MERCURY POLLUTION IN SOUTH CAROLINA

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ABSTRACT

In its purest form, mercury is an element existing as a heavy liquid metal. The element is naturally found in the Earth's crust in several forms, all of which are toxic to humans. Humans can neither create nor destroy mercury, but can cause it to be released into the atmosphere. By reducing the amount of mercury released into the atmosphere, the amount of mercury found in South Carolina waters will also be reduced. This will reduce the mercury levels in fish and ultimately reduce mercury concentrations ingested by humans. Every year thousands of unborn children, infants and young people in South Carolina are exposed to toxic mercury, substantially increasing their risk of experiencing many significant health defects. Cognizant of the problem, the South Carolina Department of Health and Environmental Control (DHEC) has advised against eating certain fish from more than 1,500 miles of South Carolina's rivers, over 45,000 acres of its lakes, and all of its coastline.

In 2005, the Environmental Protection Agency promulgated the Clean Air Mercury Rule (CAMR) to require mercury clean up on a national scale. This federal rule, however, does not force the nation's coal burning power plants to adopt the strictest available pollution controls and thus will delay meaningful clean up by several decades. The individual states have until November 2006 to either adopt the CAMR restrictions as set out by the EPA or enact their own more restrictive legislation. Coal burning power plants are South Carolina's largest source of mercury pollution, and the time to act is now. South Carolina can lead the way in reducing mercury pollution by enacting restrictive legislation in pursuit of virtual elimination of mercury pollution from coal burning power plants within the state.

INTRODUCTION

Mercury is highly toxic to humans, especially young children. Naturally embedded in fossil fuels, mercury is released into the atmosphere when those energy sources are burned. As a result, coal burning power plants are the United State's largest emitter of mercury into the atmosphere. Once in the atmosphere, the mercury falls back to earth in raindrops and becomes part of earth's intricate water system. By consuming mercury-tainted bacteria, fish are eventually contaminated and store the toxins in their fleshy muscle tissue. In the end, many humans are exposed to harmful amounts of mercury by eating tainted fish. The negative human health effects to exposure to mercury are numerous and very significant, sometimes resulting in death.

The EPA recently drafted the CAMR in an attempt to curtail human exposure to mercury by limiting coal burning power plants' mercury emissions. However, the CAMR's restrictions are so lax, particularly for South Carolina, that the new rule does virtually nothing to help clean up the problem. In fact, the CAMR might even allow the individual power plants of most concern to pollute the air with more mercury than they are currently.

Today, South Carolina finds itself with a unique opportunity to lead the nation by drafting safer, more meaningful mercury restrictions. In the CAMR, the EPA set mercury emission budgets for each state and delegated to them the duty to develop a state implementation plan for achieving their state's budget. South Carolina has the authority to draft its own more restrictive mercury emission budgets and in effect send a message to the rest of the nation, and world, that the time to clean up mercury pollution from coal-burning power plants is now.

THE ELEMENT

Naturally found in the Earth's crust, mercury is an element existing as a heavy liquid metal, usually shiny and silver-white.[1] When heated, mercury becomes a colorless, odorless gas.[2] Although mercury can be found in several forms, the chemical element can neither be created nor destroyed. Thus the amount of mercury in the environment has remained unchanged since Earth's creation.[3]

Mercury accommodates to different temperature ranges, which allows it to have many diverse uses; therefore, it is present in various places.[4] Metallic mercury is the form in which ordinary people are most familiar with and may use daily.[5] It can be found in thermometers used to check the weather, batteries used for electronics, and cavity fillings received from the dentist. Compounds of mercury can be present in antiseptic creams, ointments and some dermatological products, such as skin lightening creams.[6]

Other forms of mercury can assist in conducting electricity and other industrial sectors.[7] Mercury is a key element in electrical wiring devices and switches.[8] Fluorescent lamps and navigational devices are also aided by the naturally occurring metal.[9] Despite all the uses of the metal, all forms of mercury are toxic to humans and other life forms.[10]

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[1] U.S. EPA, *Mercury Study Report to Congress, Volume I: Executive Summary* at 2-1 (Dec. 1997).
[2] *Id.*
[3] *Id.*
[4] *Id.*
[5] *Id.*
[6] *Id.*
[7] *Id.*
[8] *Id.*
[9] *Id.*
[10] *Id.*

Mercury does not necessarily stand alone, as it readily combines with other elements to form organic and inorganic mercury compounds, often referred to as salts.[11] Salts are usually in a crystal form or a white powder.[12] Chlorine, oxygen, and sulfur are a few elements that, when combined with mercury, form salt.[13] This particular compound of mercury is frequently found in water, soils, sediments, and most other sectors of the environment, other than the atmosphere.[14]

During everyday human and natural activities, mercury cycles throughout the environment.[15] Vapor pressure of the metal depends highly on temperature, which causes mercury to vaporize.[16] Most of the mercury found in the earth's atmosphere is a result of this vaporization.[17]

MERCURY TRANSPORTATION

There are three sources of mercury emissions: natural, anthropogenic, and re-emitted mercury.[18] Natural mercury emissions include all natural biological and geological processes that transfer mercury into the atmosphere. These transfers emit mercury primarily in its elemental form. Some examples of naturally released mercury

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[11] United States Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry (ATSDR), Frequently Asked Questions (April 1999). Downloaded from www.atsdr.cdc.gov/toxfaq.html.
[12] *Id.*
[13] *Id.*
[14] *Id.*
[15] *See* U.S. EPA, *supra*, note 1, at O-1.
[16] *Id.*
[17] *Id.*
[18] U.S. EPA, *Mercury Study Report to Congress, Volume II: An Inventory of Anthropogenic Mercury Emissions in the United States*, at 1-1 (Dec. 1997).

include volcanoes, geysers, and hot springs. There is very little, if anything, humans can do to prevent, or even curtail, this kind of emission.[19]

Anthropogenic emission refers to the release of mercury into the atmosphere by human activities.[20] The primary human activity that releases mercury into the atmosphere is the burning of fossil fuels, especially by coal burning power plants.[21] Anthropogenic emissions are primarily in gaseous and particulate forms.[22] It is this form of mercury emission that humans have absolute control over and can directly mitigate or even eliminate with efficacious emission restrictions.

Re-emitted mercury refers to the transfer of previously deposited mercury into the atmosphere after initial mobilization by natural or anthropogenic emission.[23] Most of this form of emission comes from water bodies, which is then volatilized and carried elsewhere.[24]

Mercury in the atmosphere is mainly the result of coal fired electricity generating plants, an anthropogenic emission.[25] Mercury is naturally found in coal, and when these plants burn coal to generate power, elemental mercury is emitted from their smokestacks into the atmosphere.[26] According to the EPA, the plants contribute 43 percent of the air's mercury, which is equivalent to 48 tons per year.[27] In the United States, most plants

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[19] *Id.*
[20] *Id.* at 1-2
[21] *Id.*
[22] *Id.*
[23] *Id.*
[24] *Id.*
[25] *See* U.S. EPA, *supra*, note 1, at O-4.
[26] *See* U.S. EPA, *supra*, note 18, at 4-1.
[27] State and Territorial Air Pollution Program Administrators (STAPPA) and Association of Local Air Pollution Control Officials (ALAPCO), *Regulating Mercury from Power Plants: A Model Rule for States and Localities*, at 14 (Nov. 2005).

have a lack of permanent control equipment to prevent the mercury's emission into the environment. Nationally, these coal fired plants are the number one cause of mercury pollution.[28]

In addition to the coal-fired plants, municipal waste combustors and incinerators contribute to routing mercury into the atmosphere.[29] However, during the 1990's, national regulations on the control of mercury emissions became effective on these pollutant-causing systems.[30] These parameters cut down a considerable amount of mercury's flow into the air. Nevertheless, the combustors and incinerators remain a supplying factor to the atmosphere's mercury. [31]

Mercury, once in the atmosphere, can remain circulating for up to one year.[32] The element can come into contact with ozone, or any other oxidizing chemicals, most notably chlorine, making it increasingly water soluble. When water soluble, it may mix with rain, snow, or other participation forms, and be redeposited anywhere on Earth.[33] The mercury can then be volatized from bodies of water and placed into other regions.[34]

Once deposited back on earth, whether in soil, sediment, or water, mercury becomes a suspended element for other life forms and life systems to use and can enter the food web.[35] This phenomenon is referred to as bioavailability and allows chemical

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[28] *See* U.S. EPA, *supra*, note 1, at O-4.
[29] *See* U.S. EPA, *supra*, note 18, at 4-15.
[30] *See* STAPPA/ALAPCO, *supra*, note 27.
[31] *Id.*
[32] U.S. EPA, *Mercury Study Report to Congress, Volume III: Fate and Transport of Mercury in the Environment*, at 2-7 (Dec. 1997).
[33] *Id.*
[34] *See* U.S. EPA, *supra*, note 1, at O-1.
[35] *See* U.S. EPA, *supra*, note 32, at 2-13.

reactions to take place in the aquatic ecosystem.[36] In the sediments of the aquatic ecosystem, bacteria, through a process known as methylation, convert mercury into a humanly hazardous toxin known as methylmercury. This process most often takes place in aquatic ecosystems at the sediment level, but can also occur in the water column.[37]

Methylmercury is an organic (carbon-containing) compound of mercury.[38] Fish is not the only food that contains methylmercury – humans can ingest mercury from other foods.[39] However, the amount of methylmercury in fish is drastically higher than other foods, causing it to be the largest source of mercury in fish-eating humans.[40]

Methylmercury in the ecosystem is particularly troubling to humans for several reasons. First, methylmercury is the most hazardous form of mercury.[41] Second, all forms of mercury can be transformed into methylmercury by natural processes, most notably methylation by aquatic bacteria consumption.[42] Third, methylmercury bioaccumulates and biomagnifies in aquatic food webs.[43]

Bioaccumulation refers to the net uptake of a substance, usually a toxic chemical, into the tissue of a living organism.[44] Fish can bioaccumulate mercury by direct contact with contaminated water or by ingesting contaminated food sources at lower trophic levels. Biomagnification refers to the process by which toxic chemical concentrations increase at successive trophic levels or successive links in the food chain by ingesting

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[36] *Id.*
[37] *Id.*
[38] *See* U.S. EPA, *supra*, note 1, at 2-5.
[39] *Id.*
[40] *Id.*
[41] U.S. EPA, *Mercury Study to Congress, Volume VI: An Ecological Assessment for Anthropogenic Mercury Emissions in the United States*, at 2-13 (Dec. 1997).
[42] *Id.*
[43] *Id.*
[44] *Id.*

contaminated food sources from lower trophic levels.[45] As a result of bioaccumulation and biomagnification, plankton have a low methylmercury level while large, long-living predatory fish have substantially higher levels.[46]

The rate of mercury bioaccumulation is greater in aquatic ecosystems than terrestrial for several reasons. First, the extent to which a contaminant accumulates in a food chain depends on what area of the body it is stored.[47] Birds and some mammals accumulate toxic metals like mercury in their feathers and fur, parts of the animal that are usually not consumed by predatory animals. However, fish and other aquatic organisms store mercury in their muscle tissue, which is consumed by predators and humans. The result is that the rate of mercury accumulation in large, long-living predatory fish is magnified by their continual consumption of other aquatic organisms.[48] Second, mercury is present in terrestrial food chains in inorganic form rather than as methylmercury, the highly toxic organic form found in aquatic ecosystems.[49] Third, aquatic food chains usually have more trophic levels than terrestrial ones. This results in more opportunity in aquatic ecosystems for mercury to bioaccumulate and biomagnify.[50]

The process by which fish are contaminated with mercury is multi-step and highly complex. Watershed refers to the draining of land water into water bodies.[51] This phenomenon, combined with direct atmospheric deposition, is the process by which inorganic mercury eventually gets into rivers, lakes and oceans. After mercury enters a

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[45] *Id.*
[46] *Id.*
[47] *Id.* at 2-10.
[48] *Id.*
[49] *Id.*
[50] *Id.* at 2-10.
[51] *See* U.S. EPA, *supra*, note 32, at 2-13.

water body, it can remain in the water column, drain out from the water body, revolatize into the atmosphere, settle in the bottom sediments, or be taken up by aquatic organisms.[52] As watershed and rainfall can be greater in some areas than in others, mercury concentrations can vary greatly from one water body to another.

Mercury is found in water in several forms. It can be dissolved in the water, attached to particles suspended in the water column, in the sediment on the floor, or in living organisms.[53] This is important because it is the form that determines the mercury's bioavailability, or its susceptibility to be taken up by living organisms. When dissolved in water, mercury can be taken up directly by fish by contact with their skin and gills. When attached to particles in the water column, fish that eat those particles, often plankton, can take up the mercury. When deposited in the sediment on the floor, plants and bottom eating fish can take up the mercury.[54]

Once in a body of water, naturally found aquatic bacteria convert the inorganic deposits into organic form, methylmercury.[55] Once in the bacteria, the methylmercury remains there until the bacteria is consumed by another organism. As the food chain operates, small fish consume bacteria and the larger fish eat the small fish. Naturally, by ingesting the small tainted fish, the large fish become tainted with the methylmercury. As previously mentioned, long-living predatory fish bioaccumulate methylmercury. As a result of this bioaccumulation, long living predatory fish can have mercury levels one to

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[52] *Id.*
[53] *See* U.S. EPA, *supra*, note 41, at 2-5
[54] *Id.*
[55] U.S. EPA, *Mercury Update: Impact on Fish Advisories*, June 2001. Available at www.epa.gov/ost/fishadvice/mercupd.pdf.

ten million times greater than the other life forms in the surrounding waters.[56] Because the life forms that tower the food chain, like humans, eat fish, they are exposed to the highest concentration of methylmercury.[57]

As the methylmercury is ingested by the large fish, it settles and is stored in the filet portion, or the muscle, of the fish. This section of the fish is what humans and other wildlife consume for food. Trimming away the fat or skin of the fish will not remove the mercury. Therefore, the only way to avoid ingesting the mercury is to eat fish that do not contain the element.[58]

HEALTH EFFECTS

All forms of mercury have adverse health effects when humans are exposed to them.[59] However, studies have shown that methylmercury is the chemical variation of most concern, as it causes the most serious harm to more people annually than any other form of mercury.[60] Methylmercury is especially harmful to pregnant women and their unborn children because it can easily cross the placenta and irreversibly damage the brain of the rapidly developing fetus.[61] The negative human health effects on adults from mercury exposure is generally not as pronounced as children because adults are more fully developed. It does not necessarily follow, however, that adults' exposure to

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[56] *Id.*
[57] *Id.*
[58] *Id.*
[59] U.S. EPA, *Mercury Study Report to Congress, Volume: VII Characterization of Human Health and Wildlife Risks from Mercury Exposure in the United States* (Dec. 1997).
[60] *Id.*
[61] *Id.*

methylmercury is of minor importance. In fact, adults can suffer from numerous adverse health effects as a result to exposure to methylmercury.[62]

Methylmercury is broadly absorbed through the gastrointestinal tract at a very rapid pace.[63] As it flows throughout the body, it immediately penetrates into placental barriers in human and animals, as well as blood-brain barriers. Methylmercury-cysteine complex is created as methylmercury is carried into the tissue. Similar to methionin, this complex is held by neutral amino acid carrier protein, which transports it to the cells. Methylmercury can remain in the human body from 44 to 80 days before it is metabolized or excreted, a relatively long period of time compared to most other organic compounds.[64] It can be excreted from the body by urine, breast milk, and feces.[65]

Because methylmercury is a toxin, it causes many health issues when circulating throughout the body. The element targets the nervous system, and for those who are exposed, the element can cause serious developmental and neurological problems. Developing fetuses are the highest at risk when in contact with methylmercury.[66] When pregnant women ingest a significant amount of the element, their offspring could have the following abnormalities: cerebral palsy, altered muscle tone and deep tendon reflexes, delayed onset of walking and talking, impaired memory, impaired visual and motor function, and reduced neurological test scores.[67]

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[62] U.S. EPA, *Mercury Study Report to Congress, Volume V: Health Effects of Mercury and Mercury Compounds*, at E-2 (Dec. 1997).
[63] *Id.*
[64] *Id.*
[65] *Id.*
[66] *Id.* at ES-4.
[67] *Id.*

Women who do have babies should be aware of their methylmercury levels. Mothers who have ingested contaminated fish can pass it through to their babies through the umbilical cord. The methylmercury in the mother's body is also found in her breast milk, which transfers into the baby when consumed. Infants and children are at exceptionally high risk because their nervous systems continue rapidly developing until, on average, the age of 14, allowing methylmercury more opportunity to harm them.[68]

According to an EPA study in 2004, one out of every six women in the United States has significantly high methylmercury levels in her blood, posing substantial risks to potential developing fetus.[69] That translates into 630,000 children born every year, with a risk of developmental and neurological complications.[70]

In adults, high level exposures of methylmercury can cause kidney damage and failure, cardiovascular collapse, shock, and fertility problems. It can also cause multiple central nervous system effects such as paresthesia and ataxia. In some cases, high exposures to methylmercury can even result in death.[71]

Unlike methylmercury, elemental mercury is not absorbed from the gastrointestinal tract, but absorption occurs rapidly through the lungs.[72] Elemental

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[68] U.S. EPA, *Mercury Study Report to Congress, Volume: VII Characterization of Human Health and Wildlife Risks from Mercury Exposure in the United States* (Dec. 1997).
[69] Kathryn Mahaffey, Robert P. Cliffner, and Catherine Bodurow, *Blood Organic Mercury and Dietary Mercury Intake: National Health and Nutrition Examination Survey, 1999 and 2000*, Environmental Health Perspectives, 112(5) 562-570, April 2004; Kathryn R. Mahaffey, U.S. EPA, *Methylmercury Epidemiology Update*, slide presentation given at the National Forum on Contaminants in Fish, San Diego, January 2004. Available at www.epa.gov/waterscience/fish/forum/2004/presentations/monday/mahaffey.pdf.
[70] *Id.*
[71] Corrigan, Zachary. *Fishing for Trouble: How Toxic Mercury Contaminates Fish in U.S. Waterways*, at 7 (Oct. 2004).
[72] *See* U.S. EPA, *supra*, note 62, at ES-2.

mercury is promptly disseminated throughout the body, once absorbed. It meets and crosses with blood-brain and placental barriers. The hydrogen peroxidase-catalase pathway, found in most tissues, oxidizes the mercury into inorganic divalent mercury. The absorbed elemental mercury is distributed to the mercuric ion, which has the capability of crossing over the blood-brain and placental barriers. Once the mercuric ion oxidizes the elemental mercury and crosses over the barriers, it returns to the general circulation and can be preserved in brain tissue. Elemental mercury can be removed from the human body via sweat, saliva, urine, feces, and exhaled air.[73]

The most toxicological effect of elemental mercury exposure is damage to the nervous system. Some of these symptoms may be minor, such as headaches or insomnia. More serious symptoms may include: erethism, or emotional labiality, diagnosed by nervousness, confidence loss, excessive shyness, and irritability; tremors, usually affecting the hands first then dispersing to other parts of the body; neuromuscular changes such as muscle atrophy, twitching and weakness; polyneuropathy (e.g. stocking-glove sensory loss, slowed sensory and motor nerve conduction velocities, paresthesia). When exposed to high concentrations, pulmonary dysfunction and adverse renal effects may also occur.[74]

The third type of mercury, inorganic, is absorbed through the gastrointestinal tract, but can vary with the specific mercuric salt involved. As the solubility decreases, the amount of mercury absorbed is decreased. The percentage of inorganic mercury absorbed fluctuates, however, only about 20 percent may be absorbed.[75] Electrostatic

[73] *Id.*
[74] *Id.* at ES-4.
[75] *Id.* at ES-2.

interaction with the brush border membrane and limited passive diffusion causes the absorption of mercuric chloride from the gastrointestinal tract. The following have all been associated with the absorption of inorganic mercury: intestinal pH increase, a corrosive action caused by high doses of mercuric chloride, milk diets, and increase in pinocytoic activity in the gastrointestinal tract. Inorganic mercury has a threshold for penetrating the placental and blood-brain barriers. Mercuric mercury in the human body due to oral exposures can be reduced to elemental mercury and removed from the body by exhalation, however, because inorganic mercury is not often readily orally removed from the body, the majority of the element ingested in humans is excreted through the feces.[76]

In humans, there is no evidence that inorganic mercury links to carcinogenic effects, and the data for animals is limited. When exposed to inorganic mercury, male rats developed focal hyperplasia and squamous cell papillomas of the forestomach; in addition, thyroid follicular adenomas and carcinomas we observed. Female rats also had squamous cell forestomach papillomas; however, the males showed renal adenomas and carcinomas, when the females did not. Nevertheless, both genders increased tumor incidences because of the excess maximum tolerated dose. These tumors have not been proven to be present in humans.[77]

Some data indicates that inorganic mercury may be a germ cell mutagen. Results show that there are chromosomal aberrations in multiple systems. Because of this, it is suggested that inorganic mercury can reach female gonadal tissue.[78]

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[76] *Id.*
[77] *Id.* at ES-3.
[78] *Id.* at ES-4.

In sum, mercury exposure poses serious health risks to humans, especially young children and unborn fetuses. Until the virtual elimination of mercury pollution is achieved and the risk of human mercury exposure is greatly reduced, all fish-eating people and those who might come into contact with contaminated water directly should peruse their state's mercury advisories for fish and water and be cognizant of the substantial potential harm.

MERCURY POLLUTION IN SOUTH CAROLINA

Every year, thousands of unborn children, infants and young people in South Carolina are exposed to toxic levels of mercury, substantially increasing the risk of many significant health defects. Cognizant of the problem, the South Carolina Department of Health and Environmental Control (DHEC) has advised against eating certain fish from more than 1,500 miles of its rivers, over 45,000 acres of its lakes, and all of its coastline.[79]

The United States has approximately 500 coal burning power plants operating above the 25 megawatt threshold of most emissions data reports. Of those 500 plants, 12 are located in South Carolina.[80] Like most other states, coal-burning power plants are South Carolina's largest source of mercury pollution.[81]

Between 1,800 and 1,900 fish samples from the state's water bodies are collected each year by DHEC's Bureau of Water for mercury analysis. These samples are tested

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[79] Southern Environmental Law Center (SELC). *Fighting Mercury Rollback in South Carolina: SELC urges South Carolina to Lead the South in Mercury Protection*. Available at www.SouthernEnvironment.com.
[80] EPA, Emissions of Mercury by State (1999), found at www.epa.gov and EPA, 2002 TRI Mercury Emissions, found at www.epa.gov/triexplorer.
[81] *See* SELC, *supra*, note 79.

for mercury, and the results are the basis for the annually updated fish advisories. South Carolina issued its first fish consumption advisory in 1976 for mercury in Lake Jocassee and Langley Pond and for PCBs in Lake Harwell. Since then, fish advisories have been issued by the state every year. Mercury specific fish advisories have risen drastically in the years since 1993.[82] In 2005, more than 50 percent of South Carolina's water bodies, 57 to be exact, had mercury advisories issued for them.[83]

EPA INITIATIVES

The Clean Air Act (CAA) was enacted in 1970 and has since provided for federal regulation of emissions of hazardous air pollutants (HAPs).[84] In 1970, Congress instructed the Environmental Protection Agency (EPA) to establish HAP standards to protect the public health;[85] however, these standards proved difficult to adopt. By 1990, only seven HAP emitting sources had standards in place.[86] In 1990, Congress acted in reaction to the EPA's difficulties and substantially revised the HAP program to no longer include tedious health investigations.[87] In the place of health investigations, Congress mandated that the EPA adopt technology based limitations for emissions of more than 180 different HAPs, including mercury.[88] It also required the EPA to draft maximum achievable control technology (MACT) standards for industrial emitters (including coal

[82] DHEC, *Making Sense of Mercury: Mercury and Air Quality in SC*. Available at www.scdhec.net.
[83] DHEC, South Carolina Fish Consumption Advisories 2005. Available at www.scdhec.net.
[84] 70 Fed. Reg. 15994
[85] *Id.*
[86] *See* STAPPA/ALAPCO, *supra*, note 27.
[87] CAA Section 112 (b), 74 U.S.C. 7412 (b).
[88] *Id.*

burning power plants) and submit a report of its findings to Congress no later than November 15, 1994.[89] However, it was not until February 1998 that the EPA finally issued its final report to Congress.[90] The report concluded that mercury, especially emissions from coal burning power plants, was the HAP posing the greatest potential health risk and is of greatest concern to the agency.[91]

In 2000, after further research and investigation into mercury emissions, the EPA added coal burning electric utility plants to the list of source categories of HAPs.[92] The EPA concluded that "electric utility steam generating units are the largest domestic source of mercury emissions, and mercury in the environment presents significant hazards to the public health and the environment."[93] However, in subsequent years, the EPA took on a much different tone and drastically shifted its regulatory course away from stringently regulating mercury emitters.

In 2004, the EPA proposed removing coal burning power plants from the list of HAP emitters under the CAA and putting a cap-and-trade program in place.[94] In March of the following year, the EPA issued a final rule effectively removing utility mercury emission sources like coal burning power plants from the CAA's source category list for regulation. The agency concluded that its 2000 findings were erroneous and that it was not "necessary" to regulate mercury emissions from utility sources.[95]

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[89] CAA Section 112(n)(1)(A), 74 U.S.C. 7412 (n)(1)(A).
[90] EPA, "Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units: Final Report to Congress (Feb. 1998).
[91] *Id.* at ES-18.
[92] 65 Fed. Reg. 79825 (Dec. 20, 2000).
[93] *Id.* at 79830.
[94] 69 Fed. Reg. 4652 and 4661 (Jan. 30, 2004); 69 Fed. Reg. 12398 (March 16, 2004).
[95] 70 Fed. Reg. 15994, 16005 (March 29, 2005).

In May 2005, the EPA published the Clean Air Mercury Rule (CAMR) in the Federal Register, mandating the individual states to operate under certain mercury emission caps and encouraging the states to adopt a market-based cap-and-trade program to achieve the required emission levels.[96] The emission caps are required by every state regardless if the state adopts the cap-and-trade program or not. The rule mandates these national caps be achieved in two phases: Phase I limits nationwide emissions to 38 tons annually beginning in 2010 and Phase II further limits nationwide emissions down to 15 tons annually beginning in 2018.[97] However, the EPA admits that because of trading and banking that even by 2020, emissions will likely be at more than 24 tons, only a 50 percent reductions from 1999 levels.[98] This is difficult to reconcile with the EPA's own assertion that the CAMR "will reduce electric utility mercury emissions by nearly 70 percent from 1999 levels."[99]

Two months after the EPA issued the CAMR, 14 states filed a joint petition asking the EPA to reconsider the CAMR and stay the final rule removing coal burning power plants from the CAA's list of toxic emission sources.[100] The EPA promptly

[96] 40 CFR Part 60. "Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units; Final Rule."
[97] 40 CFR Part 60 at 28623. "Table 1 – State Hg Emission Budgets."
[98] *Id.* at 28619.
[99] EPA Press Release, "EPA Announces First-Ever Rule to Reduce Mercury Emissions from Power Plants" (March 15, 2005).
[100] Petition for Reconsideration filed by California, Connecticut, Delaware, Illinois, Maine, Massachusetts, New Hampshire, New Jersey, New Mexico, New York, Pennsylvania, Rhode Island, Vermont, and Wisconsin (May 31, 2005).

refused to stay the effectiveness of its final rule but did later reopen the comment period on CAMR for an additional 45 days.[101]

In September 2005, Congress attempted to effectively nullify CAMR by debating and voting on S. J. Res. 20, a proposed resolution under the Congressional Review Act to strike down the cap-and-trade program as adopted by the agency and instead require MACT standards be used. The resolution was defeated in the Senate by a narrow margin, 51-47.

Pursuant to CAMR, South Carolina has been assigned an emissions budget the state must comply with.[102] Under the new rule, South Carolina's emissions cap for Phase I beginning in 2010 is 0.58 tons of mercury per year. The Phase II mercury emissions budget for the state is 0.229 tons per year. To facilitate compliance, the Rule requires each state to submit, by November 17, 2006, a "State Plan" outlining how it will comply with its assigned mercury emissions budget for its coal burning power plants.[103] The Rule grants each state the option to adopt the EPA's proposal cap-and-trade program to meet and maintain its mercury emissions budget. The EPA provided in the Fact Sheet accompanying the Rule that "[s]tates may join the trading program by adopting the model trading rule in state regulations, or they may adopt regulations that mirror the necessary

[101] Letter to Peter C. Harvey, Attorney General of New Jersey, and Jon P. Devine, Jr., Natural Resources Defense Council from Jeffrey Holmstead, Assistant Administrator fro Air and Radiation, U.S. EPA (June 24, 2005).
[102] 40 CFR Part 60.
[103] 40 CFR Part 60 at 28621.

components of the model trading rule."[104] Even though the EPA encourages states to join and believes that most will, states are not required to adopt the cap-and-trade program.[105]

There is nationwide concern, especially in the Southeast, that the CAMR essentially rolls back mercury standard for power plants. The Southeast is of particular concern because of the region's relatively large number of old coal burning power plants combined with a relatively high number of marine estuaries which serve as incubators for the highly toxic methylmercury.[106]

SOUTH CAROLINA AND CAMR

Under CAMR, the EPA did not require coal burning power plants to operate with the most effective pollution controls to limit their mercury emissions. Instead, the new rule provides for a cap-and-trade program, which would arguably allow the nation's highest polluting plants to continue operating at the same mercury emissions levels by acquiring credits from cleaner plants across the nation. This is particularly troubling for South Carolina because the state's utility plants already emit less mercury than is required under the new rule. The CAMR allows plants to either amass their excess mercury emission credits or sell them to other plants. As a result, South Carolina plants operating within the allowances of the lax CAMR can sell their unused credits to out-of-state upwind mercury polluting plants, allowing them to further pollute South Carolina's air and water. The Southern Environmental Law Center maintains, "in a very real sense,

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[104] EPA, "Fact Sheet, EPA's Clean Air Mercury Rule," page 3 (March 15, 2005). Available at www.epa.gov

[105] *Id.*

[106] Southern Environmental Law Center, "SELC Leads Battle Against Mercury Pollution in the South," *Advocacy in Action: Quarterly Protection Highlights from the SELC.* (Winter 2005). Available at www. SouthernEnvironment.org.

adopting CAMR and buying into the national trading scheme without additional protections would expose South Carolina residents to higher mercury pollution levels than the state would achieve without any regulation whatsoever."[107]

Some argue that South Carolina should regulate its utility plants to require up to a 90 percent reduction in mercury emissions over the next seven years. At a very minimum, many believe South Carolina should not allow its coal burning power plants to sell their unused mercury emission allowances to out-of-state upwind sources, as such trading would not only further pollute South Carolina's environment but also greatly increase the risk of existing toxic hotspots being maintained and possibly even new toxic hotspots being created.[108] Upon research, these arguments prove valid and are worth analyzing further.

The cap-and-trade program as proposed by the EPA is not best suited for South Carolina individually. South Carolina should not adopt the model rule set out by EPA, but instead should make significant revisions to it and adopt its own rules complying with the overarching goals and requirements of the CAMR. If South Carolina adopts the EPA's budget and the cap-and-trade program, the state's utilities will be able to emit more mercury then they currently do and will be able to trade all their excess allowances to upwind sources.[109]

One area of great concern is the uncertainty of mercury emissions data on which the CAMR was based. There are several conflicting sources of emissions data from

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[107] *Id.*
[108] *See* SELC, *supra*, note 79.
[109] *Id.*

different reputable and trustworthy sources.[110] The EPA used its own "1999 emissions data" in drafting the CAMR and to help determine what each state's mercury emission budget would be. Those numbers show that all the coal burning power plants in the United States emitted a total of 48 tons of mercury in 1999, 0.53 tons of that coming from plants in South Carolina.[111] The 1999 emissions report shows the highest emission numbers of all the differing reports. For example, the EPA's Toxic Release Inventory (TRI) program also collects emissions data and has significantly conflicting numbers. The TRI numbers indicate that the nation's coal burning utilities emitted a total of 45 tons, only 0.33 tons of that coming from plants in South Carolina.[112]

These discrepancies are of infinite concern because there is no real consensus as to what mercury emissions levels really are in the United States, as the plants lack the technology and monitoring devices to accurately calculate their emissions. As for the plants that do have an idea of what their emissions levels are, they have no incentive to turn those numbers over to EPA or the public. In fact, the industry has a disincentive to turning over those numbers, as they likely do not want to put the EPA or the public on notice of how much they are actually polluting.[113]

One reason why these emissions numbers are of particular concern to those dealing with the CAMR at the state level is because the EPA chose to use the 1999 emissions data, which has the highest emissions numbers of the conflicting reports. Since the emissions data used by the EPA in drafting the CAMR show high current

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[110] *See* EPA and TRI, *supra*, note 80.
[111] EPA, Emissions of Mercury by State (1999).
[112] EPA, 2002 TRI Mercury Emissions, found at www.epa.gov/triexplorer.
[113] Interview with Heather Preston, Sections Manager, DHEC Bureau of Air Quality (BAQ). DHEC's BAQ regulates federal air toxics and some additional air pollutants that are names in state regulations.

emission levels, the caps and budgets required by the EPA in the rule are also high. For example, the 1999 data shows South Carolina emitting 0.53 tons while the TRI's 2002 data shows them emitting only 0.33 tons. If the EPA had used the 2002 data, it is likely that South Carolina's emissions cap would not be nearly as high as it is under the CAMR. But even assuming that South Carolina's emissions in 1999 were that high, they are probably not that high today. The United States has seen a consistent reduction in mercury emissions from coal burning power plants over the past ten years. Again assuming the worse, even if South Carolina's emissions are that high today, they will very likely, if not certainly, drop significantly in the next several years as a result of the CAIR being implemented by installing new cleaning technology on South Carolina's power utilities to control NOx and SO2 emissions. As a co-benefit of these non-mercury specific controls, mercury emissions should be significantly less than current levels within several years.[114] Some of the South Carolina Department of Health and Environmental Control (DHEC) employees who are overseeing the drafting of the state's plan for complying with CAMR believe that the state could see as much as a 90 percent reduction in mercury emissions from its utility plants.[115] Assuming the worse, that South Carolina's mercury emissions are currently 0.53 tons annually, a 90 percent reduction would leave South Carolina emitting only .053 tons annually.

However, South Carolina's mercury emissions budget under the CAMR will allow the state's utilities to emit 0.58 tons of mercury for the next 12 years, until 2018.[116] This is 8.6 percent higher than the highest mercury emissions numbers available. South

[114] *South Carolina Department of Health and Environmental Control Bureau of Air Quality Clean Air Mercury Rule (CAMR) – Proposal for Regulation* (Jan. 30, 2006).
[115] *See* Preston, *supra*, note 113.
[116] *See* Table I, *supra*, note 97.

Carolina's budget drops to 0.228 in 2018 and remains that indefinitely.[117] As is quickly apparent after comparing these numbers, South Carolina's mercury budget in the EPA's CAMR does not restrict the state's utilities beyond their current emissions. In fact, regardless which of the emissions data reports one uses, if South Carolina adopts the budget as the EPA has proposed, South Carolina's utilities will be able to emit, until 2018, even more mercury than they do presently and trade excess emission allowances to upwind sources. If South Carolina adopts the CAMR's model rules without significant revision, the rule will not only not help South Carolina, but will significantly hurt the state by allowing for increased pollution from plants within the state and others within close proximity.[118]

Cognizant of the problems and deficiencies of the CAMR as it pertains to South Carolina and understanding the need for some consensus in order to get approval from the legislature, DHEC met with stakeholders and industry representatives to negotiate lowering the state's mercury budget by 20 percent, from .58 tons annually to .464 tons.[119] The question arose as to how the 20 percent public health set-aside allowances would be used, if at all. In a subsequent meeting, the utilities expressed their position in a proposal which would require DHEC to hold the 20 percent balance and make them available to individual plants as needed.[120] The utilities' proposal provides that none of the allowances in the set-aside can be retired, and that after 2017 the utilities get back those

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[117] *Id.*
[118] *See* SELC, *supra*, note 79.
[119] Department of Health and Environmental Control Bureau of Air Quality Clean Air Interstate Rule (CAIR)/Clean Air Mercury Rule (CAMR) – Stakeholder Meeting Notes (Dec. 7, 2005).
[120] Department of Health and Environmental Control Bureau of Air Quality Clean Air Interstate Rule (CAIR)/Clean Air Mercury Rule (CAMR) – Stakeholder Meeting Notes (Jan. 30, 2006).

accumulated allowances under only one condition – that they don't trade them to out-of-state sources. DHEC countered in the same meeting with its own proposal which provided that the public health set-aside would be permanently retired at the end of each year and would not be returned to the utilities.[121] The utilities fired back expressing concern that the 1999 emissions data might not be accurate and that they might be emitting more mercury than those numbers show. Under that premise, the utilities asked DHEC to rollover the allowances from year to year as a cushion in case the utilities are unable to meet the proposed 80 percent budget requirement.[122] However, there are no conditions precedent that must be met before an individual plant could request additional allowances under neither the utilities proposal nor DHEC's proposed rule. As the rule reads now, the utilities have no incentive to make a good faith effort to comply with the 80 percent allowance requirement, as the 20 percent public health set-aside allowance will be turned over to them in the event they do not.[123]

The effectiveness of cap-and-trade programs is hotly debated. Some believe that cap-and-trade programs allow existing toxic hotspots to remain and that such programs even leave the door open for new hotspots to come into existence.[124] However, some maintain that cap-and-trade programs are highly effective, do not lead to emissions hotspots, and provide industry with great economic incentive to do all it reasonably can to clean up.[125] Regardless of which side of the debate most are on as to cap-and-trade

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[121] *Id.*
[122] *Id.*
[123] *Subpart HHHH – Emission Guidelines and Compliance Times for Coal-Fired Electric Steam Generating Units*, at 25.
[124] Swift, Byron. *Emissions Trading and Hot Spots: A Review of the Major Programs*, Environment Reporter, Vol. 35, No. 19 (May 7, 2004).
[125] *Id.*

programs generally, allowing cap-and-trade without first setting meaningfully restrictive caps on the regulated toxin could be considered foolish. The cap-and-trade program under CAMR will not benefit South Carolina unless the state substantially lowers its annual budget of 0.58 tons.

Moreover, the political nature of these rules force DHEC to build a consensus between interested groups in hopes that the rules it promulgates will be approved by the legislature. The utilities have a strong lobbying effort, especially in a conservative state like South Carolina. DHEC representatives handling CAMR are certain that if the utilities oppose the final draft of their proposed rules that the South Carolina Legislature will not approve them.[126]

RECOMMENDATIONS

South Carolina should not adopt the CAMR provisions as the EPA has proposed them. A cap-and-trade program is only effective if the emission budgets are set low enough to provide some meaningful restriction on plant emissions. As previously mentioned, the EPA's budgets for South Carolina are set so high that they will provide virtually no further restriction on the state's utilities and will likely allow them to pollute more and trade excess allowances with other upwind utilities. DHEC and the State of South Carolina should not allow this result to become a reality.

Proponents of the relaxed CAMR standards point to the small percentage of the world's mercury emissions that are the result of power plants in the United States. They maintain that since airborne mercury can travel great distances before being deposited

[126] *See* Preston, *supra*, note 113.

back to earth, that regulating domestic utilities will do virtually nothing to solve the problem.[127] The EPA and utility industry have warned citizens not to expect a reduction in mercury levels in the country's rivers and lakes anytime soon, as they believe the mercury already there will linger for years.[128] The current Bush administration believes mercury pollution is a global problem and cannot be fixed by restricting power plant emissions.[129]

While there is no doubt that the United States only emits a very small fraction of the total mercury emitted on Earth annually (about 2.7 percent)[130], coal burning power plants are the largest remaining source of mercury emissions in the country, emitting more than 40 percent of all mercury emissions in the U.S. environment;[131] restricting those plants' emissions will reduce mercury in domestic waters. There are studies that show that dramatic reducing local mercury emissions will directly result in corresponding reductions in local water and fish mercury levels.[132] For example, the state of Florida,

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[127] Borenstein, Seth. *EPA, Environmentalists Don't Expect Mercury Guidelines to do Much*, Knight Ridder Newspapers.
[128] *Id.*
[129] *Id*.
[130] Todd Stedeford, Ching-Hung Hsu, Amanda Persad, Barbara Serokee, Marek Banasik. *Environmental Quality and Health Got Merc? Regulating, Mitigating, and Litigating Merucry Levels for the Fish We Eat: Approaches of Public Health and Regulatory Agencies for Establishing Safe Levels of Exposure to Methylmercury*. Florida State University Journal of Land Use & Environmental Law, 20 J. Land Use & Envtl. Law 503 at 504.
[131] Cindy Price, Dianne Saenz, Kyle Kinner. American Nurses Association (ANA). *National Medical and Public Health Groups Sue EPA to Prevent Future Mercury Exposure: Historical Collaboration Intended to Prevent Silent, Irreversible Brain Injuries to Children*. (June 14, 2005). The ANA is the only full-service professional organization representing the nation's 2.7 million registered nurses through its 54 constituent member nurses associations.
[132] Florida Department of Environmental Protection. *Integrating Atmospheric Mercury Deposition and Aquatic Cycling in the Florida Everglades: An Approach for Conducting*

EPA, and the United States Geological Survey recently conducted a study on south Florida's mercury levels. During the past decade, mercury emissions in south Florida have decreased by nearly 90 percent. The study concluded that this dramatic decline in mercury emissions led to a corresponding 80 percent decline in mercury levels in fish and aquatic wildlife in the region. Some interested parties have suggested that South Carolina mercury deposits are largely the result of South Carolina and adjacent states' coal-burning power plants.[133] They suggest that a roughly 50 percent reduction in South Carolina mercury emissions alone will directly result in a decrease in mercury deposition across the state by up to 15 percent.[134] If the findings of this study are accurate and reductions in local emissions levels will actually result in a substantial reduction in local fish mercury levels, the South Carolina controls its own fate to that extent.

South Carolina should join the few other states that are leading the way in pursuit of virtual elimination of mercury emissions from anthropogenic sources.[135] DHEC should conduct a comprehensive study to assess South Carolina's current status with regard to mercury emissions and deposition. The study should not confine its analysis to just coal-burning power plants but rather all anthropogenic sources in the state. However, since coal burning power plants are the largest source in the state and nation, that is where the focus of the study should be. Last, the study should publish a report with recommendations that would achieve the virtual elimination of mercury emissions in

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a Total Maximum Daily Load Analysis for an Atmospherically Derived Pollutant (Nov. 2003). Downloaded from www.floridadep.org/labs/mercury/index.htm.

[133] EPA, "The Clear Skies Act of 2003: South Carolina and Clear Skies," powerpoint presentation. Available at www.epa.gov/clearskies.

[134] *Id.*

[135] Massachusetts, *Zero Mercury Strategy*, and Washington State, *Mercury Chemical Action Plan*.

South Carolina without drastically increasing the costs of products and services to residents of the state.

In the meantime, DHEC should require the state's 12 coal burning power plants to report their mercury emissions on some regular basis, quarterly perhaps. If individual plants lack the technology to accurately determine what its mercury emissions are, they should be forced to purchase and install the required devices to allow them to monitor their emissions. Accurate mercury emissions data from these plants' stacks is long overdue and much needed in order to enable the state's regulatory agencies to promulgate comprehensive and fair restrictions on emissions in pursuit of virtual elimination of anthropogenic mercury emissions into the atmosphere.

This problem is very serious; our state's health is at risk. Mercury emissions pose an unreasonable risk of harm to South Carolina's public health and degradation of valuable environmental resources. DHEC currently only monitors airborne mercury at one site in the state, near the Congaree National Park in lower Richland County.[136] The state should seek funding from the legislature to erect several more monitoring apparatuses spread throughout the state. Again, the state needs to have a comprehensive understanding of the problem in order to efficaciously address it.

Instead of adopting the CAMR provisions as drafted by the EPA, DHEC should draft its own more limiting restrictions. DHEC's state implementation plan should further cut CAMR's Phase I budget allowance for South Carolina (0.58 tons annually) by at least 25 percent, lowering the state's emissions budget to 0.435 tons annually. The state should hold the 25 percent reduction balance each year in case of unforeseen

[136] DHEC, "Making Sense of Mercury." Available at www.scdhec.gov/eqc/admin/html/mercury/activities.html

circumstances but should permanently retire the remaining balance at the end of each calendar year. It should be noted that there must be a requisite burden of proof placed on the utilities which they must overcome in order to receive an exception allotment. The additional allotments should be distributed sparingly, as to not frustrate the purpose of the entire initiative. Further, the Phase I restrictions should take effect as soon as they can feasibly be enforced, not necessarily holding off until the EPA suggested 2010.

Phase II should take effect in 2015 instead of the delayed 2018 under the CAMR. Phase II should not only kick in sooner in South Carolina, but the state implementation plan should provide significant revisions to the EPA's proposed Phase II. Instead of allowing the state's utilities to operate under a lax mercury emissions budget allowance suggested by CAMR (0.229 tons annually), DHEC should tentatively limit the proposed budget by at least 75 percent. This would drop the Phase II budget allowance for South Carolina to 0.05725 tons of mercury per year. Again, the balance of the CAMR's emissions budget not given to the utilities should be held in case unforeseen circumstances, but additional allotments will only be allocated to a utility if it demonstrates by clear and convincing evidence that individual utility needs an exception. Phase Ii will operate much like Phase I and, at the end of every calendar year, the remaining balance should be permanently retired.

DHEC's suggested study mentioned above and the new airborne mercury monitoring devices should produce accurate data before Phase II takes effect in 2015. That is why the state should only set tentative numbers for Phase II at this time, allowing for revision once the state has accurate numbers on which it can rely. If the emissions data from stacks indicate that South Carolina's utilities would be unduly burdened by a

75 percent reduction in the Phase II budget, then DHEC should hold stakeholders meetings to discuss increasing the emissions budget to a more feasible level. On the other hand, if the data shows that the utilities are operating with the realistic potential of emitting less than 75 percent less than the Phase II budget, then the state should hold stakeholders meetings to discuss revising the budget accordingly.

An alternate proposal for the handling of the unallocated CAMR budgets that are withheld by the state would be to sell those allotments to out-of-state utilities, preferably in an area that would not contaminate South Carolina's environment and use the proceeds to initiate and fund a mercury health awareness program within the state. This program could test more fish and water samples for mercury levels more often and from more locations than DHEC current does. The mercury health awareness program could then take the general information about the adverse health effects to humans and the particular data about where in South Carolina the contamination is of most concern and publish quarterly pamphlets. Those pamphlets could be disseminated around the state to make South Carolina residents more conscious of the substantial risks associated with mercury exposure, especially for pregnant mothers and their unborn fetuses.

A second alternative to permanently retiring the balance of unallocated budget allotments is to sell them to out-of-state utilities and use the proceeds to reward South Carolina utilities based on their individual reduction in mercury emissions levels. In a capitalistic society, providing incentive for the utilities to do all they reasonably can to clean up their mercury pollution should help facilitate a decline in mercury emissions. In addition, by giving a little back to the utilities, the industry is more likely to not stand in

the way of getting the state implementation plan passed by the South Carolina Legislature.

Conscious of the difficulty of getting utility restrictions through the state legislature and the utility industry's strong lobbying base, South Carolina's state implementation plan should adopt the cap-and-trade program as provided in the CAMR. With drastically lower budgets in both Phase I and Phase II, the cap-and-trade program will be an effective way to provide incentive to individual coal-burning power plants to clean up even more, as they could sell their unused allotments to another utility at a premium.

In any event, DHEC and the State of South Carolina should not cave into the pressures levied by the utility industry to adopt the CAMR provisions with minimal alterations. The problems associated with mercury pollution in South Carolina are far too widespread and longstanding to allow the state's coal burning power plants to continue polluting at unacceptable levels with minimal oversight. For example, medical treatment as a result of the adverse human health effects associated with mercury exposure likely costs South Carolina millions of dollars per year.

CONCLUSION

Today, South Carolina finds itself at an environmental crossroads. The majority of the state's water bodies are currently under mercury advisories for fish consumption. The advisories consistently grow in number and geographic reach from year to year. Every year, thousands of unborn children, infants and young people in South Carolina are exposed to toxic levels of mercury, drastically increasing their risk of many significant

adverse health effects. The amount of contamination, number of fish consumption advisories, and the number of people exposed to toxic levels of mercury in South Carolina are unacceptable. To curtail this growing problem, mercury emissions and contamination should be drastically reduced, and the state should increase awareness of the potential harms of mercury and its presence in the South Carolina's environment.

The EPA issued CAMR and made a recommendation to South Carolina for its state implementation plan. South Carolina has until November of 2006 to submit its state plan to the EPA for its approval. With environmental and citizen groups on one side and utility and industry groups on the other, DHEC is currently drafting a state regulatory plan in hopes that it will receive enough consensus to be approved by the state legislature. CAMR, as drafted by the EPA, is not best suited for South Carolina and will likely harm the state if adopted unchanged or with only minor alterations. South Carolina should join the handful of other states in leading the way in mercury pollution reform. The state should draft a state implementation plan that pursues the virtual elimination of anthropogenic mercury emissions within its borders. The costs associated with the elimination of such emissions will likely be offset by the money South Carolina will save by not having to medically treat as many of the state's residents for exposure to mercury. The decision South Carolina makes with regard to its reaction to the CAMR will likely have consequences within the state for many future generations of South Carolinians.