**Questions Submitted for the Congressional Record**
**EPA's Responses to Questions of Senator Jeffords at the March 10, 2004 EPA FY 2005 Budget Hearing**

July 8, 2004

MERCURY

Question: According to EPA projections, the proposed cap-and-trade mercury rule option, which is very similar to the Clear Skies initiative's structure and schedule, would allow about 200 coal-fired power plants to avoid putting on advanced pollution controls as far into the future as 2020. What analysis can the Agency provide that demonstrates this option will not result in more toxic "hot-spots?"

Answer: EPA is currently conducting analyses to examine the effects of the Clean Air Mercury Reduction Rule. When the analysis is completed it will be provided to Congress and the public, before the Mercury Utility Reduction Rule is finalized.

Question: What analysis can the Agency provide to the Committee to demonstrate that mercury deposition in the Northeast will decline as a result of the proposed cap-and-trade option?

Answer: We have not completed the analysis of the proposed Clean Air Mercury Reduction Rule. However, as you point out, it is similar to Clear Skies when fully implemented. Therefore, the reductions in deposition in the Northeast may be similar. For the detailed results of the Clear Skies analysis, see the Clear Skies website www.epa.gov/clearskies.

Question: What regulatory safeguards are in the mercury proposal that would prevent the development of any additional toxic "hot-spots" due to utility emissions?

Answer: The Clean Air Mercury Reduction Rule reduces emissions and caps them at a level that is 70% lower than current emissions. With this cap it is unlikely that additional hotspots due to utility emissions will be created. In addition, states maintain their authority to require additional controls at any particular facility if they are concerned about hotspots.

Question: Section 112 of the Clean Air Act requires the Agency to issue a final rule that cuts mercury emissions from each and every coal-fired electric generating unit in the country, and also does not permit subcategorization by coal type. That's every single unit at a power plant. Why is the Agency proposing to allow some units to remain uncontrolled and thereby increasing emissions above what the law requires?

Answer: The Clean Air Act requires power plants to be regulated under section 112 only if EPA determines such regulation to be "necessary and appropriate." EPA has, in fact, proposed to regulate power plants under section 112. EPA has alternatively proposed to regulate mercury and nickel emissions from power plants under section 111. This approach is based on a proposed determination that regulation under section 112 is not "necessary" because section 111 provide adequate legal authority and will produce an appropriate level of environmental protection.

Question: The Agency's proposed rule to slightly reduce mercury emissions from power plants contains three different options. As you may recall from my letter of March 16, 2004, I don't consider any of them to be legal or defensible from a public health or technological perspective. Will the Agency comply with the existing settlement agreement and promulgate a final rule under the authority of section 112 of the Clean Air Act to control hazardous air pollutants from each electric generating unit by December 15, 2004?

Answer: While the previous Administration was sued for its slow pace in addressing mercury from coal-fired power plants, we have acted. Our proposal offers two basic approaches: (1) a traditional, command-and-control regulations under section 112 of the Clean Air Act (CAA), generally known as the maximum achievable control technology (MACT) approach, and (2) a market-based cap-and-trade approach under either section 111 or section 112 of the CAA. We are seeking comments on the legal, technical, and policy rationale put forward in the proposal rule and we will carefully evaluate the comments received, along with any additional data submitted, when proceeding towards finalizing a rule. As you are aware, the comment period was recently extended to run through June 29th and the deadline for the final rule was moved to March 15, 2005.

Question: Has EPA ever proposed to renege on a settlement agreement as in the December mercury proposal?

Answer: EPA's issuance of a co-proposal to regulate mercury emissions from utilities under section 111 does not renege on its settlement agreement with NRDC. The settlement agreement calls for EPA to propose a regulation for the utility industry under section 112 by December 15, 2003. The co-proposals the Administrator signed on that date include a proposed section 112 regulation for utilities.

Question: Please compare, and quantify where possible, the benefits to public health over the next ten years between compliance with the settlement agreement on mercury (EPA and NRDC in 1998) and any of the Agency's recently proposed mercury control options.

Answer: The benefits achieved under the section 111 approach will be much greater than those under a traditional section 112 maximum achievable control technology (MACT) approach, which is limited by the available and achievable control technology.

The settlement agreement signed by EPA and NRDC committed the Agency to a

rulemaking, if appropriate and necessary, but did not include any specifications on what such a rule should look like nor on any specific emission reductions. The Clean Air Act does not mandate a specific emission reduction; rather, it requires that a process be followed to determine the emission reduction being achieved by similar sources. It is this process that the Agency has followed in developing the January 2004 proposal.

The benefits to public health over the next 10 years associated with the Agency's proposed cap-and-trade approach for regulating mercury emissions from coal-fired power plants were highlighted in the January 2004 proposal. Under the section 111 approach, the Agency will set a 2010 mercury emissions cap that is reflective of the level of mercury emissions reductions associated with co-benefits from installation of wet scrubbers for sulfur dioxide ($SO_2$) control and selective catalytic reduction (SCR) systems for nitrogen oxides ($NO_x$) reduction. Additionally, this declining cap approach results in a 15 ton cap being implemented in 2018, while garnering significant reductions in $SO_2$ and $NO_x$ emissions – both fine particle precursor species. The Agency continues to believe that a coordinated, multipollutant approach is the most cost effective and environmentally beneficial approach to regulating Hg, $NO_x$, and $SO_2$ from coal-fired power plants.

The traditional command-and-control approach, outlined under section 112, provides for only mercury controls by March 2008, with little impact on fine particle precursor species (i.e., $NO_x$ and $SO_2$) in that time frame. The Agency believes that, given the substantial public health benefits associated with fine particle reductions, an approach that provides significant reductions in ambient fine particle concentrations in conjunction with necessary mercury emission reductions provides the optimal protection of public health and the environment.

Question: I wrote to you in November 2003, along with 12 other Senators, noting our expectation that EPA would deliver on its promise to complete and distribute the analysis that was requested by the advisory workgroup on specified reduction scenarios. Why was that promise broken and no such analysis completed?

Answer: The Agency conducted preliminary Integrated Planning Model (IPM) analyses in spring 2002. The results of these analyses, which included a range of potential regulatory outcomes, were discussed with the Working Group. These discussions led to the members of the Working Group making a number of suggestions on modifications that should be made to the IPM input and assumption files. These changes were discussed with the Working Group during Summer 2002 and were incorporated into the Agency's modeling for Clear Skies 2003 and the regulatory work done prior to proposal of the alternative approaches in January 2004. As the Working Group prepared its final report to the Clean Air Act Advisory Committee in fall 2002, it became clear that the Working Group would not achieve consensus on the issues. The Agency then moved forward on its own to prepare the analyses necessary to develop the proposed rulemaking. Analysis of the various stakeholder options put forward would not have aided in achieving consensus and would have distracted key resources from the Agency's mission of complying with the December 15, 2003, settlement agreement to propose a rule.

Individual stakeholders of the Working Group made suggestions regarding additional analyses that the Agency should consider and, possibly, conduct. However, the Working Group's final report demonstrates that there was no consensus on this issue.

Question: Does the FY04 operating plan or the FY05 budget request include funds to complete the economic and feasibility analysis on a range of mercury reductions that was promised by EPA and requested by the mercury MACT advisory committee?

Answer: The Agency committed to review the recommendations of the Utility Federal Advisory Committee Act (FACA) Working Group Report, which was submitted to the Clean Air Act Advisory Committee (CAAAC) in October 2002. In that report, various stakeholder groups outlined their position(s) regarding the most effective way to regulate mercury emissions from coal-fired power plants. In delivering the December 2003 proposal, the Agency outlined two approaches for completing the first ever mercury emissions reductions from coal-fired power plants: (1) section 112, command-and-control, maximum achievable control technology (MACT); and, (2) section 111, cap-and-trade approach.

In extending the public comment period 60-days, and the promulgation date by 90-days, the Agency is committed to using this additional time to explore the analyses completed in support of the December 2003 proposal, and to identify the need for any additional analyses to support the upcoming final rule. Furthermore, the Agency has identified and allocated resources to support this rulemaking through FY 2004, and the budget request includes funds necessary for FY 2005.

Question: In the United States, nine chlor-alkali plants continue to use outdated mercury cell technology and emit as much as one hundred tons of mercury pollution annually. In 2000, the facilities added far more mercury to their cells than they reported released, resulting in 65 tons of unaccounted for mercury in that year alone. EPA acknowledges in its December 2003 rule, "the fate of all the mercury consumed at mercury cell chlor-alkali plants remains somewhat of an enigma." However, the rule fails to set emissions standards for this lost mercury, and recommends only voluntary measures to monitor fugitive mercury cell emissions. Why has EPA allowed these nine plants to continue outdated, polluting processes? Will the EPA work to account for these "lost" emissions?

Answer: The issue of unaccounted mercury from mercury cell chlor-alkali plants has been the subject of intense scrutiny for environmental groups, EPA and the industry for quite some time.

Mercury that is purchased for use in the plant can go to the air, the product produced, become solid waste, or be caught in equipment including pipes, pumps, tanks, etc. Just because the cells are replenished does not mean that this volume of mercury is lost. The industry reclaims it from the product and solid waste stream and during equipment repair and upgrades. The industry has conducted studies over the last ten years to better understand the balance of mercury coming in to plants with mercury going out by measuring mercury caught in equipment.

Although the studies are continuing, facilities have in fact recovered quantities of mercury in tanks and other equipment that would otherwise go unaccounted.

Based on these studies and emission estimates from industry questionnaire responses, EPA estimates total mercury emissions currently from this industry to be 5.6 tons per year. We estimate the fugitive contribution of these emissions to be 4.7 tons per year. While it may appear that the discrepancy in the mercury material balance is the result of fugitive emissions, there is little evidence to support this conclusion. Because mercury is so dense, a small volume accounts for a significant mass. Several tons of mercury could easily be caught in the thousands of feet of pipe in one plant.

There is a provision in the final rule that requires facilities to report on mercury consumed each year. In addition, we believe the work practice standards required by the final rule, which are more stringent than the requirements of the 1975 rule, will result in reductions beyond current fugitive emission levels.

Nevertheless, the Agency has granted a petition to reconsider this rule. In addition, we are planning to conduct ambient monitoring around some mercury cell chlor-alkali plants. Data collected from this effort will help quantify fugitive emissions of mercury from these facilities. In addition, we will initiate discussions with petitioners to help determine other appropriate actions and the necessary timeline to address their concerns. We expect to learn more information about mercury use and emissions from this industry as the requirements of the rule are implemented and additional data are collected.

Question: Where does tracking this “enigmatic” mercury fall on EPA’s priority list?

Answer: The Agency is planning to conduct ambient monitoring around some mercury cell chlor-alkali plants. Data collected from this effort will help quantify fugitive emissions of mercury from these facilities. In addition, we will initiate discussions with petitioners to help determine other appropriate actions and the necessary timeline to address their concerns. We expect to learn more information about mercury use and emissions from this industry as the requirements of the rule are implemented and additional data are collected.

Question: A December 2001 EPA presentation to industry stated doing a utility MACT standard now – based on existing technologies – would yield a ninety-eight percent reduction in mercury emissions for existing plants. Why does the draft MACT standard aim only for a twenty-nine percent reduction?

Answer: The December 2001 presentation represented a very preliminary effort by the Agency to estimate the impacts of a section 112 rule on the electric utility industry. Subsequent to the presentation, the Agency received input on industry- and Government-supported emission tests that indicated that some of the mercury removal assumptions reflected in the December 2001 presentation were erroneous (e.g., the impact on mercury removal of selective catalytic reduction on various coals). Further, at that time, the Agency had not yet fully evaluated the impacts of a number of other factors, including coal type and variability, as required by the Clean

Air Act and recent court decisions. The emission levels provided in the January 2004 proposed rule reflect the Agency's current estimates of the level of mercury emission reduction that could reasonably be expected from the industry.

Question: You have suggested and the mercury rule says that there are no technologies available today designed to control utility mercury emissions. Last year, I wrote to technology vendors on that very question. They wrote back to say they have proven products on the market today that can cut mercury by ninety percent or more. I have placed a summary of my findings in the hearing record. Have you sat down and talked to these vendors?

Answer: We have had several meetings with, and heard presentations from, many of the same equipment vendors from which you sought information. We do not believe that the summary of statements shows with certainty that control of utility mercury emissions in the range of 60 to 90 percent is technically or economically achievable within the time frame we are discussing. Further, we do not believe that electric utility, coal, and pollution control industry statements contradict its view that advanced mercury control technologies are not yet ready for commercialization. The EPA agrees with industry that these new technologies show great promise, but are not and will not be available within a 3- to 4-year time-frame.

To date, there have been four full-scale field tests on activated carbon injection (ACI), the most promising mercury-specific control technology on the near-term horizon. These tests have been conducted on three bituminous-fired units and one subbituminous-fired unit. Continuous operation of ACI was conducted for two 5-day periods, one 4-day period, one 5-day period, and one 9-day period at the four tests. We believe that this limited amount of continuous ACI operation is sufficient of itself to indicate that the technology has not been sufficiently tested to be the basis for a nationwide regulation that would require compliance all day, every day, for the remainder of the life of the unit.

One long-term ACI test was initiated in April 2003 on a bituminous-fired unit. This test was to evaluate the mercury removal efficiency of ACI over a period of several months to one year, further assess the impact of ACI on balance-of-plant operations (i.e., how will ACI impact on maintenance frequency and costs, on ash disposal and utilization, on internal plant energy use, etc.), and provide additional information on the design characteristics and costs of ACI technology for other installations. Because of problems encountered, this test has not been completed and thus the final results are not known. However, it is our understanding that this test has shown the ability of ACI, when used at a bituminous-fired unit, to average 86 percent mercury removal over an extended period of time, but has highlighted design problems that must be corrected prior to full scale installation on other units.

On April 21, 2004, the U.S. Department of Energy (DOE) made a joint announcement with WE Energies about the initiation of a joint venture to demonstrate technology that will remove an "unprecedented" 90 percent (expected but not guaranteed) of mercury emissions from coal-based power plants. This 5-year project will involve the design, installation, operation, and evaluation of an integrated system on one coal-fired power plant to control emissions of mercury, particulate matter, sulfur dioxide, and nitrogen oxides.

Further, the electric utility industry reportedly has had trouble obtaining solid, guaranteed quotes for ACI installation on coal-fired units. We have heard from a number of utility companies indicating that they have tried without success to get bids on, and guarantees for, ACI installations. To date, we are aware of only one permit outside of a Federally co-funded program (on a unit to commence operation in 2007 and burn low-sulfur Western coal) that has been issued that included ACI technology (MidAmerican Energy Station permit issued by the Iowa Department of Natural Resources). The lack of additional examples is indicative of the lack of industry confidence in guaranteeing permit levels at this time.

Of the other technology vendors noted in your summary (e.g., KFx, W.L. Gore & Associates, Powerspan, Apogee Scientific), we know of no full-scale installations utilizing their technologies. KFx has under construction one of their units but this facility will not become operational until later this year. At that time, they will be able to fully evaluate the technical and economic effectiveness of the process on a full-time, long-term basis. We have addressed the W.L. Gore technology in another of your questions but will state here that it also has not been used on any full-scale operation to our knowledge. Powerspan and Apogee Scientific have been involved in a number of DOE evaluations but, again, we know of no full-time, long-term operation.

We agree that, to date, there has been no regulatory incentive (beyond what the States are doing) to cause the utility industry to make the necessary investments to bring these advanced mercury control technologies to a level of commercial availability necessary for wide-spread utilization. We believe that our proposed rules will provide just this incentive.

Question: Executive Order 12866 requires that when an Agency proposes a rule, it should also analyze more and less stringent regulatory options. Why hasn't EPA produced analysis of a more stringent option than the mercury proposal?

Answer: For a significant regulatory action (such as our proposed Clear Air Mercury Rule), Executive Order 12866 requires EPA to prepare and submit to the Office of Information and Regulatory Affairs (OIRA) "[a]n assessment, including the underlying analysis, of costs and benefits of potentially effective and reasonably feasible alternatives to the planned regulation, identified by the agencies or the public (including improving the current regulation and reasonably viable nonregulatory actions), and an explanation why the planned regulatory action is preferable to the identified potential alternatives." EPA complied with this requirement.

Question: Has EPA modeled, or collected information on, the economic costs to society of mercury-related health or developmental problems, such as IQ decline or cardiac effects in adults? If not, does EPA plan to in the near future?

Answer: As part of the normal rule making process we are developing a Regulatory Impact Analysis (RIA) as required by Executive Order 12866. We expect to have a final RIA around the time that we finalize the Clean Air Mercury Rule. Consistent with the Executive

Order, we are attempting to quantify and monetize mercury-related health and developmental problems.

Question*:* On March 24, the EPA Office of Research and Development (ORD) released a study on mercury emission controls for coal-fired electric utilities. The results are clear: widely used technologies can achieve 98% reductions of mercury at bituminous coal plants and 70% reductions at sub-bituminous plants; and other technologies, which can be installed in one to two years' time, can achieve 90% reductions at all coal plants. What is the Agency's justification for proposing a technology standard calling for a mere 29% reduction in mercury emissions by 2008 (i.e., the "Section 112" approach), and a cap and trade approach targeting emissions reductions of only 69% in 2018 (i.e., the "Section 111" approach)?

Answer: The March 24th EPA Office of Research and Development (ORD) study builds on and contributes to extensive work that ORD and others have been doing to understand the state of mercury-specific control technologies. This study is one of the primary sources of information that we have used to inform our current understanding of the state of technology. The study concludes that, based on current information, it is projected that ACI technology will be available for commercial application after 2010 and that removal levels in the 70% to 90% range could be achievable for some coal types. This assumes the funding and successful implementation of an aggressive, comprehensive R&D program at both EPA and DOE. Such applications represent only the initiation of a potential national retrofit program which would take a number of years to fully implement.

Question: In responding to a question from Senator Carper about the effectiveness of W.L. Gore's mercury removal technology, I believe you incorrectly stated that the company has developed an activated carbon injection (ACI) process. In response to a letter I sent to W.L. Gore, Dr. Richard Bucher explained that his company has developed a filter bag insert that contains a chemical treatment effectively locking mercury to the material. Trial results of this technology show mercury capture rates consistently in excess of 90%. The company anticipates commercial sales in 2005, and projects that their technology could cost between 38-83% less than ACI. Is the Agency aware of this technology? If so, what is your response to these results?

Answer: W.L. Gore and Associates conducted a project examining its developmental proprietary mercury control process at the U.S. EPA’s Air Pollution Prevention and Control Division (APPCD) combustion research facilities in Research Triangle Park, North Carolina. The testing performed was not funded by EPA and was not conducted as part of EPA’s research to evaluate mercury control technologies. The Agency became involved when W.L. Gore and Associates entered into an agreement with ARCADIS, APPCD’s on-site contractor, to develop data on their process. ARCADIS approached APPCD about using its facilities for the testing and an agreement was worked out. On several occasions, APPCD has entered into similar agreements with private companies interested in using its unique combustion facilities to test their technologies.

While EPA did not sponsor or conduct the tests, W.L. Gore presented the results of its testing at a symposium in 2003. The broad objective for this testing was to develop data on a fabric filter-based mercury removal concept which is based on using a porous fibrous filtration media designed to allow rapid chemical oxidation of incident elemental mercury ($Hg^0$) and active binding of the oxidized mercury species to the surface of the media. The implementation of this process on coal-fired boilers would appear to involve use of mercury-trapping inserts in existing or new baghouses.

Typically new technology for large utility boilers requires testing beyond the scale at which W.L. Gore tested their technology at the RTP facility. EPA has not performed, or been provided with results of, any additional testing performed in a "real-world setting." The likelihood that this technology could be implemented widely in the near future is unclear.

Question: It has been brought to my attention that EPA now has the ability to measure the way in which atmospheric mercury deposition impacts fish concentrations of mercury. If that is the case, can please you deliver to the Committee the related findings. Can you explain how EPA will use that knowledge in setting a prospective MACT standard?

Answer: In September 2001, EPA developed the Mercury Maps project which links air deposition and freshwater fish contamination over any geographic scale of interest. The application of the approach at the national scale is currently available on the EPA web page at: www.epa.gov/waterscience/maps. A regional application and formal peer review of the approach are currently under review within EPA. We anticipate the report and peer review documentation to be made available to the public later this summer. The Mercury Maps approach has been used at a screening analysis level to estimate the percentage of reductions in air deposition needed to reduce measured fish tissue concentrations down to the methyl mercury criterion level (the maximum advisable concentration of methyl mercury in fish and shellfish tissue to protect the health of fish and shellfish consumers). The approach will therefore allow one to predict, in water-bodies where significant sources are well characterized, how measured fish tissue mercury levels will respond to changes in air deposition levels.