Michigan Manufacturers Association℠

MEMORANDUM

To: Steve Chester, Director, Michigan Department of Environmental Quality

From: Michael Johnston, Director of Regulatory Affairs
Michigan Manufacturers Association

Date: April 16, 2008

Subject: Draft Mercury Strategy Staff Report

COMMENTS:

The Michigan Manufacturers Association (MMA) appreciates the opportunity to comment on the draft Mercury Strategy Staff Report developed by the Michigan Department of Environmental Quality (MDEQ).

The report raises a number of significant policy issues. While there are many commendable recommendations in the draft that are consistent with generally accepted national and international goals of reasonably minimizing mercury releases, we cannot help but point out that the report's fundamental premise is deeply flawed.

This letter will focus on that premise. The attached Appendix is a listing of what the MMA views as the most fundamental and troubling errors in the report, errors that cannot withstand the test of scientific scrutiny.

Central to the MMA's concern is the fact that the proposed strategy goes far beyond a goal of reasonably minimizing releases to recommend the radical goal of eliminating *any* mercury use or release. And it does so without demonstrating any nexus between that goal and the stated purpose in the report to "reduce concern for the consumption of fish from Michigan's inland lakes, rivers and the Great Lakes..." as a result of mercury contamination. No data is provided that support the report's assumption that methylmercury levels in Michigan fish will decrease as a result of eliminating the remaining sources of anthropogenic (resulting from human activity) mercury in the state.

Particularly troubling is the fact that this new goal of *elimination* was predetermined. A specific charge to the Mercury Strategy Workgroup, as outlined on page one of the draft report, was to "develop an MDEQ Mercury Strategy that outlines these recommendations with appropriate timelines that **pursue the overall goal of virtually eliminating anthropogenic mercury use and releases to the environment"** (emphasis added).

Hence, in developing the report, the staff was precluded from analyzing the mercury issue from the perspective of the time-tested techniques of relative-risk or cost-benefit analysis. There is no question that the staff report would have been far different had the goal been scientific recommendations for evaluating risks for consumption of fish, or determining the relative impact of anthropogenic sources and fish tissue concentrations,

rather than the scientifically indefensible and political goal of *elimination* of mercury use and release.

Major Shortcoming of the Report

While the report recognizes that mercury is a global pollutant, it mistakenly presumes that implementation of a strategy to *eliminate* anthropogenic mercury uses in Michigan alone can be expected to result in reductions in mercury levels in fish in Michigan waters.

The truth is that mercury is a naturally occurring metal that is ubiquitous in the environment. The vast majority of mercury deposition in Michigan is from global sources. Globally, about 6,000 tons of mercury is released to the atmospheres annually. About half of that total, or about 3,000 tons, is from natural sources, and therefore, beyond human control. One thousand of the 3,000 tons of man-made emissions comes from one single country—China. Sources in the United States emit only about 100 tons of mercury annually.

Numerous studies, including those completed by the National Oceanic and Atmospheric Administration (NOAA), the U.S. Environmental Protection Agency (USEPA) and the Minnesota Pollution Control Agency have concluded that the vast majority of mercury deposited in any given state originates in other states and countries. Minnesota, for instance, estimates that 90 percent of the mercury deposited in that state originates elsewhere.

The Michigan Environmental Science Board's conclusion that "the mercury problem is more that a Michigan problem" was echoed by EPA's Great Lakes National Program Office in their 1995 development of a Binational Toxic Strategy (BTS) for the Great Lakes. In the BTS, the USEPA; together with Environment Canada, recognized that the "Movement of persistent toxic substances (including mercury) does not respect jurisdictional or geographic borders. In particular, the inter-basin transfer of persistent toxic substances from one lake to another and the short- and long-range movement and deposition of these substances from the air have compelled EC and USEPA to develop this coordinated Binational Strategy."[1]

Indeed, the 1993 report of the Michigan Environmental Science Board, *Mercury in Michigan's Environment*, concluded on page 38 that "The mercury problem is more than a Michigan problem, it is regional and, perhaps, global in scale. Regional and national support and cooperation must be obtained to achieve reductions in mercury input to the atmosphere."[2]

Nowhere in that 1993 report, one prepared by prominent Michigan scientists, is there any call for *elimination* of anthropogenic sources of mercury. And nowhere in that report is

[1] Environmental Context chapter of the BTS. [Online, accessed 4/13/08.] Available: *http://www.epa.gov/glnpo/p2/bns.html#Environmental%20Context.*

[2] L. J. Fischer, J. W. Bulkley, R.J. Cook, R. Y. Demers, D. T. Long, R. H. Olsen, B. J. Premo, E. O. van Ravenswaay, G. T. Wolff, and K. G. Harrison. 1993. Mercury in Michigan's Environment; Environmental and Human Health Concerns. Lansing, Mich.: Michigan Environmental Science Board.

there any call for Michigan to go it alone. Rather, the report laid out a series of recommendations of both rigorous study and regulatory measures.

Unfortunately, while many of the regulatory steps recommended in the report have been taken, several of the most important information needs identified in the report have been ignored:

- There has been no rigorous evaluation of levels of mercury in fish that allows estimation of mercury contamination trends **as a function of time and distance from the sources**. There has been no attempt to relate the trends in fish tissue to reductions in mercury emissions from Michigan sources, despite the fact that those emission reductions have been significant over the last 15 years.
- Because of poor project design or lack of resources, there has been no regularized monitoring of segments of Michigan society at higher risk, to determine current mercury levels and **trends of time and distance from mercury sources**. In fact, national statistics are cited in the staff report with almost no use of qualified Michigan-specific data.
- And perhaps most importantly, there has been no periodic independent review and scientific evaluation of information on accumulated mercury. It is difficult to understand why a document like the draft staff strategy that sets a direction for the MDEQ as firmly as this one does should not be subjected to peer review. Michigan continues to be home to prominent scientists who can and should contribute to the development of a Michigan strategy for mercury. To ignore their advice and counsel, and—instead—produce an insular document reflecting only staff opinion is short-sighted and divergent from credible scientific processes.

The staff report indicates that "the success of the strategy (elimination of anthropogenic mercury use) will be measured in various ways. Specifically, meeting designated water uses in the state, *including water quality that will enable unrestricted fish consumption*, is the primary means of measuring success of the strategy." But the report fails to make any connection between controlling remaining sources of mercury **in Michigan** and the likelihood that mercury levels in fish in Michigan will decrease.

While it might seem logical to assume that reducing power plant or other mercury emissions will lead to reductions in methylmercury levels in local fish, available data do not provide much support for the conclusion that those reductions will be significant, consistent, or even measurable. The relationship between mercury emissions and fish methylmercury levels is highly variable and site-specific. Predicting where and whether changes might occur is not possible with currently available data, in part because many factors that affect methylmercury levels in fish are not related to—and play larger roles than—mercury emissions themselves.

For example, in a recent report from a workshop convened by the Society for Environmental Toxicology and Chemistry, scientists concluded[3],

> It is not clear whether changes in mercury input will result in a linear change in mercury methylation. Computer models, such as one developed for the Florida Everglades, tend to predict a linear response, but there are little [sic] data to support the predictions... [D]ecision makers need more than mercury concentrations to be able to ensure defensible interpretation of the indicators, such as methylmercury in fish. Other necessary information includes land use; food-web structure; the introduction of exotic species; point-source discharges; changes in climate, atmospheric chemistry, and acidic deposition; and hydrological regimes (e.g., retention time and water level fluctuation)… Other factors such as sulfate and organic matter that impact bacterial activity, could also possibly cause an increase in fish mercury concentration even as atmospheric deposition decreases.

While the nonlinearity of the relationships involved is acknowledged on pages 156–157 of the staff report, that fact is never considered in the context of the goal of the strategy.

There has been a similar lack of correlation between mercury emissions reductions and fish methylmercury reductions in other states. The staff report cites data reported in a Florida Department of Environmental Protection report[4] to support its conclusion that reducing mercury emissions will reduce fish methylmercury levels. However, the report omits the Florida data that are inconsistent with that conclusion. Data were collected from 12 Florida locations, but the staff report describes results from only one location, the Everglades. The data from the Everglades appear to support conclusions about direct relationships among mercury emissions, mercury deposition, and methylmercury accumulation in fish, but data from the other Florida locations do not. The fish samples overall were fairly evenly split between a declining trend and no trend or increasing trend. Consistent declining trends across age groups were seen at three of the 12 locations sampled, a consistent lack of trend was seen at four locations, and an increasing trend was seen at one location. The other locations showed some declines and some absence of change, depending on the age of the fish.

The staff report also cites data from Massachusetts to support its conclusion about a direct relationship between mercury emissions and fish methylmercury concentrations. While the Massachusetts study does suggest a decrease in fish methylmercury concentrations in two species following the elimination of nearby medical waste incinerators and implementation of stringent limits on municipal solid waste incinerators, most of the data supporting that conclusion consist of only two sampling points over time

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[3] Mason RP, M. L. Abbot, R. A. Bodaly, O. R. Bullock Jr., C. T. Driscoll, D. Evers, S. E. Lindberg, M. Murray, and E. B. Swain. 2005. Monitoring the response to changing mercury deposition. Report on a workshop convened at the 2004 annual meeting of the Society of Environmental Toxicology and Chemistry. *Environmental Science and Technology* 39:14A–22A.

[4] Florida Department of Environmental Protection. 2003. *Integrating Atmospheric Mercury Deposition with Aquatic Cycling in South Florida: An approach for conducting a Total Maximum Daily Load analysis for an atmospherically derived pollutant*.

per location. Two sampling points do not define a "trend." When three data points were available, no statistically significant decline was apparent.[5]

Finally, we have an example of mercury reduction in Michigan that should be noted. Reducing incinerator mercury emissions by 4,000 pounds has not produced observable reductions in fish methylmercury concentrations.[6] It is therefore unlikely that reducing Michigan power plant mercury emissions by 3,000 pounds and industrial mercury emissions by 1,000 pounds will produce different results. So, while reducing Michigan mercury emissions seems desirable, doing so should not be overstated as a means of reducing Michigan fish methylmercury concentrations. The simple truth is that no connection has been demonstrated.

Overstating the Risk

The MMA is extremely troubled over statements in the report about the extent to which infants in Michigan and the United States are "at risk" from methylmercury. Those statements are inaccurate, misleading, and outdated.

As part of the MMA's review, we asked Dr. Gail Charnley to review the staff report. Dr. Charney is an internationally recognized scientist specializing in toxicology, environmental health risk assessment, and risk management science and policy. She has over 30 years of experience in the biological, chemical, and social policy aspects of environmental and public health protection. She is a former director of the Toxicology and Risk Assessment Program at the National Academy of Sciences, the former executive director of the bipartisan Presidential/Congressional Commission on Risk Assessment and Risk Management, and is a past president and lifetime fellow of the international Society for Risk Analysis.

She points out to us that several statements in the staff report are demonstratably false:

> Page 7: "Data have demonstrated that a significant fraction of the U.S. population is currently exposed above the safe reference dose."

A recent Electric Power Research Institute report has summarized blood methylmercury data for women of childbearing age during the periods for which data are available from the Centers for Disease Control's National Health and Nutrition Evaluation Survey (NHANES).[7] Those summary data are shown in the chart below and indicate that

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[5] Massachusetts Department of Environmental Protection. 2006. *Massachusetts Fish Tissue Mercury Studies: Long-Term Monitoring Results, 1999-2004*, Figures 4 and 5.

[6] Michigan Department of Environmental Quality/Michigan Mercury Pollution Prevention Task Force. 1996. *Mercury Pollution Prevention in Michigan. Summary of Current Efforts and Recommendations for Future Activities*. [Online, accessed 4/11/08.] Available: *http://www.michigan.gov/documents/M2P2_141687_7.pdf*.

Michigan Department of Environmental Quality. 2008. Mercury Strategy Staff Report. [Online, accessed 4/11/08.] Available: http://www.michigan.gov/documents/deq/MDEQ_MSWG_FinalReportJan2008.pdf_222256_7.pdf.

[7] Electric Power Research Institute. 2007. *Mercury in the Environment. A Research Review*. EPRI Report 1012572. L. Levin, project manager. Chapter 5. Insights from Six Years of Mercury Biomarker Data. C. Whipple, author. Palo Alto, Cal.

methylmercury exposure in the United States is decreasing over time. The most recent data show that 1.84 percent of women of child-bearing age and 0.20 percent of pregnant women in the United States exceed USEPA's reference dose (5.8 μg MeHg/L blood).

Time period	Median methylmercury (micrograms/liter)	95th percentile methylmercury (micrograms/liter)	Percent of women with methylmercury levels ≥ 5.8 micrograms/liter
Women of childbearing age (16-49 years)			
1999-2000	0.60	6.74	6.66
2001-2002	0.52	4.22	3.33
2003-2004	0.50	3.70	1.84
Pregnant women (16-49 years)			
1999-2000	0.52	5.66	3.82
2001-2002	0.42	2.22	0.23
2003-2004	0.40	2.25	0.20

Source: EPRI 2007

More importantly, despite assertions to the contrary, women whose exposures exceed the USEPA methylmercury reference dose are not "at risk" of having developmentally impaired children. The USEPA is careful to point out that, while exposure at or below a reference dose indicates that a health risk is unlikely, people who are exposed to a substance above its reference dose should not be considered at risk; specifically, "…exceeding the [reference dose] is not a statement of risk."[8] The USEPA *Regulatory Impact Assessment for the Clean Air Mercury Rule* states, "It is also important to note that the [reference dose] does not define a bright line, above which individuals are at risk of adverse effect."[9] In other words, while exposures at or below a reference dose are unlikely to pose a risk, the converse—that exposures exceeding a reference dose are likely to pose a risk—is not the case. The number of children "at risk" is determined by the quantitative relationship between exposure level and likelihood of effects (the dose-response relationship), not by the number of people whose doses or blood mercury levels exceed the reference dose at a single point in time. Of interest is the fact that

[8] U.S. Environmental Protection Agency. 2004. *Exposure and Human Health Reassessment of 2,3,7,8-Tetrachlorodibenzo-p-Dioxin (TCDD) and Related Compounds*. National Academy of Sciences (NAS) Review Draft. Washington, D.C.: National Center for Environmental Assessment. Office of Research and Development, 14.

[9] U.S. Environmental Protection Agency. 2005. *Regulatory Impact Analysis of the Clean Air Mercury Rule*. EPA-452/R-05-003. Research Triangle Park, N.C.: Office of Air Quality Planning and Standards, 9-2.

approximately 90 percent of Japanese women are exposed to methylmercury at levels exceeding USEPA reference dose,[10] yet no epidemics of neurodevelopmental problems are apparent in Japan (indicating that the USEPA reference dose is lower than would be predicted on the basis of real-world observations).

> Page 16: "New data have also demonstrated that cord blood mercury is consistently higher than maternal blood mercury; on average 70% higher, or approximately 2:1 (Morrisette et al., 2004; Stern and Smith, 2003; and Butler et al., 2006). If the cord blood to maternal blood ratio is assumed to be 2:1 (based on the reported range of variability between 0.8 to 4.36 microgram per Liter [μg/L]), then fetal exposures above the EPA's oral reference dose (RfD) of 0.1 microgram per kilogram per day (μg/kg/day) are associated with maternal blood levels of total mercury at or above 3.5 μg/L (5.8 μg/L is the concentration in maternal blood assuming a 1:1 cord blood to maternal blood ratio) (Mahaffey, 2004)."

The draft report's conclusion about the effect of adjusting the methylmercury RfD to account for the difference in mercury concentrations between fetal cord blood and maternal blood is backwards. The USEPA RfD is based on an assumption that the ratio of mercury in cord blood compared to maternal blood is 1:1, i.e., there is no difference between them. The staff report states that the real difference between cord and maternal blood mercury concentrations is 2:1, i.e., the amount of mercury that a fetus is exposed to is about twice that of the mother. If that is true, the report argues, then the "true" RfD should be lower (more stringent) than the USEPA RfD. If that is the case, the report asserts that more children are currently exposed to methylmercury above the "true" RfD than would be exposed based on the USEPA RfD. Correcting the USEPA RfD for the difference in methylmercury levels between cord blood and maternal blood does not produce a lower RfD, however; it produces a higher (less stringent) RfD.

The USEPA used a tenfold uncertainty factor (i.e., lowered the RfD tenfold) to account for uncertainties related to the fact that sensitivity to toxicity varies among individuals. That tenfold uncertainty factor is the approximate result of multiplying a factor of three for toxicokinetic (e.g., metabolic) differences and three for toxicodynamic differences (e.g., susceptibility). If the toxicokinetic part of the tenfold uncertainty factor is adjusted for the difference in methylmercury concentration between cord and maternal blood (which is actually 1.7, not 2), a default value of 3 would be used for the remaining toxicodynamic part of the uncertainty factor. The resulting RfD is 11.6 μg methylmercury per liter of blood, approximately twofold higher than the USEPA RfD (5.8 μg methylmercury per liter of blood).

> Page 16: "Utilizing this more realistic ratio of maternal blood to fetal cord blood ratio, it would mean that over 600,000 infants born annually in the U.S. are exposed to levels of MeHg above the EPA RfD (based on 15.7% of adult women age 16 to 49 with blood levels at or greater than 3.5 μg/L who participated in the

[10] Y. Iwasaki, M. Sakamoto, K. Nakai, T. Oka, M. Dakeishi, T. Iwata, H. Satoh, and K. Murata. 2003. Estimation of daily mercury intake from seafood in Japanese women: Akita cross-sectional study. Tohoku *Journal of Experimental Medicine* 200:67–73.

> National Health and Nutrition Examination Survey [NHANES] from 1999 and 2000) (Mahaffey, 2004; CDC, 2004)."

Given the updated NHANES/CDC data shown above and what the RfD would be if corrected for the cord blood/maternal blood differential, approximately 0.2% of women of childbearing age would exceed the corrected RfD (to whom about 7,500 children might be born instead of 600,000). Interestingly, no actual pregnant woman tested exceeded 10 μg/L, so no children were in fact born to women above the corrected RfD. Just as importantly, as also discussed above, exceeding the RfD does not put infants "at risk".

> Page 4: "Applying Michigan 2000 census data to the Centers for Disease Control (CDC) data suggests that over 10,000 infants born in Michigan annually are potentially at risk for neurodevelopmental deficits due to MeHg exposure (CDC, 2004)."

Actually, applying Michigan 2000 census data to current CDC data and the corrected RfD produces an estimated 100 children born to women exceeding the RfD (who, as pointed out, would not by definition be "at risk" in any case).

> Page 15: The entry in Table 1-3 for maternal hair mercury concentrations in Michigan is described as "Up to 2.50 μg/g (ppm) (range = 0.01 to 2.5 ppm)".

Giving a range of hair mercury concentrations and emphasizing the upper-end value without reporting the mean and/or median is misleading and inappropriate. In this case, the mean hair methylmercury concentration was 0.29 ppm, the median was 0.23 ppm, with and only 10 percent exceeding 0.54 ppm.[11] The number exceeding 1 ppm, the hair concentration equivalent to the USEPA's RfD, was not given and is likely to have been small. The greatest source of methylmercury exposure in this Michigan cohort was canned fish, which would remain unaffected by changes in U.S. or Michigan mercury emissions.

> Page 16: "Approximately 25% of children exceed the RfD, and 5% of children have MeHg exposure from fish/shellfish two to three times the RfD (i.e., 0.29 μg/kg body weight/day) (EPA, 1997c)."

The current USEPA RfD for methylmercury was established in 2001, so any estimates from a 1997 report would be out of date. The most recent CDC survey found only one child with a blood methylmercury level exceeding the USEPA RfD (5.8 μg/L). However, no children exceeded 10 μg/L so no children exceeded the adjusted RfD. RfDs are based on lifetime exposure, in any case, so the relevant value for comparison is the lifetime daily intake, not the daily intake at one particular time.

> Page 17: "…evidence does exist that for many populations, exposures are above the RfD and constitute an important health risk."

It is unclear exactly whom is meant to constitute "many populations" and, as discussed, exceeding an RfD does not "constitute and important health risk." Based on the

[11] F. Xue, C. Holzman, M. H. Rahbar, K. Trosko, and L. Fischer. 2007. Maternal fish consumption, mercury levels, and risk of preterm delivery. *Environmental Health Perspectives* 115:42–47.

information discussed above on current methylmercury exposures, there does not appear to be a threat from methylmercury in Michigan or the United States.

This draft report continues the penchant in Michigan policy for refusing to consider relative risks and instead focuses only on the elimination of something without considering the probability of either a beneficial result or no beneficial result. In this case, the MDEQ makes two significant assumptions: first that reductions in anthropogenic mercury in Michigan will yield changes in fish tissue, and second, that even if this were the case, that it would yield any changes for Michigan citizens relative to the Rfd.

It is a penchant that is clearly evident in Michigan fish advisories. The MMA is convinced that Michigan fish advisories are based on unreasonable assumptions and discourage people from taking advantage of the many benefits of consuming fish.

Dr. Charnley continues to believe that the method used in Michigan to establish fish advisories and determine whether fish consumption should be restricted or prevented is based on worst-case, unrealistic assumptions. Michigan establishes statewide fish advisories based on the highest methylmercury concentrations found in the most contaminated fish species sampled from a few locations. If applied to supermarket fish, Michigan's approach would use the most contaminated swordfish to represent all fish and restrict or prevent the consumption of all supermarket fish on that basis. The USEPA establishes fish advisories based on the geometric mean of methylmercury concentrations in all fish species sampled; in other words, the USEPA realizes that the U.S. population does not eat only the most contaminated fish from one location on a daily basis.

The problem with Michigan's approach is that a blanket, statewide fish advisory discourages people from eating Michigan fish. Women of childbearing age and older adults should definitely eat fish. Fish provide important nutrients that contribute to children's brain development, such as calories, omega-3 fatty acids, and antioxidants like selenium and vitamin E. In fact, a major new U.S. and British government-funded study of 11,875 pregnant women in England has found that women who ate less fish had children who were more likely to have lower a IQ and behavior problems than the children of women who ate more fish, suggesting that the benefits of eating fish in terms of children's brain development apparently outweigh the potential risks from contaminants such as methylmercury. U.S. government advice warns pregnant women not to eat shark, swordfish, king mackerel, or tilefish, because they may contain high levels of methylmercury. Instead, for their health and the health of their babies, pregnant women are advised to eat a variety of fish and shellfish that are lower in mercury, such as shrimp, canned light tuna, salmon, pollock, and catfish.[12]

The cardiovascular benefits of fish are also well established and, according to the American Heart Association (AHA), far outweigh the risks for middle-aged and older men and postmenopausal women. The AHA recommends that we eat two servings of a variety of fish weekly, both for the healthy heart benefits of omega-3 fatty acids and

[12] See USEPA brochure at *http://www.epa.gov/waterscience/fish/files/MethylmercuryBrochure.pdf*.

because fish tends to be low in the saturated fats that contribute to elevated cholesterol levels.

The staff report, like Michigan's current policy, fails woefully in acknowledging those benefits.

Misrepresenting Studies

We also take issue with the staff report's discussion of the benefits of limiting power plant mercury emissions, and conclude that the draft is misleading and unbalanced.

The staff report (pages 23–24) devotes a somewhat lengthy discussion to the shortcomings of the USEPA's 2005 Regulatory Impact Analysis of the Clean Air Mercury Rule and its benefits estimates. It then describes a benefits study performed by a group of pediatricians without mentioning that study's substantial shortcomings.[13] Dr. Charnley points out that the staff report's discussion of benefits estimates, based on IQ decrements, fails to mention the fact that none of the recent epidemiologic studies of methylmercury exposure (Faroe Islands, Seychelle Islands, New Zealand) showed an impact of exposure on IQ. Economists at the USEPA and the Harvard School of Public Health have used IQ as a surrogate for other effects so they could assign monetary values to the potential effects of methylmercury exposure for the purpose of evaluating the effectiveness of different approaches to limiting mercury exposure.

Neither the New Zealand nor the Seychelle Islands studies[14] reported a statistically significant IQ deficit and the Faroe Islands study did not evaluate IQ, so an estimate of an

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[13] Trasande et al. 2005. The economic analysis attempted by a group of pediatricians at the Mount Sinai School of Medicine has been widely criticized and extensively discounted by economists. For details, see EPA's Office of Air and Radiation presentation, Mercury Cobenefits of the Clean Air Interstate Rule (April 25, 2006).

[14] P. W. Davidson, G. J. Myers, C. Cox, et al. 1998. Effects of prenatal and postnatal methylmercury exposure from fish consumption on neurodevelopment: outcomes at 66 months of age in the Seychelles child development study. *Journal of the American Medical Association* 280:701–707.

G. J. Myers, P. W. Davidson, C. Cox, et al. 2003. Prenatal methylmercury exposure from ocean fish consumption in the Seychelles child development study. *Lancet* 361:1686–92.

P. Grandjean, P. Weihe, R. F. White, F. Debes, S. Araki, K. Yokoyama, K. Murata, N. Sørensen, R. Dahl, and P. J. Jørgensen. 1997. Cognitive deficit in 7-year-old children with prenatal exposure to methylmercury. *Neurotoxicology and Teratology* 19:417–28.

P. Grandjean, P. Weihe, R. F. White, and F. Debes. 1998. Cognitive performance of children prenatally exposed to "safe" levels of methylmercury. *Environmental Research* 77:165–72.

T. Kjellstrom P. Kennedy, S. Wallis, and C. Mantell. 1986. *Physical and Mental Development of Children with Prenatal Exposure to Mercury from Fish. Stage 1: Preliminary Tests at Age 4*. Report #3080. Solna, Sweden National Swedish Environmental Board.

T. Kjellstrom, P. Kennedy, S. Wallis, et al. 1989. *Physical and Mental Development of Children with Prenatal Exposure to Mercury from Fish. Stage 2: Interviews and Psychological Tests at Age 6*. Report #3642. Solna, Sweden: National Swedish Environmental Board.

K. S. Crump, T. Kjellström, A. M. Shipp, A. Silvers, and A. Stewart. 1998. Influence of prenatal mercury exposure upon scholastic and psychological test performance: benchmark analysis of a New Zealand cohort. *Risk Analysis* 18:701–13.

effect was made based on component effects. Although there were no associations between methylmercury exposure and IQ deficits, it is still possible mathematically to estimate a relationship. The economic analyses that used a correlation between exposure and IQ to estimate benefits integrated the data from the three studies, which required complex scaling and data transformation as well as numerous simplifying assumptions. The result is not a description of an actual biological phenomenon but is a potentially useful way to estimate the possible benefits of different risk management scenarios that limit mercury exposure in order to compare their cost-effectiveness and choose among them. **This is a policy activity, not a biological one**.

Regulatory impact analyses like these can be useful for the purpose of comparing policy alternatives but do not reflect actual biological observations. The USEPA is careful to point out that there is no conclusive evidence linking IQ and methylmercury exposure[15]and, as mentioned above, much higher exposures in Japan do not appear to be producing IQ deficits. In fact, as described below, the children of mothers consuming fewer fish during pregnancy have lower IQs and more behavioral problems than the children of women eating more fish during pregnancy, despite the fact that eating more fish produces higher methylmercury exposures.

The staff report should mention the fact that an effect of methylmercury on IQ has not been reported and should describe the many shortcomings of the Mount Sinai pediatricians' study.

Lack of Transparency

Mercury—from both natural and anthropogenic sources——cycles through air, water, and land. It often resides in soils for thousands of years before it is released to water bodies in a methylated form. In its 1993 report, the Michigan Environmental Science Board correctly pointed out that while the vast majority of mercury in soils stays in soils, occasionally tiny releases in a methylated form can have dramatic effects on fish tissue concentrations. Since the mercury in the top few inches of soil typically represents accumulation from atmospheric inputs over thousands of years, and since mercury is a global phenomenon, no regulation of anthropogenic mercury use in Michigan would affect levels in soils or in fish tissues. No amount of regulation can change natural dynamics.

As a result of the implementation of a recommendation of that 1993 report, huge reductions in mercury emissions from Michigan incinerators have occurred over the last decade, but there has been no demonstrated decline in either deposition or fish tissue levels in the state. There is simply no basis for concluding that controls on smaller sources will somehow lead to larger results.

The draft staff strategy fails to recognize that like every state agency, the MDEQ is required to implement its statutory responsibilities through properly and publicly adopted

[15] U.S. Environmental Protection Agency. 2005. *Regulatory Impact Analysis of the Clean Air Mercury Rule. Final Report.* EPA-452/R-05-003. Office of Air Quality Planning and Standards. Research Triangle Park, N.C.

rules, rules under the Michigan Administrative Procedure Act, not through internal reports and internal guidance. Governor Granholm and Director Chester have both repeatedly pointed out the importance of “transparency” in the regulatory process. Michigan’s rules process was designed to guarantee that transparency.

Unfortunately, there already is an example of the MDEQ ignoring statutory requirements (and thus transparency) regarding mercury. The MMA remains concerned that the elimination of the initial threshold screening level (ITSL) for mercury. Under the currently adopted Air Quality Division (AQD) rules the AQD must determine an ITSL or it automatically defaults to 0.1 $\mu g/m^3$. This is the standard that was discussed openly with the public during the required public comment period, and established by rule [see R336.1232(1)(i)].

The ITSL is to be established either by utilizing the methodology of Rule 232 or using an alternative methodology based upon more appropriate toxicological grounds and scientific data [see Rule 229(2)]. The AQD clearly is not free to set the ITSL at "zero." Yet that is what the AQD has effectively done with the mercury ITSL: the AQD has unilaterally eliminated the mercury ITSL, ignoring its statutory requirements. That step has caused great regulatory uncertainty in Michigan.

The AQD initially followed its rules and established an ITSL for mercury utilizing the EPA's inhalation RfC. (This is the preferred method for setting the ITSL under the AQD's own Rule 232.) However, the AQD subsequently and unilaterally voided the ITSL for mercury, replacing it with a footnote. Footnote 7 (in place of the mercury ITSL) provides that henceforth emissions of mercury will be evaluated on a case-by-case basis, and that therefore mercury emission sources seeking a permitting exemption under the Rule 290 are prohibited from doing so.

This action violates the MDEQ's own rules. The AQD and the MDEQ cannot ignore their statutory requirement to have an ITSL for mercury. Rule 232 establishes a hierarchy of methods to establish an ITSL for any compound, including mercury, complete with a default value, if all else fails. The public and the environment are protected under the law, because in issuing permits the MDEQ can substitute its own judgment if it uses appropriate toxicological grounds and scientific data under Rule 228.

Moreover, the MDEQ cannot lawfully eliminate a valid permit exemption by simply eliminating the ITSL. Rule 290 allows small sources the certainty of reviewing applicable ITSLs. Rule 290 was publicly and properly adopted, and cannot be unilaterally eliminated. If someone in AQD thinks that Rule 290 should not be available to Michigan companies, the proper recourse for a rescission is rulemaking. This requires notice and public comment, leading to open discussion, scientific data and proof. Such action, however, would put Michigan out of step with the rest of the country.

The MMA is deeply concerned that this new internal mercury study could be improperly used once again to arbitrarily impose extra-statutory burdens on Michigan industry without transparency, rules and without a proper scientific basis.

Conclusion

Imposing the radical goal of the *elimination* of anthropogenic releases and the use of mercury in Michigan puts our state out of step with the rest of the country and the world in dealing with the mercury issue. It raises false expectations, places undue and unjustified burdens on Michigan businesses, ignores transparency in the public policy process, and steers our state into an unnecessary labyrinth of lawsuits and political debate. While the report advocates for extensive new programs and bureaucratic efforts, it never identifies the costs that would be incurred by the agency in terms of staff increases or cost increases for the citizens of Michigan. We believe that ignoring cost implications is irresponsible. This goal should not be used to create new policy in the MDEQ.

In light of the numerous shortcomings in the draft report, we strongly urge you to reject the staff report. Insular staff-based reports will always be subject to criticism on the basis of process. Good policy should always be based on an open and credible process. Doing so will ensure a more reasoned approach and a strategy for mercury that is consistent with the facts, accurate in its underpinnings, and based on the current state of scientific knowledge.

We continue to believe the legislature should create an independent science advisory panel of recognized Michigan and national experts that can evaluate and establish credible science for policymakers. Mercury policy and all other environmental policy will benefit from current and credible science.

We live in a global economy and global environment. Michigan's economic and environmental future is too important to not establish a sound scientific basis for policy making. A vibrant economy and safe environment are dependent upon each other. We are willing to work with you in crafting reasonable and scientifically credible mercury policy for the state.

CC:
Sen. Jason Allen, Chair, Senate Committee on Commerce and Tourism
Rep. Doug Bennett, Chair, House Appropriations Subcommittee for Environmental Quality
Sen. Patty Birkholz, Chair, Senate Committee on Natural Resources and Environmental Affairs
Sen. Mike Bishop, Senate Majority Leader and Chair, Senate Committee on Government Operations and Reform
George Bruchmann, Waste and Hazardous Materials Division, MDEQ
Amy Butler, Environmental Science and Services Division, MDEQ
Rep. Ed Clemente, Chair, House Committee on New Economy and Quality of Life
Rep. George Cushingberry Jr., Chair, House Committee on Appropriations
Rep. Andy Dillon, Speaker of the House
Rep. Barbara Farrah, Chair, House Committee on Regulatory Reform
Sen. Valde Garcia, Chair, Senate Appropriations Subcommittee for Department of Environmental Quality
G. Vinson Hellwig, Air Quality Division, MDEQ
Andrew Hogarth, Remediation and Redevelopment Division, MDEQ

Marcia Horan, Environmental Science and Services Division, MDEQ
Sen. Ron Jelinek, Chair, Senate Committee on Appropriations
Steve Kratzer, Environmental Science and Services Division, MDEQ
Carol Linteau, Legislative Liaison, MDEQ
Rep. Andy Meisner, Chair, House Committee on Commerce
Joy Taylor Morgan, Air Quality Division, MDEQ
Sen. John Pappageorge, Chair, Senate Joint Committee on Administrative Rules
Rich Powers, Water Bureau, MDEQ
Frank Ruswick, Special Assistant to the Director, MDEQ
Sen. Alan Sanborn, Chair, Senate Committee on Economic Development and Regulatory Reform
Cathy Simon, Air Quality Division, MDEQ
Jim Sygo, Deputy Director, MDEQ
Rep. Rebekah Warren, Chair, House Committee on the Great Lakes and Environment
Rep. Lisa Wojno, Chair, House Committee on Government Operations

Appendix:
Inaccuracy and Inconsistencies

The Michigan Department of Environmental Quality (MDEQ) Mercury Strategy Staff Report has a number of inaccurate or misleading statements. Moreover, key assessments such as the 1993 Michigan Environmental Science Board (MESB) report or a comparison of Michigan emission, deposition, and fish tissue data are missing, even though such very relevant data is readily available. The cumulative result of these errors, biases and omissions leaves the reader with the erroneous impression that mercury levels in fish are harming Michigan residents, that mercury use and emissions influences deposition values and fish tissue levels, that reductions in emissions and use will significantly reduce fish tissue levels, and that virtual elimination policies are consistent with the policies of other states and countries. Following are selected examples of inaccurate or misleading statements.

Page 1

The overall goal of elimination is not consistent with any portion of the Michigan Environmental Code. Various portions of the Environmental Code deal with criteria for the use and releases to air, water, and land. In every instance, the Code provides for reasonable uses and releases, not the elimination of mercury, provided those uses and releases are reasonable and protective of human health and the environment.

Page 3

One of the summary statements refers to past contamination from mercury legacy sites associated with coal-fired power plants. Since the summary statement discusses such power plant mercury legacy sites, the clear implication is that they exist, but the body of the report does not contain a single example where a coal-fired power plant caused a mercury legacy.

Page 4

Language here implies that several other states have adopted virtual elimination when they have not. Some states have mercury emission regulations that are stricter than federal emissions, but they still allow the emission of mercury. A handful of states have very limited mercury-in-product bans, but they still allow most uses of mercury in products. Many states have no mercury regulations that are stricter than federal regulations. Moreover, not a single state has eliminated all uses and releases of mercury, the strategy that this Mercury Report suggests for Michigan.

Page 5

The Great Lakes Water Quality Act is mischaracterized in several ways. The Strategy gives the false impression that the GLWQA provides a rationale for the elimination of mercury.

Two points need to be made. First, even though the protocol amending the 1978 GLWQA was not ratified, the U. S. Environmental Protection Agency (USEPA) used it as a template for the Great Lakes Initiative, which regulates mercury releases to water. This

GLI mercury standard allows, rather than eliminates, the discharge of mercury to water. Much of the mercury in water is naturally occurring and cannot be eliminated.

Second, in further advancing the Great Lakes Water Quality Act, Region V of the USEPA created a voluntary program called the Binational Toxic Strategy. This strategy has also recognized that it is impossible to eliminate mercury—a naturally occurring substance—from the Great Lakes and the USEPA has only sought a 50 percent reduction (that has already been accomplished) in mercury use and emissions.

Finally, the Court of Appeals for the D.C. Circuit specifically held in reviewing the proposed limits on mercury discharges from publicly owned treatment works that the Clean Water Act's mercury reduction requirements do not require "total elimination" of mercury "at any cost," not even in the Great Lakes[1] and that the cost of end-of-pipe mercury controls at the publicly owned treatment works (POTWs) are not cost-effective.[2] The USEPA itself has long recognized "the importance of implementing only those control strategies determined to be cost-effective";[3] EPA has approved Ohio EPA and Michigan Department of Environmental Quality ("MDEQ") statewide mercury variances from the Great Lakes water quality standard (an even more stringent standard than is applicable for the Region VIII States) precisely because the cost of compliance "would result in substantial and widespread social and economic impacts."[4]

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[1] *American Iron & Steel Institute v. EPA*, 115 F.3d 979, 1001 (D.C.Cir. 1997).

[2] See DRI/McGraw Hill Report, Great Lakes Water Quality Initiative - Regional Cost and Benefit Analysis. Great Lakes Water Quality Coalition Report, Water Quality Guidance for the Great Lakes System (July 1993); Michigan Department of Environmental Quality, Draft Mercury Permitting Strategy (issued February 3, 2004), available at: *http://www.deq.state.mi.us/documents/deq-wd-swpas-draftmercurystrategy.pdf*, and Ohio EPA, Pollutant Minimization Programs, Permit Guidance No. 7 (final) (August 13, 2000), available at: *http://www.epa.state.oh.us/dsw/guidance/permit7.pdf* ("Ohio EPA PMP Guidance").

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

[4] Ohio EPA, Pretreatment Guidance No. 1, The Use of Best Management Practices (BMPs) as Industrial Local Pretreatment Limits at 1 (final) (June 21, 2000), available at: *http://web.epa.state.oh.us/dsw/guidance/pretreatment1.pdf*. Ohio EPA's mercury permitting implementation guidance is replete with admonishments to consider "the social and economic impacts" of requiring compliance with the water quality standard for mercury and to use cost-effective methods of reducing mercury discharges. Id. at 1. The Ohio EPA mercury variance guidance states that: "[a]ll controls, whether treatment or pollution prevention, must be cost-effective for the permittee or industrial user source." Ohio EPA, Mercury Variance Permit Guidance No. 7 at 3 (final) (August 13, 2000), available at: *http://www.epa.state.oh.us/dsw/guidance/permit7.pdf* ("Ohio EPA PMP Guidance"). The Ohio EPA Pretreatment guidance provides that the POTW develop a best management plan that identifies pollution prevention and wastewater reduction opportunities that are "technically and economically feasible." The mercury variance guidance defines pollutant minimization programs as including "any cost-effective process for reducing pollutant levels, including pollution prevention, treatment, best management practices or other control

None of these federal programs seek to "eliminate" mercury uses and releases.

Page 7

The bullet point at top of page 7 indicates that "Data have demonstrated that concentrations of mercury in the atmosphere and sediments have increased by a factor of two to five since pre-industrial times because of its liberation from the earth due to anthropogenic activity." While this statement is generally true, the real focus of environmental levels of mercury should be within the past 100 years or less. Most of the Hg fish tissue trends and lake sediment trends for the Great Lakes follow the same pattern: peak levels in the 1950s and 1960s followed by a strong decrease from 1970 to 1985, with levels after this point fluctuating due to variable global source contributions.

Page 9

Two very costly and new programs are identified on page 9. One would create a new monitoring program for very small releases of mercury. The second program calls for the ban on ***all*** mercury uses. In contrast to proposed Michigan bans, the federal program encourages voluntary reduction of mercury uses and minimization of releases to the environmental from the uses which remain. Also, while the federal Toxic release Inventory (TRI) program requires reporting of certain mercury releases, it does not require reporting of very small releases of mercury. The staff report does not identify where the legislative authority exists to ban all mercury uses in Michigan. As explained elsewhere in these comments, the staff report does not describe a compelling environmental imperative for either a ban or a new monitoring program.

Page 10

The second paragraph notes that "…Hg(0) is primarily toxic through the ingestion route…" There is no mention of the continual, low-level exposure of elemental mercury in people with dental amalgams. There needs to be recognition of the difference between high level and low level exposure.

Page 17

The last sentence of the first paragraph indicates that studies "have documented that consuming marine fish in the U.S. has resulted in elevated blood mercury concentrations (Hightower and Moore, 2003)". The study is taken completely out of context. This was a study that showed clinical mercury poisoning symptoms in a health fitness advocate in California who ate tuna fish every single day. This study has nothing to do with the actual day-to-day exposure of normal fish eaters.

Page 20

The first paragraph attempts to convince the reader that the mere **exposure** to mercury causes an adverse health effect. This is a pervasive, erroneous, undertone throughout the entire report.

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mechanisms" and are concerned with "the sources of the pollutant that contribute to discharge levels." Ohio EPA, Mercury Variance Permit Guidance No. 10 at 6 (final) (June 23, 2000), available at: *http://www.epa.state.oh.us/dsw/guidance/permit10.pdf*.

Page 21

This page refers to statewide Michigan Hg screening in blood and urine. The last sentence in the first paragraph states,

> In the first year of reporting (2006) MDCH received over 4,500 clinical laboratory reports of mercury tests in blood and urine. About **half of the test did not find detectable levels**, and **most of the rest were within the normal range**. Follow-up is underway for the **30 test results that were higher than normal.**

Thirty "above normal" Hg level results out of 4,500 people tested results in **a frequency of 0.67 percent**. This is a good example of the **actual** exposure of Michigan residents to Hg, which is completely different from the **theoretical** exposure. Throughout the report, the agency ignores fact, in favor of justifying its theory.

Page 25

The costs discussion here only describes the costs for mercury controls on power plants and omits any discussion of any other mercury controls, bans, or monitoring programs. As indicated above, an August 2007 report released by MMA indicates that the MDEQ's draft mercury rule would impose $1.2 billion in more costs beyond the federal rule. Since the Administrative Procedures Act requires that the cost of regulations be identified and since the strategy is advocating some extremely expensive initiatives, it would appear that at minimum, there should be some discussion of costs for these other programs.

Page 36

The staff report offers in support of its "elimination" policy, the observation that there are widespread exceedances of various mercury standards. These standards are the Great lakes Initiative (GLI) water column criteria for mercury, the GLI fish tissue standard for mercury and the Michigan Department of Community Health Fish Tissue criteria. A more detailed analysis of these standards demonstrates that these standards are not consistent with each other or with underlying federal policy.

For instance, federal policy, as expressed in the USEPA's Clean Water Act rules for both fish tissue standards and the GLI, directs states to average the mercury content of all fish species when evaluating compliance and whether water bodies should be on the Section 303(d) impaired list. Michigan, however, does not average all fish species, but chooses without rulemaking authority to use only the fish species with the highest mercury content. Additionally the MDEQ chooses to use a fish species standard of 0.3 that is measured against the single fish species with the highest mercury level, while the MDCH chooses to use a standard of 0.5 measured against the largest size of fish within single fish species.

Moreover, the basis for the MDCH standard is different from the basis for the GLI standard and both differ from the basis offered in the strategy report. The differences center on the relationship between blood mercury in various organs in the human body and corresponding safe levels. The calculations behind the MDCH fish tissue standards, the MDEQ GLI standard, the USEPA's revised GLI standard, and this strategy report are all inconsistent. The MDEQ Director's charge was to create consistent standards, but this staff report takes the three inconsistent standards (the MDCH fish tissue, the MEDQ GLI

fish tissue, and the USEPA revised GLI fish tissue) and adds to this confusion a fourth set of erroneous calculations about mercury pertaining to various human organs and acceptable reference doses. In a separate part of the MMA's submittal a critique by Dr. Charnley identifies these erroneous calculations.

The USEPA has given the MDEQ the opportunity to upwardly revise its mercury GLI water column criteria, and the MMA has advocated such an upward revision to make the MDEQ's standard consistent with the latest science. To date, however, the MDEQ has chosen to not make its GLI standard consistent with the latest science and has not created the consistent set of mercury fish tissue standards called for in the Director's letter.

The Part 201 cleanup criteria for groundwater are discussed briefly in the strategy report, but deserve much more attention. Like the GLI standard, this standard is in need of revision to make it consistent with the USEPA's revised GLI criteria. Moreover, other GLI states choose to not apply the GLI standard to groundwater. While there is obviously a nexus between groundwater quality and surface water quality there are fate and transport processes that occur in groundwater (adsorption) and surface water (evasion) that are not properly considered in the existing 201 program.

Page 95

The Staff Report recommends that Michigan "[r]equire dentists placing or removing dental mercury amalgam fillings to install and properly operate a certified dental mercury amalgam separator" [that is, use a separator that meets the International Standard Organization (ISO) 11143 criteria for removing the approximately 30 percent of dental amalgam entering dental office sinks and not being captured by the existing chairside traps and vacuum filters currently used in dental offices]. This is an example of the tendency of the report to abandon voluntary approaches in lieu of mandatory approaches and, as noted above, a failure to consider the cost effectiveness of its recommendations.

The voluntary best management practice of the professional association that represents most United States dentists includes the use of amalgam separators.[5] According to a peer-reviewed, published paper, the nationwide cost per ton of installing separators in lieu of chairside traps and vacuum filters is $380 million to $1.14 billion.[6] However, the MDEQ staff report recommends mandatory separators without any rigorous analysis of the costs, feasibility, or benefit of such an approach.

Equally troubling is the fact that the report contains a discussion of "[n]ew approaches in plumbing adaptation [that] have also been developed specifically for dental practices" that use "holding tanks [to] remove and store mercury-containing fluids separate from the rest of the wastewater lines" and transports the material off site for proper treatment and disposal" (Staff Rpt at p. 123). This new plumbing approach captures 100 percent of the dental amalgam entering dental office sinks. Again, however, no attempt is made to consider whether the benefit is worth the enormous cost.

[5] American Dental Association, Best Management Practices for Dental Offices (2007).

[6] J. A. Vandeven and S. L. McGinnis. 2005. An assessment of mercury in the form of amalgam in dental wastewater in the United States. *Water, Air, and Soil Pollut.* 164: 349–66.

First, simply capturing every drop of a wastewater discharge in tanks and disposing of 100 percent of that discharge as a waste is not new technology and is certainly not cost-effective.

Second, if a dental office installs and operates an amalgam separator, approximately 99.2 percent of the amalgam that enters the dental office sink is captured prior to discharge to surface water (by the chairside trap, vacuum filter, amalgam separator, and POTW).[7] The mere fact that the report discusses an approach to capture the last 0.8 percent without considering the incremental cost per ton prevented from entering the surface water by adding amalgam separators suggests that at least some of the authors of this report believe (as the report states on p. 8) that the "policy of zero discharge be applied to prevent further releases from all sources of persistent toxic substances," even if this would lead to a completely cost ineffective approach.

Page 98

The staff report wrongly implies that the effort of the Northeast Waste Management Officials' Association (NEWMOA) resulted in mercury elimination legislation. The NEWMOA effort was a staff report. None of the associated state legislatures adopted an elimination strategy. A handful of states ban certain uses of mercury, but no state bans all uses of mercury. Moreover, most states do not ban any of the many uses of mercury. The opposite is implied.

Page 125

The protocol amending the 1978 GLWQA was not ratified by Congress.

Page 129

The Zero Mercury Global Campaign is not a governmental organization. No governmental organization supports mercury elimination. The opposite in implied.

The Binational Strategy only sought a 50 percent mercury reduction, not elimination

Page 133

The strategy report implies that Minnesota endorses mercury elimination, but Minnesota's policies described by the report, "Hg Reduction Progress Report to the Minnesota Legislature" at *http://www.pca.state.mn.us/publications/reports/lrp-mercury 2005.pdf*, seek reductions, not elimination. Furthermore, many of the reductions that Minnesota is seeking are voluntary.

Page 135

(The New England Governors and Eastern Canadian Premiers) NEG/ECP is a staff organization that advocated bans on a broad array of mercury uses but no state legislature

[7] Report of ENVIRON International at 5 (December 21, 2007), Attachment 1 to the ADA Submission to EPA's Office of Pretreatment (EPA-HQ-OW-2006-0771-0837.3, available at <http://www.regulations.gov/fdmspublic/ContentViewer?objectId=090000648037dc24&disposition=attachment&contentType=pdf>).

approved broad bans on most mercury uses. Only a few legislatures banned a limited number of mercury uses. The opposite is implied.

Pages 136 and 137

Here the staff report correctly describes the Binational Toxic Strategy (BTS) as being (a) voluntary and (b) seeking a 50 percent reduction in use and emissions. That characterization is contrary to previous sections of the report, which mischaracterize the BTS as seeking the elimination of mercury.

While the Lake Superior LaMP (Lakewide Management Plan) advocates "zero mercury" it does so "consistent with a sustainable economy." Moreover, the LaMP has little regulatory authority. Minnesota recently permitted new taconite smelters in the Lake Superior basin that have new mercury releases. The permitting of new mercury releases, controlled to the maximum extent economically feasible, would appear to be consistent with the Lake Superior LaMP and does not support the argument that the LaMP mandates "elimination."

Page 140

The Great Lakes Regional Collaboration (GLRC) recommendations to reduce and eliminate discharges of mercury have not been accepted. The opposite is implied.

Page 141

Ohio has declined to participate in the Mercury Phase Down Strategy. The report wrongly implies that the phase down strategy is viable and is being implemented in all states.

Page 141

The Mercury Emission Strategy is unlikely to be implemented.

Page 143

The United Nations Environment Programme (UNEP) has called for reductions, not elimination, of mercury use and emissions. The national results are cited below.

Page 149

The discussion here omits reports by Keeler that attribute much of the north/south variation in Michigan monitoring data to colder temperatures in the north. Mercury deposition is less in colder climates. The report wrongly implies that the north/south gradient is solely associated with Michigan emissions. Also omitted are the results of a much larger national mercury deposition network. Those national results do not show strong gradients downwind of U.S. emission sources and contradict the finding of the strategy report.

Page 153

While Keeler's hypothetical model predicts that Ohio power plants are the cause of local mercury deposition, actual monitoring data show no difference in deposition upwind and downwind of the Ohio River valley. The strategy report fails to acknowledge contrary data and data based on actual monitoring, as opposed to hypothetical computer models. Actual data is available from the Mercury Deposition Network Website,

http://nadp.sws.uiuc.edu/mdn/maps/2005/05MDNconc.pdf, and demonstrates that during typical years deposition in Pennsylvania (downwind of the major concentration of U.S. power plants on the Ohio River) is less than or the same as deposition on the prairies of southwest Minnesota (which are far removed from power plant emissions).

Page 154

It is very important to note that the figure presented on page 154 shows no charge in mercury deposition in the state from 1995 to 2005, when the largest reductions in Michigan mercury emissions were occurring. The strategy report implies that controls on the remaining releases and uses of mercury will significantly reduce fish tissue concentrations of mercury. But Michigan has already reduced mercury use and releases by a great amount with no perceptible change in either mercury deposition or fish tissue levels.