPA is considering additional external analyses, we note that EPA has not conducted the analyses recommended by the CHPAC in our January 26, 2004 letter. Specifically we asked the Agency to develop "an integrated analysis with respect to whether emissions reductions under either of these proposals are the most child-protective, timely, and cost-effective," using existing available data.

We have had an opportunity to discuss the NODA and the five principles, and would like to offer responses to the questions posed in **Principle 1** which mirrors a number of questions presented in the NODA. The questions that seem most relevant to the CHPAC are those framed in the NODA as further questions to assist EPA in developing a revised health benefits analysis. With regards to the other principles, we would strongly encourage EPA to broaden the definition of America's competitiveness in **Principle 4** to include attention to healthy child brain development as an important contributor to the nation's economic success. Furthermore, our consultations with external experts demonstrate that compliance can be achieved in a cost-effective manner.

***EPA's Guiding Principle 1*: The final rule will concentrate on the need to protect children and pregnant women.**

The neurological effects of mercury on fetuses, infants and children are of particular concern to this Committee, and they need to be more thoroughly addressed in this rulemaking. In addition to the landmark reports underscoring the risk posed by mercury to our children cited in our January 26, 2004 letter, the new December 2004 policy statement of the American Academy of Pediatrics entitled "Ambient Air Pollution: Health Hazards to Children" addresses mercury emissions from industrial sources and recommends that such emissions be decreased.[1]

The CHPAC has reviewed the six elements of this Principle and the related questions posed in the NODA. The NODA asks for input on existing models developed by EPA and modeling input parameters, many of which have been subject to much debate already. We would strongly encourage EPA to rely on the breadth of scientific knowledge on mercury behavior in the environment and existing health-conservative input parameters for the benefits modeling as it finalizes its mercury rule. We would like to offer the following specific points to the Agency:

1. <u>Speciation – How do different forms of mercury behave?</u>

In addition to understanding the different forms of mercury, EPA is seeking additional input on the effectiveness of existing, commercially-available air pollution control systems to reduce the emissions of mercury, as well as on the ability of models to

[1] Ambient Air Pollution: Health Hazards to Children. American Academy of Pediatrics Policy Statement. *Pediatrics*. 114(6), December 6, 2004: 1699-1706.

accurately predict the transport, chemistry and deposition of mercury once it is released into the atmosphere.

Based on our consultations with outside experts in Fall 2004, the CHPAC concluded that effective technology is available to reduce the emissions of mercury in a much shorter time frame than proposed by EPA. In addition, we have also concluded that the transport, chemistry and deposition of mercury have been well documented by both EPA scientists and outside experts including the Northeast States for Coordinated Air Use Management. Mercury emissions from coal-fired power plants account for over 40% of total US mercury air emissions, a significant fraction of which is deposited locally or regionally.[2] EPA's own models show that in the states with the highest mercury concentrations, more than 50% of the mercury deposited comes from local sources.[3] Studies show that the ionic or reactive form of mercury deposits quickly and so tends to deposit relatively close to its initial source. As demonstrated in the Florida Everglades, reductions of ionic mercury emissions will show benefits at the local or regional scale within a relatively short period of time.[4] While the global contribution of mercury into the US environment is important, it is vital to recognize and address the significant contribution of the largest US source of mercury air emissions, namely coal-fired power plants, to mercury contamination at the local and regional scale in the US. EPA should show leadership in applying stringent mercury controls to our own coal-fired power plants and involve the U.S. in technology transfer to improve emissions in other parts of the world.

2. Deposition – How and where does mercury enter our waterways?

EPA is seeking additional information about the rate at which mercury moves through the terrestrial and aquatic environment, particularly on modeling affected ecosystems.

In response to EPA's questions raised in the NODA about EPA's own model, Mercury Maps (MMaps), the CHPAC notes that the MMaps is a tool developed by the Agency to relate reductions in air depositions to reductions in fish tissue concentrations, by watershed, nationwide. This model, created by the Office of Water, offers an excellent tool to evaluate the benefits of anticipated reductions in air deposition as explained in the October 2004 Mercury Maps fact sheet on EPA's web site.[5] As noted above, EPA should use existing methods and health-conservative modeling input parameters to evaluate the benefits of the control options available. Using the same yardstick (e.g., model, input parameters) for each control option provides the comparison needed and requested by CHPAC in our January 26, 2004 letter.

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[2] Presentation to CHPAC Regulatory Policy Work Group October 7, 2004, by Praveen Amar, Director, Science and Policy, NESCAUM, entitled "Role of Regulatory Drivers in Promoting Large-Scale Application of Mercury Control Strategies for Coal-Fired Boilers."

[3] NODA public comment OAR-2002-0056-2118

[4] Presentation to CHPAC Regulatory Policy Work Group October 7, 2004, by Tom Atkeson, Mercury Coordinator, Florida State Department of Environmental Protection, entitled, "Mercury in the Environment: Can Controls Be Effective?" (developed by Tom Atkeson, Don Axelrad, and Curtis Pollman).

[5] www.epa.gov/waterscience/maps/fs.htm

Recent studies indicate that, if mercury air emissions are reduced, reductions in ecosystems follow. During consultations with outside experts in the Fall of 2004, the CHPAC learned of two case studies, conducted in Florida and Wisconsin, that demonstrate an association between mercury air reductions and reduction of mercury in fish. As cited in our January 8, 2004 letter, significant data from Florida indicate that changes in atmospheric mercury depositions resulting from regulating mercury emissions from municipal waste combustors and medical waste incinerators have led to a 75 percent decline in the amount of mercury detected in Everglades fish and wildlife.[6] Similar results have been reported in Wisconsin[7] and New Hampshire.[8] Scientists have demonstrated that reductions of mercury emissions will show benefits at the local or regional scale within a relatively short period of time.[9] These findings demonstrate that deposition of hot spots can exist and highlight the importance of a rule that prevents such areas of concentration.

3. Bioaccumulation– How does mercury move through the food chain?

As we have stated in our previous letters, the process by which methylmercury bioaccumulates is well documented in the scientific literature and prior EPA documents. When mercury deposits in water bodies, it becomes methylated . Methyl mercury is fat soluble and accumulates in organisms including fish, a process known as bioaccumulation. Larger, long-lived predator fish have the highest concentrations as a result of eating contaminated prey.[10] The bioaccumulation of methylmercury in fish results in exposures in humans, especially impairing brain development of children both *in utero* and at very young ages. We urge EPA to accept the scientific evidence in existence and to avoid delay from an extended debate regarding the possible input parameters to use in modeling. Rather, EPA should use health-conservative assumptions in evaluating the issue of bioaccumulation in its health benefits analysis.

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[6] Presentation to CHPAC Regulatory Policy Work Group October 7, 2004, by Tom Atkeson, Mercury Coordinator, Florida State Department of Environmental Protection, entitled, "Mercury in the Environment: Can Controls Be Effective?" (developed by Tom Atkeson, Don Axelrad, and Curtis Pollman).

[7] Hrabik TR, Watras CJ, Recent declines in mercury concentration in a freshwater fishery: isolating the effects of de-acidification and decreased atmospheric mercury deposition in Little Rock Lake. The Science of the Total Environment. 2002.

[8] Evers DC, Taylor KM, Major A, Taylor RJ, Poppenga RH, Scheuhammer AM. Common loon eggs as indicators of methylmercury availability in North America. Ecotoxicology. 2003 Feb-Aug;12(1-4):69-81.

[9] Presentation to CHPAC Regulatory Policy Work Group October 7, 2004, by Tom Atkeson, Mercury Coordinator, Florida State Department of Environmental Protection, entitled, "Mercury in the Environment: Can Controls Be Effective?" (developed by Tom Atkeson, Don Axelrad, and Curtis Pollman).

[10] US EPA, 1997. Mercury Study to Congress, Volume II: An Inventory of Anthropogenic Mercury Emissions in the United States. EPA-452/R-97-004. Washington, DC: US Environmental Protection Agency.

4. Consumption patterns – What are the types, sources and amounts of fish consumed?

In response to EPA's request for more information on the types of fish Americans eat and the concentrations of mercury found in these fish, the location where these fish are caught, and the types, amounts, location and mercury levels in fish consumed by highly exposed populations, the CHPAC would like to reiterate our previous point that relevant analysis has already been done and that EPA should utilize their own existing estimates for fish consumption patterns and vulnerable populations. Most notably, in preparation for the new joint EPA/FDA advisory on mercury in fish, both Agencies undertook an evaluation of consumption patterns, locations and vulnerable populations[11]. In addition, external partners including a number of states and environmental and public health organizations have also tracked such data. Across all of these analyses, there is broad consensus about the pervasiveness of mercury contamination, and the high number of states with fish advisories for mercury.

In addition, the CHPAC would like to affirm EPA's apparent intent to look at susceptible populations (i.e., the tails of the fish consumption distribution, not just the average) to ensure that all Americans are adequately protected.

5. Dose response – What are the health impacts from different exposure levels?

The CHPAC supports the selection of children's neurodevelopmental toxicity as a primary endpoint for assessing the economic benefits of mercury reduction, and the use of Intelligence Quotient (IQ) as a marker of children's neurodevelopmental toxicity. These measures are among the best studied of endpoints, and their economic value has been repeatedly studied and peer reviewed. It must be plainly stated in any cost-benefit analysis, however, that reliance on IQ as the sole measure upon which to base economic value will result in a significant underestimate of true economic value, as multiple other benefits of mercury reduction will not be valued. These other benefits include avoidance of other neurodevelopmental damage that is not included in the IQ measure, as well as cardiovascular and immune system damage that occurs at similar dose levels. We also support the consideration of data from the three major studies (Faroe Islands, New Zealand and Seychelles studies) but believe that the decision of whether to combine the actual data should rest with experts in neuroepidemiology who are most familiar with the nature of the data. The final choice of the dose-response model should similarly be made by experts after consideration of which model best fits the actual data, but we support the use of a linear model as being the most appropriate model for mercury toxicity data. EPA's own IRIS document for methylmercury states "No evidence of a threshold arose for neurotoxicity within the range of exposures in the Faroe Islands study." [12] We note that these issues of model choice have been deliberated upon and well-presented by the National Academy of Sciences subcommittee in their report on methylmercury. We

[11] http://www.epa.gov/waterscience/fish/advisory.html
[12] http://www.epa.gov/iris/subst/0073.htm

support the work of the National Academy of Sciences and are not aware of any new developments that contradict their conclusions.[13]

6. Local health impacts – Is there a relationship between emissions and local health impacts?

The connection between mercury emissions for coal-fired power plants and the creation of local or regional hot spots is well documented. As we addressed in previous letters, the CHPAC remains concerned that the cap and trade program, as proposed, may not address existing hot spots and may create new local hot spots for mercury, disproportionately impacting local communities (e.g., those depending on subsistence fishing). Our concerns raised about subsistence fishing are similar to those raised by one of the public comments included in the NODA, namely from the Bad River Band of Lake Superior Tribe of Chippewa Indians[14]. EPA should take into consideration the findings in studies showing that reducing mercury air emissions has a positive impact on local mercury levels,[15] [16] [17] and may not need to take the time to develop six new case studies, thereby potentially delaying the final rule.

In conclusion, we believe that the documented scientific evidence on mercury transport, chemistry, deposition, bioaccumulation, consumption patterns, dose-response and local impacts makes a compelling case for EPA to develop a comprehensive health benefits analysis using existing health-conservative input parameters. Such an analysis is responsive to the CHPAC's earlier recommendations and vitally important to protecting children as soon and as much as possible.

***EPA Guiding Principle 4*: The final rule will consider the need to maintain America's competitiveness**

The CHPAC notes that none of the Principle's questions for consideration addresses the importance of healthy child development in assessing a country's economic competitiveness. Economic competitiveness incorporates the ability to compete internationally and to maintain economic growth. Research clearly indicates that

[13] National Research Council, *Toxicological Effects of Methylmercury*, Committee on the Toxicological Effects of Methylmercury, Board on Environmental Studies and Toxicology, National Research Council, National Academy Press, Washington, DC, 2000, p. 293.
[14], NODA public comment OAR-2002-0056-2118
[15] Presentation to CHPAC Regulatory Policy Work Group October 7, 2004, by Tom Atkeson, Mercury Coordinator, Florida State Department of Environmental Protection, entitled, "Mercury in the Environment: Can Controls Be Effective?" (developed by Tom Atkeson, Don Axelrad, and Curtis Pollman).
[16] Hrabik TR, Watras CJ, Recent declines in mercury concentration in a freshwater fishery: isolating the effects of de-acidification and decreased atmospheric mercury deposition in Little Rock Lake. The Science of the Total Environment. 2002.
[17] Evers DC, Taylor KM, Major A, Taylor RJ, Poppenga RH, Scheuhammer AM. Common loon eggs as indicators of methylmercury availability in North America. Ecotoxicology. 2003 Feb-Aug;12(1-4):69-81.

countries with more educated, healthier populations experience higher rates of economic growth[18], while the abundance of energy and mineral resources does not always guarantee growth[19]. Also, it is recognized that IQ decrements are associated with lower levels of schooling attainment[20]. The **direct health care costs** of pollution-related illness and disability among children are enormous[21], and these costs come directly off the "bottom line" of the nation's economic performance. The **indirect costs** of toxic exposures, notably those associated with children's intellectual and emotional development, are perhaps even larger. Since mercury is a neurotoxin that targets children, reducing their intellectual capacity, and since more stringent controls will reduce children's exposures, such controls will promote healthier, better performing children.

We therefore urge you to recognize that protecting our children from neurodevelopmental damage is a cornerstone of maintaining America's competitiveness, and we request that this be reflected in the issuance of a final mercury standard. By implementing a more stringent and public health-protective standard at home, the US can lead the international community as a model and work to stimulate the necessary global mercury reductions from other industrialized nations.

In conclusion, the CHPAC welcomes this opportunity to offer the Agency new input related to the NODA and the five principles from our perspective as children's health experts. We hope to discuss these issues, and this critical rule, with you and your senior leadership in person.

Sincerely,

Melanie A. Marty

Melanie A. Marty, Ph.D., Chair
Children's Health Protection Advisory Committee

Cc: Rich McKeown, Chief of Staff to Administrator Leavitt
Stephen Johnson, Deputy Administrator

[18] Barro, R. J. and X. Sala-i-Martin, 1995, *Economic Growth*. MIT Press, Cambridge MA.

[19] Sachs, J.D. and A.M. Warner, 2001. "The curse of natural resources," *European Economic Review* 45: 827-838.

[20] Salkever, D.S., 1995. "Updated estimates of earnings benefits from reduced exposure of children to environmental lead," *Environmental Research* 70: 1-16.

[21] Landrigan PJ, Schecter CB, Lipton JM, Fahs MC, Schwartz J. 2002. Environmental pollutants and diseases in American children: estimates of morbidity, mortality, and costs for lead poisoning, asthma, cancer, and developmental disabilities. Environ Health Perspect 110:721-728.

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