IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA

WHITE STALLION ENERGY CENTER, LLC, et al.,	)	
Petitioners,	)	
v.	)	**Case No. 12-1100 (and consolidated cases)**
U.S. ENVIRONMENTAL PROTECTION AGENCY,	)	
Respondent.	)	

DECLARATION OF PAUL J. MILLER, PhD.
DEPUTY DIRECTOR AND CHIEF SCIENTIST
NORTHEAST STATES FOR COORDINATED AIR USE MANAGEMENT

I, Paul J. Miller, state and declare as follows:

I. Purpose of this Declaration

1. I am the Deputy Director and Chief Scientist of the Northeast States for Coordinated Air Use Management ("NESCAUM"). NESCAUM is a nonprofit association of air quality agencies in the six New England states (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont), New Jersey, and New York ("NESCAUM states"). NESCAUM provides scientific, technical, analytical, and policy support to the air quality and climate programs of those eight Northeast states. A fundamental component of our efforts is to assist our member

states in implementing national environmental programs required under the Clean Air Act and other federal legislation.

2. I provide this declaration on behalf of NESCAUM in support of the State, Local Governments, and Public Health Respondent-Intervenors' motion requesting that the Court remand the Mercury and Air Toxics Standards ("Air Toxics Rule"), 77 Fed. Reg. 9304 (Feb. 12, 2012), to EPA without vacating it because the Air Toxics Rule provides essential protection of public health and the environment from the serious harms posed by emissions of mercury and other air pollutants from coal-fired power plants.

II. Experience and Qualifications

3. My responsibilities at NESCAUM include providing technical, policy, and legal support for all NESCAUM initiatives. I have more than 20 years of experience in the fields of atmospheric science and environmental policy. I am familiar with the air pollutant emissions of coal- and oil-fired power plants, such as acid gases, mercury, and other heavy metals, the transport of those pollutants, and the technologies available to control those emissions. I have co-authored a number of institutional reports and peer-reviewed science journal articles on mercury pollution and power plant emissions.

4. I have previously been a Senior Research Fellow at Princeton University's Center for Energy and Environmental Studies, and a National

Research Council Associate at the Joint Institute for Laboratory Astrophysics, University of Colorado, Boulder. I hold a Bachelor of Science in Chemistry, with Highest Distinction, from Purdue University, and was awarded a Kent Fellowship from Yale University where I earned a Doctorate in Philosophy (Chemical Physics). My research involved investigating the photochemical physics of small molecules in the gas phase using laser spectroscopic techniques. I also hold a Juris Doctor from Stanford Law School, and currently apply my combined science and legal backgrounds in support of sound environmental policymaking among the NESCAUM states. My curriculum vitae is attached as Attachment A to this declaration.

III. Efforts by the States to Reduce the Risks to Public Health and the Environment from Mercury Emissions

5. Mercury is a persistent, bioaccumulative, and neurotoxic pollutant. The major route of exposure to mercury in humans is through consumption of fish in which methylmercury, a particularly toxic form of mercury, has become concentrated through bioaccumulation. Women of child bearing age are of special concern because methylmercury ingested by a mother can move across the placenta into the brain of a developing fetus. In young children and fetuses, methylmercury inhibits the normal development of the nervous system, an effect

that may occur even at low exposure levels.[1] Birds, such as common loons, and mammals, such as otters, that eat fish have also been shown to suffer adverse effects from high concentrations of mercury in their bodies.[2]

6. In light of the dangers posed by mercury contamination, the NESCAUM states have for more than fifteen years aggressively regulated in-region mercury releases to the air. Starting in the 1990s, those states imposed strict limits on mercury emissions from municipal waste combustors and medical waste incinerators, and stringent limits on mercury emissions from coal-fired power plants followed in the mid-2000s.[3] Today, all of the NESCAUM states with coal-fired power plants located in their borders, and many other states, have placed limits on mercury emissions from coal-fired power plants, and many of those emission limits are well below that required by the Air Toxics Rule.

7. Despite those efforts, mercury contamination of surface waters continues to be a significant problem throughout the Northeast. Today, approximately 1.7 million acres of lakes, ponds, and reservoirs, and 56,000 miles of rivers and streams, located in the NESCAUM states are considered impaired

[1] Salonen, et al., Mercury Accumulation and Accelerated Progression of Carotid Atherosclerosis: A Population-Based Prospective 4-year Follow-Up Study in Men in Eastern Finland, 148 *Atherosclerosis* 265-273 (2000); 76 Fed. Reg. 24,976, 24,983, 25,000-01, 25,007 (May 3, 2011).
[2] Driscoll, et al., Mercury Contamination in Forest and Freshwater Ecosystems in the Northeastern United States, 57 *BioScience* 18-28 (2007); 77 Fed. Reg. at 9310; 76 Fed. Reg. at 25,000.
[3] The NESCAUM states and others have also implemented programs to reduce mercury releases to water and waste streams, such as use of dental amalgam separators and restrictions on the sale and disposal of mercury-added products, such as thermometers.

because of mercury.[4] Due to that widespread mercury contamination, each of the NESCAUM states has set an EPA-approved total maximum daily load ("TMDL") for mercury pursuant to the federal Clean Water Act. *See* 33 U.S.C. § 1313(d)(1) (requiring development of TMDLs for impaired waters).[5]

8. Due to efforts that began in the late 1960s, most of the direct discharges of mercury into the Nation's waters have now been identified and controlled. As a result, the primary source of mercury entering U.S. aquatic ecosystems today comes from atmospheric deposition.[6] At specific locations within the NESCAUM region, sixty to eighty percent of that deposition has been attributed to North American mercury emission sources.[7] At the regional scale, NESCAUM modeling for the year 1998 estimated that nineteen percent of the

[4] Impaired waterbodies were determined from the most recent (Current Year) data available in state summaries for Massachusetts, New Hampshire, New York, Rhode Island, Vermont, and New Jersey, available at EPA's "National Summary of State Information," http://iaspub.epa.gov/waters10/attains_nation_cy.control (visited September 8, 2015). Information for Connecticut and Maine was taken from each state's 2012 Integrated Water Quality Monitoring and Assessment Report: Connecticut - http://www.ct.gov/deep/lib/deep/water/water_quality_management/305b/2012_iwqr_final.pdf; Maine - http://www.maine.gov/dep/water/monitoring/305b/2012/report-final.pdf.

[5] New Jersey established a state-level TMDL in 2009 (*see* EPA Region 2 Decision Letter, Review of Total Maximum Daily Load (TMDL) for Mercury Impairments Caused Mainly by Air Deposition in 122 HUC 14s Statewide, New Jersey (NJ), September 29, 2009, http://www.epa.gov/waters/tmdldocs/FinalNJMercuryTMDLApproval9-25.pdf), and the New England states and New York jointly adopted a TMDL in 2007 (*see* Northeast Regional Mercury Total Maximum Daily Load, October 24, 2007 ("Northeast TMDL"), https://www.neiwpcc.org/mercury/mercury-docs/FINAL%20Northeast%20Regional%20Mercury%20TMDL.pdf.

[6] U.S. Geological Survey Circular 1395, Mercury in the Nation's Streams—Levels, Trends, and Implications 65 (2014), http://pubs.usgs.gov/circ/1395/.

[7] Seigneur et al., Global Source Attribution for Mercury Deposition in the United States, 38 *Environ. Sci. Technol.* 555-569 (2004).

mercury deposition within New England and New York came from mercury emission sources in states outside of this region;[8] that percentage likely underestimates the current contribution from such states because the modeling predates the implementation of state-based mercury emission limits on waste incinerators and power plants in the NESCAUM states.[9]

9. Domestic coal-fired power plants are a significant contributor to the NESCAUM region's deposition.[10] Thus, the regional mercury TMDL for the New England states and New York concludes that in order to meet the ninety-eight percent reduction in atmospheric mercury deposition required to return fish methylmercury concentrations to safe levels "significant reductions from upwind out-of-region sources, primarily coal-fired power plants" are necessary.[11]

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[8] Northeast TMDL, *supra* note 5 at 22, Table 6-2 (1,207 kg/yr for "Rest of U.S. Sources") and *supra* note 5 at 28 (6,506 kg/year total "nonpoint source load" atmospheric deposition).

[9] King et al., Reducing Mercury in the Northeast United States, *EM* 9-13 (May 2008), http://www.nescaum.org/documents/reducing-mercury-in-the-northeast-united-states/ne-mercury-progress-em-200805.pdf.

[10] NESCAUM, Sources of Mercury Deposition in the Northeast United States 1 (March 2008) ("NESCAUM 2008 Report"), http://www.nescaum.org/documents/nescaum-sources-of-hg-depo-in-northeast_2008-final.pdf; Memorandum from Marc Houyoux and Madeleine Strum, Emission Inventory and Analysis Group, U.S. EPA, Emissions Overview: Hazardous Air Pollutants in Support of the Final Mercury and Air Toxics Standard 5-6 (Dec. 1, 2011) (coal-fired power plants accounted for fifty percent of the Nation's mercury emissions in 2005 and were projected to account for forty-two percent in 2016).

[11] Northeast TMDL, *supra* note 5, at vi (setting a 90th percentile reduction in fish mercury concentrations as the TMDL target), ix, Table ES-1 (section entitled "Overall Reductions to Meet TMDL") (concluding that a 98.2 percent reduction in anthropogenic atmospheric deposition is required to reach the 90th percentile reduction), 44 (noting the need for national coal-fired power plant emissions reductions to meet TMDL target).

IV. The Transport, Deposition, and Bioaccumulation of Mercury Emitted to the Air

10. Coal combustion at power plants releases three forms, or species, of mercury through a smokestack plume – 1) gaseous elemental mercury, 2) gaseous oxidized mercury (also called "reactive gaseous mercury"), and 3) mercury bound to particles. Natural mercury sources also exist, but anthropogenic sources, of which coal-fired power plants are a major component, account for about two-thirds of the total global mercury atmospheric burden.[12]

11. Transport through the air is the primary method by which mercury is distributed across the environment. The distance mercury travels from its emission source depends upon its form and weather patterns. Oxidized mercury and particle-bound mercury are relatively soluble in water and more chemically reactive than elemental mercury, hence they have much shorter transport lifetimes (i.e., distances). Measurements in stack plumes at coal-fired power plants have found that a significant portion of total emitted mercury is in the oxidized and particle-bound forms. The combination of the specific forms of mercury found in coal combustion plumes and their shorter transport distances result in enhanced local and regional mercury deposition (e.g., in rainfall) near coal-fired power

[12] Anon., The Madison Declaration on Mercury Pollution, 36 *Ambio* 62–65 (2007).

plants.[13] For example, during summertime measurements of rainfall collected within one kilometer of several coal-fired power plants in Ohio, forty-two percent of the average atmospheric mercury wet deposition was attributed to the adjacent coal-fired power plant.[14] This local deposition amount is much higher than regional estimates of deposition in New England and New York described in paragraph 8 above, and is not well captured by regional modeling (the model used by NESCAUM has a nominal resolution of thirty-six kilometers[15]) or by mercury wet deposition monitors in the national Mercury Deposition Network (siting criteria require mercury monitors to be at least twenty kilometers away from large mercury emitting sources[16]).

12. Once deposited, reactive gaseous mercury can be readily methylated to biologically toxic methylmercury form.[17] Methylated mercury builds up (bioaccumulates) in fish when it enters aquatic ecosystems. Fish acquire most of their methylmercury loading through their diet. Mercury bioaccumulates in fish

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[13] White et al., Spatial Variability of Mercury Wet Deposition in Eastern Ohio: Summertime Meteorological Case Study Analysis of Local Source Influences, 43 *Environ. Sci. Technol.* 4946-4953 (2009) (and studies therein referenced on pages 4946-4947).
[14] *Id.* at 4952.
[15] NESCAUM, Modeling Mercury in the Northeast United States 26 (October 2007), http://www.nescaum.org/documents/mercury-modeling-report_2007-1005b_final.pdf/.
[16] National Atmospheric Deposition Program (NADP), NADP Site Selection and Installation Manual 14 (version 1.9, revised November 2014), http://nadp.sws.uiuc.edu/lib/manuals/NADP_Site_Selection_and_Installation_Manual_2014_11.pdf.
[17] Harris et al., Whole-Ecosystem Study Shows Rapid Fish-Mercury Response to Changes in Mercury Deposition, *PNAS* 16586–16591 (2007); Munthe *et al.*, Recovery of Mercury-Contaminated Fisheries, 36 *Ambio* 33-44 (2007).

(as well as birds and mammals) at higher levels of the food web as they eat plankton and smaller fish at lower levels of the food web.[18] Terrestrial songbirds that do not eat fish can also have elevated mercury levels through consuming spiders that in turn captured aquatic insects (e.g., mosquitoes) exposed to elevated levels of environmental mercury.[19] Spatial patterns of mercury in mosquitoes, in fact, have been proposed as a sensitive indicator of atmospheric mercury deposition to aquatic systems.[20]

13. The manner in which an ecosystem responds to changes in mercury deposition depends upon the site-specific physical, chemical, and biological characteristics of the waterbody and surrounding watershed, and the form of deposited mercury. Mercury conversion to biologically toxic methylmercury is most efficient in warm, shallow, organic-rich sediments in lakes and wetlands, low-oxygen waters, and soil drying and re-wetting locations.[21] Because of these differences, water bodies having different characteristics can respond differently to changes in mercury deposition.

14. Whole-ecosystem field experiments encompassing a lake and its watershed have demonstrated that it is the most recent mercury directly deposited

[18] Kidd et al., Bioaccumulation and Biomagnification of Mercury through Food Webs, *in Environmental Chemistry and Toxicology of Mercury*, 455-499 (Liu et al. eds., 1st ed. 2012).
[19] Cristol et al., The Movement of Aquatic Mercury Through Terrestrial Food Webs, 320 *Science* 335 (2008).
[20] Hammerschmidt and Fitzgerald, Methylmercury in Mosquitoes Related to Atmospheric Mercury Deposition and Contamination, 39 *Environ. Sci. Technol.* 3034-3039 (2005).
[21] Madison Declaration, *supra* note 12 at 65.

into the lake which rapidly builds up in fish.[22] Those experiments also showed that changes in the amount of mercury deposited on the lake surface were directly proportional to changes in the amount of mercury appearing in fish within weeks of the deposition change.[23] These are important findings because they demonstrate that limiting mercury emissions from local and regional sources can have near-immediate benefits in reducing mercury levels in fish, thus reducing mercury exposure for people who eat the fish.

V. Local and Regional Mercury Levels Can Respond Relatively Rapidly to Changes in Emissions from Coal-Fired Power Plants and Other Sources

15. Numerous studies appearing in the peer-reviewed science literature have tied local and regional mercury levels in the environment to nearby anthropogenic mercury emission sources. Elevated mercury levels downwind of coal-fired power plants have been measured in Illinois,[24] New York,[25] Florida,[26] Indiana,[27] and Ohio.[28] In a study where there was no enhanced mercury deposition

[22] Harris et al., *supra* note 17, at 16587.; Orihel et al., Experimental Evidence of a Linear Relationship between Inorganic Mercury Loading and Methylmercury Accumulation by Aquatic Biota, 41 *Environ. Sci. Technol.* 4952-4958 (2007).
[23] Orihel et al., *supra* note 22, at 4955.
[24] Gratz et al., Assessing the Emission Sources of Atmospheric Mercury in Wet Deposition across Illinois, 448 *Sci. Total Envt*. 120-131 (2013).
[25] Wang et al., Effect of the Shutdown of a Large Coal-Fired Power Plant on Ambient Mercury Species, 92 *Chemosphere* 360-367 (2013).
[26] Sherman et al., Investigation of Local Mercury Deposition from a Coal-Fired Power Plant Using Mercury Isotopes, 46 *Environ. Sci. Technol.* 382-390 (2012).
[27] Hatcher and Filippelli, Mercury Cycling in an Urbanized Watershed: The Influence of Wind Distribution and Regional Subwatershed Geometry in Central Indiana, USA, 219 *Water Air Soil Pollut.* 251-261 (2011).

measured downwind of a group of coal-fired power plants, it was found that the coal being burned had a very low mercury content.[29] This illustrates the impact mercury pollution controls can have on reducing local and regional mercury deposition as there is little practical difference between burning low mercury content coal and burning higher mercury content coal with pollution controls.

16. Additional examples of local mercury deposition being tied to local sources include historical coal combustion used for residential heating and industrial processes,[30] municipal and medical waste incinerators burning mercury-contaminated waste,[31] metal smelters,[32] and a cement kiln emitting mercury from petroleum coke and limestone used in the manufacturing process.[33]

17. Changing trends and spatial patterns of local and regional mercury emissions are reflected in spatial mercury relationships observed in fish, birds, and

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[28] White et al., *supra* note 13 at 4952. ; Keeler et al., Sources of Mercury Wet Deposition in Eastern Ohio, U.S.A., 40 *Environ. Sci. Technol.* 5874-5881 (2006).
[29] Martin et al., Local Deposition of Mercury in Topsoils around Coal-Fired Power Plants: Is it Always True? 21 *Envtl. Sci. and Pollution Res*. 10205-10214 (2014).
[30] Engstrom and Swain, Recent Declines in Atmospheric Mercury Deposition in the Upper Midwest, 31 *Environ. Sci. Technol.* 960-967 (1997).
[31] Hutcheson et al., Temporal and Spatial Trends in Freshwater Fish Tissue Mercury Concentrations Associated with Mercury Emissions Reductions, 48 *Environ. Sci. Technol.* 2193-2202 (2014); Han et al., Reduced Mercury Deposition in New Hampshire from 1996 to 2002 Due to Changes in Local Sources, 156 *Environ. Poll.* 1348-1356 (2008); Manopolos et al., Sources of Speciated Atmospheric Mercury at a Residential Neighborhood Impacted by Industrial Sources, 41 *Environ. Sci. Technol.* 5626-5633 (2007); Dvonch et al., Use of Elemental Tracers to Source Apportion Mercury in South Florida Precipitation." 33 *Environ. Sci. Technol.* 4522-4527 (1999).
[32] Olmez et al., Canadian and U.S. Sources Impacting the Mercury Levels in Fine Atmospheric Particulate Material Across New York State." 32 *Environ. Sci. Technol.* 3048-3054 (1998).
[33] Rothenberg et al, Wet Deposition of Mercury within the Vicinity of a Cement Plant Before and During Cement Plant Maintenance, 44 *Atmos. Envt.* 1255-1262 (2010).

other fauna in the environment. As a fundamental matter, mercury concentrations in wild fish populations are linked to atmospheric mercury deposition, two-thirds of which is from anthropogenic sources.[34] Decreases in mercury levels in fish tissue associated with local and regional decreases in anthropogenic mercury emissions have been measured in freshwater largemouth bass and yellow perch in Massachusetts[35] and in yellow perch in Wisconsin.[36] Decreasing trends in mercury concentrations in the growing feathers of great egrets and white ibises have been observed in Florida at the same time mercury emissions were decreasing from local waste incinerators.[37] Mercury levels in the blood of loon chicks captured in Wisconsin showed a decreasing trend at the same time atmospheric mercury deposition and mercury levels in yellow perch in local lakes were declining.[38]

18. A recent study finds strong correlation of decreasing mercury in a commercially important ocean fish (bluefish) in the Mid-Atlantic bight, defined as the continental shelf waters from Cape Cod, Massachusetts, to Cape Hatteras,

[34] Hammerschmidt and Fitzgerald, Methylmercury in Freshwater Fish Linked to Atmospheric Mercury Deposition, 40 *Environ. Sci. Technol.* 7764-7770 (2006).
[35] Hutcheson et al., *supra* note 31 at 2196.
[36] Hrabik and Watras, Recent Declines in Mercury Concentration in a Freshwater Fishery: Isolating the Effects of De-Acidification and Decreased Atmospheric Mercury Deposition in Little Rock Lake, 297 *Sci. Total Envt*. 229-237 (2002).
[37] Frederick et al., Wading Birds as Bioindicators of Mercury Contamination in Florida, USA: Annual and Geographic Variation, 21 *Envtl. Toxicol. Chem.* 163-167 (2002).
[38] Fevold et al., Bioaccumulation Patterns and Temporal Trends of Mercury Exposure in Wisconsin Common Loons, 12 *Ecotoxicol*. 83-93 (2003).

North Carolina, with decreasing U.S. mercury air emissions.[39] This finding extends to ocean fish what has been previously seen with freshwater fish and their relatively rapid responses to decreases in local and regional mercury emissions. The authors of this study conclude that if bluefish are representative of other marine predators, then the fish-consuming public has benefited from a decrease in the amount of mercury consumed due to decreases in mercury emissions occurring in the eastern United States. That is particularly true given that, as they note, women living in Atlantic coastal areas have shown higher mean mercury blood levels than other U.S. women of child-bearing age.

19. These studies demonstrate that the species of mercury emitted by coal-fired power plants (reactive gaseous and particulate-bound mercury) and other mercury emission sources can and do deposit close to the emission sources. In turn, that mercury accumulates in fish and other biota much more rapidly than the elemental mercury that makes up the global mercury pool. They also demonstrate that reductions in local and regional mercury emissions can translate relatively rapidly—in the span of weeks to a few years—into reductions in mercury levels in fish and other biota.[40]

[39] Cross et al., Decadal Declines of Mercury in Adult Bluefish (1972–2011) from the Mid-Atlantic Coast of the U.S.A., 49 *Environ. Sci. Technol.* 9064–9072 (2015).
[40] *See also* Evers et al., Biological Mercury Hotspots in the Northeastern United States and Southeastern Canada, 57 *BioScience* 29-43 (2007).

20. Thus, any delay in the coal-fired power plant mercury reductions required by the Air Toxics Rule creates a risk that more mercury will be deposited to the environment and that people who consume mercury-contaminated fish will be exposed to higher mercury levels than would be the case had the Air Toxics Rule had remained in place continuously.

VI. Without the Air Toxics Rule, Many Coal-Fired Power Plants Will Have an Economic Incentive Not to Install or to Operate Installed Mercury Controls

21. There are a variety of control technologies that are currently being used by power plants to remove mercury. Mercury can be removed by controls used primarily to remove other power plant pollutants. Such pollution controls include fabric filters and electrostatic precipitators to remove particulate matter, which encompasses particle-bound mercury; wet or dry flue gas desulfurization ("scrubbing") to remove sulfur dioxide (SO_2), which can also capture mercury either in the scrubber or in conjunction with other downstream controls; and selective catalytic reduction to remove nitrogen oxides (NO_X), which allows for more effective capture of oxidized mercury downstream.[41]

22. Other methods of mercury control are used by power plants solely to remove mercury. Activated carbon injection adsorbs and converts gaseous

[41] NESCAUM, Control Technologies to Reduce Conventional and Hazardous Air Pollutants from Coal-Fired Power Plants 19, 20-21 (March 31, 2011) ("NESCAUM 2011 Report"), http://www.nescaum.org/documents/coal-control-technology-nescaum-report-20110330.pdf/.

mercury to particle mercury that can be captured downstream by a particulate matter control device.[42] The addition of halogens, such as calcium bromide, to flue gas increases the oxidized mercury that is more readily captured by a downstream scrubber or particulate matter control device.[43] Unlike scrubbers, particulate matter controls, and selective catalytic reduction, these mercury-specific controls can be turned off without affecting a power plant's ability to control other air pollutants, such as SO_2 and NO_X, that a plant may be required to reduce under other federal and state requirements.

23. As with any pollution control technology, there is a financial cost associated with the installation and operation of the controls used to remove mercury from power plant emissions. As a result, there is an economic incentive for power plants both to avoid initial installation and, even after installation, not to operate pollution controls absent an enforceable obligation to do so under a permit, regulation, or court order. For example, analysis of emissions data by the Ozone Transport Commission has shown that power plants do turn off installed pollution controls when they are not obligated to operate them. Specifically, the Ozone Transport Commission's analysis shows that in 2012, numerous coal-fired power plants equipped with post-combustion NO_X emission controls, in particular selective catalytic reduction controls, stopped or limited operation of those controls

[42] *Id.* at 19-20
[43] *Id.* at 20.

and instead chose to achieve compliance with the federal Clean Air Interstate Rule by purchasing NO_X emissions allowances, presumably because it was less expensive to do so.[44] A specific example is the coal-fired Montour Power Plant in Pennsylvania, where a company spokesperson stated that in recent years it has become much cheaper to buy allowances than run its already installed NO_X controls.[45]

24. Thus, there is reason to expect that even the many coal-fired power plants that have already met the April 2015 Air Toxics Rule compliance deadline by installing mercury controls, and which are not located within the eleven states[46] that require mercury controls under state law, will not operate or will limit operation of their mercury controls if the Air Toxics Rule is not in effect. This is particularly true for controls specific to mercury reduction, like activated carbon injection and halogen (e.g., bromine) addition, that cost money to operate and that

[44] *See* Statement from the Ozone Transport Commission Requesting the Use and Operation of Existing Control Devices Installed at Electric Generating Units (June 13, 2013), http://www.otcair.org/upload/Documents/Formal%20Actions/Statement_EGUs.pdf.

[45] J.M. O'Neill, *N.J. Air Quality Takes a Hit*, The Record (Bergen County, NJ), May 17, 2015, *available at* http://www.northjersey.com/news/n-j-air-quality-takes-a-hit-1.1336654 (quoting a company spokesperson, "[t]oday, the cost of using installed controls far exceeds the cost of obtaining allowances in the trading market.").

[46] *See* 5 COLO. CODE REGS. § 1001-8:B.VIII.c (first phase compliance by Jan. 1. 2012); CONN. GEN. STAT. § 22a-199(b)(1) (compliance by Jul. 1, 2008); DEL. ADMIN. CODE, tit. 7, § 1146-6.1 (first phase compliance by Jan. 1, 2009); ILL. ADMIN. CODE tit. 35, § 225.230(a) (compliance by Jul. 1, 2009); MD. CODE REGS. tit. 26, § 11.27.03.D (first phase compliance by Jan. 1, 2010); 310 MASS. CODE REGS. § 7.29(5)(a)(3)(e) (first phase compliance by Jan. 1, 2008); MONT. ADMIN. R. 17.8.771(1)(b) (compliance by Jan. 1, 2010); N.H. REV. STAT. ANN. § 125-O:11-18, I. (compliance by Jul. 1, 2013); N.J. ADMIN. CODE § 7:27-27.7(a) (compliance by Dec. 15, 2007); N.Y. COMP. CODES R. & REGS. tit. 6, § 246.6(c) (first phase compliance by Jan. 1, 2010); OR. ADMIN. R. 340-228-0606(1) (compliance by Jul. 1, 2012).

can be readily turned off without affecting compliance with other non-mercury pollution control obligations. Given that the majority of the Nation's coal-fired power plant capacity is located in states without state-based mercury controls—such as Indiana, Pennsylvania, Ohio, West Virginia, and Texas—uncontrolled mercury emissions in the event of full or partial vacatur of the Air Toxics Rule could be substantial.

25. Uncontrolled mercury emissions from Pennsylvania's coal-fired power plants are of particular concern to the NESCAUM states because Pennsylvania has numerous coal-fired power plants and contributes significantly to mercury deposition in the NESCAUM states, due to its proximity to the region and prevailing weather patterns.[47]

26. I have examined the 2014 mercury emissions data reported by coal-fired power plants located in Pennsylvania to EPA in the Toxics Release Inventory ("TRI") database.[48] As shown in the table below, the four Pennsylvania coal-fired power plants with the largest mercury emissions in 2014, as reported on the TRI database, emitted nearly 2000 pounds of mercury.

[47] NESCAUM 2008 Report, *supra* note 10, at 18 (showing that Pennsylvania contributed approximately twenty-two percent of all U.S. domestic mercury deposition in New York and the six New England states, even prior to when the NESCAUM states began to reduce their own power plant mercury emissions).

[48] The TRI database can be downloaded from the following link: http://www2.epa.gov/toxics-release-inventory-tri-program/download-trinet .

Table 1. Mercury emissions and Air Toxics Rule compliance approaches for top four mercury-emitting coal-fired power plants in Pennsylvania.

	2014 Mercury Emissions (lbs from stack)[a]	MATS Rule Compliance Date[b]	Proposed Mercury Control Approach[c]
Bruce Mansfield Station	748	April 16, 2016 (units 1, 2, and 3)	Flue gas desulfurization re-emission control systems, selective catalytic reduction improvements, and activated carbon injection on all three units.
Homer City Generating Station	557	April 16, 2016 (units 1, 2, and 3)	Flue gas desulfurization systems and selective catalytic reduction on units 1, 2, and 3, with activated carbon injection on units 1 and 2. Possible activated carbon injection or other mercury control technology under evaluation for unit 3.
Conemaugh Power Plant	525	October 16, 2015 (units 1 and 2)	Selective catalytic reduction and flue gas desulfurization upgrades on both units.
Brunner Island Steam Electric Station	125	April 16, 2015 (units 1, 2, and 3)	Calcium bromide chemical additive system, sorbent injection system, and flue gas desulfurization re-emission inhibitor injection system on all three units.

[a] Emissions data were obtained from EPA's Toxics Release Inventory database, available at "Download TRI.NET," http://www2.epa.gov/toxics-release-inventory-tri-program/download-trinet (downloaded August 27, 2015).

[b] Extension information was obtained from extension request approvals issued by the Pennsylvania Department of Environmental Protection. *See* Attachment B.

[c] Mercury control information was obtained from EPA's National Electric Energy Data System (NEEDS) v.5.15, available at "EPA's Power Sector Modeling Platform v.5.15," http://www.epa.gov/powersectormodeling/psmodel514.html (downloaded September 3, 2015) and from individual plan extension request letters, included in Attachment B. In some cases, the proposed mercury control approach is contingent upon further evaluation of controls.

27. All four of those coal-fired power plants have sought and obtained from the Pennsylvania Department of Environmental Protection extensions of the April 2015 compliance deadline, three until April 2016, and one until October 2015. Each power plant's extension request includes an extension of time to install and operate mercury controls. Attached as Attachment B are copies of the extension requests and approvals for each of those plants obtained from the Pennsylvania Department of Environmental Protection. Absent a stay or vacatur of the Air Toxics Rule, those plants will be required to install those controls by their respective extension deadlines.

28. Vacating the Air Toxics Rule solely with regard to coal-fired power plants that have obtained extensions could still result in the same nearly 2000 pounds of mercury emissions from these Pennsylvania plants, because those emissions come from power plants with compliance extensions. Given that the technologies the plants are proposing to install—activated carbon injection, calcium bromide sorbent injection systems, and flue gas desulfurization and selective catalytic reduction systems—have been shown to reduce mercury emissions by ninety percent or more when optimized for mercury reduction,[49] the

[49] NESCAUM 2011 Report, *supra* note 41, at 19-21 & Table 8; NESCAUM, Technologies for Control and Measurement of Mercury Emissions from Coal-Fired Power Plants in the United States: A 2010 Status Report 1-15, 3-1 (July 2010), http://www.nescaum.org/documents/hg-control-and-measurement-techs-at-us-pps_201007.pdf.

failure to operate such control technologies would result in a significant increase in mercury emissions over those that would occur under the Air Toxics Rule.

I declare that to the best of my knowledge, under the penalty of perjury under the laws of the United States, that the foregoing is true and correct.

Executed on September 23, 2015, at Boston, Massachusetts.

Paul J. Miller