These comments were submitted by individuals via email between April 27 and June 18, 2012. The comments have not been modified; however, names and contact information have been removed.

130 people submitted the following comment:

I am writing to urge the Environmental Management Commission (EMC) to pursue the strongest possible measures to keep mercury pollution out of our air and water, and to pay special attention to opportunities to correct contamination 'hot spots' in our state.

The following comments were unique and were included with the comment stated above. Each number represents a separate commenter.

1. *The technology is here. There is no excuse to keep polluting our air and water.*
   It is deeply troubling that the health of our people is consciously sacrificed at times for the sake of power company profits and the threat of higher electricity rates. Who can dare presume to put such a price on our lives? Do the right thing. You know what it is.

2. *I have three young boys to protect. We love to take them fishing, and we eat what we catch. I recently discovered that I have been putting them in harm's way by doing so. There is no reason not to hold polluters responsible to do business in such a way that others around them are protected.*

3. *I see people fishing in our waterways all over the state, and I know that most are consuming those fish with their families. Mercury pollution is such a serious threat, especially to our children, that we simply cannot afford (both literally and figuratively) to leave people vulnerable. Please state now to approve the water implementation plan for facilities with very high mercury levels. This would be an interim step, but at least then the state could require some reductions.*

4. *A few years ago, as part of a state program, we submitted fish samples from the New River.*
   The results were: GOT EXCESS MERCURY!

   Two weeks ago I launched my canoe at Rhodestown Road bridge on the New River and paddled upstream 2 miles and returned. I observed 4 people fishing with some success.

   These were not bass boat and fish finder fishermen. They were people with worms in a can and cane poles. One had a nice stringer of fish, the woman and her daughter had a 5 gallon bucket in the back seat of the car. The other guy just started and had no fish to show.

   I am pretty confident that every one of those fish were enjoyed for supper that night. And that was just 2 miles of a 46 mile stream (with 100s of miles of tributaries) on a spring weekday afternoon. . .

   You have in your records the testimony from several years ago from the hearing in Whiteville of the Pitt County public health director reporting the number of live births that were developmentally delayed (about 10% of the total), and that of the those with problems 80% had elevated excess mercury in their blood. I have seen numbers documenting 13,000+ annually for NC.

The damage is clear and not hard to document. We need to do what we can to stop the mercury that we can. (Yes, I know that we cannot totally 'fix' the problem, but we can do our part.)

We can also act to change the culture that assigns corporate risk and liability to the public while promoting private profit.

The science is clear. The health consequences are clear. Corporate opposition is clear. The political will to do the right thing will prevail - eventually it will have to - so what's wrong with you doing the right thing now??

5. *This issue matters to me because I have a grandchild here and hope to have more.*

6. *Coal fired plants are toxic to all living things. Keep these plants in compliance with the most stringent EPA standards and gradually transition to clean technology. There is plenty of opportunity to ease into geo-thermal, solar, wind, and tidal energy in our state. Please support this endeavour.*

7. *Mercury pollution of water ways contaminates fish and thereby causes health problems in humans who consume those fish. The existing regulations are insufficient for health. I urge you to increase attention to and regulation of North Carolina waterways regarding said pollution.*

8. *I really don't understand why we have to beg regulatory agencies to protect us, wildlife, and the environment from a handful of greedy sociopaths who see nothing wrong with poisoning for profit.*

   We rely on those of authority to comprehend that, aside from the incomprehensible devastation of destroyed potential, the profits from pollution enjoyed by a few cost billions to those who must try to cope with and treat the profound physiological and emotional damage to loved ones caused by mercury pollution.

   DO NOT ALLOW POISONING FOR PROFIT!!!!!!

9. *My family owns property on High Rock Lake in Rowan County and the Mercury levels there are a constant concern. We only catch and release when we fish around our property and we worry about our pets drinking the water and our children swimming in it.*
   Please make mercury pollution a priority in North Carolina!

10. *Mercury is a potent neurotoxin. Young children and the babies of pregnant mothers who eat mercury-laden fish are at risk of permanent neurological damage. These health effects include lowered intelligence, speech problems, vision and*
    hearing loss, and permanent learning and thinking problems.
    This is a serious public health issue. Please address it.

11. *I have copied and pasted some statements in this letter due to the fact it is senseless to restate well presented ideas. You know the issues with mercury, the science behind modeling their deposition and eliminating it at the source has improved greatly over the past 20 years so lets get off our duffs and do something about it.*

Specifically, have the power generating entities accept the full(true) cost of their money making endeavor. It is their pollution problem created by their financial endeavor they should bear the cost. Stop passing it on the the public in the form of toxic deposition of mercury.

North Carolina's rivers, lakes, and estuaries are impaired statewide because of unsafe levels of mercury found in our fish including fish that many people eat regularly. The top source of mercury emissions are coal fired power plants. While North Carolina plants have reduced their mercury emissions by upwards of 70% over the past decade, technology is available to capture 90% or more of these toxic emissions.

Mercury is a potent neurotoxin. Young children and the babies of pregnant mothers who eat mercury-laden fish are at risk of permanent neurological damage (read what fish they should avoid here). These health effects include lowered intelligence, speech problems, vision and hearing loss, and permanent learning and thinking problems.

Mercury pollution is a serious threat that demands a comprehensive response, and we appreciate the chance to comment on the TMDL study, the water implementation plan, and the options for next steps.

The federal Clean Water Act requires preparation of a Total Maximum Daily Load (TMDL) study when a waterbody (in this case, the whole state) is polluted to such an extent that people can't use it normally (for example, by eating fish they've caught). A TMDL identifies the sources of the pollutant causing the problem, and calculates the reductions in pollution needed from each source to make waters clean and healthy again.

Unfortunately, the current mercury TMDL study relies on a simplistic model and misses the chance to identify whether strong cuts from specific mercury sources could help improve conditions in the worst watersheds. In other states, cuts in local mercury emissions have resulted in surprisingly fast improvement in fish tissue levels.
The EMC should call for additional studies of hot spots in North Carolina, using a more sophisticated air model that is readily available and can account for local deposition. Recent scientific studies show that much mercury emitted into the air lands locally.

A 67% cut in mercury from all sources locally, regionally, and globally is a not a sufficient goal for restoring the health of North Carolina's waters and the TMDL study cannot demonstrate that. Instead, if additional studies show that stronger controls may have major local benefits, the EMC should lay out a path for specific watersheds to be designated as healthy again, on a case-by-case basis, as mercury concentrations in fish tissue drop to safe levels.

Despite flaws in the proposed TMDL study, the EMC should move now to approve the water implementation plan for facilities with very high mercury levels as an interim step, so the state can require these reductions.

12. *There is no excuse for not eliminating more mercury as the technology is there to do so.*

Please, it is critical for our health and future generations' health for you to make sure we are cleaning up as much mercury as possible.

13. *Also, do whatever you can to get Duke Energy to eliminate coal fired power plants, which causes much pollution in many ways besides mercury.*

14. *Stewardship of natural resources implies careful attention to effects of polluting businesses and industries. In the past the outcomes weren't known as they are now.*

15. *Please do what you can to restore the health of North Carolina's waters, and in turn, be improving the health of North Carolina's environment and it's residents.*

16. *We should be using the best technlogy available to rid us of mercury*

17. *The simple facts are: 1. Fish in NC waterways are contaminated with levels of mercury which, in many cases, make regular dining on such fish hazardous to human health. 2. Coal-fired power plants are the largest sources of mercury pollution. Mercury emissions from such plants have been reduced by 70 percent in recent years, but COULD, using available technologies, be reduced by 90 percent or more.*

18. *Mercury is in the fish in our rivers and lakes. This is a a dangerous situation. Please use the strongest means to eliminate mercury pollution.*

19. *Mercury is bad for living things. We must pursue the highest standards for keeping it out of our environment.*

20. *I am particularly wanting you to prevent the costs of the rising number of learning disabled children whose disabilities come from mercury. Educating these children is very costly money-wise and the human costs of poor quality of life for them are without price.*

21. *Are we content to stand by and watch as big coal continues to sicken and kill our population by our allowing these power plants to spew toxins into our air and water? This is intolerable, and has been dragging on for years without sufficient action on the part of our state government.*

    Please do something about it, such as encouraging the installation of solar panels and other nonpolluting power systems through tax breaks and other programs to encourage and subsidize clean energy. Educating people on how to conserve electricity and offering incentives to do so (such as income tax credits) should be another impetus to curb this pollution.

22. *Please do all that you can to eliminate mercury polution or we won't be able to eat fish.*

23. *Mercury kills. Please protect us from energy companies short sighted cost and profit motivations.*

24. *NC does not need this kind of problem , we don't need it as citizens. Let's get it cleaned up with law that pervent it from killing us. Mercury in our air & water needs to be a thing of the past not a currant condition . Let it go the way of the dinosaurs .*

25. *I am an avid fishman and it is very disharting not to be able to eat the fish that are caught. This applies to thousands of other citizens that fish the lakes and streams of NC. There are many citizens that don't realize the dangers of eating contaimanted fish. I urgeb you to give this matter your immediate attention.*

26. *I have read the reports and agree with what this message is saying. I support what efforts are needed to help with this matter.*

27. *Hg pollution if especially devastating to infants and small children.*

28. *A 67% cut in mercury from all sources locally, regionally, and globally is a not a sufficient goal for restoring the health of North Carolina's waters and the TMDL study cannot demonstrate that. Instead, if additional studies show that stronger controls may have major local benefits, the EMC should lay out a path for specific watersheds to be designated as healthy again, on a case-by-case basis, as mercury concentrations in fish tissue drop to safe levels.*

    As a mother, I implore you to protect North Carolina's children from mercury pollution.

29. *I have paid attention to issues of toxic pollutants in air and water for years, and I am certain that mercury is one of the worst. The impacts on children and pregnant women are very concerning. Mercury also lingers in water, and never goes away.*
    Please consider the measures which will most stringently protect our environment.

30. *Please call for additional studies of hot spots in North Carolina.*
    Unsafe levels of mercury have been found in fish taken from our rivers, lakes and estuaries. Studies show that mercury emitted into the air lands locally. In other states cuts in local mercury emissions have brought about rapid improvement in fish tissue levels. The technology is available. What are we waiting for? Mercury is poisonous! It causes permanent damage to our children.

31. *The current mercury TMDL study relies on a simplistic model and misses the chance to identify whether stronger cuts from specific mercury sources could help improve conditions in the worst watersheds. In other states, cuts in local mercury emissions have resulted in surprisingly fast improvement in fish tissue levels.*

    I urge the EMC to move now to approve the water implementation plan for facilities with very high mercury levels as an interim step so the state can achieve these reductions.

32. *A 67% cut in mercury from all sources locally, regionally, and globally is a not a sufficient goal for restoring the health of North Carolina's waters and the current TMDL study cannot demonstrate that.*

    Instead, if additional studies show that stronger controls may have major local benefits, the EMC should lay out a path for specific watersheds to be designated as healthy again, on a case-by-case basis, as mercury concentrations in fish tissue drop to safe levels.
    Unfortunately, the current mercury TMDL study relies on a simplistic model and misses the

chance to identify whether strong cuts from specific mercury sources could help improve conditions in the worst watersheds. In other states, cuts in local mercury emissions have resulted in surprisingly fast improvement in fish tissue levels.

Please encourage the EMC to call for additional studies of hot spots in North Carolina, using a more sophisticated air model that is readily available and can account for local deposition.

33. *To have the technology available to further protect ourselves from further mercury pollutrion and to not use it is equivalent to having well-trained doctors available to treat our physical and mental illnesses but to decide not to use them. We can all agree that such inaction would be irresponsible.*

34. *As a special education teacher I see everyday the hardship of families with handicapped children. It is a major financial, emotional, social chellenge for families and society. If we can prevent brain developmental delay - we have to stop all known source of damage!*

35. *I've met locals in the Smokey Mountains that said 50 years ago, there used to be so many fish in the creeks they could walk across their backs. Now when I go camping, I rarely see any fish. Or birds either, in some places. Surely the mercury is part of the problem, and it's not something we want to be eating in the fish we catch.*

36. *I have a house just 6 miles west of where Titan America wants to put the 4th largest cement plant in the US. The North East Cape Fear river is STILL on a state list of mercury impaired waterways. It has not be cleaned up and needs to be cleaned NOT have another major source of mercury introduced into the air and water of this tourist area. Our children, elderly and indeed of of us citizens of North Carolina deserve to have a reasonable expectation of health especially lung health.*

    PLEASE move to approve the water implementation plan for facilities with very high mercury levels as an interim step so the state can require reductions. Individual areas need special attention.

37. *I am afraid to eat our fish and am not alone. Please do what is necessary to reduce and eliminate mercury from our waterways. We are counting on you to protect us. Please don't let us down. Thank you in advance for your constructive actions.*

38. *The idea that the public is uneducated and unaware of the mercury problem does not lessen the responsibility to those public servants who are entrusted with the public's safety! Mercury polution is dangerous to humans and all living things. You know this. The TMDL study is flawed. You know it is flawed and you know how to correct it. Water rights are already being bought up in the USA by foreign corporations because they know how valuable CLEAN water is quickly becoming! Please ask yourselves if you do not mind your loved ones or even yourself drinking this water! There is more to life than money and the safety of our air, land, and water is what ALL of our lives depend on.*

39. *Since the Total Maximum Daily Load study relies on a simplistic model, we need the readily available and more sophisticated air model to get a reliable and valid idea of how much really needs to be done to cut mercury to a safe level.*

40. *Mercury pollution is a serious threat that demands a comprehensive response, and we appreciate the chance to comment on the TMDL study, the water implementation plan, and the options for next steps.*

    The federal Clean Water Act requires preparation of a Total Maximum Daily Load (TMDL) study when a waterbody (in this case, the whole state) is polluted to such an extent that people can't use it normally (for example, by eating fish they've caught). A TMDL identifies the sources of the pollutant causing the problem, and calculates the reductions in pollution needed from each source to make waters clean and healthy again.
    Unfortunately, the current mercury TMDL study relies on a simplistic model and misses the chance to identify whether strong cuts from specific mercury sources could help improve conditions in the worst watersheds. In other states, cuts in local mercury emissions have resulted in surprisingly fast improvement in fish tissue levels. The EMC should call for additional studies of hot spots in North Carolina, using a more sophisticated air model that is readily available and can account for local deposition.

    Recent scientific studies show that much mercury emitted into the air lands locally.
    A 67% cut in mercury from all sources locally, regionally, and globally is a not a sufficient goal for restoring the health of North Carolina's waters and the TMDL study cannot demonstrate that. Instead, if additional studies show that stronger controls may have major local benefits, the EMC should lay out a path for specific watersheds to be designated as healthy again, on a case-by-case basis, as mercury concentrations in fish tissue drop to safe levels.

    Despite flaws in the proposed TMDL study, the EMC should move now to approve the water implementation plan for facilities with very high mercury levels as an interim step, so the state can require these reductions.

41. *Coal-fired plants create tons of mercury -- and now it's not just in the air we breathe, it's also in the fish we eat. Mercury overdoses can cause so many problems, especially for children. Please do more than look at the simplistic approaches and research -- look at the really significant stuff -- we desperately need to act on this now.*

42. *I ave 4 small children ad I am concerned about their health and welfare associated with mercury exposure. I m Los concerned with the number or neighbors and friends who have recently been diagnosed with cancer. Let's o everything possible to reduce our risks. I urge you to approve the water implementation plan to reduce the acceptable levels of mercury levels in our waterways/fish.*

43. *Also, the EMC needs to be very outspoken about fracking as it will lead to more Hg getting released into the waterways and water supplies and aquifers.*

44. *We have a gorgeous, clean state. Let's keep it that way. We can't continue to allow the desecration of the earth, air and water for the selfish needs of corporations, or us real live citizens. Please do the right thing and make the strongest rules possible to curb the release of mercury, and all other toxic chemicals, into our water, air, and the earth.*

45. *As a chemically sensitive person (I have MCS) keeping the level of toxins in the environment low is, for me, a matter of life and breath. I will be very grateful for everything that you can do to protect the purity of our air.*

46. *It's within your power to curb mercury pollution in our waterways. You can help protect us from the health effects of mercury: lowered intelligence, speech problems, vision and hearing loss, and permanent learning and thinking problems.*

47. *This is an essential step in order to keep our fish safe to eat for us now and our future generations. As technology keeps improving and making it possible for power plants to curb more and more mercury discharges, those power plants should have to implement these upgrades. It just makes sense. Do you want to go swimming in a local waterway with elevated mercury levels? Do you want to take your children fishing, and then tell them, "sorry, we can't eat that because it's unsafe."*

    Mercury poisoning is no joke, but very detrimental to us all, but especially to developing children and pregnant women.

    Please help us protect our state and each other with requiring new technologies readily available for power plants. We need additional studies of hot spots in North Carolina with air models that can account for the local depositing of mercury emitted from stacks.

    We need more than a 67% cut in mercury from ALL sources, locally, regionally and globally. Please work together and lay out a specific path for watersheds to be designated as healthy again, on a case by case basis, as mercury concentrations drop in fish tissues to safe levels. I appreciate your time and concern.

    Please take this opportunity to recommend that a the most sophisticated models available be used to provide TDML reports so that North Carolina can make the best choices to achieve the standards in water quality that our state of outdoors-man expects.

48. *The current federal Total Maximum Daily Load study relies on a simplistic model that doesn't address primary local mercury sources where reductions would do the most good. It cannot demonstrate that its proposed 67% cut in all mercury is insufficient to restore the heath of North Carolina's waters. Please give special attention to opportunities to correct contamination "hot spots" in our state, most notably coal-fueled power plants. C.O.P.D. and various unexplained nervous defects already hamper my life, so regulation of toxins and elimination of fossil and nuclear fuels in favor of clean, sustainable energy are top priority for me.*

49. *As a pediatrician, I am aware of the risks posed by mercury to our children. The byproduct of power plants reaches fish and, thereby, poses a danger to children and pregnant mothers who find fish an important source of protein and anti-inflammatory free fatty acids. In the same sentence that I recommend eating fish, I have to caution the parent about quality and fish type. In a time of economic hardship when fish may be an important supplement to some families diet, I have to urge caution.*

50. *We certainly know enough about this issue. Research is clear about the health, environmental and economic impacts yet we continue to delay. Continued delay defies simple common sense.*

1383 people submitted the following comment:

I understand that the state has released a draft total maximum daily load to identify the sources of mercury pollution and calculate the reductions in pollution needed from each source to make waters clean and healthy again.

I am writing to urge the Environmental Management Commission (EMC) to pursue the strongest possible measures to keep mercury pollution out of our air and water, and to pay special attention to opportunities to correct contamination 'hot spots' in our state.

I am especially concerned about mercury pollution being discharged from Progress Energy's Asheville Coal Plant. Mercury is a potent brain toxin that is particularly dangerous for pregnant women and small children. Please make the strongest standard possible to limit exposure to mercury.

Thank you for the opportunity to comment.

The following comments were unique and were included with the comment stated above. Each number represents a separate commenter.

1. *I live on a river and love to fish. I don't think it is right for any industry to have the right to pollute our rivers and streams. Mercury is a particularly toxic pollutant which accumulates in fish, crabs, and oysters and anyone who eats them.*

2. *I've had mercury poisoning myself, and I guarantee it causes tremendous difficulties even if it doesn't entirely ruin one's life. I was fortunate to find a doctor who discovered my toxicity. Most doctors would never think to check for such a problem. Please help us avoid more mercury poisoning. It took me years to overcome this toxicity.*
   The medical cost of dealing with this could be devastating.

3. *PLEASE! PLEASE! PLEASE! Help us! I have already chosen not to eat fish because of potential and probable mercury levels. I have a river in front of my property and I am saddened and angry because I am unable to fish it due to pollutants.*

4. *I'm counting on the EMC to do the right thing for the people and environment of our beautiful state of N.C.!*

5. *As a physician, I already have to warn my patients not to eat too many of the fish they catch in our local Tar River.*

6. *I realize that corporate owners don't care about the health of their customers, otherwise why would they even consider polluting our air and water? However public Commissions are by their design and purpose are to ensure that the public's interests are protected. I look forward to learning that you did the right thing in protecting the environment.*

7. *The toxins / pollution emitted in the air and the past failure of coal sludge holding ponds have proven to be very detrimental to the health of too many citizens of our state. North Carolina must protect*

our natural beauty and the people who call our great state home. Our opportunities to make decisions that will benefit future generations are becoming too few.

8. *I don't suppose that Duke/Progress might take any of that money they are going to "save" bydeep-sixing all those jobs when the merge to invest in technolog to clean up the mercury being dumped into the air and water by their Asheville Coal Plant? Or, when they merge, will they be "too big to clean up."? Or will the EMC deem cleaning up Duke/Progress's mercury dumping to be "job killing" (as opposed to the merger itself)???*

9. *As an aquatic ecologist who has been involved in extensive research to evaluate the factors responsible for often-high levels of mercury contamination in fish across North Carolina, I am writing to urge the Environmental Management Commission (EMC) to pursue the strongest possible measures to keep mercury pollution out of our air and water, and to pay special attention to opportunities to correct contamination 'hot spots' in our state. Conditions in many areas of our state are particularly conducive to converting mercury to methylmercury, the highly toxic form that accumulates in fish. Fish consumption is the primary way that people are exposed to contamination, which can cause neurological development problems in fetuses and small children, and contribute to heart problems in adults.*

10. *Mercury is a potent brain toxin that is particularly dangerous for pregnant women and small children. Please make the strongest standard possible to limit exposure to mercury.*

11. *We must protect our children.*

12. *I feel very strongly about this issue and am concerned for my children and the future generations.*

13. *Developmental disorders such as autism have been linked to toxins such as mercury. Autism is on the rise in North Carolina*

14. *One of the reasons this is so important to me is because I am a resident of Asheville. I love my city & strongly desire for the land and the people to be healthy.*

15. *Please take this issue as a personal interest in the future health of your loved ones and those that want to take care of what we have been given to support life, of which water is the most vital element.*

16. *Please make the strongest standard possible to limit exposure to mercury.*
    This would include stopping approval for the Titan Cement plant in Castle Hayne!!!

17. *We moved to Arden when our son was 16 months old and we live about 1 mile downwind of the Asheville Coal Plant. We knew from shortly after that time something had happened to our child. We did not get an answer to our search until he was 10 years old and was diagnosed with Autism.He is 14 now. I've known for years that mercury had something to do with it. This confirms for me that my suspicions were right.*

    We have already watched his childhood hospital asthma visits come to a halt immediately as soon as the new scrubbers were installed at the Asheville Coal Plant.

Please show you care about our children in these dangerously affected areas, especially when so many of them have already had such adverse health issues from the mercury and other local toxins. Once again, please make the strongest possible stand to limit mercury exposure to a bare minimum.

18. *I live within 3 miles of the Progress Energy plant in Asheville. My home has a well, so this issue concerns me.*

19. *We must protect our children from mercury. If the Republicans win all three branches of government, the future of North Carolina will be gone, so we must work now against mercury contamination while we still have a Democratic governor. Grover Norquist is on the way. God help us.*

20. *This is of critical concern to me as a physician as we are creating devastating probelms for the children yet to be born. Mercury is a serious toxic element that effects the brain and neurological development. Thanks for your serious consideration of this issue.*

21. *We cannot leave it up to the industry to regulate itself when that may cause them to lose a little profit and unfortunately, many corporations will take profit over the health of people in the region every-time.*

22. *My child and grandchildren live very close to this plant, can we not move to save them and all other North Carolinians? Money should not be the bottom line.*
    Thank you for the opportunity to comment.

23. *Since I live down the mountain, I am especially concerned about mercury pollution being discharged from Progress Energy's Asheville Coal Plant.*

24. *I write this as someone who tried to have chidlren and repeatedly failed to carry to term.*
    I'm not saying I attribute this to environmental contamination with elements like mercury and lead; I don't know for sure what caused my problems, and I never will. But I don't know that it wasn't environmental contamination, either, of which there is so much, and so many kinds, that no one can any longer rule it out in public health issues like birth defects, cancer, miscarriage, asthma and a host of other issues. The cost of these health issues to the state has yet to be calculated. The cost of preventing mercury-based medical problems is, in comparison, negligible.

25. *I will live to 100 or die hiking, unless pollution kills me first. Mercury combines with radiation, particulate matter, arsenic and other coal plant discharges to cause cancer, emphazema and asthma. Which way do you wish to kill me pollution or poverty?*

26. *The American Academy of Pediatrics and dozens of other medical and public health organizations have endorsed the strongest possible mercury controls as mercury is a known neurological toxin that is particularly dangerous for pregnant women, fetuses and small children. We already see entirely too many neurodevelopmental problems in children. We need to do whatever we can to keep known neurodevelopmental toxins out of the environment. Please make the strongest standard possible to limit exposure to mercury.*

27. *According to the Sierra Club, the fish from North Carolina's rivers and Iakes contain unsafe levels of mercury. Many people eat these fish regularly.*

28. *I recently moved here from Colorado..Not by choice.. I have never lived in such a filthy discusting area. I am desperatly trying to save money so I can move away from this state. I wont even plant a garden because the soil is so contaminated. GROSS!*

29. *Thank you for the chance to express this and just to add: REPUBLICANS are the most serious PROBLEM. Carrying forward the BUSH-CHENEY Programs that have set the WORLD back FIFTY YEARS, and put the World's Super-Rich fifty years ahead. In closing I would just like to add, if, as it appears, they have nothing to offer other than a pale carbon copy of the BUSH-CHENEY years, if their only purpose, as usual, is to gain and retain power for the Super-Rich at the expense of poor and middle class tax payers, then, in my most respectful opinion, THE REPUBLICAN PARTY OF 2012 no longer has any reason to exist, and they ought to get out of the business of politics all together.*

30. *This is as pathetic as a B-Movie about monsters yet ~ THIS IS REAL! Do the right thing as if your own children would be affected ~ because they most certainly will ingest these poisons in our environments.*

31. *It is amazing and sad that there is not more done to control this toxic pollution. I have a home in Arden (Locust Court) that I am thinking about selling because of the coal plant. If there had been honest forthright information about the plant and coal, I would have never purchased the house in the first place and exposed my young daughter to the toxic pollution from this plant.*

32. *I am especial adversed to mercury pollution. At a time when the Oak Ridge National Laboratory was releasing Mercury into Little Tennessee River I was director of Environmental Mutagen Information Center (EMIC) In Oak Ridge Tenn. and wrote a report on Mercury pollution together with John Wassom and the Old Senator Gore. The report contained all references to published data at that time which must have been in the late 60ties. So The danger of Mercury pollution has been known a long time.*

33. *We need strong measures to protect our families and state.*

34. *As an environmental engineer and former EPA contractor who worked early on with mercury air emission regulatory development, I know personally the d and and angers that mercury poses and again urge you to put forward the strongest possible standard to limit mercury emissions.*

35. *North Carolina is known for its beauty and carries a reputation of having pristine forest, water and air. That attracted us to move here in the first place. Please do not tarnish the state by allowing pollutants to to destroy the health of its citizens.*

36. *I am a jogger who also works outside in the yard almost every day.*
    Please do more to keep our air clean and safe. I would like to go fishing and be able to eat mountain trout without mercury poisoning. Tennessee was able to close down old polluting coal plants. Please do the same enforcement in North Carolina.

37. *My concern is also personal, as I grew up near Onondaga Lake in Upstate New York. If you want to see what happens with mercury in bodies of water, that is a great place to research. The*

cleanup continues nearly 40 years and many millions of dollars after Allied Chemicals left our area and moved to Jordan Lake in Chatham County, changing their name as well. Nearly all of my classmates, graduating in the late 80s and early 90s, have thyroid problems. Mercury displaces iodine in the thyroid.
The shame of the town of Solvay is the memory of lost ones; so many died of various cancers directly linked to living in such close proximity to the dumping by Allied and others.

38. *We cannot afford to delay setting adequate standards to protect our citizens from mercury poisoning.*

39. *I have lived in Western North Carolina for most of my life. I have also lived in Kansas, Oklahoma, Texas, Arkansas, and South Carolina. I consider WNC the most beautiful place to live. When I moved away my health declined. WhenI finally returned after being gone for 20 years I believe it is returning.*

40. *Thank you for your commitment and sense of responsibility, and the integrity to which you demonstrate leadership. Standing up to big business polluting and their tactics is not an easy position, but your ethics and determination will be a standard to not only protect the land and it's people, but to also cut the need for health care in many instances, which is also becoming an increasingly urgent issue.*

41. *Money isn't worth your grandchildren!*

42. *Just so the industry can make MORE money, we are condemning people to death. Why is this even a debatable subject?*

43. *Do you want your family to consume mercury laden water and fish? Please act strongly to eliminate mercury in waters.*

44. *wake up and smell the poison.*

45. *Imagine you were the one being exposed to this and please make the right decision.*

46. *My wife and I live directly on the border of the Progress Energy coal power plant in Asheville with our two daughters (2.5 years old and 16 months). Since living here, we've been astonished at the conditions surrounding the plant. In the winter a layer of black dust will lie on a cover of the new-fallen snow. DAILY the roads are destroyed by the repeated running routes of the dump trucks transporting ash waste to the airport. It is infuriating to see the road condition in such poor shape and have to perform excessive maintenance on our cars due to these conditions. Finally, wnless we've been fed misinformation, we're amazed that still today that the ash ponds remain unlined in this modern culture where environmental effects are well known and studied.*

47. *What is more important, the health of North Carolina's citizens or Progress Energy's profits?*

48. *We certainly need to become more aware and to take action to stop and prevent our sensitive environment from being polluted with toxic chemicals, because we have to live in it, don't we? We owe it to our children to clean up the mess.*

49. *As a North Carolinian I understand that this is of utmost importance and fresh water shouldn't be marred or soiled by the threat of pollution by way of mercury disposition into streams and rivers. I am urging you, as someone whom has lived in this state all of his 24 years, to take measures to prevent our water from becoming any worse and I encourage and ask that more and better methods are made in making our water as clean as possible.*

50. *You were given the power to make changes for the good of all people and the planet. Please do the right thing.*

51. *Smart decisions and actions today, will maximize the potential for a better future. We must begin today, to reverse environmental degradation from years and years of contamination, it is the only moral choice we have.*

165 people submitted the following comment:

I am writing to urge you to use the best scientific information to help reduce mercury pollution from our waterways. Mercury pollution is a serious threat to our waterways and the safety of our fisheries, and we need to make sure any plan the state of North Carolina pursues yields actual reductions in mercury pollution, especially where mercury hotspots are an issue.

Additional studies of hotspots in North Carolina, using a more sophisticated air model that is readily available and can account for local deposition are needed to accurately assess these hotspots. Scientific studies show that a significant proportion of mercury emitted into the air lands locally.

A simple 67% reduction in mercury from 2002 levels is a not a sufficient goal for restoring the health of North Carolina's waters. The EMC should lay out a path for reviewing individual watersheds to determine the health of each particular waterway. As mercury concentrations in fish tissue drop to safe levels, these watershed can then be designated as healthy again, on a case-by-case basis.

North Carolina demonstrated true leadership in protecting our air and water in 2002 when we passed the Clean Smokestacks Act. Let's continue to be a leader by implementing a strong TMDL plan that will actually make our water safe for fishing once again.

The following comments were unique and were included with the comment stated above. Each number represents a separate commenter.

1. *This is something that most people, I'm sure, do not even consider when they want to have a funfilled day of fishing or go fishing with their kids. Please take action to help keep us as safe and healthy as we can be- not just us, but the fish themselves and the animals that depend on the fish to survive.*

2. *I grew up fishing in ponds in Sampson County, in eastern North Carolina. Now it's dangerous to eat the fish from those ponds. Please use the best current scientific information to determine mercury standards for our waterways. Also, please conduct additional studies of mercury hotspots in North Carolina, using new, sophisticated air model that is readily available. The scientific studies show that a significant proportion of mercury emitted into the air lands locally. Please implement a strong TMDL plan that will actually make our water safe for fishing once again.*

3. *I worry abut my health and te health of others fishing in North Carolina. I worry about my grandchildren as well. Good fried or broiled North Carolina fish has been a special part of my life and I want it to stay that way. Won't you please help? Please use the best scientific information to help reduce mercury*

4. *I have lived in Wilmington my entire life, as have my parents and their parents. My life, like so many of the people in this area, revolves around water. I canoe the rivers, swim in the waterways, eat from the ocean. Things have changed drastically in my lifetime alone. The delicate balance is off. There aren't as many small sea creatures now. I used to find conch,*

starfish and lots of sand dollars on the shore. We need to work towards repairing the damage. Stricter regulations are in order. Please help us keep our coastline healthy. Require stricter mercury standards for our waterways.

5. *Water is life.*

6. *We are paying a fortune for health care for people whose health is damaged by this mercury. Let's do the right thing and prevent this human damage to start with!*

7. *Our families' health should be more important than anything!*

8. *We all need to pay careful attention to the best scientific information to help reduce mercury pollution from our waterways; such pollution is a veryserious threat to our waterways and the safety of our fisheries, and the health of our citizens. We absolutely need to make sure any plan North Carolina pursues yields actual reductions in mercury pollution, especially where mercury hotspots are an issue.*

9. *Please act responsibly for the citizens of North Carolina*

The following comments from individuals were entirely unique. Each number represents a separate commenter:

1. *As a fisherman who regularly eats fish that I catch, I am very concerned about the current levels of mercury in fish. You should identify, using the most advanced measuring techniques available, sources of mercury pollution and take necessary steps to eliminate that pollution. 100% reduction should be your goal.*

2. *I am very concerned about the safety of North Carolina's air and water and therefore am writing to urge the Environmental Management Commission (EMC) to work to ensure that mercury pollution is drastically reduced in our state. Please advocate for more studies of measures to reduce mercury pollution further than currently accepted measures. A 67% cut in mercury from all sources is not an acceptable goal. The current Total Maximum Daily Load Study falls short in many ways to address the very high mercury concentrations in specific local waterways. Still, I urge the EMC to approve the water implementation plan for very high mercury level facilities as it is important to have some reductions legislated by the state until more effective strategies are proven from further study.*

3. *Mercury is bad for living things. We must pursue the highest standards for keeping it out of our environment.*

4. *Mercury kills. Please protect us from energy companies short sighted cost and profit motivations.*

5. *For my (our) GRANDCHILDREN, please get the mercury out of our water.*

6. *thank you for the opportunity to comment on the TMDL study of mercury and the wate implementation plan. The current TMDL study is too simplistic and the EMC should require additional studies using a better model.*

7. *The only acceptable level of mercury is no mercury whatsoever.*

8. *The contamination of the drinking water from burning coal is obviously threatening the health of North Ccarolina Americans by toxic minerals such as Mercury, but almost certainly also by the naturally occuring radioisotopes in coal. The medical costs of the illnesses inflicted on North Carolina residents, are not being compensated by the power companies that burn coal. Please get your lawyers to determine if the power companies are violating provisions of the Homeland Security Act by poisoning our water. The last time I read the Act, their behavior would have violated the act.If that is still so, please get an injunction to stop the disease-causing behavior of the power companies. Thanks for considering these steps in seeking rare justice for the people of North Carolina, so that North Carolina's children will have a better chance to meet their full intellectual potential, which is now being sacrificed by the neurotoxic effects of mercury in coal smoke emitted by the major N.C Power companies, as a result of insufficient or ineffective regulation in North Carolina.*

9. *I am trying to eat fish at least once a week but am getting more and more uneasy about what I am eating, especially if it's NC fish. The levels of mercury are of great concern. I don't believe there can be one blanket plan -- we need to address individual waterways and have a reliable scientific model for determining levels of mercury. This can be done but it takes determination and leadership so*

please let us know that we can count on you for just that so that we can continue to enjoy our NC fish and feel safe in doing so.

10. *Please keep our air and water as free of mercury as possible. We should require industries to update their ability to capture as much mercury as possible (upwards of 90% can be captured with current technology). Do NOT let industries get away with lax standards. We want to be able to eat our fish and breathe our air!*

18 June 2012

Ms. Jing Lin
Modeling and TMDL Unit
Division of Water Quality
NC Dept. of Environmental and Natural Resources

RE: Comments on the Draft NC Mercury TMDL

Dear Ms. Lin:

The Catawba Riverkeeper® Foundation ("Catawba Riverkeeper" or "CRF") is a 501(c)(3) non-profit environmental conservation organization based in North Carolina and has been working to protect the Catawba River since 1997. The CRF mission is to advocate for and secure the protection and enhancement of the Catawba River and of its lakes, tributaries and watershed so that it will always sustain the human and wildlife populations that depend on it for life. With approximately 750 members throughout the 25 counties that span the Catawba-Wateree River basin, CRF is the only local river conservation and advocacy organization focused solely on the protection and enhancement of the Catawba River.

DENR is proposing a TMDL for mercury because of concerns about the impact of mercury exposure on human health. This concern has led to the issuance of statewide fish advisories due to unsafe levels of mercury in some species of fish. Although a TMDL for mercury is required to meet the legal requirements of the Clean Water Act, when reviewing the adequacy of the proposed TMDL, it is important to keep in mind that the purpose of the TMDL is to protect human health and not simply to meet certain legal requirements. As is explained below, CRF believes that the proposed TMDL is inadequate to protect the health of North Carolina citizens, particularly its children and pregnant women for multiple reasons:

1. The proposed TMDL assumes, without adequate basis, that most of the required reductions in mercury will come from reductions in mercury emissions outside of North Carolina and outside of the United States;
2. The proposed TMDL does not consider options to reduce the introduction of mercury, particularly methylmercury, into the surface waters of North Carolina through storm water BMPs; and
3. The proposed TMDL does not consider potential mercury hotspots and whether additional measures are required to address hotspots.

Background

Mercury is a neurotoxin.[1] It is damaging to human health because of its negative effects on the nervous system, immune system, eyes, skin, gums, lungs, kidneys, and thyroid. Neurological damage to the brain as a result of mercury cannot be reversed. Currently, there are also strong concerns about the relationship between mercury – especially methylmercury – and autism. Mercury is particularly harmful to the health of pregnant women and their infants, who are affected as their developing brains are attacked by the mercury, which contributes to learning disabilities. What makes mercury so problematic is that there are no known safe exposure levels for elemental mercury in humans. Even low levels can affect individual health. Methylmercury is the most toxic form and affects the immune system as well as the nervous system. It affects the latter by damaging coordination and the senses of touch, taste, and sight. Methylmercury alters also the genetic and enzyme systems. To developing embryos, the effects are even more

[1] Stein, Jill, Ted Schettler, David Wallinga, and Maria Valenti. "In Harm's Way: Toxic Threats to Child Development." Developmental and Behavioral Pediatrics. http://www.healthychild.ucla.edu/wp/pdf/in_harms_way.pdf (accessed June 7, 2012).

negative given that they are five to 10 times more sensitive to mercury than are adults.[2] What makes methylmercury more dangerous is that it is absorbed more readily and more slowly than other forms of mercury. Pregnant women and young children who consume large amounts of fish and seafood have the greatest risk of mercury poisoning. According to a published report by the National Research Council in 2000, approximately 60,000 children are born each year at risk of adverse neurodevelopmental effects as a result of exposure to methylmercury.[3] According to the North Carolina state epidemiologist, in North Carolina, 12,667 children per year have lifelong disabilities as a direct result of being exposed to mercury.

The Total Maximum Daily Load (TMDL) program is designed for the purpose of helping a certain impaired stream or lake meet basic water quality standards. A TMDL should ensure the quality of drinking water and the safety of fish and aquatic life for consumption. TMDLs describe the maximum amount of a pollutant that a body of water can receive without violating the water quality standards. TMDLs are part of the U.S Clean Water Act, specifically section 303 (d). This section specifies not only the authority for the TMDL program but also explains how to develop plans for waters that do not meet the desired quality standards[4].

In North Carolina

Although TMDLs have been used extensively by the U.S. Environmental Protection Agency and state environmental agencies, including In North Carolina, to implement the Clean

[2] "Disturbing Behavior: Neurotoxic Effects in Children Environmental HealthPerspectives v.108, n.6, Jun00." Mindfully Green. http://www.mindfully.org/Health/Children-Neurotoxic-Effects.htm (accessed June 7, 2012).

[3] Stein, Jill, Ted Schettler, David Wallinga, and Maria Valenti. "In Harm's Way: Toxic Threats to Child Development." Developmental and Behavioral Pediatrics. http://www.healthychild.ucla.edu/wp/pdf/in_harms_way.pdf (accessed June 7, 2012).

[4] "ADEQ: Water Quality Division: Monitoring and Assessment: Total Maximum Daily Load (TMDL) Program." Arizona Department of Environmental Quality (ADEQ). http://www.azdeq.gov/environ/water/assessment/tmdl.html (accessed June 5, 2012).

Water Act by establishing maximum pollution limits for specific water bodies, problems persist that affect the quality of the water; mercury in fish is one of those problems.

Mercury is a metal that occurs naturally at very low levels in the soil, rock, and water resources of North Carolina. It is also released into the air, water, and land through the burning of fossil fuels, municipal solid waste, and medical waste[5]. A significant source of mercury in the environment coal-fired power plants, of which there are three located on the Catawba River around Charlotte. These include the massive Marshall Stream Station on N.C Highway 150, west of Lake Norman, the Allen Station in Belmont, along Lake Wylie, and the Riverbend Station on Mountain Island Lake. This last one is the oldest and dirtiest of all three, and it in particular is of concern as it sits on the banks of what is the primary drinking water source for hundreds of thousands of people and businesses in the Charlotte area. A fourth coal-fired power plant is located just to the south of Charlotte on the Wateree River (which is really the same river as the Catawba River), and another coal-fired power plant is located directly upwind of the Catawba basin in Cliffside, North Carolina.

The fact that mercury is released into the environment by coal-fired plants is particularly disturbing given the fact that North Carolinians get approximately 60% of their electricity from coal-fired plants. For additional context, North Carolina's electricity consumption is among the highest in the nation. The 17 coal-fired power plants of North Carolina have a combined total capacity of 12,837 megawatts. Given the century-old standards and exceptions these are often granted, all of these plants pollute the environment, including through the discharge of mercury into the environment. In fact, coal-fired plants are the leading source of mercury contamination

[5] "Mercury in Fish: Health Advice on Eating Fish." Epidemiology in North Carolina. http://epi.publichealth.nc.gov/fish/mercuryhealthfacts.html (accessed June 5, 2012).

in the U.S in general and particularly in North Carolina, which ranks among the top 12 states with the highest mercury emissions from power plants in the U.S. The relevant question is how this affects the water resources of the state[6].

Statewide fish advisories exist because of mercury contamination. Larger fish – often those caught for consumption – generally contain more mercury. The problem is so significant that the North Carolina Department of Health and Human Services currently lists 24 freshwater and saltwater types of fish with high levels of mercury and should thus not be consumed by children or pregnant women. Among these is the largemouth bass, which is commonly found in the Catawba basin.[7]

Mercury occurs in two forms: inorganic mercury (also known as metallic or elemental mercury) and methylmercury. Though the forms are different, both can be highly toxic to humans when exposure is high. In general, methylmercury presents more of a risk to humans at the levels commonly found in the environment. Inorganic mercury and methylmercury are different because they behave differently in terms of absorption into the body and the extent to which they migrate to organs. Inorganic mercury occurs naturally, mostly in the form of ores, and enters the environment through events such as volcanic activity and erosion from wind and water.[8]

Methylmercury is the most common organic form of mercury and is converted from inorganic mercury to methylmercury through natural processes, such as the activity of bacteria and fungi. Methylmercury can accumulate in fish and animals (bioaccumulation). Through an

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[6] "The Dirty Lie: North Carolina Fact Sheet." TheDirtyLie.com. http://www.thedirtylie.com/ (accessed June 7, 2012).
[7] *Id*.

[8] "Draft Risk and Benefit Report: Section II, Exposure to Methylmercury in the United States." U S Food and Drug Administration Home Page. http://www.fda.gov/food/foodsafety/product-specificinformation/seafood/foodbornepathogenscontaminants/methylmercury/ucm173271.htm (accessed June 5, 2012).

effect called biomagnification, this accumulation is exponentially pronounced up the food chain in creatures at higher and higher trophic levels (i.e., humans and larger predator fish) because mercury is not excreted with the rest of the digested animal that had been consumed.

Mercury is initially released into the air but falls out and enters the ecosystem and makes its way up the food chain (eventually to humans), concentrating in water bodies through rain water and storm water run-off. The proximity of coal-fired power plants to water bodies exacerbates this contamination problem. If mercury falls on land, and particularly if it falls on impervious surfaces, it generally reaches surface waters through storm water run-off. Upon reaching water, some mercury is biologically modified into methylmercury by anaerobic organisms that exist in lakes, rivers, soils, and oceans, among others.

Methylation can be understood as a sum of complex processes that transform mercury. Once in surface water, mercury begins a complex process where it is converted from one form into another. The transportation pathways are also complicated, as mercury can attach to particles (i.e., sediments) for transport and deposition, though it can diffuse and become bioavailable again, especially if the particles resuspend or are in a zone of biogeochemical activity.[9] Methylmercury can enter the food chain or it can be again released back into the atmosphere through the process of volatilization, a process where a dissolved sample is vaporized.

What affects the fate of mercury in the ecosystem is the concentration of dissolved organic carbon and pH. For example, research has established that increasing the acidity of the water, and thereby decreasing the pH and/or the dissolved organic carbon content, generally leads to higher mercury levels in fish. On the other hand, higher pH and dissolved organic

[9] "Mercury in the Environment." USGS. www.usgs.gov/themes/factsheet/146-00/ (accessed June 7, 2012).

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carbon content has been associated with increased mercury movement in the environment, thereby increasing the chances of higher mercury levels in fish. Several studies have established that ultraviolet light has a detoxifying effect on both mercury and methylmercury. Sunlight can break down methylmercury to inorganic divalent mercury (Hg (II)) or elemental mercury (Hg (0)), which is desirable because methylmercury is the more toxic form and is difficult to remove from the environment. When methylmercury is broken down, the mercury can leave the aquatic environment and re-enter the atmosphere as a gas, eliminating and/or decreasing with that the chance of contamination of the food chain.[10]

However, methylmercury is still readily present and absorbed by tiny aquatic organisms.[11] When fish consume those tiny aquatic organisms, the mercury begins to build up in their bodies. When the larger fish eat the smaller fish, the mercury from the tissue of the prey is very efficiently adsorbed into the tissue of the predator, which can therefore accumulate very high levels. Because of this binding to the protein in fish muscles, methylmercury cannot be removed through cleaning and cooking procedures. This makes it very hazardous to the health of humans, particularly children and pregnant women who can pass the mercury to their babies.[12]

General Comments

1. <u>The proposed TMDL does not accomplish the purpose of the TMDL.</u>

The proposal is largely a paperwork exercise and would result in no significant reduction in mercury. Most of the reduction in mercury is assumed to come from a reduction in mercury emissions outside of North Carolina. According to the documents supporting the TMDL,

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[10] "Mercury in the Environment." USGS. www.usgs.gov/themes/factsheet/146-00/ (accessed June 7, 2012).
[11] "Mercury in Fish: Health Advice on Eating Fish." Epidemiology in North Carolina. http://epi.publichealth.nc.gov/fish/mercuryhealthfacts.html (accessed June 5, 2012).
[12] "Environmental Effects of Mercury." US Environmental Protection Agency. http://www.epa.gov/hg/eco.htm (accessed June 7, 2012).

mercury deposition occurring in approximately 70% of the U.S. surface area originates in other countries. If this is correct, it means that mercury is often transferred thousands of miles into the U.S. According to the studies relied upon by DENR, approximately 1/15th of the mercury deposited in the U.S. originates from domestic power plants. This means that reducing domestic power plant sources of mercury, but not sources outside the U.S., may not reduce mercury deposition in North Carolina. However, there is no evidence to suggest that emissions of mercury outside of the U.S. are likely to decrease. In fact, many experts project that emissions of mercury in China and developing countries are likely to increase. If the assumption that worldwide mercury emissions will decrease is incorrect, then under the proposed TMDL, North Carolina will not experience the mercury reductions necessary to reduce the concentrations of mercury in fish to safe levels. It is improper to base a proposed TMDL on assumptions that are outside of the control of domestic governments.

2. The proposed TMDL does not consider options to reduce the amount of methylmercury getting into surface waters from storm water runoff.

The drafters of the proposed TMDL assume that there is nothing that can be done to significantly reduce the amount of mercury entering the surface waters because the majority of mercury entering the surface waters in North Carolina originates from mercury in air emissions. However, most of the mercury getting into the surface waters deposits onto ground surfaces and enters streams and rivers through storm water runoff. Balogh et al. (1996) identified a high correlation between suspended sediment and mercury content. And sediment inputs are driven by runoff. Thus, there must be an aspect of the TMDL that addresses storm water runoff and the material transported in it. The proposed TMDL does not examine whether there are BMPs or storm water treatment techniques that might reduce the amount of mercury, particularly methylmercury, that migrates into surface waters from storm water runoff.

During public hearings, the drafters of the regulation were unable to say whether existing storm water BMPs had any impact on mercury or whether some types of BMPs were better at reducing the amount of methylmercury that entered surface waters. If there are storm water BMPs that would reduce the conversion of inorganic mercury to methylmercury, requiring these BMPs could significantly reduce the amount of methylmercury in the water and fish.

The TMDL does not consider whether the use of wet retention ponds or dry detention ponds has any impact on the amount of mercury or methylmercury that enters surface waters. Many dry detention ponds are planned to empty in a time period of less than 24 hours, which might reduce the opportunity for methylization. Wet retention ponds are designed to hold a certain amount of water indefinitely, and retention in such an environment conducive to the bacteria that perform the methylation will allow for more methylation of inorganic mercury.

A study by Serrano and DeLorenzo (2008), which analyzed water samples taken from wet retention ponds and storm water detention ponds, concluded that the water in these ponds contained low dissolved oxygen levels (less than 4 mg/L). If, as was noted earlier, decreasing the pH and/or the dissolved oxygen content, leads generally to higher levels of methylmercury and higher mercury levels in fish, BMPs that increase the pH and dissolved oxygen levels in storm water ponds would be expected to reduce the levels of methylmercury and mercury in fish. Furthermore, if ultraviolet light and sunlight can break down methylmercury into inorganic divalent mercury (Hg (II)) or elemental mercury (Hg (0)), the BMPs that expose storm water to sunlight could help reduce levels of methylmercury, and an aeration of storm water might reduce levels methyl mercury. The failure of the proposed TMDL to consider options to reduce the level of methylmercury entering surface waters through storm water is a serious failure of the proposed TMDL.

3. <u>The proposed TMDL does not address the potential for hot spots.</u>

The DENR fish testing data and modeling of mercury levels in North Carolina suggests that mercury is not likely to be spread evenly across the state. There are likely to be hotspots where there is a significantly increased risk of exposure to unsafe levels of mercury. The proposed TMDL does not address the potential for hotspots.

There need to be specific TMDLs for areas with the potential for or proven higher concentrations of mercury. In particular, the areas around coal-fired power plants, particularly old unscrubbed power plants, likely will have a greater risk of unsafe levels of mercury. Coal-fired power plants are the largest source of mercury pollution in North Carolina.

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Conclusion

Catawba Riverkeeper Foundation, Inc. appreciates the opportunity to comment on the Draft NC TMDL. If you have any questions, please do not hesitate to contact us. Our address and phone number follows: Catawba Riverkeeper Foundation; 421 Minuet Lane, Suite # 205; Charlotte, NC 28217. My email address is rick@catawbariverkeeper.org and our phone number is (704) 679-9494.

Sincerely,

Richard C. Gaskins, Jr.
Executive Director & Catawba Riverkeeper

Mercury Comment/Response Matrix
Marine Corps Installations East – Marine Corps Base Camp Lejeune

Mercury Post TMDL Permitting Strategy – DRAFT

#	Page	Line # or Figure #	Reviewer/ Organization	Comment
1.	1 of 3	2nd Paragraph	Steven Whited MCIEAST-MCB CAMLEJ	How was the baseline calculated? What facilities were used to develop the baseline loading?
2.	1 of 3	5th Paragraph	Steven Whited MCIEAST-MCB CAMLEJ	7% of the facilities will need additional treatment to comply with mercury limit requirements? What is the compliance timeline/schedule for systems that do not meet discharge limits for mercury?
3.	2 of 3	Information below 2. Major facilities currently with an Hg limit	Steven Whited MCIEAST-MCB CAMLEJ	If determined that a facility should have a limit on mercury, would monitoring requirements be included in a NPDES permit or will this be enforced by another permit?
4.	2 of 3	Information below 2. Major facilities currently with an Hg limit	Steven Whited MCIEAST-MCB CAMLEJ	This section does not indicate how long each facility will be given to get in compliance with this requirement? (This information is listed for #3 but not #2).
5.	2 of 3	4. New or expanding municipal facilities	Steven Whited MCIEAST-MCB CAMLEJ	Sentence does not make sense – "If there is a potential for mercury to be in the discharge, they will………..
6.	General Comment	General Comment	Steven Whited MCIEAST-MCB CAMLEJ	This requirement seems to be geared towards the wastewater NPDES program. Are there any plans to monitor mercury through the Stormwater NPDES program?
7.	2of 3	A.1.	Pat Raper MCIEAST-MCB CAMLEJ	MCB Camp Lejeune currently does not have a Hg limit in its NPDES WW permit or its NPDES Phase 1 Stormwater Permit. WE are not required to analyze for Priority Pollutants on a regular basis; normally these scans are only conducted when renewing the NPDES permit. The NPDES permit would have to be modified to require these scans and their frequency.

8.	1 of 3	3rd para	Pat Raper MCIEAST-MCB CAMLEJ	Current Priority Pollutant Scan method analyzes mercury utilizing EPA Method 245.2. The current reporting limit for Hg using this method is <0.0002 mg/L or <200 ng/L – which is of no use if trying to compare to a water quality standard of 12 ng/L. If Hg is to be analyzed using EPA Method 1631, either a request to contracting laboratory would have to be made to change the Hg test method or a separate sample would need to be analyzed using just this method. This would make more sense rather than adding a requirement to conduct a Priority Pollutant Scan on a regular frequency; just add the requirement for Hg analysis to the permit.
9.	General Comment	General Comment	Pat Raper MCIEAST-MCB CAMLEJ	Recent process of renewing MCB Camp Lejeune's NPDES permit required Priority Pollutant Scans to be conducted. Results from sampling in Nov 11 and Feb 12 showed no detections (<0.0002 mg/L or <200 ng/L) of Hg.
10.				
11.				
12.				
13.				
14.				

Duke Energy Carolinas

GEORGE T. EVERETT, Ph.D.
Director
Environment and Legislative Affairs

Duke Energy Carolinas, LLC
3700 Glenwood Avenue
Suite 330
Raleigh, NC 27612

919-235-0955
704-906-5351 cell
919-828-5240 fax
gteverett@duke-energy.com

June 11, 2012

Ms. Jing Lin
NC Division of Water Quality
Planning Section
1617 Mail Service Center
Raleigh, NC 27699-1617

RE: Draft North Carolina Mercury TMDL
Draft Mercury Post TMDL Permitting Strategy
North Carolina Mercury Reduction Options for Non-Point Sources

Dear Ms. Lin

Duke Energy is an international energy company headquartered in Charlotte, North Carolina. Duke Energy owns and operates more than 36,000 megawatts of electrical generating capacity in the United States. Duke Energy Carolinas, LLC "Duke Energy Carolinas" owns and operates over 12,000 megawatts of electric generating capacity in North Carolina. Duke Energy offers the following comments on the draft North Carolina Total Maximum Daily Load (TMDL) for mercury.

Duke Energy Carolinas's comments focus primarily on the following key points:

- The assessment of mercury sources and trends is accurate but the TMDL program is not the appropriate tool to mitigate these atmospheric sources of mercury.
- The water quality targets were devised inappropriately and are inconsistent with the NC Administrative Procedures Act and the 2012 Use Assessment Methodology.
- The selected water quality targets are inconsistent with EPA guidance and overly conservative.
- Minimization plans should be the mechanism used to address the small contribution of mercury from water point sources.
- If a TMDL should be developed, both the TMDL and the Post TMDL Permitting Strategy should be modified to provide an "off-ramp" for dischargers to stream segments where use attainment can be demonstrated.
- The Level Currently Achieved (LCA) "standard" is unscientifically derived, extraneous, and should be eliminated.

- The TMDL process should incorporate a more adaptive management strategy.
- Additional state mercury air emissions options are not warranted, owing to the stringency of the Mercury and Air Toxics (MATS) and the Industrial Boiler Maximum Achievable Control Technology (MACT) rules.

These main points will be examined in greater detail below.

The assessment of mercury sources and trends is accurate but the TMDL program is not the appropriate tool to mitigate these atmospheric sources of mercury.

The sections of the report discussing the air emissions of mercury and the air quality modeling performed by the NC Division of Air Quality (DAQ) correctly describe the international nature of the issue of atmospheric deposition of mercury.

The DAQ's mercury deposition modeling results are consistent with those of other, similar analyses performed by EPA and the Electric Power Research Institute (EPRI), and they confirm the relatively small (16 percent and decreasing) contribution from in-state sources. Again, the report correctly reveals that the vast majority of anthropogenically-emitted atmospheric mercury being deposited in North Carolina is comes from sources outside the U.S. Duke Energy agrees with this conclusion and appreciates the fact that the DAQ recognizes the significant reductions in mercury emissions already accomplished by the state's utilities and the fact that they will continue to decrease over the next several years. Indeed, the state's coal-fired power plants are in the process of reducing their mercury emissions to the maximum extent possible in accordance with the federal MATS rule, which requires the installation of MACT.

Atmospheric deposition from international sources is the primary cause of mercury impairment in many states, including North Carolina. The North Carolina TMDL Program, nor the Clean Water Act, provides any authority over the sources of atmospheric deposition. Given this international contribution of air deposition of mercury and the minor contribution from NPDES permit holders, it is not clear why the agency is pursuing a TMDL for mercury in North Carolina.

The water quality targets were devised inappropriately and are inconsistent with the NC Administrative Procedures Act and the 2012 Use Assessment Methodology.

In Section 4.3.1, DWQ reviews various recommendations for fish tissue criteria for mercury made by various federal and state agencies. In Section 4.3.2, DWQ selects EPA's recommended human health criterion of 0.3 mg methylmercury/kg in fish tissue as the water quality target level for the TMDL. Section 4.3.2 also includes the following statement:

"the fish tissue mercury target of 0.3 mg/kg would be **equivalent to a total mercury concentration target of 0.6 - 5 ng/l in surface waters**. Therefore, by meeting the target for this TMDL, the numerical water column criterion for total mercury in North Carolina (12 ng/l) will be met simultaneously."

The NC water quality criterion for mercury in fresh water is 0.012 µg/l [15A NCAC 02B .0211(3)(l)(ix)]. The adopted criterion is applicable to the water column. As acknowledged in Section 4.3.1, DWQ has not adopted a water quality criterion for mercury applicable to fish tissue. DWQ certainly has the authority to adopt a fish tissue criterion, but it may not exercise this authority in an *ad hoc* manner. DWQ should abide by the procedural requirements set forth in Section 303(c) of the Clean Water Act and Article 2A of the NC Administrative Procedure Act. In the absence of any other duly promulgated water quality criteria, Duke Energy believes DWQ should use the adopted water column criterion for mercury as the water quality target for the TMDL.

The selected water quality targets are inconsistent with EPA guidance and overly conservative.

DWQ proposes to apply the water quality target to the 90th percentile of standardized-length largemouth bass. In contrast, EPA recommends (Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion) the following:

> "if target populations consume fish from different trophic levels, the state or authorized tribe should consider factoring the consumption by trophic level when computing the average methylmercury concentration in fish tissue. To take this approach, the state or authorized tribe would need some knowledge of the fish species consumed by the general population so that the state or authorized tribe could perform the calculation using only data for fish species that people commonly eat."

In effect, DWQ's proposed application of the water quality target uses data in a considerably more stringent approach than recommended by EPA. Duke Energy recommends that the TMDL be modified such that the final water quality target, assuming it is based on fish tissue, should be applied to a trophic weighted average of all fish species actually consumed.

Minimization plans should be the mechanism used to address the small contribution of mercury from water point sources.

The draft TMDL in Section 6.5 recognizes that wastewater discharge point sources contribute an extremely small proportion (2%) of the total mercury loadings to the waters of the state. Significant decreases in mercury loading will require reductions in atmospheric deposition. Accordingly, the TMDL indicates that mercury reduction from point sources "will be accomplished primarily through mercury minimization plans (MMPs) as needed and ancillary efforts that reduce point source particulate loading (e.g., phosphorus controls, biochemical oxygen demand (BOD) and total suspended solids (TSS) reductions, etc)." Duke Energy agrees that an MMP is an appropriate mechanism for addressing point source mercury discharges, and supports use of that regulatory tool in the TMDL instead of numeric permit limits. Stringent numeric limits on point sources would accomplish little or nothing to improve water quality. In contrast, implementation of MMPs allows the point sources, and the regulating agencies, to focus instead on taking real, practical steps to minimize these mercury discharges, in an iterative process, without posing any significant impacts to water quality or to mercury levels in fish tissue. MMPs facilitate adaptive implementation, which is invaluable considering the uncertainties surrounding mercury. MMPs are consistent with the applicable federal regulations (40 CFR 122.44(k)).

If a TMDL should be developed, both the TMDL and the Post TMDL Permitting Strategy should be modified to provide an "off-ramp" for dischargers to stream segments where use attainment can be demonstrated.

Duke Energy Carolinas has a long history of collecting muscle elemental concentration data from several fish species in Mountain Island Lake, Belews Lake, and the Dan River in NC. In general, data have been evaluated and characterized in accordance with the EPA's recommended protocol, *EPA 823-R-10-001, Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010*, which suggests a trophic-weighted average. An even more conservative analysis, assuming human consumption of fish of only the highest trophic group (Trophic level 4, largemouth bass), was used on Mountain Island and Belews lakes. In the Dan River, only fish of Trophic Level 3 (redbreast sunfish and golden redhorse) were used, since these were the most prevalent species collected and would provide the most robust dataset.

In Mountain Island Lake, fish tissue data collected from four distinct regions of the lake showed that the average fish tissue concentration for Trophic level 4 was 0.085 mg of mercury/kg of fish tissue from 2006 through 2010, and that this average had dropped from 0.130 mg of mercury/kg of tissue for the years of 1991 - 2010. The 2006 – 2010 value is well below the EPA Tissue Residue Criterion of 0.3 mg of methylmercury/kg of fish tissue, as well as the NCDHHS threshold value of an average of 0.4 mg of mercury/kg of fish tissue. The average measured since 1991 has been below both regulatory criteria and further indicates a decline in average mercury levels in fish over the last 20 years. Duke Energy Carolinas believes that these extensive, site-specific fish tissue data substantiate that Mountain Island Lake is not impaired for mercury.

In Belews Lake, fish tissue data collected from four distinct regions of the lake showed that the average fish tissue concentration for Trophic level 4 was 0.080 mg of mercury/kg of fish tissue from 2007 through 2010. This value is well below the EPA Tissue Residue Criterion of 0.3 mg of methylmercury/kg of fish tissue, as well as the NCDHHS threshold value of an average of 0.4 mg of mercury/kg of fish tissue. Again, Duke Energy Carolinas believes that these extensive, site-specific fish tissue data substantiate that Belews Lake is not impaired for mercury.

In the Dan River, fish tissue data (redbreast sunfish and golden redhorse) collected from three distinct regions of the river showed that the average fish tissue concentration for Trophic level 3 was 0.143 mg of mercury/kg of fish tissue from 2006 through 2010, and that this average had dropped from 0.257 mg of mercury/kg of tissue for the years of 1994 - 2010. The 2006 – 2010 value is well below the EPA Tissue Residue Criterion of 0.3 mg of methylmercury/kg of fish tissue, as well as the NCDHHS threshold value of an average of 0.4 mg of mercury/kg of fish tissue. One again, the average measured since 1994 has been below both regulatory criteria and further indicates a decline in average mercury levels in fish over approximately the last two decades. Duke Energy Carolinas believes that these extensive, site-specific fish tissue data substantiate that the Dan River is not impaired for mercury.

Therefore, Duke Energy strongly recommends that the draft TMDL include an "exit" mechanism that would allow for water body segment-specific determinations of attainment and exclude point source discharges from additional reduction requirements otherwise specified by the TMDL or implementation strategy. Section 303(d)(1)(C) of the Clean Water Act suggests that imposing a TMDL on a nonimpaired water segment is prohibited.

A state-wide fish consumption advisory for mercury has no scientific validity.

The Level Currently Achieved (LCA) "standard" is derived in an unscientific manner, is extraneous, and should be eliminated.

In general terms, the Strategy document appropriately proposes to assess each point source discharge by performing a reasonable potential analysis and when the discharge could result in an exceedance of the state's water quality standard, to impose a water quality-based effluent limitation (WQBEL). North Carolina has adopted, and EPA has approved, a mercury water column criterion of 12 ng/L. This is the applicable standard. However, the Strategy document inappropriately proposes use of an additional, *ad hoc* standard referred to as the Level Currently Achieved (LCA). The LCA, which is a concentration value, is apparently intended to establish a cap on WQBELs. Duke Energy is opposed to the proposed use of this additional, *ad hoc* standard for the following reasons:

- The LCA is an *ad hoc* standard that has not been duly promulgated in accordance with NC Administrative Act.
- This *ad hoc* standard, which is based on the EPA recommended national criterion of 0.3 mg/kg, is considerably more stringent that the approved 12 ng/L water quality standard. As stated earlier, Duke Energy asserts that the use of the 0.3 mg/kg criterion is not applicable for TMDL purposes until it is approved via the formal rulemaking process.
- Additionally, the LCA is basically a technology based limit. A technology based limit like the LCA is inappropriate for a TMDL because the TMDL is a water quality based tool used to derive water quality based permitting decisions.
- Application of the LCA will result in stringent numeric limits on point sources that would accomplish little or nothing to improve water quality.
- The cost of imposing the LCA on point source dischargers has not been assessed. Overall a 67% mercury reduction on point source dischargers will be realized by this TMDL program. There is no discernable proof on record that this level

of reduction would be effective. DWQ should be required to demonstrate that this level of reduction would be meaningful, cost effective or achievable or restore the wasteload allocation back to baseline conditions.

- The process for determining WQBELs already contains inherent layers of conservative assumptions that result in stringent limits.

The TMDL process should incorporate a more adaptive management starategy.

Given these complexities and uncertainties, not to mention the jurisdictional limitations NC faces in its attempt to deal with a multi-media and multi-jurisdictional issue like mercury within the confines of a regulatory program focusing exclusively on water, the TMDL process should include a well-articulated adaptive management method that will be used to periodically validate or revise the assumptions and requirements embedded in the TMDL. Without such a method, even the most proactive implementation efforts may fail or be misdirected.

Although understanding of mercury in the environment has made many advancements over recent years, there are many uncertainties that still need to be addressed, including:

1. The relationship between the chemical states of mercury, the prevailing conditions where these species predominate, and the resulting impacts on water quality and biota;

2. The relationship between various source load reductions and discernable improvements in water quality and biota;

3. The relative costs and benefits of reductions from different regulated water dischargers.

EPA has defined adaptive management methods as follows:

"[A] type of project management method where a facility chooses an approach to meeting the project goal, monitors the effectiveness of that approach, and then based on monitoring and any other relevant information, makes any adjustments necessary to ensure continued progress toward the project's goal. This cycle of activity is repeated as necessary to reach the project's goal."

Duke Energy recommends that the TMDL identify specific milestones that will trigger formal review of the assumptions and requirements in the TMDL. Since these periodic reviews may trigger revisions to the TMDL, we also urge DWQ to explicitly account for the backsliding prohibition in the Clean Water Act by articulating the relevant backsliding exemptions in Sections 402(o) and 303(d)(4) and how they will be implemented in the review/revision process.

North Carolina Mercury Reduction Options for Non-Point Sources

In conjunction with the draft TMDL report, the North Carolina Division of Air Quality (DAQ) published a discussion of options that may be considered in order to address the mercury air emissions from North Carolina facilities. This options document states that "The Department of Environment and Natural Resources (DENR) does not believe that the mercury reduction strategy requires additional mercury air emission reductions from existing sources in North Carolina."

Thus, the North Carolina Division of Air Quality (DAQ) has already concluded that additional air reduction strategies for NC sources are not necessary. Additional regulation of NC sources or expansion of mandated energy programs such as renewable energy to address mercury emissions will result in unjustified additional burdens on the economy of NC. Likewise, since there are federal programs already in place that will drive reductions in mercury from the combustion of coal in power plants, it is illogical for NC to engage in interstate actions against sources. Such actions are unproductive (since reductions will occur anyway) and are likely to tie up the state in unnecessary litigation that may take years to resolve.

Duke Energy Carolinas appreciates the opportunity to submit comments on this important regulatory action. Please do not hesitate to contact me at (919) 235-0955 (George.Everett@duke-energy.com) or Allen Stowe at (704) 516-5548 (Allen.Stowe@duke-energy.com) if you have any questions.

Sincerely,

George T. Everett

George T. Everett, PhD.
Director, Environmental & Legislative Affairs

**Appalachian Voices • Clean Air Carolina • Environmental Defense Fund •
North Carolina Conservation Network • Rocky River Heritage Foundation •
Sierra Club • Southern Environmental Law Center**

June 18, 2012

Ms. Jing Lin
Modeling and TMDL Unit
Division of Water Quality Planning
NC Department of Environment & Natural Resources
Raleigh, NC 27699-1617

Re: draft statewide Mercury TMDL and Mercury Post-TMDL Permitting Strategy

Dear Ms. Lin,

We appreciate the opportunity to offer comments on the draft North Carolina Mercury TMDL, the Mercury Post TMDL Permitting Strategy, and North Carolina's Mercury Reduction Options for Nonpoint Sources. Collectively, our organizations advocate on behalf of thousands of North Carolinians who fish, swim, and paddle in our state's lakes, rivers, swamps, and estuaries. They want North Carolinians to be able safely to eat fish from North Carolina's waters, and to know that native wildlife, especially predator species, will not be placed at risk by mercury contamination.

With respect to the proposed statewide mercury TMDL and implementation plan, we offer these recommendations: we encourage the Division of Water Quality (DQW) and the Environmental Management Commission (EMC) to approve a modified TMDL and Permitting Strategy to limit point source discharges. The final TMDL should commit North Carolina to remodel using the CMAQ model 5.0 to account for hotspots, and should exclude from coverage under this statewide TMDL those watersheds where the model shows that deposition from local sources contributes significantly to impairment. DWQ and the EMC should commit to conduct site-specific TMDLs for those excluded watersheds. Those site-specific TMDLs, in addition to identifying local sources and assigning them appropriate load allocations, should address NPDES stormwater point source discharges. Finally, the site-specific TMDLs should be designed to assure compliance with the water quality standard for mercury as well as with the fish tissue criterion.

We understand that while the comment period on the first two documents closes today, the comment period on the Reduction Options for Nonpoint Sources remains open for at least some weeks longer. We expect to submit full comments on that document soon and will recommend that the EMC pursue a comprehensive, statewide mercury reduction program; petition the Environmental Protection Agency (EPA) to make upwind sources reduce their mercury emissions; and require maximum mercury reductions from North Carolina emitters, avoiding any kind of trading or offset program.

1. **Mercury is a potent neurotoxin that threatens North Carolinians and warrants action.**

A. Mercury in the environment threatens the health of people and wildlife.

Mercury harms both people and wildlife.[1] Mercury deposited into water bodies can be transformed into methylmercury (an organic form of mercury[2]) via microbial activity.[3] "This conversion of inorganic mercury to methylmercury is important for two reasons: (1) methylmercury is much more toxic than inorganic mercury, and (2) organisms require considerably longer to eliminate methylmercury."[4]

Once formed, methylmercury enters the food chain through fish, which accumulate the toxin in their tissues.[5] As predatory fish consume smaller contaminated fish, methylmercury travels up the food chain and increases in concentration; some predator fish are in turn consumed by birds, mammals, and people.[6] Methylmercury harms wildlife in a variety of ways: death, reduced fertility, hindered growth and development, and abnormal behavior that reduces chances of survival.[7] Additionally, research indicates that methylmercury can affect fishes' endocrine systems, interfering with their development and reproduction.[8]

In the United States, most people exposed to methylmercury are exposed by eating contaminated fish.[9] Other sources of methylmercury exposure – more common in some other parts of the world – include rice grown in contaminated paddies[10] and consumption of terrestrial animals.[11] Of all forms of mercury, methylmercury is the most bioavailable and toxic to humans.[12]

Much of the research on the health impacts of methylmercury focuses on pre-natal and neo-natal exposures. If a pregnant woman eats contaminated fish – or if she is already carrying a body burden of methylmercury – the compound is transferred across the placenta to the fetus quite effectively.[13] A recent report estimates that approximately six percent of women of childbearing age have mercury blood concentrations that exceed safe levels.[14] During pregnancy, fetal methylmercury blood concentrations are on average seventy percent higher than maternal blood concentrations.[15] The transfer to the fetus is so efficient that a mother's body burden of

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[1] *Environmental Effects, Fate & Transport and Ecological Effects of Mercury*, Environmental Protection Agency, http://www.epa.gov/hg/eco.htm (last visited June 14, 2012).
[2] *Methylmercury*, U.S. Geological Survey, http://toxics.usgs.gov/definitions/methylmercury.html (last visited June 14, 2012).
[3] *Environmental Effects*, *supra* note 1.
[4] David P. Krabbenhoft & David A. Rickert, *Mercury Contamination of Aquatic Ecosystems*, U.S. Geological Survey, http://pubs.usgs.gov/fs/1995/fs216-95/ (last visited June 14, 2012).
[5] Donna Mergler et al., *Methylmercury Exposure & Health Effects in Humans: A Worldwide Concern*, AMBIO: A Journal of the Human Environment (2007).
[6] *Environmental Effects*, *supra* note 1.
[7] *Id.* (citing the Mercury Report to Congress, Volume VII, which is available at http://www.epa.gov/hg/report.htm).
[8] *Id.*
[9] *Methylmercury*, s*upra* note 2.
[10] *See, e.g.,* U.S. Geological Survey, *Integrated Study of Rice Fields and Non-Agricultural Wetlands*, http://ca.water.usgs.gov/mercury/riceFields.html (last visited June 14, 2012); Sarah E. Rothenberg, Research, http://www.sph.sc.edu/enhs/xfacultystaffdetails.php?MorID=810 (last visited June 14, 2012).
[11] Krabbenhoft & Rickert*, supra* note 4 (noting that methylmercury has been reported in chicken, pork, and in the organ meats of terrestrial animals).
[12] Charles N. Alpers & Michael P. Hunerlach, *Mercury Contamination from Historic Gold Mining in California*, U.S. Geological Survey, http://toxics.usgs.gov/definitions/methylmercury.html (last visited June 14, 2012).
[13] Lindsey Jones, Jennifer Parker, & Pauline Mendola, *Blood Lead & Mercury Levels in Pregnant Women in the United States, 2003-2008*, Centers for Disease Control & Prevention, National Center for Health Statistics (2010).
[14] *Blood Mercury Levels in Young Children and Childbearing-Aged Women --- United States, 1999—2002*, Centers for Disease Control & Prevention, http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5343a5.htm (last visited June 14, 2012).
[15] Mergler, et al., s*upra* note 5.

methylmercury tends to decrease during pregnancy.[16] Additional early-life methylmercury exposure can occur through breast milk.[17]

Fetal, infant, and childhood exposures to methylmercury can cause lifelong damage.[18] The most common impact of exposure is impaired neurological development.[19] More specifically, exposure at the fetal stage can result in poor brain and nervous system development, damaging cognition, memory, attention, language, fine motor, and visual spatial skills.[20] In newborns, effects of methylmercury exposure include cerebral palsy-like symptoms, mental retardation, cerebellar ataxia, primitive reflexes, dysarthria,[21] and hyperkinesias[22]—all "hallmarks" of congenital methylmercury poisoning.[23]

Studies analyzing methylmercury's health effects on adults report deficits in motor, psychomotor, visual, and cognitive functions.[24] Additionally, methylmercury exposures are linked to increased cardiovascular disease in adult men, including coronary heart disease, acute myocardial infarction (AMI), and ischemic heart disease.[25] Thus, although methylmercury is often thought of as a problem primarily for young children and women of child-bearing age, it in fact has significant implications for seniors as well. Lastly, both inorganic mercury and methylmercury have been shown to suppress immune functions and to induce autoimmunity in multiple species.[26]

B. North Carolinians are exposed to unsafe levels of methylmercury through locally-caught fish

Vulnerable North Carolinians show blood levels of methylmercury sufficient to cause harm. A 2011 study of 211 pregnant women in six North Carolina counties found that 4 women (1.9%) had blood levels above the EPA's blood guideline of 5.8 µg/L. A much larger number, 134 (63.8%), had detectable levels of mercury in their blood.[27] The Fourth National Report on Human Exposure to Environmental Chemicals (NHANES IV) has found that 5% (out of a national sample of 4,241) of women of childbearing age (16 – 49) had blood levels above 4.40 µg/L.[28] Moreover, the EPA blood guideline has been criticized as insufficiently protective, and experts have recommended lowering it to 3.5 µg/L, to reflect higher concentrations across the placental

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[16] *Id.*
[17] *Id*.
[18] *See Health Effects,* Environmental Protection Agency, http://www.epa.gov/hg/effects.htm (last visited June 14, 2012).
[19] *Id.*
[20] *Id.*
[21] "Dysarthria is a condition in which you have difficulty controlling or coordinating the muscles you use when you speak, or weakness of those muscles. Dysarthria often is characterized by slurred or slow speech that can be difficult to understand." Definition, http://www.mayoclinic.com/health/dysarthria/DS01175 (last visited June 14, 2012).
[22] Also referred to as hyperkinesis, this disorder is characterized by restlessness, short attention span, excessive activity, and impulsive behavior. Also known as attention deficit disorder or ADD. Definition, http://medical-dictionary.thefreedictionary.com/hyperkinesis (last visited June 14, 2012).
[23] Mergler, s*upra* note 5.
[24] *Id.*
[25] *Id.*; Anna L. Choi et al., *Methylmercury Exposure and Adverse Cardiovascular Effects in Faroese Whaling Men*, Environmental Health Perspectives (2009), *available at* http://ehp03.niehs.nih.gov/article/info%3Adoi%2F10.1289%2Fehp.11608*,*
[26] Mergler, *supra* note 5; C.S. Via et al., *Low-Dose Exposure to Inorganic Mercury Accelerates Disease and Mortality in Acquired Murine Lupus*, Environmental Health Perspectives (2003), *available at* http://www.ncbi.nlm.nih.gov/pubmed/12896845; Said Havarinasab & Per Hultman, *Organic Mercury Compounds and Autoimmunity*, Autoimmunity Reviews (2005), *available at* www.oracknows.com/pdf/havarinasab.pdf.
[27] A.P. Sanders, K. Flood, S. Chiang, A.H. Herring, L Wolf, et al.,*Towards Prenatal Biomonitoring in North Carolina: Assessing Arsenic, Cadmium, Mercury, and Lead Levels in Pregnant Women*. PLoS ONE (2012) 7(3): e31354, at 3. doi:10.1371/journal.pone.0031354.
[28] *Id*, at 2.

barrier.[29] Even then, "prenatal mercury exposures below this lower threshold have still been associated with preterm birth and delays in neurological development."[30]

Policymakers may find it hard to credit that a responsible pregnant mother would eat fish high in mercury. Indeed, warning signs are posted along many lakes and rivers. However, as a demographic profile of methylmercury exposure suggests, policymakers should not necessarily generalize from their own life experiences on this point:

> Race, education, and household income were associated with reporting consumption of fish caught by someone known to the participant (all $p < 0.05$). Compared to [white] women, [black] and [Hispanic] women were over 3 times as likely to eat fish caught by themselves or a friend/family member. About 7% of women with more than a high school education reported eating fish caught by someone they knew, while significantly higher rates of consumption of caught fish were reported by women with lower educational attainment (~14%). Women in the highest household income category were half as likely to eat fish caught by someone they knew compared to the lowest income group.[31]

Not only are some North Carolinians poorly equipped to read consumption warnings; they may not see them at all if a friend or family member is catching the fish and sharing it. Moreover, hunger remains a real challenge for at least 5% of North Carolina households; these families need the protein wild caught fish can provide.[32]

Even if all North Carolinians were in a position to read consumption warnings, those warnings may not be consistently protective. A recent study of six North Carolina marine species (three caught primarily recreationally rather than commercially) found that actual tissue concentrations in our coastal waters related poorly to the national average levels that inform state and private advisories, and that, for some species, tissue concentrations were higher in fish caught in North Carolina than the national average.[33] Convincing people not to eat caught fish is not a winning strategy to protect public health; in any event, it does not satisfy the Clean Water Act, which calls for all the state's waters to ultimately be made fishable and swimmable.[34]

2. Comments on the draft Mercury TMDL

We commend the state's decision to prepare a Total Maximum Daily Load (TMDL) for mercury.

The federal Clean Water Act requires preparation of a Total Maximum Daily Load (TMDL) when a waterbody is impaired for any water quality standard or designated use – that is, polluted to such an extent that people

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[29] ML Miranda ML, S Edwards, PJ Maxson, *Mercury Levels in an Urban Pregnant Population in Durham County, North Carolina*, International Journal of Environmental Research and Public Health (2011*)* 8: 698–712, at 699.
[30] *Id,* at 699.
[31] *Id,* at 705.
[32] Alisha Coleman-Jensen, Mark Nord, Margaret Andrews & Steven Carlson, Household Food Security in the United States in 2010, USDA Economic Research Service Report 125, at 17, *available at* http://www.ers.usda.gov/Publications/ERR125/ERR125.pdf. The USDA estimates that 5.2% of North Carolina households suffered from 'very low food security' in 2010; 15% suffered from 'low food security'.
[33] S.J. Petre, D.K. Sackett., D.D. Aday, *Do national advisories serve local consumers: an assessment of mercury in economically important North Carolina fishes?* Journal of Environmental Monitoring (2012), DOI: 10.1039/C2EM30024A, *available at* http://www.ncsu.edu/project/fish-lab/pdfs/Petreetal2012.pdf.
[34] CWA § 101, 33 U.S.C. § 1251.

and/or wildlife cannot use the waterbody normally, as by eating fish caught there.[35] A conventional approach to building a TMDL in North Carolina has been to rely on a transport model to apportion responsibility to each source, and a response model to calculate how much load the receiving water can take and still meet its designated use. For example, in the Jordan Lake TMDL, the watershed model estimates the contribution of each source, while the lake model tries to predict the condition of the lake at different loadings of nutrients.[36]

The draft mercury TMDL departs from this template. For transport, the mercury TMDL relies mostly on the US EPA's Community Multi-Scale Air Quality (CMAQ) model; but it foregoes a response model entirely. Instead, the TMDL uses a simple calculation to establish a target for reductions: 90% of largemouth bass sampled in North Carolina have a tissue concentration of mercury of no more than 0.9 mg/kg; the recommended EPA fish tissue criteria is 0.3 mg/kg; to go from 0.9 to 0.3 is a two-thirds, or 67% decrease; therefore the 'reduction factor' for the TMDL is 67%.[37]

Below, we critique assumptions made both in the source modeling and in the calculation of the needed reduction factor. We do not intend these critiques to derail the TMDL, or encourage inaction. As noted above, methylmercury exposure presents a serious and ongoing health threat to North Carolinians. For that reason, after raising several concerns, we propose a path forward that will take the strengths of the proposed mercury TMDL as a platform for immediate action, while relying on follow-on analyses to achieve additional targeted reductions where they can make a difference.

While we argue below that the TMDL must provide for further site-specific analyses of specific watersheds, we do support adoption of a baseline statewide TMDL. One can imagine an approach that would dispense with the statewide impairment listing and instead classify water bodies as impaired for mercury one by one. However, given limited monitoring resources, that approach would virtually guarantee that watersheds with significant contamination problems would not be listed as impaired or addressed for years. A recent study of the Cape Fear and Lumber basins estimated that the median concentration of mercury in fish tissue likely exceeds the EPA criterion of 0.3 mg/kg for over 90% of the river miles of those watersheds.[38] Other river basins may also have high levels of contamination. Such a threat to people and wildlife deserves a prompt, two step response: an initial statewide study and plan for reductions, followed by targeted site-specific TMDLs and implementation plans.

A. The draft Mercury TMDL may need a more stringent criterion and a larger reduction factor.

North Carolina has not established a numeric mercury criterion for *fish tissue* under the CWA. Rather, the state has only an ambient numerical water quality standard for mercury and none for methylmercury. So, DWQ borrowed the mercury fish tissue criterion recommended by EPA: 0.3 milligrams of methylmercury per kilogram of fish (mg/kg).[39] The draft TMDL states that it will be satisfied if the 90th-percentile-size largemouth

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[35] CWA § 303(d), 33 U.S.C. § 1313(d).
[36] B. Everett Jordan Reservoir, North Carolina Phase I Total Maximum Daily Load, Final Report, September 2007.
[37] North Carolina Division of Water Quality, North Carolina Mercury TMDL (Apr. 2012) [hereinafter NC Draft TMDL], at 50-51.
[38] E.S. Money, D.K. Sackett, D.D. Aday, M.L. Serre, *Using river distance and existing hydrography data can improve the geostatistical estimation of fish tissue mercury at unsampled locations*. Environmental Science and Technology (2011) 45:7746-7753, *available at* http://www.ncsu.edu/project/fish-lab/pdfs/Moneyetal2011.pdf. Note that the study was not conducted primarily to show this; this was a side conclusion of a study aimed at testing a new, more effective method of estimating spatial extent of high levels of fish tissue contamination, which we reference below.
[39] NC Draft TMDL, at 26–27.

bass contains less than that concentration of mercury, on a statewide average.[40] We appreciate the effort to build in a margin of safety by choosing the 90th percentile. Nonetheless, we are concerned that the fish tissue criterion and reduction factor are insufficiently protective, for the following reasons.

Fish tissue criterion. EPA's default standard may not be sufficiently stringent for North Carolina. Despite having determined a default fish tissue standard, EPA strongly encourages states to "develop a water quality criterion for methylmercury using local or regional data" to account for local circumstances. Minnesota, for instance, also used the 90th-percentile-size fish in its mercury TMDL, but set its target at 0.2 mg/kg – a more stringent target than the EPA/FDA standard – "because of higher fish consumption rates in the state." [41] Certain groups of North Carolina residents (including, for example, recreational and subsistence fishermen in eastern North Carolina) also consume locally caught fish at higher rates than other populations in the state and nation, thereby increasing their (and their families') risk of exposure to mercury.[42] Because high fish-tissue concentrations are prevalent in eastern North Carolina, a region of the state with high fish consumption, a similar reassessment is appropriate here.

If North Carolina applied that criterion and also aimed for 0.2 mg/kg as its target to more fully protect such at-risk populations, the TMDL would apply a 77% reduction factor. Instead, the draft North Carolina TMDL uses the EPA default as its fish tissue mercury target, and does not address potential higher levels of fish consumption in the state or in specific communities. It also does not assess water-body-specific factors, such as pH, temperature, length of the aquatic food chain, etc., that could magnify bioaccumulation in particular water bodies.

Reduction factor. In crafting the reduction factor, the draft TMDL assumes a linear relationship between changes in total mercury emissions into North Carolina and levels in fish tissue. That may well be true, but in the absence of an estimate for natural attenuation or flushing of mercury that is already cycling in the system, it is not clear why it would be. The final TMDL could strengthen its method by citing evidence to support the assumption that a 67% cut in mercury emissions and deposition will translate to a 67% cut in fish tissue concentrations. Alternatively, if science does not support the assumption of linearity, the final TMDL could propose a larger reduction factor as a margin of safety.

Maternal blood hits. As noted above, although EPA recommends a fish tissue criterion of 0.3 mg/kg, to avoid dangerous blood levels in people who eat the fish, toxicologists have suggested that mercury exposure can harm a developing fetus at lower concentrations. Given the concern over the effects of even small doses of methylmercury, DWQ and the EMC should consider adding another criterion to the statewide TMDL: percentage of pregnant women showing detectable mercury in samples of maternal blood, such as those already submitted to the North Carolina Department of Health and Human Services for blood typing.[43] This would not replace the fish tissue criterion (or, as noted below, a numeric water quality standard), but it could offer an additional endpoint that ties directly to the goal of preventing pre-natal and neo-natal exposures to mercury during critical developmental phases.

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[40] NC Draft TMDL, at 28-31.

[41] Minn. Pollution Control Agency, Minnesota Statewide Mercury Total Maximum Daily Load 5 (Mar. 27, 2007), *available at* http://www.pca.state.mn.us/index.php/view-document.html?gid=8507

1. [42] J. Hayward, K. Clevenger & T. Crawford, *Long-Term Atmospheric Mercury Trends in Eastern North Carolina: Relationships Between Local Source Activities and Ambient Air Mercury Concentrations* NCDENR – Division of Air Quality, *available at* http://daq.state.nc.us/toxics/studies/mercury/aq2final.pdf

[43] *See, e.g.*, Sanders, *supra* note 27.

B. *The TMDL must recognize hot spots and the potential for strong local reductions to benefit specific watersheds or water bodies.*

The draft TMDL does not adequately acknowledge the fact that local sources can create substantial hot spots through deposition, and that major reduction targeted to those sources can deliver profound improvements in specific water bodies and watersheds. Hot spots are areas of particularly high mercury and/or methylmercury concentrations.

Much mercury deposits locally and regionally. In 2006, Pennsylvania regulators announced that state surveys indicated that waters near coal-fired power plants had 47% more mercury contamination than waters further away.[44] In the same year, scientists in Ohio found that a majority of mercury deposition resulted from local sources.[45] In the mid-1990s, North Carolina scientists recorded very high levels of mercury in people, fish, and rainwaters around Lake Waccamaw. After a major local source, the Holtrachem plant in Rieglewood, reduced its emissions, mercury levels in rainwater at Lake Waccamaw dropped rapidly by 90%, returning to background levels.[46]

Others states have also found that cutting local emissions reduces local contamination. In 2003, the Florida Department of Environmental Protection developed a Total Maximum Daily Load analysis for mercury pollution in south Florida.[47] Based on several complementary lines of analysis, the agency estimated that 92% of the mercury deposited in the Everglades came from local sources, while acknowledging the challenges of modeling global contributions. Nonetheless, Florida had previously required local incinerators to reduce their emissions by 99%. Over two decades, those emissions resulted in 60% to 70% reductions in contamination levels in fish and wading birds.[48] Similarly, seven years after Massachusetts enacted tough emissions reductions standards for incinerators, the state reported a 32% average decrease in concentrations of mercury in yellow perch caught in nearby lakes, and a 15% average drop in mercury concentrations in yellow perch statewide. State regulators found mercury levels in largemouth bass decreased 24% near the incinerators, 19% statewide.[49] Strong local reductions can significantly improve local conditions.

The draft TMDL has little to say about hot spots. The Community Multiscale Air Model (CMAQ), on which the draft TMDL relies, predicts mercury hot spots near coal-fired power plants. However, the draft TMDL minimizes their importance by pointing to a study (the 'Sackett Study') in which "fish tissue mercury concentrations were found to be lower close to power plants . . . in North Carolina" despite the fact that the water itself contained higher levels of mercury.[50] The Sackett study, however, actually *acknowledges* that water bodies near coal plants are hot spots for mercury in the water column. The only reason these power-plant-caused mercury hot spots do not translate into higher fish-tissue mercury is that coal plants also emit

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[44] Pennsylvania Department of Environmental Protection, *Data Collected over Eight Years Show Mercury Levels 47% Higher in Areas Near Power Plants* (May 2006).

[45] *See, e.g.,* Gerald Keeler, Matthew Landis, Gary Norris, Emily Christianson, and Timothy Dvonch, *Sources of Mercury Wet Deposition in Eastern Ohio,* USA, Environ Sci Technol. 2006 Oct 1;40(19):5874-81.

[46] Rodney Foushee, *Mercury Rising*, North Carolina Wildlife (November 2000), at 13.

[47] Florida Department of Environmental Protection, *Integrating Atmospheric Mercury Deposition with Aquatic Cycling in South Florida: an approach for conducting a Total Maximum Daily Load Analysis for an atmospherically derived pollutant* (November 2003), at 44.

[48] *Id*, at 4.

[49] Massachusetts Department of Environmental Protection, *Freshwater Fish in Mass. Lakes Show Reductions in Mercury: Improvements correlate to State's Zero Mercury Strategy*.

[50] NC Draft TMDL, at 39 (citing Dana K. Sackett et al., *Does proximity to coal-fired power plants influence fish tissue mercury?,* 19 Ecotoxicology 1601 (2010)).

selenium, a chemical that (although toxic itself) prevents mercury from accumulating in fish.[51] Similar hot spots may have developed around other sources, including cement kilns and communities with multiple industrial boilers.

In addition, the specific version of the CMAQ used to build the TMDL may provide a poor prediction of hot spots. The draft TMDL relies on CMAQ version 4.71.[52] At the May 2012 EMC meeting, staff noted that a newer version of the model, CMAQ 5.0, released in October 2011, is available from EPA and would provide greater resolution on the local scale.[53]

Both because it overlooks water column hotspots, and because it used a version of CMAQ with less capacity to model local deposition, the draft TMDL leaves the misleading impression that global mercury is the major driver of impairment across the state, with minimal variation between watersheds. In fact, modeling with CMAQ 5.0 and attention to water column levels may show that deposition from local sources comprises a significant share of the loading in specific water bodies or their watersheds. In those watersheds, a global reduction may be neither necessary nor adequate to restore waters to their designated uses. Instead, tough controls on specific sources – controls that would look like 'overcontrol' in the context of the draft TMDL – could help erase hot spots and restore fishability, as required by the Clean Water Act.

For this reason, the final TMDL should reject the notion that a 67% cut in mercury from all sources – locally, regionally, and globally – is a sufficient goal to restore the health of North Carolina's waters. The draft TMDL cannot demonstrate that. Instead, the final TMDL should establish a baseline of target reductions, then call for additional studies of hot spots using CMAQ 5.0, as described below.

C. The final statewide TMDL must address the relationship between the fish tissue criterion and North Carolina's water quality standard for mercury.

The federal Clean Water Act requires that TMDLs "be established at a level necessary to implement the applicable water quality standards."[54] To meet this requirement, a TMDL must set out the applicable water quality standards, and establish "a quantitative value used to measure whether or not the applicable water quality standard is attained."[55] "Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical."[56] Even if the requirement for the TMDL is triggered by violation of only one part of a standard, the TMDL itself must be designed so that it "encompasses *all* designated uses of a water body and *all* water quality criteria that define pollutant levels necessary to protect those uses."[57]

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[51] Sackett, *supra* note 50, at 1602, 1609.
[52] NC Draft TMDL, at 38.
[53] *See* Community and Multiscale Air Quality (CMAQ), webpage, US EPA, http://www.epa.gov/amad/CMAQ/index.html, accessed June 18, 2012.
[54] CWA § 303(d)(1)(C), 33 U.S.C. § 1313(d)(1)(C).
[55] Environmental Protection Agency, *Guidelines for Reviewing TMDLs under Existing Regulations issued in 1992* (May 20, 2002), available at http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/final52002.cfm.
[56] *Id.*
[57] *Anacostia Riverkeeper, Inc. v. Jackson*, 798 F. Supp. 2d 210 (D.D.C. 2011). In this case, a federal court rejected a sediment TMDL developed jointly by Maryland and D.C. for the Anacostia River. Both Maryland and the District of Columbia had designated recreation, aesthetic enjoyment, and protection of aquatic life as uses for the River, and both had promulgated water-quality criteria to protect all three uses (224). The river was listed as being impaired only for protection of aquatic life, so the TMDL focused exclusively on protecting that use. The Anacostia Riverkeeper challenged EPA's approval of the TMDL on grounds that, regardless of the specific impairment for which the river was listed, the TMDL had to address *all* designated uses and *all* water quality criteria for the relevant

EPA acknowledged this requirement in a 2008 guidance document specifically addressing mercury TMDLs. It explained that "[w]here a fish tissue target is used for a TMDL, appropriate justification for using a fish tissue target should be included, considering existing numeric and narrative criteria as well as designated uses."[58] Thus, to comply with the Clean Water Act, North Carolina's statewide mercury TMDL must ensure that North Carolina's waters will attain the standard for mercury in the water column—0.012 µg/L – in addition to meeting fish tissue targets.

The case of the hot spots around coal-fired power plant illustrates the importance of designing the TMDL to run on both fish tissue concentrations and mercury concentrations in the water column. As the Sackett study indicates, there is not a proportional, linear relationship between water-column mercury concentrations and fish-tissue mercury concentrations. Thus, the statement in the draft TMDL that that "[t]he fish tissue mercury target of 0.3 mg/kg would be equivalent to a total mercury concentration target of 0.6–5 ng/l in surface waters,"[59] even if true on average, says nothing about what mercury concentrations will be in particular surface waters near coal plants or other hot spots. Fish tissue concentrations are simply not a sufficient surrogate for water column mercury levels in all circumstances.[60]

We note that if water column concentrations must generally stay below 0.005 µg/L (rather than the more lenient current standard of 0.012 µg/L) to assure that fish tissues stay below 0.3 mg/kg,[61] the numeric water quality standard for mercury should be lowered in the next triennial review. We recommend that the TMDL and its implementation plan be designed to easily incorporate this more stringent future standard.

D. The TMDL should account for point source contributions from stormwater NPDES phase II permits, which could significantly alter the balance between point and nonpoint contributions.

The draft TMDL estimates that just 2% of the mercury in state waters comes from a point source; the rest comes from emissions into the air that are eventually deposited into water, either directly or indirectly, as through stormwater runoff. That statement, although well meant, merges two unrelated concepts: where the mercury is originally released, and whether it passes through a point source. For example, mercury discharged from a wastewater treatment plant is not likely to have started at the plant. It is far more likely to have passed through that point source from someplace else – say, from a dentist's office, down a drain into the sewer system. Similarly, while a great percentage of the mercury reaching North Carolina's waters falls onto the state from the air, some of that also comes through a point source discharge – any mercury carried through a municipal separate storm sewer system (MS4) is being discharged from a regulated point source under the federal Clean Water Act.

pollutant. The court agreed, holding that "the CWA's plain text" forecloses the view that a TMDL may target only certain uses or criteria (225-26)."The term water quality standard encompasses all designated uses of a water body and all water quality criteria that define pollutant levels necessary to protect those uses" (227-28).

[58] US EPA, *TMDLs Where Mercury Loadings Are Predominately From Air Deposition*, at 4 (2008) [hereinafter EPA Mercury TMDL Guidance] (a*vailable at* www.epa.gov/owow/tmdl/pdf/document_mercury_tmdl_elements.pdf).

[59] NC Draft TMDL, at 28.

[60] Sackett et al., *supra* note 50, at 1601 ("Due to the relatively large amounts of particulate and oxidized Hg released from coal-fired power plants and their rapid local deposition rates, water bodies close to coal-fired power plants are expected to receive greater atmospheric Hg deposition than systems farther away").

[61] NC Draft TMDL, at 28.

It is well-established in North Carolina that an MS4 can be held responsible for a pollutant that comes to the MS4 through aerial deposition. Aerial deposition is a major driver of nitrogen pollution in the state's water. In nutrient sensitive watersheds, packages of nutrient management rules include targets for control of nitrogen in stormwater from both new and, in some cases, existing development. That includes not just the nitrogen generated by activities on a property (such as spreading of lawn fertilizer), but all nitrogen that washes off the property when it rains. From both a practical and a legal perspective, mercury should be treated similarly. That does not necessarily mean that the task of controlling mercury should be placed on the shoulders of the MS4s. Almost certainly, controls can be achieved more cheaply and efficiently by the original air emitters, through the maximum reductions envisioned by the 2006 North Carolina state mercury rule.

Yet, local governments do have several options to promoting greater retention and management of water onsite. For example, local governments can adopt a total volume control standard for new development, requiring that post-development flow (including whatever loadings wash off a site) must approximate the pre-development runoff profile of the site. Local governments can, through regulation, incentives, or capital financing programs, encourage greater rainwater capture and water reuse. To the extent that certain best management practices can be identified that help capture mercury, local governments can build those into development standards and ongoing retrofit efforts.

Over time, if mercury is not released through stormwater or to the sanitary sewer system, it will accumulate on-site. Ultimately, the solution must be to minimize all mercury emissions and prevent its build-up in the environment generally, whether on land or in the water. But, Clean Water Act requirements for control of pollution in point source stormwater discharges provides a legal mechanism to move at least one step back from the endpoint water bodies towards the original sources.

We recommend that the final TMDL acknowledge the distinction between the original agent by which mercury is introduced into the state (air transport, specific streams of commerce, combustion or scrubber residue) and the question of whether it passes through a point source or not before it reaches fish tissue. Both breakouts may offer useful inspiration for reduction strategies. To simplify, for the calculation of point versus nonpoint contributions, we recommend that the statewide TMDL attribute a rough percentage of the total loading to stormwater, based on the percentage of the overall area of the state contained in MS4s. DWQ and the EMC can leave the assessment of particular MS4s for the follow-on analyses of individual watersheds recommended below.

E. The EMC should approve a modified statewide Mercury TMDL now, with a commitment to modeling and follow-on watershed-specific TMDLs.

We argue above that the draft TMDL has a number of shortcomings; we believe they can be addressed without delaying the adoption and implementation of the TMDL. Given the urgency of curbing mercury contamination, and the fact that mercury levels in the environment appear to respond well to source reductions, there are good reasons to move forward now, finalizing a version of the draft TMDL while committing to steps that will provide additional targeted protection over time. Specifically, we recommend that the EMC approve the draft TMDL with these modifications:

- The final statewide mercury TMDL should provide for another round of statewide modeling using the CMAQ 5.0 model, which has a much greater capacity to predict hot spots around and immediately downwind from local sources of mercury emissions.

- Watersheds with water bodies that are predicted to exceed the EPA fish tissue criterion of 0.3 mg/kg, and where specific local sources appear to account for a larger than average share of mercury loading, should be excluded from the final statewide TMDL. That is, when EPA approves the statewide TMDL, these watersheds should remain in category V, 'impaired', on the 305(b) list of all the state's waters, and require site-specific TMDLs. There is a precedent for this: Minnesota's mercury TMDL, approved by EPA in 2007, excluded waters that would not meet water quality standards purely on the basis of the reductions called for in that TMDL, and required those waters to receive site-specific TMDLs.[62]

- The final TMDL should commit DWQ and the EMC to develop watershed-specific TMDLs for each of the excluded watersheds, taking account of deposition from local sources, NPDES stormwater point source discharges, and compliance with the water column standard. These site-specific TMDLs should provide for monitoring of both water and fish tissue levels.

- We recommend that all watersheds – both those under and those excluded from the statewide TMDL – be subject to the proposed implementation plan and the nonpoint source options (that is, whatever initiatives emerge as part of a comprehensive statewide plan to reduce mercury contamination). Statewide efforts will benefit excluded watersheds as well; those efforts are necessary but not sufficient for the excluded watersheds to return to compliance with water quality standards and their designated uses.

- The final statewide TMDL should also explain how the state will identify watersheds that are backsliding and respond promptly to them. For example, consider a watershed whose mercury load is not dominated by deposition from local sources. Under our approach, it is covered under the statewide TMDL and moved to category IV, subject to the state implementation plan, but without a site-specific TMDL. Imagine, then, that an air emissions source opens just across the state line in South Carolina or Tennessee, and the local source promptly dominates the loading of mercury in the watershed. The final TMDL should explain the modeling protocol and triggers the state will use to decide when such a watershed should be flipped out from under the statewide TMDL and into a category requiring a site-specific analysis. Again, we recommend that the monitoring and the trigger address not just fish tissue concentrations, but also water column concentrations, and also maternal blood levels, where available, as the variable most directly tied to an outcome of concern.

In passing, we note that these recommendations are a logical outgrowth of provisions in the draft TMDL. For example, the draft TMDL states that fish tissue concentrations "will be continually monitored and evaluated" and that if "locally elevated fish mercury concentrations due to local point sources" are detected, then DWQ will take action including additional permit limits and the development of site-specific mercury TMDL.[63] This statement is vague and lacks an explanation of how DWQ will choose sites to monitor or develop monitoring plans, and does not identify thresholds for future action. The approach we recommend provides greater specificity while responding to the same underlying concern.

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[62] Minnesota Pollution Control Agency, *Implementation Plan for Minnesota's Statewide Mercury Total Maximum Daily Load*, October 2009, at 5. Although phrased differently, the concept is the same. Minnesota exclusion is intended to require site-specific analysis for every water body where the basic statewide plan will not be adequate. The intent of the recommended exclusion in North Carolina is the same, but if phrased to same way, would also require site-specific TMDLs where local sources are not a significant driver – it's all global – but that will not be returned to compliance under the statewide implementation plan. That is inefficient, since the state has no additional tools to clean up those watersheds. Our recommended exclusion focuses site-specific work in North Carolina where it can make a difference.

[63] NC Draft TMDL, at 65.

3. Comments on the Mercury Post-TMDL Permitting Strategy

The Mercury Post TMDL Permitting Strategy outlines a plan for achieving the waste load allocations (WLAs) derived in the TMDL. We offer two comments on this document.

A. The permitting strategy should be submitted to EPA along with the mercury TMDL.

DWQ has traditionally taken the position that while the permitting strategy is developed at the same time as the TMDL, it does not need to be submitted with the TMDL for EPA approval. Nonetheless, EPA cannot fully assess the adequacy of a TMDL without an indication of the permitting strategy the state will pursue. Every TMDL involves choices – scientific assumptions, model selection, questions of how to handle uncertainty. Those choices can result in a TMDL that cannot support or guide certain permitting or implementation strategies. For example, to the extent that the mercury TMDL does not account for the contribution of aerial deposition through stormwater runoff from MS4s, the TMDL cannot serve as a basis for components of an implementation strategy that involve MS4s. The TMDL may not be scientifically flawed in any way that is visible on a reading of the document; to spot the mismatch between the TMDL and the implementation plan, EPA must have the implementation plan on hand to review alongside the proposed TMDL.

In the interests of efficiency and effective EPA review, we recommend that the state share the Permitting Strategy with EPA when it submits the draft Mercury TMDL for approval.

B. *The implementation plan based on the proposed statewide TMDL should be approved and implemented.*

Under the water implementation plan, two facilities (Davidson River Partners and Progress Energy's Asheville plant) with very high mercury levels in their wastewater will have to reduce their discharges. That will benefit everyone who lives, visits, or eats fish from the French Broad River, in North Carolina and downstream. The EMC should move now to approve the water implementation plan as an interim step, so the state can require these reductions.

Conclusion

Although it was offered for public comment at the same time, we understand that the draft Mercury Reduction Options for Nonpoint Sources remains open for continued public comment. We hope to submit more detailed comments on that document in the near term. However, we will say at this stage that we strongly support option 1 (development of a comprehensive mercury reduction strategy) and option 2 (petitioning the federal government to require upwind states to curb their mercury air emissions). Both of those steps are consistent with the recommendations we offer above that the EMC approve a modified statewide TMDL with provisions for further site-specific analysis. Equally strongly, we recommend that the EMC not pursue options 3 – 7, each of which entails some form of trading or offsets, and would allow total mercury emissions to remain higher than technically necessary.

We appreciate the opportunity to comment on the draft Mercury TMDL and the draft Mercury Post-TMDL Permitting Strategy. Thank you for considering these comments.

Sincerely,

Grady McCallie
Policy Director
North Carolina Conservation Network

June Blotnick
Executive Director
Clean Air Carolina

Kelly Martin
North Carolina Campaign Representative
Sierra Club

Sam Pearsall
SE Regional Manager for Land Water & Wildlife
Environmental Defense Fund

Julie Youngman
Senior Attorney
Geoff Gisler
Staff Attorney
Southern Environmental Law Center

Kathleen Hundley
Vice President
Rocky River Heritage Foundation

Willa Mays
Executive Director
Appalachian Voices

NC LEAGUE OF MUNICIPALITIES

215 North Dawson Street
Raleigh, NC 27603
Post Office Box 3069 | 27602-3069
919-715-4000 | fax: 919-733-9519
www.nclm.org

To: Jing Lin, Modeling and TMDL Unit
From: Erin Wynia, Legislative & Regulatory Issues Manager
Re: N.C. Draft Mercury TMDL and Draft Post Mercury TMDL Permitting Strategy
Date: June 15, 2012

Dear Ms. Lin,

The NC League of Municipalities is a membership organization of over 550 N.C. municipalities and affiliate organizations, many of which hold NPDES permits that allow them to discharge wastewater and stormwater in accordance with the federal Clean Water Act and its associated federal and state laws and regulations. The League's member cities, towns, and affiliates therefore have interest in the contents and effects of the "N.C. Draft Mercury TMDL," dated April 2012, and the "N.C. Draft Post Mercury TMDL Permitting Strategy," dated April 18, 2012.

League members uphold a central tenet of environmental stewardship, as stated in the member-adopted Core Municipal Principles: "Local governments are partners with state and federal agencies in protecting the environment and quality of life for our citizens." Cities and towns understand their responsibility in ensuring the highest possible water quality in their communities. Therefore, they allocate extensive staff time and public financial resources to activities that protect water quality in an efficient manner based on sound science.

On behalf of the League's members, I appreciate the opportunity to provide feedback on the draft Total Maximum Daily Load (TMDL) and permitting strategy, and we look forward to working with you on the concerns raised below.

Respectfully submitted,

Erin L. Wynia

Erin L. Wynia
Legislative & Regulatory Issues Manager
ewynia@nclm.org
(919) 715-4126

Statewide Mercury Listing & TMDL Approach

As a threshold matter, League members object to the statewide listing of mercury that led to this TMDL, as indicated in related comments on the 2012 Draft 303(d) list, submitted March 12, 2012 (Attachment 1).

In general, those comments reflect a concern that the TMDL process is poorly suited to address a water quality problem resulting from atmospheric deposition of a globally-generated contaminant. League members have serious concerns with the determination that all waters in North Carolina are impaired for mercury and the supporting assessment methodology used by the N.C. Division of Water Quality (DWQ) to make the decision. League members that hold National Pollutant Discharge Elimination System (NPDES) permits regulating their wastewater discharges face further regulation as a result of the inclusion of a statewide mercury listing on this 303(d) list. Therefore, they have an acute interest in assuring that this listing was made on a sound analytical basis. Based on the limited information available to them regarding this listing, League members continue to maintain that a statewide listing of all water segments in North Carolina as impaired for mercury is erroneous.

In light of the sources of error identified in the March 12, 2012, comments, League members strongly recommend that DWQ postpone adoption of a statewide TMDL for mercury until the process used to determine statewide impairment for mercury is revisited. Possible alternatives to this TMDL approach identified earlier by the League include de-listing all the state's waters for mercury impairments in favor of listings based on site-specific data. Such site-specific listings would avoid the scientifically-dubious approach of naming all waters as impaired for mercury based on a fish consumption advisory that was given pursuant to different analytical methods than those used by DWQ when evaluating the health of individual water body segments.

Another alternative identified by the League and allowed by the U.S. Environmental Protection Agency (EPA) is a 5m categorization of the state's waters for mercury, which would allow DWQ to focus its efforts on the programs already in place in North Carolina to reduce mercury emissions. This approach makes more sense when the vast majority of mercury in the state's waters – 98% by DWQ's estimate – comes from air emissions rather than direct discharges into waters.

This approach could also allow DWQ, by relying on programs such as the Clean Smokestacks Act to reduce mercury emissions, to avoid allocating a point source load on mercury discharges from point sources. Because the point source load acts as a cap, it could prohibit future economic development if the new discharge would exceed the point source load. From a policy perspective, the potential to harm the state's fragile economy over a de minimus source of mercury in waters does not make sense.

Draft Post Mercury TMDL Permitting Strategy

Notwithstanding the general objection to development of a statewide TMDL, the League submits the following comments on the "Draft Post Mercury TMDL Permitting Strategy."

1. **The League supports the decision to not include municipal stormwater NPDES permit-holders in the TMDL permitting strategy.** While most of the mercury making its way to N.C. waters comes from air deposition, via stormwater discharges, the League agrees with DWQ that the appropriate place for regulation is the source of air emissions, not the vehicle ultimately carrying the emissions to the state's waters (stormwater).

2. **The League supports the strategy's use of mercury minimization plans for point sources.** The draft TMDL in Section 6.5 recognizes that wastewater discharge point sources contribute an extremely small proportion (2%) of the total mercury loadings to the waters of the state and that significant decreases in mercury loading will require reductions in atmospheric deposition. Further, the permitting strategy acknowledges that point source dischargers have already achieved significant reductions in mercury discharges in recent years. Accordingly, the TMDL indicates that mercury reduction from point sources "will be accomplished primarily through mercury minimization plans (MMPs) as needed and ancillary efforts that reduce point source particulate loading (e.g., phosphorus controls, biochemical oxygen demands (BOD) and total suspended solids (TSS) reductions, etc.)."

   The League agrees that an MMP is an appropriate mechanism for addressing point source mercury discharges, and League members support use of that regulatory tool in the TMDL instead of numeric permit limits. Stringent numeric limits on point sources would accomplish little or nothing to improve water quality. In contrast, implementation of MMPs allows the point sources and DWQ to focus on taking real, practical steps to minimize these mercury discharges, in an iterative process, without posing any significant impacts to water quality or to mercury levels in fish tissue.

3. **League members support revision of the permitting strategy to allow adjustment of permit limits for water segments where attainment of water quality standards can be demonstrated.** The TMDL as written contains no procedures for de-listing an individual stream segment based on site-specific analysis. So unless DWQ were to de-list all of the state's waters for mercury, point source dischargers have no ability to request a change their permit limits in light of data showing a water segment is not impaired for mercury. Therefore, the permitting strategy should include a provision to adjust permit limits upon submission of approved data that demonstrates a specific water segment is not impaired.

4. **The Level Currently Achieved feature is unnecessary and should be omitted.** In general terms, the permitting strategy appropriately proposes to assess each point source discharge by performing a reasonable potential analysis, and when the discharge could result in an exceedance of the state's water quality standard, imposing a water quality-based effluent limitation (WQBEL). This process follows standard NPDES permitting practices.

   However, the permitting strategy goes a step further and inappropriately proposes use of an additional, ad hoc standard – the Level Currently Achieved (LCA). The LCA, which is a concentration value, is apparently intended to establish a cap on WQBELs. The League is opposed to the proposed use of this additional, ad hoc standard for the following reasons:

   a. The LCA functions as a water quality standard and has not been duly promulgated in accordance with N.C. Administrative Procedures Act.

   b. Application of the LCA will result in stringent numeric limits on point sources when the reasonable potential analysis process would otherwise allow a higher WQBEL due to factors such as dilution in the receiving stream.

   c. The cost of imposing the LCA on point source dischargers has not been assessed.

   d. The reasonable potential analysis process for determining WQBELs already contains inherent layers of conservative assumptions that result in stringent limits. Therefore, the resulting permit limit yielded through this process should be sufficient to control mercury discharges while not resulting in water quality impairments.

   e. A de facto cap on point source dischargers could potentially interfere with the economic development prospects for a particular area. As argued above, for a TMDL based on a tenuous scientific grounding that affects a de minimus source category in comparison to the overwhelming larger source category of air emissions, imposing a cap will likely never realize the desired water quality benefit to the state's waters. It could, however, impose very real costs without a corresponding benefit. Without these extra costs, systems can use existing revenue to comply with other permit terms and re-invest in their system infrastructure. Any of those alternative activities would surely yield more tangible improvements in water quality than compliance with the LCA.

Attachment 1: NCLM Comments on Draft 2012 303(d) List

To: Jennifer Everett, Modeling and TMDL Unit
From: Erin Wynia, Policy Analyst
Re: Draft 2012 N.C. 303(d) List
Date: March 12, 2012

Dear Ms. Everett,

The NC League of Municipalities is a membership organization of over 550 N.C. municipalities and affiliate organizations, many of which hold NPDES permits that allow them to discharge wastewater and stormwater in accordance with the federal Clean Water Act and its associated federal and state laws and regulations. The League's member cities, towns, and affiliates therefore have interest in the contents and effects of the "Draft 2012 N.C. 303(d) List," dated February 12, 2012.

League members uphold a central tenet of environmental stewardship, as stated in the member-adopted Core Municipal Principles: "Local governments are partners with state and federal agencies in protecting the environment and quality of life for our citizens." Cities and towns understand their responsibility in ensuring the highest possible water quality in their communities. Therefore, they allocate extensive staff time and public financial resources to activities that protect water quality in an efficient manner based on sound science.

Throughout these activities, League members have formed many good working relationships with you and other Division of Water Quality (DWQ) staff members. These comments are offered in the spirit of strengthening these relationships to yield an open, transparent, and analytically sound 303(d) listing process. On behalf of the League's members, I appreciate the opportunity to provide feedback on the draft list, and we look forward to working with you on the concerns raised below.

I am available at either ewynia@nclm.org or (919) 715-4126. Thank you for the opportunity to provide these comments.

Respectfully submitted,

Erin L. Wynia

Erin L. Wynia ewynia@nclm.org
Policy Analyst (919) 715-4126

303(d) Listing Process Improvements

League members are very encouraged by the N.C. Environmental Management Commission's (EMC) plans to institutionalize oversight of the 303(d) listing process, as announced at the March 8, 2012, EMC meeting. That effort is supported by League members. The comments below suggest improvements for the 303(d) listing process and may be useful during the EMC discussion as well.

Decisions regarding placement of water body segments on the 303(d) list can have large implications for local governments. Those local governments who hold a National Pollutant Discharge Elimination System (NPDES) permit that allows them to discharge either wastewater or stormwater into a listed water segment potentially face further limitations on those discharges as a result of the listing. It is the experience of League members that permit limitations can increase the cost of wastewater treatment and disposal, and limitations can also require a further dedication of resources to stormwater program operations. Sometimes, these limitations result in dramatically increased operational costs.

Therefore, to better justify this increased dedication of public dollars to their environmental programs affected by 303(d) listings, League members support improvements that result in transparency and accessibility throughout the 303(d) listing process. Generally, such improvements would:

1. **Institute approval of water segment assessment methodology by the EMC.** The U.S. Environmental Protection Agency (EPA) describes "assessment methodology" as, "…[T]he decision process (including principles of science, statistics and logic used in interpreting data and information relevant to segment conditions) that a state employs to determine to which of the five integrated reporting categories a segment belongs." *Guidance for 2006 Assessment, Listing and reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, pg. 20 (July 29, 2005)*.

   Currently, DWQ determines its assessment methodology internally and then includes the methodology in its package for EPA review. This year, the explanation of assessment methodology provided for review on February 17, 2012, only includes cursory, general descriptions of the assessment methodology. With such short descriptions of the methods used to evaluate data and make listing decisions, regulated entities cannot easily discern the analysis behind a listing decision. Allowing for approval of water segment assessment methodology by the EMC would allow for a more public examination of this process and increase transparency of these regulatory decisions. It would also allow a longer window of time for examination of the assessment methodology than the current 30-day comment period affords interested parties.

2. **Allow the EMC to set policies for prioritization of segments.** With its 303(d) list submission requirements, EPA requires states to submit a priority ranking of water segments for TMDL

development. *40 CFR 130.7(b)(4)*. This ranking must include waters targeted for TMDL development within two years following submission of the list. Because the N.C. 303(d) listing materials do not include any policies to guide the prioritization of water segments for TMDL development, League members encourage the open discussion and approval of such a policy by the EMC. Such a decision would assist the regulated community in better forecasting the need to allocate resources for TMDL compliance.

3. **Make available the assessment methodology in advance of submission of the 303(d) list.** As explained above, with the package of materials accompanying this draft 303(d) list, the assessment methodology was made public on February 17, 2012. Therefore, the public had 25 days remaining in the comment period to review this description of the decision-making process that leads to a listing determination.

   Given the technical nature of 303(d) listing decisions, League members believe more time is needed for regulated entities to understand the analysis behind these regulatory actions. EPA also encourages advance availability of assessment methodology: "EPA strongly encourages states to submit their draft and current methodologies to EPA and to the public for review and comment (but not formal approval) well in advance of any deadline the state sets for submission of data and information." *Guidance for 2006 Assessment, Listing and reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, pg. 30 (July 29, 2005)*. Because North Carolina accepts data and information on a rolling basis, it should continually provide the public an updated document describing its assessment methodology.

4. **Publish explicit EMC-approved guidelines for water segment data collection and submission.** Currently, the guidance available to interested parties wishing to submit data to be integrated into the assessment process instructs parties to consult DWQ. While grateful for the open-door policy with DWQ, League members prefer a more transparent approach by which DWQ would publish EMC-approved guidelines with explicit instructions for water segment data collection and submission. Such guidelines would include, at a minimum, instructions for acceptable sampling techniques, sufficiency of data sets, and the process for data submission.

5. **Publish instructions for access to DWQ data sets and processes for data analysis.** Currently, DWQ bases most listing decisions on data it collects and analyzes itself. For regulated entities to understand how a water segment came to be placed on the 303(d) list, and for them to determine if they have additional information useful for a listing a decision, the DWQ-produced data must be easily accessible and understood. A thorough data set would include, at a minimum, information regarding the number of samples gathered for each water segment, when the samples were gathered, where the samples were gathered, and the methods used in

sampling. In addition to more accessible data sets, League members support the availability of clearly-described data analysis techniques to enhance understanding of the data underlying 303(d) listing decisions.

6. **Develop methods for regulated entities to obtain assistance.** League members understand that the capability of regulated parties to understand and analyze a complicated 303(d) listing decision varies widely. They support enhanced customer service tools for assistance to all parties potentially affected by listing decisions.

7. **Make available lists of all categories of waters.** For this comment period, DWQ made available its draft lists for all waters in categories 4 and 5 of the 303(d) list – the categories for impaired waters. However, the regulated community would benefit from seeing the categorization determinations for all water segments – categories 1-5 – along with the data supporting that decision. Because water segments may move from an unimpaired category to an impaired category in just two years, knowing a segment's categorization at all times may help affected parties to plan future allocations of resources.

8. **Provide formal public notice.** For this public comment period, DWQ provided notice through listservs and a press release. League members do not believe such notification adheres to the spirit of true public notice. There are few other government regulatory actions whereby an email to a self-selected group of recipients and a press release would be considered adequate public notice. Further, with such a complicated and technical topic as the 303(d) list, a 30-day comment period is too short to allow for thorough review. League members recommend that future 303(d) list comment periods follow more formal notice procedures, such as publication of the notice in the NC Register and allowance for a 60-day comment period.

Statewide Mercury Listing

League members that hold NPDES permits regulating their wastewater discharges face further regulation as a result of the inclusion of a statewide mercury listing on this 303(d) list. Therefore, they have an acute interest in assuring that this listing was made on a sound analytical basis. Based on the limited information available to them regarding this listing, League members maintain that a statewide listing of all water segments in North Carolina as impaired for mercury is erroneous.

One potential source of an error originates with the data supporting this listing decision. DWQ has stated that the statewide mercury listing determination resulted from a statewide fish consumption advisory issued by the N.C. Department of Health and Human Services (DHHS). So unlike most other listings, this statewide listing was based on data collection and analysis methodologies performed by

DHHS, not DWQ. League members are unclear about whether the DHHS data and methodologies adhere to DWQ's standards for making listing decisions. For example, DWQ follows EPA's advice to utilize the most-recent five-year period of time when assessing a water body for inclusion on this list. For this iteration of the 303(d) list, that five-year period is 2006-2010. However, the data referenced by DHHS in its public document explaining the mercury fish consumption advisory is 1990-2003. *Technical Health Effects of Methylmercury and North Carolina's Advice on Eating Fish, pg. 15 (2006) ("Mercury Concentrations in NC Fish Tissue Summarized by County 1990-2003.").* The draft 303(d) list and supporting materials offered do not explain this discrepancy in time periods.

Further, by applying the listing statewide, DWQ ignores the advice of EPA. In multiple guidance documents regarding 303(d) listings based on fish consumption advisories, EPA advises states to consider listing individual water segments. In an October 2000 memo authored by Geoffrey H. Grubbs and Robert H. Wayland, EPA recommends four criteria under which a fish consumption advisory should result in a 303(d) listing. One criterion limits the listing to circumstances in which "the data are collected from the *specific waterbody in question*" (emphasis added). And in a more recent guidance document, EPA recognizes that a statewide fish consumption advisory may not necessitate a 303(d) listing "unless there are segment-specific data…showing non-attainment…" *Guidance for 2006 Assessment, Listing and reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, pg. 62 (July 29, 2005)*. In this case, contrary to EPA's advice, DWQ listed every segment in the state.

Recommendation for statewide de-listing. It is possible that these missteps in listing methodology could constitute "good cause" for removal of this statewide listing for mercury. EPA considers "good cause" to include "flaws in the original analysis of data and information [that] led to the segment being incorrectly listed." *Guidance for 2006 Assessment, Listing and reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, pg. 58 (July 29, 2005)*. League members recommend that DWQ explore this reason for de-listing upon reconsideration of the data used to make this mercury listing.

Such a de-listing would not preclude listing individual segments when sufficient data exists to demonstrate impairment of that segment for mercury.

League members make this recommendation in lieu of another possible approach that has been suggested: removal of segments individually upon demonstration that fish tissue is not impaired. This approach seems counter-intuitive and wasteful of resources. In this instance, with a lack of segment-specific data to support the listing in the first instance, placing the burden of proving no impairment on the regulated parties is akin to a criminal defendant being asked to prove he did not commit a crime, while prosecutors offer no evidence upon which to support the charges. League members believe that if the state asserts a water segment is impaired for mercury, it should have the data and analysis to back up that contention.

Alternative recommendation for 5m categorization. If DWQ can successfully defend a statewide listing of all waters for mercury, then League members urge DWQ to consider an alternate 303(d) listing category allowed by EPA, called Category 5m. An EPA memo authored by Craig Hooks explains the principles behind this new category:

> EPA is recommending the voluntary approach for States that have in place a comprehensive mercury reduction program with elements recommended by EPA. These States may separate their waters impaired by mercury predominantly from atmospheric sources in a subcategory of their impaired waters list ("5m") and defer the development of TMDLs for those waters. A State using the 5m subcategory may also continue to defer the development of mercury TMDLs where the State is carrying out its mercury reduction program and demonstrates continuing progress in reducing in-State mercury sources.

Listing Waters Impaired by Atmospheric Mercury Under Clean Water Act Section 303(d): Voluntary Subcategory 5m for States with Comprehensive Mercury Reduction Programs, pg. 1 (March 8, 2007).

North Carolina appears to meet the general criteria for a category 5m listing. Most importantly, use of this listing option requires that a state have already implemented a comprehensive mercury reduction program. In North Carolina, that program is the Clean Smokestacks Act, passed by the N.C. General Assembly in 2002.

This landmark air quality law is relevant because DWQ estimates that 98% of mercury in N.C. waters comes from air deposition, with the largest sources being the same facilities targeted by the law. According to information provided by DWQ to the EMC in July 2011, this wildly successful program is expected to reduce in-state mercury emissions 72% from a 2002 baseline in the time period 2003-2016. In tandem with this projection, DWQ told the EMC in January 2012 that it estimates needing a 67% reduction of mercury from the 2002 baseline to remove the statewide mercury listing.

These figures show that with the existing Clean Smokestacks program already in place, North Carolina will soon exceed the required reductions for this listing without any additional strategies as a result of the statewide mercury listing. Therefore, League members recommend that DWQ at the very least consider utilizing this 5m listing option and forestall any further mercury reduction strategies pending the expected reductions from the Clean Smokestacks Act.

NORTH CAROLINA WATER QUALITY ASSOCIATION

NORTH CAROLINA WATER QUALITY ASSOCIATION

June 18, 2012

By Electronic (jing.lin@ncdenr.gov) and First Class Mail

Ms. Jing Lin
Environmental Senior Specialist
NCDENR
DWQ Planning Section
1617 Mail Service Center
Raleigh, NC 27699-1617

Re: Comments on Draft Mercury TMDL and Post TMDL Permitting Strategy

Dear Ms. Lin,

I am writing to convey the attached comments of the North Carolina Water Quality Association (NCWQA) on the referenced Mercury TMDL and Permitting Strategy.

The NCWQA comprises public water, sewer, and stormwater utilities statewide. Our members protect public health and the environment every day. Our members' facilities do not create mercury. Instead, they remove mercury from (1) surface waters through drinking water purification technologies, (2) municipal wastewater through advanced wastewater treatment, and (3) urban stormwater through programs to control mercury and other pollutants to the maximum extent practicable. While our members' facilities remove mercury through their varying treatment processes, the facilities were not designed specifically to remove mercury. Accordingly, any requirement to remove mercury to very low levels will be technically impossible and/or financially infeasible. Given the insignificant overall statewide point source loadings, any such requirement would not be warranted.

At the outset, we appreciate the Department's acknowledgement that point sources (municipal, industrial, and urban stormwater) are insignificant sources of the overall statewide mercury loadings. We further applaud the Department's efforts to impose reasonable regulatory requirements consistent with the insignificant nature of the point source loadings to this important problem. Nothing will be achieved by compelling public wastewater plants to expend huge sums in an attempt to manage a very small part of the overall point source contribution of two percent of the problem, especially given that our facilities do not create mercury loadings. Likewise, it is not necessary to constantly and exactingly seek to measure our two percent contribution to the problem, especially given the significant cost of the analytical methods being prescribed by DWQ. While we offer several clarifications and revisions below, we agree with the general premise of the TMDL that surface water dischargers play an insignificant role in the statewide mercury problem, and the real reductions must come from ambient (mostly out-of-state) source sectors.

We are pleased to see the significant atmospheric loading reductions which have been accomplished by the North Carolina point sources under DENR's air quality program. These are impressive reductions which should be taken into consideration as further controls are identified and implemented for these sources. It is important that the instate air sources have led the way in reducing their ambient loadings. However, the Department should ensure that out-of-state sources are doing their part before any further particularly burdensome requirements are placed on the remaining sources of instate ambient loadings.

Although the NCWQA disagrees with the Department's overly broad approach of classifying all North Carolina waters as impaired for mercury and the development of a Statewide mercury TMDL, we applaud the Department for its effort to address the mercury impairments issue. We are willing to support this regulatory effort, provided the Department adopts its proposed permitting strategy to include the refinements we suggest in our attached comments. With our revisions, we believe the strategy will address the insignificant point source mercury surface water discharges in an appropriate manner that will be protective of public health and the environment as well as acceptable to NCWQA members.

We appreciate the Department's consideration of the NCWQA's comments and remain available to discuss our comments at any time.

Sincerely,

for Chad Ham
Chair, NCWQA NPDES Committee

Attachment

C: NCWQA Members
Mr. Chuck Wakild
Mr. Jeff Poupart

NORTH CAROLINA WATER QUALITY ASSOCIATION

North Carolina Water Quality Association Comments

on the

Draft Mercury TMDL Document and Mercury Post-TMDL Permitting Strategy

Mercury TMDL Document.

Page 53, Section 6.4 Margin of Safety. The implicit margin of safety is based upon four different factors in this section. We believe any of these factors individually would provide an adequate margin of safety and that the combination of the four factors makes the MOS significantly overly protective and unnecessarily burdensome. Moreover, there are additional implicit margins of safety elsewhere in the document, such as the conservative (overestimation of) point source loadings as described in Section 6.1 (the point source loading "number is likely over-predictive.").

Accordingly, we suggest that the Department acknowledge that the margin of safety may be overly protective and that it can be revisited in the future if a less conservative (yet still legally adequate) MOS becomes desirable. For example, if point source loadings turn out to be slightly above two percent, a small reduction in the large MOS could readily offset any natural variability in the statewide point source mercury loadings.

Page 54, Section 6.5 Wasteload Allocation. Please revise the second sentence in the second paragraph as follows: "~~Although the contribution of stormwater to mercury loading is unknown, t~~The vast majority of mercury ~~from~~ in stormwater ~~that contributes to the impairment of these waters~~ originates from air sources and ~~should~~will be controlled accordingly."

We note that DWQ has characterized the statewide mercury stormwater loadings in Section 5.4 on page 48 (finding stormwater loadings of mercury to fall "within the range of mercury concentrations normally observed in rainwater."). Accordingly, the language above suggesting that the loadings are unknown is incorrect and should be deleted.

Page 55, second line. Change the word "tiny" to "insignificant" in describing statewide point source mercury loadings. We suggest that DWQ consistently use the term "insignificant" to describe statewide point source loadings in the document (rather than "small" (page 5), "tiny," (page 55) "low," etc.).

Page 56, Section 6.5 Wasteload Allocation. This section states that "All new or increased discharges will be required to stay below the statewide WLA." We believe this should say that all new or increased discharges will be permitted in accordance with the Permitting Strategy. Otherwise, readers might misinterpret this as a requirement to offset future point source loadings. Such an overly stringent requirement is completely inappropriate given the insignificant levels of point source mercury. Statewide point source reductions in mercury loadings clearly outpace contributions from new or expanded sources. Moreover, any insignificant increase in point source loadings on top of the insignificant baseline statewide levels, will be more than offset by the correspondingly massive ambient reductions that are being achieved. Thus, the document should be revised to clarify that new or expanded point source discharges to surface waters will be addressed pursuant to the permitting strategy.

For the reasons noted above, we also suggest that DWQ delete or revise the last paragraph in Section 6.5.

Page 57, Section 6.7 Daily Load. We recommend that the Department modify this section as follows:

"Because this TMDL addresses mercury accumulation in fish over long periods of time, annual loads are the only technically ~~more~~ appropriate approach for expressing mercury loading goals. Daily loadings simply cannot be shown to correlate to fish tissue concentrations. There are far too many variables at work to establish such a relationship. Therefore, the calculations and compliance with this TMDL are based on annual loads. However, in order to comply with current EPA guidance, the TMDL ~~is~~ also identifies ~~expressed as~~ a daily load for informational purposes."

Page 57, Section 6.8 Final TMDL. Revise this section as follows:

"As described in Section 6.4, a very conservative implicit MOS, based on several factors, is used for this TMDL, and therefore, it is not necessary to include an explicit MOS in the calculations."

Page 58, Table 6-2 TMDL Allocation Summary. We recommend that the Department add an asterisk to the "daily loads" columns in this table noting that the daily loads are shown for "informational purposes" only and that the reader should see the discussion of the appropriateness of implementing the annual loading goals in Section 6.7.

Sections 6.5 (Wasteload Allocation) and 6.8 (Final TMDL). These two sections should incorporate by reference the Final TMDL Permitting Strategy, as it is amended, consistent with our comments below.

Mercury Post TMDL Permitting Strategy

The Department has several regulatory options for addressing point source mercury loadings.

As we understand the Permitting Strategy, the Department intends to implement a two-part analysis to determine whether point sources will have mercury limits.

Facilities with current water quality-based mercury limits will retain those limits unless the 47 ng/L Technology-Based Effluent Limit ("TBEL") is more stringent, in which case the 47 ng/L will be imposed as an annual average concentration/loading limit. Similarly, facilities without mercury limits will undergo both a water quality standards compliance assessment for mercury as well as an evaluation of their compliance with the proposed 47 ng/L annual average concentration TBEL over the past five years. If either assessment results in the need for a limit, the appropriate limit (TBEL or WQBEL, whichever is more stringent) will be imposed.

We disagree with this approach.

We believe the optimum approach for municipal treatment plants (which remove, but do not create mercury) would be as follows:

Evaluate each major point source against the 12 ng/L water quality standard for localized impacts in relation to whether a water quality-based limit is necessary.

- The evaluation should use the 12 ng/L criterion as an annual average limit given its purpose of addressing aquatic life assimilation of mercury over extended periods of time (years) rather than protecting against short-term exposures. We would welcome the opportunity to discuss with the Department an appropriate reasonable potential methodology for mercury limits.
- If such a limit is warranted, the calculated limit should be put in the permit.
- The limit should be expressed as an annual average requirement given that short-term loadings do not correlate to fish tissue levels. See Section 6.7 of the TMDL.
- Further, we urge the DWQ to also specify that compliance with any such limit will be achieved through the development and implementation of a DWQ-approved Mercury Minimization Plan (MMP). An MMP approach to effluent limit compliance is the only realistic way for municipal facilities to reduce the already insignificant levels of mercury in their discharges.
- We agree that a four year schedule to develop and begin to implement the MMP is appropriate.
- Imposing any numeric mercury limits on point sources makes little sense to us, even where the 12 ng/L instream limit might be exceeded, except in effluent dominated streams. This is because most fish, particularly the larger predator fish upon which the consumption advisories are based, are non-sessile. Thus, while the instream mercury standard may be exceeded in a small area of a stream due to a point source discharge, it is highly unlikely that fish species that will be publicly consumed are resident there on an indefinite basis. Furthermore, our experience is that most people don't fish in proximity to our members' wastewater treatment plant outfalls. Thus, we urge DWQ to reconsider its approach to reasonable potential analysis and the establishment of effluent limits for mercury. In our view, if a limit must be imposed, it should be expressed as an annual average concentration. It should be implemented through an

MMP and compliance with the MMP should expressly establish compliance with the annual average mercury WQBEL.

- Imposing regulatory limits, particularly numeric effluent limits, on two percent of the problem is unnecessary in our view. Especially given that our treatment plants are not designed to remove mercury. Accordingly, we recommend a course of minimal regulation of point sources as long as the point source loadings remain an insignificant share of the overall loadings.

Finally, we don't think it makes any sense to impose limits on municipal facilities based upon an evaluation of the past five years against the proposed 47 ng/L "TBEL." If there is no localized water quality concern then why should we bother point sources with TBELs when they are collectively approximately two percent of statewide mercury loadings? We are really an insignificant part of the problem and should not be part of the solution (until there comes a time when slight differences in individual facility loadings matters on a statewide basis – which we don't think will be the case in our lifetimes). As an insignificant part of the problem, public facilities should not be subjected to the liabilities associated with traditional numeric effluent limits.

While we agree the 47 ng/L threshold is reasonably set, we just don't see the need for this exercise and the triggering of MMPs for these facilities given the overall insignificant mercury loadings from point sources, particularly where there is no localized water quality issue. Finally, we note that many facilities will have only taken one mercury sample each year as part of their priority pollutant scans. Thus, the TBEL evaluation may be inappropriately performed on one sample.

For these reasons we urge the Department to refine its Strategy consistent with the limit evaluation, development, expression, and implementation approach we outline above.

<u>Other Permitting Strategy Considerations</u>

<u>Monitoring for Mercury</u>.

<u>Method 245.7</u>. We ask that DWQ also authorize the use of method 245.7 (1.8 ng/L detection level) as an alternate to method 1631 (2 ng/L detection limit). Some facilities may find this equivalent method to be beneficial either in terms of accuracy or cost or both.

<u>Monitoring Frequencies</u>. Given the insignificant overall level of point source mercury loadings, we believe that facilities with local water quality-based effluent limits should monitor for the first two years at a frequency of quarterly. However, after characterizing the mercury loadings over that period, the monitoring should be reduced to either twice-per-year or annual. That would ensure 11-14 samples each permit cycle and that is more than enough in our view to measure an individual facility's insignificant contribution to the insignificant two percent overall point source loadings. Quite frankly, after the first permit cycle, the monitoring should be reduced to annually or solely with the priority pollutant scans.

For major facilities that do not have mercury limits we believe that monitoring for mercury as part of the priority pollutant scan requirement is appropriate.

Major Facilities Receiving New Limits.

Again, new limits for facilities should be based only on local water quality concerns and then be expressed (annual average) and implemented (through MMPs) as we outline above.

We agree that a four year schedule for developing and beginning to implement an MMP is appropriate.

New or Expanding Facilities.

We disagree with the suggested approach of imposing limits where "there is a potential for mercury to be in the discharge." This will mean mercury limits for every new or expanding POTW. This makes no sense given the larger perspective that the entire point source community is approximately two percent of statewide loadings.

We believe that new or expanding facilities should be permitted as suggested above – with the sole focus on local water quality standards compliance. If a limit is warranted, it should be expressed (annual average) and implemented (through compliance with an MMP) as we suggest above.

Modification of Existing Permit Limits.

Where the normal reasonable potential analysis shows that there is no longer any reasonable potential to exceed the 12 ng/L water quality-based limit, the limit should be removed and monitoring should revert to the priority pollutant scans.

Revisit the need for and expression of the State's 12 ng/L Water Column Limit for Mercury.

We urge DWQ to revisit the State's water column number for mercury and initiate a rulemaking to either remove it altogether in lieu of a whole body fish tissue concentration approach (which would dovetail with the fish consumption advisory approach). In the interim, DWQ should express the 12 ng/L limit as an annual average concentration. A water column mercury criterion is not required under State or Federal law. A fish tissue concentration criterion would fully satisfy federal and state law.

In the interim, expressing the12 ng/L as an annual average criterion makes much sense than imposing it as a short-term criterion. This is because when we are concerned about long-term fish tissue accumulation (over potentially many years).

Municipal Stormwater Discharges

We believe that MS4 permits should not impose any mercury-related requirements unless the receiving water has documented water column impairments for mercury. In such a circumstance, an MMP requirement for the MS4 system may be appropriate.

Again, a four year schedule should be provided to develop and begin to implement the approved MMP and compliance with the MMP should establish compliance with any mercury-related effluent limitation or condition in the permit.

We agree that the vast majority (if not all) reductions in mercury loadings in stormwater will be achieved through ambient point source controls rather than MS4 best management practices. MS4 BMPs , such as suspended solids and sediment controls, may yield some tangential mercury reduction, yet should not be relied upon to resolve the State's mercury impairment.

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Progress Energy

June 11, 2012

<u>Sent Via E-mail (Jing.Lin@ncdenr.gov)</u>
Ms. Jing Lin
North Carolina Division of Water Quality
1617 Mail Service Center
Raleigh, North Carolina 27699-1617

Re: Draft North Carolina Mercury TMDL
Draft Mercury Post TMDL Permitting Strategy
North Carolina's Mercury Reduction Options for Non-Point Sources

Dear Ms. Lin:

Progress Energy, Inc. is a regional energy company serving the Southeast region of the country. Progress Energy, Inc. is organized as a holding company that owns Carolina Power & Light Company, doing business as Progress Energy Carolinas, Inc. (PEC or the Company), a regulated electric utility operating in North and South Carolina that serves approximately 1.5 million homes, businesses and industries. On behalf of Progress Energy Carolinas, I offer the following comments on the subject documents regarding the draft North Carolina Total Maximum Daily Load (TMDL) for mercury in the state's waters.

Progress Energy Carolinas believes the determination that all waters in North Carolina are impaired for mercury is fundamentally flawed and the need for a statewide TMDL at this time is not substantiated. In a letter dated March 12, 2012, PEC submitted extensive comments (see Enclosure 1) addressing North Carolina's 2012 draft 303(d) lists and its Use Assessment Methodology. Those comments explain the Company's serious concerns with the assessment methodology used to make the determination that all waters in North Carolina are impaired for mercury. The Company strongly recommends that the process used to determine all North Carolina waters are impaired for mercury, including the Division of Water Quality's Use Assessment Methodology, be revisited and made available for public review and comment before a statewide TMDL for mercury is approved.

Notwithstanding our general objection to development of a statewide TMDL, the Company respectfully submits specific comments on each of the subject documents. The Company's detailed comments on the draft TMDL focus on the following key points:

- The assessment of mercury sources and trends is sound. However, the draft TMDL could be improved by including a more robust discussion comparing and contrasting the different global sources of anthropogenic mercury emissions.
- The water quality target is essentially *ad hoc*, has not been adopted in accordance with NC Administrative Procedures Act, and is inconsistent with the Mercury Assessment Criteria specified in the 2012 Use Assessment Methodology.
- DWQ's application of the selected water quality target as proposed is inconsistent with EPA's guidance and not representative of fish actually consumed by the public.

- PEC supports the use of mercury minimization plans for point sources given the relatively small contribution of mercury from point sources.
- The TMDL should be revised to include a detailed, specific adaptive implementation methodology.
- The TMDL and the companion Permitting Strategy should be revised to provide an off-ramp for dischargers to stream segments where use attainment can be demonstrated.

PEC also submits the following points for consideration in regards to the draft Post-TMDL Permitting Strategy:

- The Strategy should rely on mercury minimization plans to achieve any needed reductions from point source dischargers.
- The Level Currently Achieved is *ad hoc*, unnecessary and should be omitted.

Finally, options presented for further managing air mercury emissions in the state are generally unnecessary, due to the stringency of the Mercury and Air Toxics (MATS) rule, which applies to coal- and oil-fired electric utility units, and the Industrial Boiler Maximum Achievable Control Technology (MACT) rule, which applies to industrial coal- and oil-fired boilers. Both of these rules apply to existing and new sources, not only in North Carolina but throughout the U.S.

Draft North Carolina Mercury TMDL

The Divisions of Water and Air Quality (DWQ and DAQ, respectively) published for review and comment the draft North Carolina Mercury TMDL on April 27, 2012. PEC has reviewed the draft and submits the following comments.

The assessment of mercury sources and trends is sound. However, the draft TMDL could be improved by including a more robust discussion comparing and contrasting the different global sources of anthropogenic mercury emissions.

PEC agrees with the report's findings regarding estimates of in-state emission sources. The DAQ's mercury deposition modeling results are consistent with those of other, similar analyses performed by EPA and the Electric Power Research Institute (EPRI), and they confirm the relatively small (16 percent and decreasing) contribution from in-state sources. Again, the report correctly reveals that the vast majority of anthropogenically-emitted atmospheric mercury being deposited in North Carolina is coming from sources outside the U.S. PEC agrees with this conclusion and appreciates the fact that the DAQ recognizes the significant reductions in mercury emissions already accomplished by the state's utilities and the fact that they will continue to decrease over the next several years. Indeed, the state's coal-fired power plants are in the process of reducing their mercury emissions to the maximum extent possible in accordance with the federal MATS rule, which requires the installation of MACT.

The sections of the report discussing the air emissions of mercury and the air quality modeling performed by the DAQ correctly describe the international nature of the issue of atmospheric deposition of mercury. Natural sources of mercury account for 1/3 to 2/3 of total mercury emissions to the atmosphere, depending on the source of the estimate. Of the anthropogenic mercury to the air, current total emissions from electric utility units in the U.S. are estimated by EPA to be 29 tons per year, or approximately 1 percent of the global total. The draft TMDL report does a good job of comparing this relatively small total to the much larger amount of emissions from Asia (on the order of 1,100 metric tonnes). However, the report states that "Together, China, India, and the United States are responsible for 57 percent of the total estimated global anthropogenic emissions of mercury emitted into the air in 2005 (1097 out of 1921 tonnes)." Without the proper context regarding actual U.S. emissions, this statement may give the reader the impression that U.S. mercury emissions are a relatively high proportion of the total, when exactly the opposite is true. U.S. emissions are relatively low and will continue to decrease. PEC recommends that the report discuss the low magnitude of U.S. emissions and contrast the U.S. total with the order-of-magnitude larger emissions from China and India.

The water quality target is essentially *ad hoc*, has not been adopted in accordance with NC Administrative Procedures Act, and is inconsistent with the 2012 Use Assessment Methodology.

In Section 4.3.1, DWQ reviews various recommendations for fish tissue criteria for mercury made by various federal and state agencies. In Section 4.3.2, DWQ selects EPA's recommended human health criterion of 0.3 mg methylmercury/kg in fish tissue as the water quality target level for the TMDL. Section 4.3.2 also includes the following statement:

> "the fish tissue mercury target of 0.3 mg/kg would be **equivalent to a total mercury concentration target of 0.6 - 5 ng/l in surface waters**. Therefore, by meeting the target for this TMDL, the numerical water column criterion for total mercury in North Carolina (12 ng/l) will be met simultaneously."

The NC water quality criterion for mercury in fresh water is 0.012 µg/l [15A NCAC 02B .0211(3)(l)(ix)]. The adopted criterion is applicable to the water column. As acknowledged in Section 4.3.1, DWQ has not adopted a water quality criterion for mercury applicable to fish tissue. DWQ certainly has the authority to adopt a fish tissue criterion, but it may not exercise this authority in an ad hoc manner. DWQ must abide by the procedural requirements set forth in Section 303(c) of the Clean Water Act and Article 2A of the NC Administrative Procedure Act. In the absence of any other duly promulgated water quality criteria, PEC believes DWQ must use the adopted water column criterion for mercury as the water quality target for the TMDL.

In addition, the 2012 Use Assessment Methodology used by NC to assess impairment and identify state waters that require a TMDL (i.e. the "303(d) list") states that fish consumption advisories "were based on the NC Department of Health and Human Services (DHHS) consumption advisories developed using fish tissue data that exceed standards." DHHS's consumption advisory for mercury indicates fish safe to eat if mercury concentrations are less than 0.4 mg methylmercury/kg fish tissue. For 2012, DWQ concluded that "all 13,178 Waters in NC are in Category 5-303(d) List for Mercury due to statewide fish consumption advice for several fish species." In developing its advisory, the DHHS applies its "advisory action level" to all fish species. In contrast, the draft TMDL proposes to apply the "water quality target" to the 90th percentile of standardized-length largemouth bass. PEC is bewildered and perplexed by the seemingly subjective and inconsistent use of varying fish tissue criteria and how those various criteria are applied. DWQ's impairment decision was based on an advisory action level that NCDHHS applied to all species but its TMDL water quality target level is based on an EPA criterion applicable to one species.

DWQ's application of the selected water quality target as proposed is inconsistent with EPA's guidance and not representative of fish actually consumed.

DWQ proposes to apply the water quality target to the 90th percentile of standardized-length largemouth bass. As shown in Table 4-1 of the draft TMDL, largemouth bass had the highest mercury concentrations of the 19 species considered "most popular and most likely consumed" in eastern NC. In contrast, EPA (*Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, EPA 823-R-10-001) recommends the following:

> "if target populations consume fish from different trophic levels, the state or authorized tribe should consider factoring the consumption by trophic level when computing the average methylmercury concentration in fish tissue. To take this approach, the state or authorized tribe would need some knowledge of the fish species consumed by the general population so that the state or authorized tribe could perform the calculation using only data for fish species that people commonly eat."

In effect, DWQ's proposed application of the water quality target selected results in a considerably more stringent target than recommended by EPA. PEC recommends that the TMDL be modified such that the final water quality target, assuming it is based on fish tissue, must be applied to a trophic level weighted average of all fish species actually consumed.

PEC supports the use of mercury minimization plans for point sources given the relatively small contribution of mercury from point sources.

The draft TMDL in Section 6.5 recognizes that wastewater discharge point sources contribute an extremely small proportion (2%) of the total mercury loadings to the waters of the state and that significant decreases in mercury loading will require reductions in atmospheric deposition. Accordingly, the TMDL indicates that mercury reduction from point sources "will be accomplished primarily through mercury minimization plans (MMPs) as needed and ancillary efforts that reduce point source particulate loading (e.g., phosphorus controls, biochemical oxygen demands (BOD) and total suspended solids (TSS) reductions, etc)." PEC agrees that an MMP is an appropriate mechanism for addressing point source mercury discharges, and we support use of that regulatory tool in the TMDL instead of numeric permit limits. Stringent numeric limits on point sources would accomplish little or nothing to improve water quality. In contrast, implementation of MMPs allows the point sources, and the regulating agencies, to focus instead on taking real, practical steps to minimize these mercury discharges, in an iterative process.

The TMDL should be revised to include a detailed, specific adaptive implementation methodology.

Significant efforts have been made by federal and state agencies and other interested entities to better understand mercury's behavior in the environment. Nonetheless, many uncertainties remain including: (1) the relationship between the chemical state of mercury at issue, the conditions under which it occurs, and the resulting impacts on water quality/biota; (2) the relationship between point source load reductions and discernible water quality/ biota improvements; (3) the relative effectiveness of various regulatory options for reducing mercury loading; (4) the economic implications of regulating mercury discharges; (5) the benefits of local and state mercury reduction efforts; and (6) the relative costs and benefits of reductions from point and non-point source dischargers.

Given these complexities and uncertainties, not to mention the jurisdictional limitations NC faces in its attempt to deal with a multi-media and multi-jurisdictional issue like mercury within the confines of a regulatory program focusing exclusively on water, the TMDL process must include a well-articulated adaptive management method that will be used to periodically validate or revise the assumptions and requirements embedded in the TMDL. Without such a method, even the most proactive implementation efforts may fail or be misdirected.

EPA has defined adaptive management methods as follows:

> "[A] type of project management method where a facility chooses an approach to meeting the project goal, monitors the effectiveness of that approach, and then based on monitoring and any other relevant information, makes any adjustments necessary to ensure continued progress toward the project's goal. This cycle of activity is repeated as necessary to reach the project's goal."

PEC recommends that the TMDL identify specific milestones that will trigger formal review of the assumptions and requirements in the TMDL. Since these periodic reviews may trigger revisions to the TMDL, we also urge DWQ to explicitly account for the backsliding prohibition in the Clean Water Act by articulating the relevant backsliding exemptions in Sections 402(o) and 303(d)(4) and how they will be implemented in the review/revision process.

The TMDL should be revised to provide an off-ramp for stream segments where use attainment can be demonstrated.

As part of the NPDES permit requirements for PEC's generation facility located near Asheville, North Carolina (Asheville Plant or Plant), the Company has collected and analyzed fish tissue samples in the French Broad River adjacent to the Asheville Plant for several years (2004-present). Robust sampling in the French Broad River has been conducted upstream of the Plant (approximately 3.9 miles upstream), in the vicinity of the Plant's wastewater discharge, and downstream of the Plant (approximately 6.7 miles downstream). The sampling program was approved by DWQ.

These fish tissue data were evaluated and characterized in accordance with the EPA's recommended protocol, EPA 823-R-10-001, Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010, which provides for a trophic-weighted average. Fish tissue data collected over the last several years demonstrated the weighted-average fish tissue concentration was 0.19 mg of mercury/kg of fish tissue in the French Broad River segment identified above. This value is well below the "Applicable Water Quality Target" for this TMDL of 0.3 mg of methylmercury/kg of fish tissue as well as the Department of Health and Human Services threshold value of an average of 0.4 mg of mercury/kg of fish tissue.

In addition, the Company has conducted an extensive review of water column data for the same segment of the French Broad River. The review included EPA STORET data, both legacy and modernized; DWQ's Mercury Extension Study Data 2005-2006, the French Broad River Basin – Ambient Monitoring System Report January 2009 and results from DWQ's Random Ambient Monitoring Station (RAMS) program from 2007-2010. None of the water column data examined indicated impairment in the applicable segment of the French Broad River. In fact, the Company's review indicated that 1368 of the 1398 (97.85%) samples for low level mercury in the State's RAMS sampling statewide were below 12 ng/l. Similarly, 165 of the 169 samples in the French Broad River Basin (97.6%) were below the State's water column criterion of 12 ng/l.

Based on its experience at its Asheville Plant and the 10-mile segment of the French Broad River described above, PEC is convinced this segment of the river is not impaired when assessed using the NC water quality criterion for fresh surface waters, the NCDHHS fish consumption action level or the draft TMDL's "water quality target." For specific segments similar to this segment of the French Broad River where sufficient data are available and the data show full attainment with the segment's designated "best use," PEC strongly recommends that the draft TMDL include a mechanism that would provide for segment-specific determinations of attainment and exclude point source discharges to the segment from additional reduction requirements otherwise specified by the TMDL or implementation strategy.

Draft Mercury Post TMDL Permitting Strategy

The Strategy should rely on mercury minimization plans to achieve any needed reductions from point source dischargers.

The Strategy document acknowledges that point source dischargers are only responsible for 2% of overall mercury loading to surface waters in NC and have already achieved significant reductions over the last several years. The draft TMDL indicates that mercury reduction from point sources "will be accomplished primarily through mercury minimization plans (MMPs) as needed and ancillary efforts that reduce point source particulate loading (e.g., phosphorus controls, biochemical oxygen demands (BOD) and total suspended solids (TSS) reductions, etc)." PEC agrees that an MMP is an appropriate mechanism for addressing point source mercury discharges. Implementation of MMPs allows the point source discharger, and DWQ, to focus on taking real, practical steps to minimize mercury discharges from point sources.

The Level Currently Achieved is *ad hoc*, unnecessary and should be omitted.

In general terms, the Strategy document appropriately proposes to assess each point source discharge by performing a reasonable potential analysis and when the discharge could result in an exceedance of the state's water quality standard, to impose a water quality-based effluent limitation (WQBEL). However, the Strategy document inappropriately proposes use of an additional, *ad hoc* standard referred to as the Level Currently Achieved (LCA). The LCA, which is a concentration value, is apparently intended to establish a cap on WQBELs. PEC is opposed to the proposed use of this additional, ad hoc standard. for the following reasons:

- The LCA is an *ad hoc* standard that has not been duly promulgated in accordance with NC Administrative Act.
- Application of the LCA will result in stringent numeric limits on point sources that would accomplish little or nothing to improve water quality.
- The cost of imposing the LCA on point source dischargers has not been assessed.
- The process for determining WQBELs already contains inherent layers of conservative assumptions that result in stringent limits.

North Carolina's Mercury Reduction Options for Non-Point Sources

In association with the draft TMDL report, the DAQ published a discussion of options that may be considered in order to address the mercury air emissions from North Carolina facilities. The options document states that "The Department of Environment and Natural Resources (DENR) does not believe that the mercury reduction strategy requires additional mercury air emission reductions from existing industrial facilities in North Carolina," which is appropriate given that these sources are already subject to the previously-discussed regulations requiring maximum reductions.

Options presented for further managing air mercury emissions in the state are generally unnecessary

Overall, the options presented for further managing air mercury emissions in the state are generally unnecessary, due to the stringency of the MATS rule, which applies to coal- and oil-fired electric utility units, and the Industrial Boiler MACT rule, which applies to industrial coal- and oil-fired boilers. Both of these rules apply to existing and new sources, not only in North Carolina but throughout the U.S. These rules ensure that mercury emissions will continue to be minimized without the addition of new regulatory or administrative programs for these sources, which only account for a relatively small proportion of the issue. With this observation regarding air emissions management as a backdrop, PEC also has the following comments on each specific option.

Option 1

This option discusses the potential development of a statewide comprehensive mercury strategy, which may include measures to reduce mercury in the environment such as expanding the use of renewable energy, requiring the sorting and separation of mercury-containing materials, and encouraging the EPA to press for national and international action to address mercury emissions originating outside the state.

North Carolina Senate Bill 3 is a significant, landmark commitment to increasing the use renewable energy resources in the state. PEC does not believe that it is feasible or necessary to expand these requirements. To the extent that materials separation is feasible and cost-effective, PEC supports evaluation of this alternative. Finally, the MATS rule and the Industrial Boiler MACT ensure that U.S. coal- and oil-fired utility unit and industrial boiler emissions will be minimized for the foreseeable future, so additional action in the U.S. regarding air emissions of mercury is unnecessary. Because most of the air deposition issue originates from outside the U.S., encouraging additional international attention to this issue is appropriate.

Option 2

Option 2 considers filing a petition under Section 319(g) of the Clean Water Act to focus attention on sources of mercury air emissions located outside of North Carolina.

As discussed above, the federal MATS rule and the Industrial Boiler MACT ensure that out-of-state air emissions of mercury will be minimized to the maximum extent possible; therefore, such a petition is unnecessary and would serve only to increase the administrative burden on the affected states and the associated regulated community.

Option 3

Under Option 3, a statewide emission reduction credit program would be established, which would administer credits for emission reductions not required by state and federal rules. These credits could then be purchased by new or modified facilities to offset increases in emissions, similar to the way emissions increases for criteria pollutants are offset in nonattainment areas.

If implemented, this option would operate under a significant practical constraint, which is that the new source emissions standards under the MATS rule and the Industrial Boiler MACT are extremely stringent; indeed, many experts do not believe that they can be met on a consistent basis. Therefore, there are unlikely to be creditable emissions decreases beyond those required by federal rules.

Again, the regulation of mercury emissions from North Carolina and U.S. sources, which comprise a minor component of the issue, under federal programs is sufficient, and no additional air regulatory programs to reduce emissions are necessary.

Option 4

Under Option 4, the DAQ would establish a case-by-case technology evaluation as part of the permitting requirements for any new facilities or modifications to existing facilities resulting in increases in mercury emissions.

As discussed previously in these comments, the federal MATS rule and the Industrial Boiler MACT require the installation of MACT pollution controls on existing, new and modified sources, and the new source emission limits are very challenging to meet. These regulations, as a practical matter, force case-by-case technology evaluations in order to design new and modified facilities that will comply with the requirements of the applicable federal standard; therefore, PEC believes that a supplemental technology evaluation requirement at the state level is unnecessary.

Option 5

Implementation of Option 5 would establish a cap-and-trade program that would apply to existing facilities and any new facilities. A statewide cap on mercury emissions would be established and existing facilities would be assigned an allocation of emissions.

Again, as discussed earlier in this letter, the federal MACT regulations of utility and industrial boiler emissions already require the maximum reduction of mercury emissions that is technically feasible from both existing and new sources. A cap-and-trade program in addition to these requirements would be an unnecessary administrative burden on both the DAQ and the regulated community with no additional benefit, particularly in light of the fact that North Carolina sources provide a relatively small contribution to the deposition of atmospheric mercury. PEC urges the DAQ to rely on the federal technology-based regulatory programs and not to establish an additional and unnecessary state cap-and-trade program.

Option 6

Option 6 describes an initiative under which a new facility emitting mercury would fund an energy efficiency project in the community that would result in less electricity demand, such as the installation of solar panels on a commercial property.

Through Senate Bill 3, North Carolina has established requirements applying to the state's electric utilities for increasing the development and use of renewable energy resources and energy efficiency. Should the DAQ decide to pursue the program outlined in Option 6, PEC requests that the state's electric utilities be exempted from this additional requirement.

Option 7

Option 7 would establish, through legislation, a mercury mitigation fund that would be used to implement energy efficiency and renewable energy projects.

Although the implementation of this option would be in addition to the increasing renewable energy and energy efficiency targets contained in Senate Bill 3, PEC does not necessarily oppose it, depending on details such as the size of the fund and the mechanisms to provide the necessary funding.

PEC appreciates the opportunity to provide comments on this extremely important regulatory initiative. Please do not hesitate to contact me at (727) 820-5153, Mick Greeson at (919) 546-5438 or Mike Kennedy at (727) 820-5567 if you have any questions.

Sincerely,

Michael Olive
Director, Environmental Services

cc: Ms. Joelle Burleson, Division of Air Quality

Enclosure

Enclosure – Letter from Michael Reid to Jennifer Everett dated March 12, 2012

Progress Energy

March 12, 2012

Sent Via E-mail (jennifer.everett@ncdenr.gov) and U.S. Postal Service
Jennifer Everett
NC Division of Water Quality
Planning Section
1617 Mail Service Center
Raleigh, NC 27699-1617

RE: Comments on the North Carolina 2012 Use Assessment Methodology and Draft 303(d) Lists

Dear Ms. Everett:

Progress Energy is a regional energy company located in the Southeast region of the United States providing electricity to more than three million customers. Progress Energy is organized as a holding company that operates regulated utilities in the Carolinas and Florida. The Company owns and operates more than 25,000 megawatts of electrical generating capacity with more than 11,000 megawatts of that capacity located in North Carolina (NC). Many of the Company's NC generating facilities have been issued wastewater and/or storm water discharge permits and will be potentially affected by the assessment methodology and the resulting list of impaired waters.

On behalf of these operations, I am writing to provide comments on the NC 2012 Use Assessment Methodology and the draft 303(d) lists. Our comments for the draft 303(d) lists focus on mercury and include an explicit request for removal of specific waterbodies from the draft list.

2012 Use Assessment Methodology

I. The Use Assessment Methodology should be made available for public review and comment prior to the release of the draft impaired waters list.

The 2012 Use Assessment Methodology was not made available for public review until February 2012. The Methodology sets forth certain factors considered in assessing impairment of NC's waters, and it is of fundamental importance that it be issued for public review and comment well before the draft impaired waters list is published. Posting the Methodology concurrently with the draft impaired waters list, as was done for the 2012 listings, essentially denies the public any meaningful opportunity for input and renders the review process as perfunctory. Progress Energy strongly recommends that NCDWQ develop an explicit schedule and process for commenting on the 2014 Use Assessment Methodology and draft impaired waters list.

II. The Use Assessment Methodology should be explicit in describing the actual data sets used for assessments and where the data can be accessed by the public.

The Methodology briefly describes a broad set of possible data sources. However, the Methodology does not reveal which data is actually used in performing impairment assessments nor does it inform the public of how that data could be accessed and reviewed. To ensure transparency and increase confidence in the conclusions from impairment assessments performed, more information about the data used or excluded, should be provided as a part of the overall development process for the 303(d) listings.

III. The Fish Consumption Assessment Methodology is fundamentally flawed and should be omitted.

The Fish Consumption Assessment Methodology essentially depends on *ad hoc* targets developed by the NC Department of Health and Human Services (NCDHHS). The use of statewide fish consumption advisories developed by the NCDHHS effectively circumvents the standards-setting and review process established in §303(c) of the Clean Water Act. Impairment decisions should be based solely on duly promulgated water quality criteria. For narrative criteria, only duly adopted translator procedures should be employed.

A similar concern is that when fish consumption advisories developed by NCDHHS are used for impairment decisions, many of the factors established in the Use Assessment Methodology are potentially circumvented. For example, the Methodology specifies that the "data window/assessment period" for the 2012 assessment included data collected during the period 2006 through 2010. Whether or not NCDHHS also uses recent data per the period specified in the Methodology is unknown. This is a critical issue for pollutants that have been the focus of extensive and expensive abatement efforts.

IV. If the Fish Consumption Assessment Methodology is retained; it must be modified.

A. The basis for the fish consumption advisories should be transparent.

The NCDHHS has posted a document on its website titled "Technical Health Effects of Methylmercury and North Carolina's Advice on Eating Fish." The document is dated 2006 and according to footnotes contained in the document, uses fish tissue data collected from 1990 through 2003 [Footnote (g): Mercury Concentrations in NC Fish Tissue Summarized by County 1990-2003. Requested by Dr. Luanne K. Williams with the North Carolina Division of Public Health. Prepared by Mr. Mark Hale with the North Carolina Division of Water Quality"]. However, for the 2012 assessment, no information has been provided about the quality or age of the fish tissue data used. Based on information recently presented by NCDWQ, mercury air emissions were reduced by 65% from 2003 to 2010. This reduction should have had a profound impact on fish tissue data. Further, no information is provided regarding the statistical methods or interpretation employed. EPA strongly recommends that such statistical interpretations be fully explained and included in 303(d) use assessment/listing methodologies, especially if the interpretation becomes the primary basis for listing decisions. No such explanation is provided in the 2012 Use Assessment Methodology. An impaired water designation has potentially severe implications for electric utility dischargers. These implications can include more stringent discharge limitations, significantly increased capital and O&M costs, and higher rates for our NC customers. Accordingly, NCDWQ should provide access to the specific data and the statistical data evaluation that support impairment decisions.

B. Fish consumption advisories should be employed for impairment decisions only for water bodies for which segment-specific data justify the advisory.

In its *Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act,* EPA clearly discourages the use of fish consumption advisories as a basis for impairment decisions without segment-specific data. Progress Energy recommends that impairment decisions based on fish consumption advisories be avoided unless there is segment-specific data to the support the advisory.

V. The Mercury Assessment Criteria is flawed and should be modified.

As stated above, impairment decisions should be based solely on duly promulgated water quality criteria. For mercury, 15A NCAC 02B .0211(3)(l)(ix) specifies that the freshwater criterion is 0.012 μg/L. The narrative describing the Mercury Assessment Criteria appropriately acknowledges this criterion and explains how it is used in assessing impairment. For the reasons described above, the portion of the Criteria that addresses the statewide mercury fish consumption advice should be deleted.

<u>2012 Draft 303(d) List</u>

VI. The 2012 Draft 303(d) inappropriately lists "all 13,178 Waters in NC" as impaired for mercury.

Progress Energy has provided extensive, multi-year fish tissue data (see Enclosure 1 – Letter from Michael Reid to Coleen Sullins dated August 15, 2011) from a ten-mile segment of the French Broad River that provided "good cause" per 40 CFR Part 130.7(b) for removing or "delisting" the segment from the state's 303(d) List / Integrated Report List. The data submitted had been evaluated and characterized in accordance with the EPA's recommended protocol, EPA 823-R-10-001, Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010, which yields a trophic-weighted average. The fish tissue data showed that the trophic weighted-average fish tissue concentration was 0.19 mg of mercury/kg of fish tissue in the French Broad River segment identified above. This value is well below the EPA Tissue Residue Criterion of 0.3 mg of methylmercury/kg of fish tissue as well as the NCDHHS threshold value of an average of 0.4 mg of mercury/kg of fish tissue. Progress Energy firmly believes that this data, along with similar data collected for other waterbodies, demonstrates that not all NC waters are impaired for mercury.

Additionally, it is observed that data found in the Biological Assessment Unit Fish Tissue Results (http://portal.ncdenr.org/web/wq/ess/bau/fish-tissue-data) in many water body segments and in more than one river basin in the data window of 2006 through 2010, does not support a blanket state-wide advisory when the data is compared to the thresholds presented above.

VII. Progress Energy Requests Removal of Certain River Segments and Waterbodies from the 2012 303(d) List

Enclosed with this letter is a summary sheet of mercury values in fish tissue that Progress Energy has generated for water bodies adjacent to four power plants (Enclosure 2). These segments and water bodies are delineated as follows:

(1) Cape Fear River - segments adjacent to the Sutton Plant at Wilmington, NC. The segments consist of the following:

- Cape Fear River - from transmission line crossing upstream of Sutton Cooling Pond to Atlantic Coast Line Railroad bridge downstream.
- Indian Creek - From source to Cape Fear River
- Cartwheel Branch - From source to Cape Fear River
- Unnamed tidal flat canal - From source on east side of the Cape Fear River south of the Sutton Cooling Pond to Cape Fear River

(2) French Broad River - segment adjacent to the Asheville Plant at Arden, NC; which consists of the French Broad River from Cane Creek to Biltmore Estate canoe portage.

(3) Lake Julian – entire water body adjacent to the Asheville Plant in Arden, NC

(4) Hyco Lake – entire water body adjacent to the Roxboro Plant in Person County

(5) Mayo Lake – entire water body adjacent to the Mayo Plant in Person County

Also enclosed is the supporting fish tissue data for each segment or water body (Enclosures 3-7). This data conclusively demonstrates that the fish tissue values are below both the EPA threshold value of 0.3 mg mercury per kg fish tissue and the NCDHHS threshold value of 0.4 mg per kg fish tissue. The fish tissue data collected from these segments do not support the listing of these waterbodies as impaired for mercury.

In regard to water column data, Progress Energy has reviewed EPA STORET data, both legacy and modernized; the Division's Mercury Extension Study Data 2005-2006, the French Broad River Basin – Ambient Monitoring System Report January 2009, the Cape Fear River Basin – Ambient Monitoring System Report January 2009, the Roanoke River Basin Ambient Monitoring System Report 2010, and results from the Division's Random Ambient Monitoring Station (RAMS) program from 2007-2010. We could find no data that indicated a water column issue in the river segments and water bodies referenced above. In fact, our review indicated that 1368 of the 1398 (97.85%) samples for low level mercury in the State's RAMS sampling statewide were below12 ng/l. If the Division has data that indicates otherwise, we would appreciate a copy of the data or direction to the source of the data.

As described above, Progress Energy has been unable to identify any reasonable evidence, based on a thorough assessment of existing and reasonably available fish tissue and water column data that would support listing these waters as impaired. Consequently, Progress Energy requests these specific river segments and water bodies be removed from the 2012 303(d) list.

Progress Energy appreciates the opportunity to submit comments on this important regulatory action. Please do not hesitate to contact me at 919-546-5872 if you have any questions.

Sincerely,

Michael Reid

Michael Reid, PhD.
Director, Environmental Services

Enclosures

Enclosure 1. Letter from Michael Reid to Coleen Sullins dated August 15, 2011.

Progress Energy

August 15, 2011

Ms. Coleen Sullins
Director
North Carolina Division of Water Quality
1617 Mail Service Center
Raleigh, NC 27699-1617

Subject: 2010 Integrated Report
Request for Delisting of Segment of French Broad River
Request for Revision of Assessment Methodology for Mercury

Dear Ms. Sullins:

I am writing regarding the Division of Water Quality 2010 303(d) list as well as the Division's preparations for the 2012 303(d) list. Based on a review of the Division's current assessment methodology and the enclosed data, Progress Energy Carolinas, Inc. requests that the Division remove a segment of the French Broad River from the current 303(d) list and preclude the segment from being included in the 2012 report. In addition, Progress Energy Carolinas, Inc. requests that the Mercury Assessment Criteria for the 2012 Use Assessment Methodology allow assessment of site-specific data for a listing/delisting.

In the Division of Water Quality *NC 2010 Integrated Report Categories 4 and 5 Impaired Waters List*, there is a statement that globally asserts: "All 13,123 Waters in NC are in Category 5-303(d) List for Mercury due to statewide fish consumption advice for several fish species."

The Division's *2010 Use Assessment Methodology* addresses mercury through a Fish Consumption Assessment Methodology (methodology). This methodology abandons site-specific listings because all Assessment Units (AUs) are considered impaired due to advice from the North Carolina Department of Health and Human Services.

As part of the National Pollutant Discharge Elimination System (NPDES) permit requirements for our generation facility located near Asheville, North Carolina (Asheville Plant or Plant), Progress Energy Carolinas, Inc. has collected and analyzed fish tissue samples in the French Broad River adjacent to the Asheville Plant for several years. Robust sampling in the French Broad River has been conducted upstream of the Plant (approximately 3.9 miles upstream), in the vicinity of the Plant's wastewater discharge, and downstream of the Plant (approximately 6.7 miles downstream). The sampling program was approved by the Division of Water Quality.

Progress Energy Service Company, LLC
P.O. Box 1551
Raleigh, NC 27602

This fish tissue data has been evaluated and characterized in accordance with the Environmental Protection Agency's (EPA) recommended protocol, EPA 823-R-10-001, Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010, which provides for a trophic-weighted average. Fish tissue data collected over the last several years demonstrated the weighted-average fish tissue concentration was 0.19 mg of mercury/kg of fish tissue in the French Broad River segment identified above. This value is well below the EPA Tissue Residue Criterion of 0.3 mg of methylmercury/kg of fish tissue as well as the Department of Health and Human Services threshold value of an average of 0.4 mg of mercury/kg of fish tissue. I have enclosed the data for your information.

This data presents information that provides good cause as per 40 CFR Part 130.7(b) for removing or "delisting" the applicable segment of the French Broad River from the state's 303(d) List / Integrated Report List.

Progress Energy Carolinas, Inc. understands that the Division will soon be preparing its 2012 303(d) List and Integrated Reports. Based on our review of the Division's current assessment methodology and the enclosed data, Progress Energy Carolinas, Inc. presents two requests. First, in light of the data we have collected, we request the segment of the French Broad River delineated above be removed from the current 303(d) List/Integrated Report List and not be listed as impaired for mercury in the 2012 303(d) List/Integrated Report List. Second, we request that the Mercury Assessment Criteria for the 2012 Use Assessment Methodology be revised (as compared to the 2010 methodology) to allow assessment of site-specific data using the EPA procedures referenced above for a listing or delisting of an AU or water body.

Progress Energy Carolinas, Inc. is in the process of assembling similar data sets for water bodies adjacent to other specific generation plants. We anticipate sending this data and similar requests for delisting shortly.

Thank you in advance for your attention to this matter.

If you or your staff has any questions, please do not hesitate to contact Fred Holt of my staff at 919-546-5286 or fred.holt@pgnmail.com.

Sincerely,

Michael Reid

Michael Reid, PhD.
Director, Environmental Services
Progress Energy Carolinas, Inc.

Enclosures

cc: Alan Clark
Kathy Stecker

Table 1. Total mercury concentrations in axial muscle of fish from the French Broad River, 2004.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	145	72	3	Upstream	< 0.27	
Redbreast	149	61	3	Upstream	< 0.17	
Redbreast	190	160	3	Upstream	0.12	
Redbreast	194	159	3	Upstream	< 0.16	
Redbreast	160	87	3	Upstream	0.32	
Redbreast	172	106	3	Upstream	< 0.18	
Black redhorse	372	540	3	Upstream	< 0.15	
Black redhorse	380	550	3	Upstream	< 0.17	
Black redhorse	410	790	3	Upstream	0.53	
Black redhorse	413	843	3	Upstream	0.54	
Black redhorse	415	989	3	Upstream	0.40	
Black redhorse	405	863	3	Upstream	0.46	
Black crappie	332	658	3	Upstream	0.96	
Black crappie	320	625	3	Upstream	< 0.17	
Flat bullhead	225	132	4	Upstream	< 0.14	
Flat bullhead	270	231	4	Upstream	0.23	
Flat bullhead	290	305	4	Upstream	0.41	
Flat bullhead	261	229	4	Upstream	< 0.16	
Flat bullhead	273	265	4	Upstream	0.26	
Flat bullhead	291	370	4	Upstream	0.73	
Smallmouth bass	246	201	4	Upstream	0.87	
Smallmouth bass	297	370	4	Upstream	0.49	
Smallmouth bass	346	620	4	Upstream	0.44	
Smallmouth bass	445	1,300	4	Upstream	1.66	
Smallmouth bass	370	744	4	Upstream	1.49	
Rock bass	177	96	4	Upstream	0.64	**0.29**
Redbreast	136	52	3	Discharge	< 0.19	
Redbreast	183	108	3	Discharge	< 0.17	
Redbreast	164	80	3	Discharge	0.20	
Redbreast	182	128	3	Discharge	< 0.15	
Redbreast	177	109	3	Discharge	< 0.18	
Redbreast	149	58	3	Discharge	< 0.18	
Black redhorse	375	618	3	Discharge	< 0.18	
Black redhorse	383	765	3	Discharge	0.25	
Black redhorse	457	1,050	3	Discharge	0.52	
Black redhorse	465	1,025	3	Discharge	0.76	
Black redhorse	493	1,450	3	Discharge	0.69	
Black redhorse	475	1,200	3	Discharge	0.43	
Black redhorse	410	745	3	Discharge	< 0.20	
Flat bullhead	240	128	4	Discharge	0.20	
Flat bullhead	235	132	4	Discharge	0.44	
Flat bullhead	243	171	4	Discharge	0.18	
Flat bullhead	227	145	4	Discharge	< 0.16	
Flat bullhead	238	183	4	Discharge	0.09	
Flat bullhead	311	340	4	Discharge	0.63	
Smallmouth bass	263	223	4	Discharge	0.52	
Smallmouth bass	355	565	4	Discharge	0.54	

Smallmouth bass	374	871	4	Discharge	0.27	
Smallmouth bass	368	802	4	Discharge	0.74	
Smallmouth bass	440	1,300	4	Discharge	0.99	
Largemouth bass	395	611	4	Discharge	< 0.16	
Largemouth bass	405	795	4	Discharge	0.17	
Largemouth bass	475	1,725	4	Discharge	0.74	
Rock bass	152	63	4	Discharge	< 0.17	
Rock bass	172	99	4	Discharge	< 0.16	**0.10**
Redbreast	162	66	3	Downstream	0.32	
Redbreast	175	96	3	Downstream	< 0.18	
Redbreast	185	139	3	Downstream	0.25	
Redbreast	198	156	3	Downstream	< 0.15	
Redbreast	273	324	3	Downstream	0.54	
Redbreast	162	66	3	Downstream	0.32	
Redbreast	175	96	3	Downstream	< 0.18	
Redbreast	185	139	3	Downstream	0.25	
Redbreast	198	156	3	Downstream	< 0.15	
Redbreast	273	324	3	Downstream	0.54	
Redbreast	161	80	3	Downstream	0.11	
Redbreast	126	46	3	Downstream	< 0.14	
Redbreast	187	170	3	Downstream	0.12	
Redbreast	198	154	3	Downstream	< 0.16	
Redbreast	126	46	3	Downstream	< 0.14	
Redbreast	187	170	3	Downstream	0.12	
Redbreast	198	154	3	Downstream	< 0.16	
Black redhorse	410	745	3	Downstream	< 0.20	
Black redhorse	365	509	3	Downstream	< 0.18	
Black redhorse	356	518	3	Downstream	0.08	
Black redhorse	375	651	3	Downstream	< 0.16	
Black redhorse	395	755	3	Downstream	< 0.16	
Black redhorse	388	810	3	Downstream	0.50	
Black redhorse	423	910	3	Downstream	< 0.16	
Bluegill	135	59	3	Downstream	< 0.16	
Bluegill	135	59	3	Downstream	< 0.16	
Flat bullhead	215	117	4	Downstream	< 0.16	
Flat bullhead	218	125	4	Downstream	< 0.16	
Flat bullhead	236	157	4	Downstream	0.38	
Flat bullhead	224	140	4	Downstream	0.14	
Flat bullhead	233	155	4	Downstream	< 0.15	
Flat bullhead	255	199	4	Downstream	0.17	
Smallmouth bass	277	265	4	Downstream	0.29	
Smallmouth bass	295	410	4	Downstream	0.32	
Smallmouth bass	310	460	4	Downstream	0.77	
Smallmouth bass	347	620	4	Downstream	0.68	
Smallmouth bass	345	750	4	Downstream	0.40	
Rock bass	175	98	4	Downstream	< 0.21	**0.16**
					2004 Average	**0.22**

[1]Upstream station is approximately 3.9 river miles from plant; Discharge station is in the area of the discharge to the French Broad River; Downstream station is approximately 6.7 river miles from the plant.

[2]Weighted Average is developed consistent with Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010 ,**EPA 823-R-10-001.**

Table 2. Total mercury concentrations in axial muscle of fish from the French Broad River, 2006.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	190	143	3	Upstream	< 0.16	
Redbreast	186	137	3	Upstream	< 0.16	
Redbreast	182	110	3	Upstream	0.10	
Redbreast	187	118	3	Upstream	< 0.16	
Redbreast	178	112	3	Upstream	< 0.16	
Redbreast	168	94	3	Upstream	0.29	
Black redhorse	416	780	3	Upstream	0.34	
Black redhorse	428	710	3	Upstream	< 0.18	
Black redhorse	419	652	3	Upstream	< 0.17	
Black redhorse	465	1,125	3	Upstream	0.47	
Black redhorse	405	624	3	Upstream	0.34	
Black redhorse	440	1,000	3	Upstream	0.47	
Smallmouth bass	298	322	4	Upstream	0.80	
Smallmouth bass	294	354	4	Upstream	0.53	
Smallmouth bass	313	424	4	Upstream	0.63	
Smallmouth bass	264	207	4	Upstream	0.37	
Smallmouth bass	213	134	4	Upstream	0.35	
Largemouth bass	350	608	4	Upstream	0.44	**0.30**
Redbreast	185	128	3	Discharge	< 0.16	
Redbreast	193	120	3	Discharge	< 0.17	
Redbreast	182	118	3	Discharge	< 0.16	
Redbreast	177	112	3	Discharge	< 0.14	
Redbreast	180	126	3	Discharge	< 0.16	
Redbreast	175	104	3	Discharge	< 0.16	
Black redhorse	495	1,375	3	Discharge	0.39	
Black redhorse	427	773	3	Discharge	0.54	
Black redhorse	484	1,200	3	Discharge	0.23	
Black redhorse	503	1,400	3	Discharge	0.35	
Black redhorse	431	818	3	Discharge	0.26	
Black redhorse	438	845	3	Discharge	0.21	
Smallmouth bass	382	777	4	Discharge	0.35	
Smallmouth bass	343	566	4	Discharge	0.29	
Smallmouth bass	424	1,250	4	Discharge	0.46	
Smallmouth bass	378	738	4	Discharge	0.61	
Smallmouth bass	390	798	4	Discharge	0.73	
Smallmouth bass	355	664	4	Discharge	0.27	**0.27**
Redbreast	171	104	3	Downstream	< 0.15	
Redbreast	194	122	3	Downstream	< 0.15	
Redbreast	176	98	3	Downstream	< 0.18	
Redbreast	176	98	3	Downstream	< 0.16	
Redbreast	173	103	3	Downstream	< 0.16	
Redbreast	174	99	3	Downstream	< 0.16	
Black redhorse	388	558	3	Downstream	< 0.11	
Black redhorse	493	1,375	3	Downstream	0.30	
Black redhorse	448	1,050	3	Downstream	0.52	
Black redhorse	433	949	3	Downstream	< 0.17	
Black redhorse	450	1,050	3	Downstream	< 0.18	

Black redhorse	381	802	3	Downstream	< 0.16	
Smallmouth bass	460	1,300	4	Downstream	0.79	
Smallmouth bass	329	472	4	Downstream	0.45	
Smallmouth bass	426	890	4	Downstream	0.80	
Smallmouth bass	262	209	4	Downstream	< 0.18	
Smallmouth bass	335	403	4	Downstream	0.54	
Smallmouth bass	299	318	4	Downstream	0.33	**0.23**
					2006 Average	**0.26**

[1]Upstream station is approximately 3.9 river miles from plant; Discharge station is in the area of the discharge to the French Broad River; Downstream station is approximately 6.7 river miles from the plant.

[2]Weighted Average is developed consistent with Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010 ,**EPA 823-R-10-001.**

Table 3. Total mercury concentrations in axial muscle of fish from the French Broad River, 2007.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	183	178	3	Upstream	< 0.14	
Redbreast	183	159	3	Upstream	0.21	
Redbreast	183	162	3	Upstream	0.08	
Redbreast	183	151	3	Upstream	< 0.14	
Redbreast	183	222	3	Upstream	0.23	
Redbreast	183	193	3	Upstream	< 0.16	
Redbreast	183	206	3	Upstream	< 0.15	
Redbreast	183	187	3	Upstream	< 0.19	
Redbreast	183	161	3	Upstream	< 0.16	
Redbreast	183	202	3	Upstream	0.08	
Black redhorse	480	1,040	3	Upstream	0.19	
Black redhorse	453	958	3	Upstream	0.16	
Black redhorse	428	864	3	Upstream	0.51	
Black redhorse	482	1,500	3	Upstream	0.42	
Black redhorse	446	988	3	Upstream	0.58	
Black redhorse	426	856	3	Upstream	0.15	
Black redhorse	395	759	3	Upstream	0.44	
Black redhorse	416	805	3	Upstream	0.08	
Black redhorse	448	724	3	Upstream	< 0.17	
Black redhorse	390	760	3	Upstream	< 0.15	
Bluegill	149	68	3	Upstream	< 0.15	
Bluegill	162	88	3	Upstream	< 0.15	
Bluegill	168	101	3	Upstream	< 0.16	
Smallmouth bass	366	586	4	Upstream	0.99	**0.49**
Redbreast	183	126	3	Discharge	< 0.14	
Redbreast	188	124	3	Discharge	< 0.16	
Redbreast	176	95	3	Discharge	< 0.13	
Redbreast	194	132	3	Discharge	< 0.13	
Redbreast	176	106	3	Discharge	< 0.12	
Redbreast	173	98	3	Discharge	< 0.13	
Redbreast	196	164	3	Discharge	< 0.14	
Redbreast	204	169	3	Discharge	< 0.13	
Redbreast	182	108	3	Discharge	< 0.14	
Redbreast	184	116	3	Discharge	< 0.14	
Black redhorse	451	1,050	3	Discharge	0.19	
Black redhorse	442	1,025	3	Discharge	< 0.16	
Black redhorse	447	868	3	Discharge	0.30	
Black redhorse	433	838	3	Discharge	0.10	
Black redhorse	482	1,200	3	Discharge	0.14	
Black redhorse	446	964	3	Discharge	< 0.20	
Black redhorse	492	1,525	3	Discharge	0.41	
Black redhorse	481	1,250	3	Discharge	0.22	
Black redhorse	472	1,175	3	Discharge	< 0.16	
Black redhorse	453	1,275	3	Discharge	0.29	
Smallmouth bass	348	560	4	Discharge	0.26	
Smallmouth bass	309	378	4	Discharge	0.31	
Smallmouth bass	457	1,400	4	Discharge	1.04	

Smallmouth bass	242	163	4	Discharge	< 0.16	
Smallmouth bass	348	582	4	Discharge	0.30	
Smallmouth bass	283	318	4	Discharge	0.09	
Smallmouth bass	327	467	4	Discharge	0.33	
Smallmouth bass	427	1,004	4	Discharge	0.61	
Smallmouth bass	266	247	4	Discharge	0.19	
Smallmouth bass	278	269	4	Discharge	< 0.14	**0.16**
Redbreast	182	111	3	Downstream	< 0.16	
Redbreast	176	94	3	Downstream	< 0.15	
Redbreast	192	134	3	Downstream	< 0.14	
Redbreast	167	76	3	Downstream	< 0.13	
Redbreast	168	78	3	Downstream	0.29	
Redbreast	152	78	3	Downstream	< 0.14	
Redbreast	175	89	3	Downstream	< 0.13	
Redbreast	197	121	3	Downstream	< 0.14	
Redbreast	192	127	3	Downstream	< 0.14	
Redbreast	178	118	3	Downstream	< 0.14	
Black redhorse	507	1,400	3	Downstream	< 0.18	
Black redhorse	457	997	3	Downstream	0.10	
Black redhorse	509	1,700	3	Downstream	0.13	
Black redhorse	483	1,475	3	Downstream	0.51	
Black redhorse	492	1,500	3	Downstream	0.19	
Black redhorse	483	1,025	3	Downstream	< 0.17	
Black redhorse	456	1,200	3	Downstream	0.21	
Black redhorse	460	1,175	3	Downstream	< 0.14	
Black redhorse	468	1,250	3	Downstream	< 0.16	
Black redhorse	423	907	3	Downstream	< 0.16	
Smallmouth bass	342	591	4	Downstream	0.34	
Smallmouth bass	332	444	4	Downstream	0.16	
Smallmouth bass	296	299	4	Downstream	0.35	
Smallmouth bass	351	528	4	Downstream	0.30	
Smallmouth bass	293	309	4	Downstream	0.19	
Smallmouth bass	312	421	4	Downstream	0.28	
Smallmouth bass	331	627	4	Downstream	0.14	
Rock bass	202	168	4	Downstream	0.12	
Rock bass	172	93	4	Downstream	< 0.16	
Rock bass	186	123	4	Downstream	< 0.14	**0.13**
					2007 Average	**0.26**

[1]Upstream station is approximately 3.9 river miles from plant; Discharge station is in the area of the discharge to the French Broad River; Downstream station is approximately 6.7 river miles from the plant.

[2]Weighted Average is developed consistent with Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010 ,**EPA 823-R-10-001.**

Table 4. Total mercury concentrations in axial muscle of fish from the French Broad River, 2008.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	192	135	3	Upstream	< 0.13	
Redbreast	192	125	3	Upstream	< 0.12	
Redbreast	188	131	3	Upstream	< 0.15	
Redbreast	181	120	3	Upstream	0.17	
Redbreast	183	112	3	Upstream	< 0.13	
Redbreast	190	119	3	Upstream	< 0.13	
Redbreast	180	128	3	Upstream	< 0.12	
Redbreast	172	107	3	Upstream	< 0.16	
Redbreast	174	116	3	Upstream	< 0.12	
Redbreast	181	108	3	Upstream	< 0.14	
Redbreast	425	854	3	Upstream	0.30	
Redbreast	394	750	3	Upstream	0.19	
Redbreast	458	1,050	3	Upstream	0.20	
Black redhorse	431	818	3	Upstream	< 0.17	
Black redhorse	450	975	3	Upstream	0.54	
Black redhorse	413	840	3	Upstream	0.17	
Black redhorse	445	960	3	Upstream	0.48	
Black redhorse	447	1,050	3	Upstream	0.39	
Black redhorse	433	720	3	Upstream	0.30	
Black redhorse	470	872	3	Upstream	0.26	
Smallmouth bass	249	191	4	Upstream	0.22	
Smallmouth bass	305	332	4	Upstream	< 0.15	
Smallmouth bass	243	172	4	Upstream	< 0.16	
Smallmouth bass	382	690	4	Upstream	0.82	
Largemouth bass	312	410	4	Upstream	< 0.15	
Largemouth bass	287	319	4	Upstream	< 0.15	
Rock bass	260	350	4	Upstream	0.53	
Rock bass	245	328	4	Upstream	0.25	
Spotted bass	288	308	4	Upstream	0.10	**0.15**
Redbreast	173	101	3	Discharge	< 0.15	
Redbreast	156	80	3	Discharge	< 0.16	
Redbreast	202	151	3	Discharge	< 0.15	
Redbreast	177	105	3	Discharge	< 0.15	
Redbreast	173	95	3	Discharge	< 0.15	
Redbreast	176	103	3	Discharge	< 0.13	
Redbreast	165	84	3	Discharge	< 0.15	
Redbreast	165	86	3	Discharge	< 0.13	
Redbreast	154	73	3	Discharge	< 0.13	
Redbreast	192	101	3	Discharge	0.20	
Black redhorse	478	1,325	3	Discharge	0.23	
Black redhorse	520	1,650	3	Discharge	0.39	
Black redhorse	467	1,150	3	Discharge	0.32	
Black redhorse	489	1,400	3	Discharge	< 0.16	
Black redhorse	465	1,100	3	Discharge	< 0.17	
Black redhorse	462	1,125	3	Discharge	< 0.18	
Black redhorse	473	1,075	3	Discharge	0.21	
Black redhorse	461	1,050	3	Discharge	< 0.17	

Black redhorse	446	1,100	3	Discharge	0.50	
Black redhorse	445	1,050	3	Discharge	0.24	
Smallmouth bass	432	938	4	Discharge	0.68	
Smallmouth bass	205	99	4	Discharge	< 0.17	
Smallmouth bass	215	125	4	Discharge	0.18	
Smallmouth bass	192	94	4	Discharge	< 0.14	
Smallmouth bass	205	104	4	Discharge	0.12	
Smallmouth bass	381	808	4	Discharge	0.52	
Smallmouth bass	408	972	4	Discharge	0.65	
Smallmouth bass	232	169	4	Discharge	0.18	
Smallmouth bass	236	145	4	Discharge	0.36	
Smallmouth bass	233	182	4	Discharge	< 0.15	**0.16**
Redbreast	190	127	3	Downstream	0.42	
Redbreast	186	108	3	Downstream	0.15	
Redbreast	193	140	3	Downstream	< 0.16	
Redbreast	195	130	3	Downstream	< 0.13	
Redbreast	192	132	3	Downstream	0.09	
Redbreast	198	144	3	Downstream	< 0.13	
Redbreast	198	150	3	Downstream	< 0.16	
Redbreast	202	141	3	Downstream	< 0.14	
Redbreast	210	166	3	Downstream	< 0.15	
Redbreast	192	132	3	Downstream	< 0.12	
Black redhorse	402	781	3	Downstream	0.27	
Black redhorse	473	1,250	3	Downstream	0.18	
Black redhorse	492	1,200	3	Downstream	0.30	
Black redhorse	468	1,025	3	Downstream	< 0.16	
Black redhorse	447	924	3	Downstream	0.31	
Black redhorse	438	888	3	Downstream	< 0.15	
Black redhorse	445	1,040	3	Downstream	< 0.18	
Black redhorse	465	1,038	3	Downstream	0.18	
Black redhorse	507	1,375	3	Downstream	< 0.19	
Black redhorse	500	1,525	3	Downstream	< 0.13	
Smallmouth bass	355	596	4	Downstream	0.37	
Smallmouth bass	312	365	4	Downstream	< 0.17	
Smallmouth bass	224	160	4	Downstream	< 0.15	
Smallmouth bass	283	273	4	Downstream	0.11	
Largemouth bass	291	300	4	Downstream	< 0.15	
Largemouth bass	210	120	4	Downstream	< 0.13	
Largemouth bass	280	262	4	Downstream	< 0.12	
Largemouth bass	316	418	4	Downstream	< 0.13	
Largemouth bass	231	180	4	Downstream	0.12	
Rock bass	215	208	4	Downstream	0.31	**0.11**
					2008 Average	**0.14**

[1]Upstream station is approximately 3.9 river miles from plant; Discharge station is in the area of the discharge to the French Broad River; Downstream station is approximately 6.7 river miles from the plant.

[2]Weighted Average is developed consistent with Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010 ,**EPA 823-R-10-001.**

Table 5. Total mercury concentrations in axial muscle of fish from the French Broad River, 2009.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	164	98	3	Upstream	< 0.15	
Redbreast	188	158	3	Upstream	< 0.16	
Redbreast	172	97	3	Upstream	0.23	
Redbreast	172	124	3	Upstream	0.24	
Redbreast	167	103	3	Upstream	< 0.15	
Redbreast	161	76	3	Upstream	0.08	
Redbreast	178	101	3	Upstream	< 0.15	
Redbreast	155	81	3	Upstream	< 0.14	
Redbreast	196	140	3	Upstream	0.08	
Redbreast	212	196	3	Upstream	< 0.17	
Black redhorse	455	1,008	3	Upstream	0.23	
Black redhorse	404	669	3	Upstream	0.36	
Black redhorse	439	750	3	Upstream	< 0.15	
Black redhorse	430	988	3	Upstream	0.32	
Black redhorse	448	984	3	Upstream	0.26	
Black redhorse	435	796	3	Upstream	0.27	
Black redhorse	435	992	3	Upstream	0.32	
Black redhorse	402	701	3	Upstream	0.73	
Black redhorse	424	760	3	Upstream	0.28	
Black redhorse	390	532	3	Upstream	0.33	
Black redhorse	248	189	3	Upstream	< 0.16	
Smallmouth bass	292	332	4	Upstream	0.30	
Smallmouth bass	270	250	4	Upstream	0.45	
Smallmouth bass	259	220	4	Upstream	0.25	
Smallmouth bass	251	185	4	Upstream	0.52	
Smallmouth bass	237	156	4	Upstream	0.44	
Smallmouth bass	249	184	4	Upstream	0.28	
Largemouth bass	526	2,275	4	Upstream	0.71	
Largemouth bass	405	1,090	4	Upstream	0.37	
Rock bass	177	142	4	Upstream	< 0.14	**0.23**
Redbreast	162	75	3	Discharge	< 0.14	
Redbreast	180	104	3	Discharge	< 0.14	
Redbreast	172	82	3	Discharge	< 0.14	
Redbreast	176	112	3	Discharge	< 0.15	
Redbreast	155	84	3	Discharge	< 0.14	
Redbreast	153	68	3	Discharge	< 0.14	
Redbreast	150	65	3	Discharge	< 0.12	
Redbreast	171	99	3	Discharge	< 0.13	
Redbreast	159	76	3	Discharge	0.09	
Redbreast	171	90	3	Discharge	< 0.13	
Black redhorse	467	1,110	3	Discharge	0.39	
Black redhorse	500	1,275	3	Discharge	0.26	
Black redhorse	453	1,025	3	Discharge	< 0.16	
Black redhorse	438	879	3	Discharge	< 0.14	
Black redhorse	460	1,100	3	Discharge	< 0.15	
Black redhorse	453	849	3	Discharge	0.18	
Black redhorse	440	855	3	Discharge	0.13	

Black redhorse	447	860	3	Discharge	0.27	
Black redhorse	407	704	3	Discharge	0.43	
Black redhorse	392	530	3	Discharge	< 0.14	
Smallmouth bass	265	242	4	Discharge	0.22	
Smallmouth bass	237	175	4	Discharge	< 0.16	
Smallmouth bass	238	178	4	Discharge	0.14	
Smallmouth bass	214	141	4	Discharge	0.22	
Smallmouth bass	267	222	4	Discharge	0.18	
Smallmouth bass	236	188	4	Discharge	< 0.16	
Smallmouth bass	267	243	4	Discharge	< 0.16	
Smallmouth bass	214	130	4	Discharge	< 0.13	
Smallmouth bass	262	229	4	Discharge	0.22	
Smallmouth bass	235	157	4	Discharge	< 0.16	**0.11**
Redbreast	169	85	3	Downstream	< 0.15	
Redbreast	180	113	3	Downstream	< 0.15	
Redbreast	165	85	3	Downstream	< 0.14	
Redbreast	156	76	3	Downstream	< 0.15	
Redbreast	212	181	3	Downstream	< 0.13	
Redbreast	170	96	3	Downstream	< 0.13	
Redbreast	163	76	3	Downstream	< 0.15	
Redbreast	179	100	3	Downstream	< 0.14	
Redbreast	171	80	3	Downstream	< 0.15	
Redbreast	167	88	3	Downstream	< 0.14	
Black redhorse	432	876	3	Downstream	< 0.16	
Black redhorse	410	691	3	Downstream	< 0.14	
Black redhorse	438	878	3	Downstream	0.15	
Black redhorse	452	987	3	Downstream	0.29	
Black redhorse	446	968	3	Downstream	0.28	
Black redhorse	420	752	3	Downstream	0.18	
Black redhorse	497	1,225	3	Downstream	0.28	
Black redhorse	442	945	3	Downstream	0.48	
Black redhorse	460	950	3	Downstream	0.44	
Black redhorse	421	852	3	Downstream	< 0.14	
Smallmouth bass	237	191	4	Downstream	< 0.16	
Smallmouth bass	237	145	4	Downstream	< 0.14	
Smallmouth bass	301	305	4	Downstream	< 0.14	
Smallmouth bass	231	144	4	Downstream	< 0.15	
Smallmouth bass	280	242	4	Downstream	< 0.16	
Smallmouth bass	341	440	4	Downstream	0.51	
Smallmouth bass	227	143	4	Downstream	< 0.14	
Smallmouth bass	212	172	4	Downstream	0.29	
Largemouth bass	320	424	4	Downstream	< 0.15	
Rock bass	244	180	4	Downstream	0.29	**0.12**
					2009 Average	**0.13**

[1]Upstream station is approximately 3.9 river miles from plant; Discharge station is in the area of the discharge to the French Broad River; Downstream station is approximately 6.7 river miles from the plant.

[2]Weighted Average is developed consistent with Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010 ,**EPA 823-R-10-001.**

Table 6. Total mercury concentrations in axial muscle of fish from the French Broad River, 2010.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	186	132	3	Upstream	< 0.12	
Redbreast	201	168	3	Upstream	< 0.12	
Redbreast	198	136	3	Upstream	< 0.13	
Redbreast	190	128	3	Upstream	0.23	
Redbreast	181	105	3	Upstream	< 0.14	
Redbreast	178	106	3	Upstream	< 0.16	
Redbreast	180	108	3	Upstream	< 0.14	
Redbreast	177	111	3	Upstream	< 0.12	
Redbreast	168	97	3	Upstream	< 0.12	
Redbreast	173	108	3	Upstream	< 0.13	
Black redhorse	472	940	3	Upstream	0.26	
Black redhorse	460	843	3	Upstream	0.27	
Black redhorse	414	846	3	Upstream	0.41	
Black redhorse	439	994	3	Upstream	< 0.16	
Black redhorse	409	836	3	Upstream	0.54	
Black redhorse	483	901	3	Upstream	0.41	
Black redhorse	438	916	3	Upstream	0.44	
Black redhorse	393	728	3	Upstream	< 0.14	
Black redhorse	360	567	3	Upstream	< 0.14	
Black redhorse	445	828	3	Upstream	0.52	
Smallmouth bass	283	264	4	Upstream	0.36	
Smallmouth bass	266	231	4	Upstream	0.16	
Smallmouth bass	204	118	4	Upstream	< 0.15	
Largemouth bass	358	526	4	Upstream	0.39	
Largemouth bass	323	506	4	Upstream	0.27	
Rock bass	197	156	4	Upstream	< 0.15	
Rock bass	211	194	4	Upstream	< 0.14	
Rock bass	233	254	4	Upstream	< 0.16	
Rock bass	178	116	4	Upstream	< 0.15	
Rock bass	202	151	4	Upstream	< 0.15	**0.13**
Redbreast	154	65	3	Discharge	0.11	
Redbreast	182	114	3	Discharge	0.11	
Redbreast	147	60	3	Discharge	0.20	
Redbreast	174	74	3	Discharge	0.17	
Redbreast	150	54	3	Discharge	0.08	
Redbreast	147	54	3	Discharge	0.14	
Redbreast	154	61	3	Discharge	0.12	
Redbreast	154	61	3	Discharge	0.19	
Redbreast	172	84	3	Discharge	0.06	
Redbreast	173	91	3	Discharge	0.04	
Black redhorse	447	796	3	Discharge	0.26	
Black redhorse	483	1,050	3	Discharge	< 0.17	
Black redhorse	394	600	3	Discharge	< 0.17	
Black redhorse	410	706	3	Discharge	< 0.15	
Black redhorse	442	797	3	Discharge	0.09	
Black redhorse	394	538	3	Discharge	< 0.13	
Black redhorse	428	774	3	Discharge	< 0.15	

Black redhorse	518	1,400	3	Discharge	0.28	
Black redhorse	511	1,150	3	Discharge	0.49	
Black redhorse	439	788	3	Discharge	0.48	
Smallmouth bass	281	254	4	Discharge	< 0.18	
Smallmouth bass	290	300	4	Discharge	0.26	
Smallmouth bass	277	271	4	Discharge	0.30	
Smallmouth bass	231	154	4	Discharge	< 0.16	
Smallmouth bass	297	308	4	Discharge	0.38	
Smallmouth bass	273	256	4	Discharge	0.36	
Smallmouth bass	288	244	4	Discharge	0.33	
Smallmouth bass	227	136	4	Discharge	0.26	
Smallmouth bass	228	152	4	Discharge	0.32	
Smallmouth bass	226	138	4	Discharge	0.15	**0.17**
Redbreast	190	125	3	Downstream	< 0.14	
Redbreast	196	146	3	Downstream	< 0.14	
Redbreast	175	102	3	Downstream	< 0.10	
Redbreast	163	102	3	Downstream	< 0.13	
Redbreast	169	100	3	Downstream	< 0.13	
Redbreast	171	92	3	Downstream	< 0.11	
Redbreast	171	89	3	Downstream	0.08	
Redbreast	166	88	3	Downstream	0.07	
Redbreast	177	106	3	Downstream	< 0.11	
Redbreast	171	104	3	Downstream	< 0.13	
Black redhorse	471	1,050	3	Downstream	0.18	
Black redhorse	409	666	3	Downstream	< 0.14	
Black redhorse	453	1,000	3	Downstream	< 0.15	
Black redhorse	442	920	3	Downstream	0.19	
Black redhorse	384	667	3	Downstream	0.14	
Black redhorse	471	1,100	3	Downstream	0.11	
Black redhorse	447	896	3	Downstream	0.20	
Black redhorse	384	661	3	Downstream	< 0.13	
Black redhorse	476	1,150	3	Downstream	0.22	
Black redhorse	391	604	3	Downstream	< 0.12	
Smallmouth bass	352	536	4	Downstream	< 0.17	
Smallmouth bass	287	316	4	Downstream	< 0.02	
Smallmouth bass	290	342	4	Downstream	0.17	
Smallmouth bass	287	287	4	Downstream	0.12	
Smallmouth bass	275	238	4	Downstream	0.36	
Smallmouth bass	281	257	4	Downstream	0.37	
Smallmouth bass	260	225	4	Downstream	0.26	
Smallmouth bass	218	120	4	Downstream	< 0.17	
Rock bass	176	102	4	Downstream	0.12	
Rock bass	167	87	4	Downstream	0.21	**0.10**
					2010 Average	**0.13**
					Overall	**0.19**

[1]Upstream station is approximately 3.9 river miles from plant; Discharge station is in the area of the discharge to the French Broad River; Downstream station is approximately 6.7 river miles from the plant.

[2]Weighted Average is developed consistent with Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion, April 2010 ,**EPA 823-R-10-001.**

Enclosure 2. Summary of Fish Tissue Mercury Data (mg/kg—fresh weight)

Cape Fear River Mercury Data

Year/Station	Upstream	Discharge	Downstream	Overall Average
2007	0.15	0.13	0.19	0.15
2008	0.1	0.1	0.09	0.12
2009	0.11	0.1	0.12	0.11
2010	0.1	0.08	0.08	0.09
2011	0.09	0.09	0.14	0.11

French Broad River Mercury Data

Year/Station	Upstream	Discharge	Downstream	Overall Average
2006	0.3	0.27	0.23	0.26
2007	0.49	0.16	0.13	0.26
2008	0.15	0.16	0.11	0.14
2009	0.23	0.11	0.12	0.13
2010	0.13	0.17	0.1	0.13
2011	0.13	0.12	0.1	0.12

Lake Julian Mercury Data

Year/Station	Overall Average[1]
2008	0.07
2010	0.07
2011	0.07

[1] Samples were taken lake wide.

Hyco Lake Mercury Data

Year/Station	South Hyco	Discharge	City Lake	Overall Average[1]
2006	0.09	0.06	0.08	0.08
2007	0.06	0.06	---	0.06
2008	0.07	0.06	---	0.06
2009	0.07	0.05	---	0.06
2010	0.07	0.09	---	0.08
2011	0.07	0.08	0.07	0.07

[1] Roxboro City Lake data not included in overall weighted averages.

Mayo Lake Mercury Data

Year/Station	Discharge	Across lake	Mid-lake	South lake	Overall Average
2006	0.06	0.07	0.09	0.09	0.08
2007	0.07	0.10	0.06	0.10	0.08
2008	0.06	0.06	0.08	0.15	0.09
2009	0.12	0.09	0.06	0.07	0.09
2010	0.07	0.07	0.07	0.08	0.07
2011	0.11	0.06	0.09	0.09	0.09

Enclosure 3. Cape Fear River Mercury Data

Table 1. Total mercury concentrations in axial muscle of fish from the Cape Fear River, 2007.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Bluegill	196	137	3	Upstream	0.21	
Bluegill	212	225	3	Upstream	0.18	
Bluegill	206	206	3	Upstream	0.24	
Bluegill	200	183	3	Upstream	0.19	
Bluegill	181	118	3	Upstream	0.19	
Bluegill	182	122	3	Upstream	0.11	
Bluegill	167	88	3	Upstream	0.08	
Bluegill	190	133	3	Upstream	0.16	
Bluegill	191	154	3	Upstream	0.18	
Bluegill	162	84	3	Upstream	0.15	
Blue catfish	360	390	4	Upstream	0.31	
Blue catfish	806	5600	4	Upstream	0.47	
Blue catfish	842	7350	4	Upstream	0.31	
Blue catfish	498	1150	4	Upstream	< 0.14	
Flathead catfish	577	2200	4	Upstream	< 0.15	
Flathead catfish	509	1400	4	Upstream	< 0.15	
Flathead catfish	541	1650	4	Upstream	0.94	
Flathead catfish	692	3925	4	Upstream	0.36	
Flathead catfish	438	1000	4	Upstream	< 0.14	
Flathead catfish	476	1100	4	Upstream	< 0.16	
Largemouth bass	325	510	4	Upstream	0.15	
Largemouth bass	266	174	4	Upstream	< 0.17	
Largemouth bass	285	352	4	Upstream	< 0.18	
Largemouth bass	267	300	4	Upstream	0.15	
Largemouth bass	238	218	4	Upstream	< 0.15	
Largemouth bass	248	215	4	Upstream	< 0.19	
Largemouth bass	257	247	4	Upstream	< 0.14	
Largemouth bass	237	217	4	Upstream	< 0.16	
Largemouth bass	266	298	4	Upstream	< 0.15	**0.15**
Bluegill	212	192	3	Discharge	0.21	
Bluegill	237	321	3	Discharge	0.23	
Bluegill	217	224	3	Discharge	0.29	
Bluegill	198	150	3	Discharge	0.17	
Bluegill	232	274	3	Discharge	0.19	
Bluegill	175	106	3	Discharge	0.10	
Bluegill	208	164	3	Discharge	0.11	
Bluegill	176	119	3	Discharge	0.15	
Bluegill	204	186	3	Discharge	0.09	
Bluegill	179	106	3	Discharge	< 0.05	
Blue catfish	422	607	4	Discharge	0.19	
Blue catfish	367	385	4	Discharge	< 0.14	
Blue catfish	706	4700	4	Discharge	0.33	
Blue catfish	632	3250	4	Discharge	0.31	
Blue catfish	467	896	4	Discharge	< 0.13	
Blue catfish	637	2600	4	Discharge	< 0.16	
Blue catfish	700	4025	4	Discharge	0.34	
Blue catfish	768	4950	4	Discharge	0.43	
Blue catfish	788	6100	4	Discharge	0.21	
Channel catfish	516	1225	4	Discharge	< 0.15	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	368	697	4	Discharge	< 0.17	
Largemouth bass	270	300	4	Discharge	< 0.17	
Largemouth bass	342	580	4	Discharge	< 0.15	
Largemouth bass	283	364	4	Discharge	< 0.15	
Largemouth bass	385	776	4	Discharge	0.18	
Largemouth bass	293	398	4	Discharge	< 0.15	
Largemouth bass	258	223	4	Discharge	< 0.14	
Largemouth bass	277	351	4	Discharge	< 0.17	
Largemouth bass	299	398	4	Discharge	< 0.15	
Largemouth bass	261	242	4	Discharge	< 0.14	**0.13**
Blue catfish	453	744	4	Downstream	0.43	
Blue catfish	660	3650	4	Downstream	0.43	
Blue catfish	879	9150	4	Downstream	0.59	
Blue catfish	401	523	4	Downstream	< 0.17	
Blue catfish	716	4250	4	Downstream	0.17	
Blue catfish	709	3900	4	Downstream	0.17	
Blue catfish	790	7250	4	Downstream	< 0.17	
Blue catfish	785	6150	4	Downstream	0.45	
Blue catfish	704	3750	4	Downstream	0.10	
Blue catfish	443	758	4	Downstream	< 0.15	**0.19**
					2007 Overall Average	**0.15**

[1]Station locations: Upstream = area between 1.5 miles upstream the power plant effluent discharge to the confluence of Indian Creek and Indian Creek, Discharge = effluent discharge area of the power plant to the Cape Fear River, and Downstream = area 1.5 miles downstream of the effluent discharge to the Atlantic Coast Line Railroad bridge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 3. Cape Fear River Mercury Data (continued)

Table 2. Total mercury concentrations in axial muscle of fish from the Cape Fear River, 2008.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Bluegill	162	71	3	Upstream	< 0.13	
Bluegill	168	62	3	Upstream	< 0.15	
Bluegill	189	123	3	Upstream	0.30	
Bluegill	209	221	3	Upstream	< 0.16	
Bluegill	173	92	3	Upstream	< 0.15	
Bluegill	180	111	3	Upstream	< 0.13	
Bluegill	171	100	3	Upstream	0.20	
Bluegill	208	192	3	Upstream	< 0.13	
Blue catfish	628	2650	4	Upstream	< 0.15	
Blue catfish	724	4600	4	Upstream	0.28	
Flathead catfish	464	882	4	Upstream	0.30	
Flathead catfish	580	2100	4	Upstream	< 0.14	
Flathead catfish	685	3650	4	Upstream	< 0.13	
Flathead catfish	636	2700	4	Upstream	< 0.13	
Flathead catfish	556	1950	4	Upstream	< 0.13	
Flathead catfish	542	1600	4	Upstream	< 0.15	
Flathead catfish	490	1100	4	Upstream	0.15	
Flathead catfish	491	1100	4	Upstream	< 0.13	
Flathead catfish	209	210	4	Upstream	0.46	
Flathead catfish	193	179	4	Upstream	0.34	
Largemouth bass	405	1000	4	Upstream	< 0.16	
Largemouth bass	299	432	4	Upstream	< 0.15	
Largemouth bass	336	478	4	Upstream	< 0.16	
Largemouth bass	446	1250	4	Upstream	0.30	
Largemouth bass	372	684	4	Upstream	0.18	
Largemouth bass	316	430	4	Upstream	< 0.14	
Largemouth bass	444	1250	4	Upstream	< 0.16	
Largemouth bass	349	560	4	Upstream	< 0.17	
Largemouth bass	285	339	4	Upstream	< 0.14	
Largemouth bass	337	580	4	Upstream	< 0.14	**0.10**
Bluegill	199	197	3	Discharge	0.08	
Bluegill	209	219	3	Discharge	< 0.15	
Bluegill	206	183	3	Discharge	< 0.15	
Bluegill	219	228	3	Discharge	< 0.14	
Bluegill	201	174	3	Discharge	< 0.13	
Bluegill	170	105	3	Discharge	< 0.12	
Bluegill	191	132	3	Discharge	< 0.13	
Bluegill	158	80	3	Discharge	< 0.12	
Bluegill	174	100	3	Discharge	< 0.15	
Bluegill	200	139	3	Discharge	< 0.15	
Blue catfish	665	3100	4	Discharge	0.15	
Blue catfish	626	2550	4	Discharge	0.14	
Blue catfish	648	2900	4	Discharge	< 0.18	
Blue catfish	654	2900	4	Discharge	0.26	
Blue catfish	769	4550	4	Discharge	0.47	
Blue catfish	810	7150	4	Discharge	0.15	
Blue catfish	520	1450	4	Discharge	0.25	
Blue catfish	391	544	4	Discharge	< 0.13	
Blue catfish	395	458	4	Discharge	< 0.15	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Flathead catfish	465	912	4	Discharge	0.25	
Largemouth bass	268	270	4	Discharge	< 0.15	
Largemouth bass	219	142	4	Discharge	< 0.14	**0.10**
Blue catfish	715	4150	4	Downstream	0.45	
Blue catfish	545	1550	4	Downstream	< 0.14	
Blue catfish	589	2100	4	Downstream	0.31	
Blue catfish	648	2850	4	Downstream	0.16	
Blue catfish	665	3200	4	Downstream	< 0.16	
Blue catfish	723	4500	4	Downstream	< 0.17	
Blue catfish	803	6050	4	Downstream	0.32	
Blue catfish	873	8850	4	Downstream	0.24	
Blue catfish	828	6200	4	Downstream	0.30	
Blue catfish	840	7500	4	Downstream	0.27	**0.19**
					2008 Overall Average	**0.12**

[1]Station locations: Upstream = area between 1.5 miles upstream the power plant effluent discharge to the confluence of Indian Creek and Indian Creek, Discharge = effluent discharge area of the power plant to the Cape Fear River, and Downstream = area 1.5 miles downstream of the effluent discharge to the Atlantic Coast Line Railroad bridge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 3. Cape Fear River Mercury Data (continued)

Table 3. Total mercury concentrations in axial muscle of fish from the Cape Fear River, 2009.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Bluegill	191	124	3	Upstream	< 0.14	
Bluegill	177	113	3	Upstream	< 0.15	
Bluegill	207	179	3	Upstream	0.30	
Bluegill	191	144	3	Upstream	< 0.13	
Bluegill	184	133	3	Upstream	< 0.14	
Blue catfish	838	8100	4	Upstream	0.32	
Blue catfish	819	6800	4	Upstream	0.72	
Blue catfish	733	5100	4	Upstream	0.19	
Blue catfish	650	3250	4	Upstream	< 0.11	
Blue catfish	524	1550	4	Upstream	0.21	
Flathead catfish	637	3050	4	Upstream	< 0.13	
Flathead catfish	656	3450	4	Upstream	< 0.13	
Flathead catfish	604	2150	4	Upstream	< 0.15	
Flathead catfish	470	1050	4	Upstream	< 0.13	
Flathead catfish	656	3550	4	Upstream	0.29	
Flathead catfish	168	107	4	Upstream	< 0.15	
Flathead catfish	167	93	4	Upstream	< 0.15	
Flathead catfish	168	96	4	Upstream	< 0.16	
Flathead catfish	150	82	4	Upstream	< 0.14	
Flathead catfish	160	94	4	Upstream	0.41	
Largemouth bass	285	223	4	Upstream	0.12	
Largemouth bass	297	388	4	Upstream	0.21	
Largemouth bass	244	215	4	Upstream	0.24	
Largemouth bass	258	263	4	Upstream	0.24	
Largemouth bass	327	606	4	Upstream	< 0.14	
Largemouth bass	256	256	4	Upstream	< 0.16	
Largemouth bass	333	508	4	Upstream	< 0.14	
Largemouth bass	278	324	4	Upstream	< 0.17	
Largemouth bass	365	756	4	Upstream	0.18	
Largemouth bass	362	740	4	Upstream	< 0.14	**0.11**
Bluegill	211	221	3	Discharge	< 0.16	
Bluegill	197	152	3	Discharge	< 0.13	
Bluegill	166	91	3	Discharge	< 0.14	
Bluegill	215	237	3	Discharge	< 0.14	
Bluegill	192	160	3	Discharge	0.20	
Bluegill	173	102	3	Discharge	< 0.13	
Bluegill	192	136	3	Discharge	< 0.15	
Bluegill	198	179	3	Discharge	< 0.15	
Bluegill	204	199	3	Discharge	< 0.15	
Bluegill	225	274	3	Discharge	< 0.14	
Blue catfish	713	4550	4	Discharge	0.33	
Blue catfish	702	3500	4	Discharge	0.17	
Blue catfish	604	2175	4	Discharge	< 0.15	
Blue catfish	450	881	4	Discharge	< 0.14	
Flathead catfish	891	7500	4	Discharge	0.53	
Flathead catfish	685	3900	4	Discharge	0.30	
Flathead catfish	595	2450	4	Discharge	< 0.15	
Flathead catfish	756	4650	4	Discharge	0.49	
Flathead catfish	566	1800	4	Discharge	< 0.13	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Flathead catfish	340	362	4	Discharge	< 0.13	
Largemouth bass	285	355	4	Discharge	< 0.16	
Largemouth bass	383	1044	4	Discharge	< 0.16	
Largemouth bass	462	1500	4	Discharge	< 0.16	
Largemouth bass	292	380	4	Discharge	0.23	
Largemouth bass	268	293	4	Discharge	< 0.16	
Largemouth bass	296	430	4	Discharge	< 0.15	
Largemouth bass	318	501	4	Discharge	< 0.15	
Largemouth bass	277	308	4	Discharge	< 0.14	
Largemouth bass	289	400	4	Discharge	< 0.18	
Largemouth bass	311	450	4	Discharge	0.12	**0.10**
Bluegill	172	106	3	Downstream	0.18	
Bluegill	193	171	3	Downstream	0.16	
Bluegill	193	162	3	Downstream	0.15	
Bluegill	163	78	3	Downstream	0.17	
Bluegill	152	70	3	Downstream	0.10	
Bluegill	140	66	3	Downstream	0.09	
Bluegill	133	51	3	Downstream	0.09	
Bluegill	128	40	3	Downstream	0.08	
Bluegill	120	32	3	Downstream	0.08	
Blue catfish	720	4250	4	Downstream	< 0.13	
Blue catfish	635	3000	4	Downstream	0.15	
Blue catfish	720	3550	4	Downstream	< 0.15	
Blue catfish	703	4400	4	Downstream	0.21	
Blue catfish	658	3150	4	Downstream	< 0.15	
Blue catfish	718	4050	4	Downstream	< 0.16	
Blue catfish	685	3500	4	Downstream	< 0.15	
Blue catfish	640	2150	4	Downstream	0.32	
Flathead catfish	662	3000	4	Downstream	0.28	
Flathead catfish	726	3850	4	Downstream	0.40	
Largemouth bass	310	498	4	Downstream	< 0.15	
Largemouth bass	314	460	4	Downstream	< 0.14	
Largemouth bass	352	726	4	Downstream	< 0.14	
Largemouth bass	317	472	4	Downstream	0.27	
Largemouth bass	365	874	4	Downstream	0.17	
Largemouth bass	275	413	4	Downstream	< 0.15	
Largemouth bass	268	302	4	Downstream	< 0.14	
Largemouth bass	328	595	4	Downstream	0.12	
Largemouth bass	195	98	4	Downstream	< 0.16	
Largemouth bass	203	126	4	Downstream	< 0.14	**0.12**
					2009 Overall Average	**0.11**

[1]Station locations: Upstream = area between 1.5 miles upstream the power plant effluent discharge to the confluence of Indian Creek and Indian Creek, Discharge = effluent discharge area of the power plant to the Cape Fear River, and Downstream = area 1.5 miles downstream of the effluent discharge to the Atlantic Coast Line Railroad bridge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 3. Cape Fear River Mercury Data (continued)

Table 4. Total mercury concentrations in axial muscle of fish from the Cape Fear River, 2010.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Bluegill	196	189	3	Upstream	< 0.17	
Bluegill	201	194	3	Upstream	< 0.16	
Bluegill	168	98	3	Upstream	0.14	
Blue catfish	705	4075	4	Upstream	0.05	
Blue catfish	490	975	4	Upstream	0.22	
Blue catfish	728	4040	4	Upstream	< 0.14	
Blue catfish	622	2450	4	Upstream	0.26	
Blue catfish	710	4600	4	Upstream	0.17	
Blue catfish	631	2800	4	Upstream	< 0.11	
Blue catfish	701	3600	4	Upstream	0.11	
Blue catfish	633	3100	4	Upstream	< 0.11	
Blue catfish	517	5150	4	Upstream	< 0.13	
Channel catfish	475	1040	4	Upstream	0.17	
Flathead catfish	180	112	4	Upstream	0.23	
Flathead catfish	163	82	4	Upstream	0.24	
Flathead catfish	176	109	4	Upstream	0.24	
Flathead catfish	164	98	4	Upstream	0.10	
Flathead catfish	157	86	4	Upstream	0.22	
Flathead catfish	166	105	4	Upstream	0.09	
Flathead catfish	163	86	4	Upstream	0.22	
Largemouth bass	279	344	4	Upstream	< 0.12	
Largemouth bass	279	314	4	Upstream	< 0.13	
Largemouth bass	267	256	4	Upstream	< 0.12	
Largemouth bass	282	284	4	Upstream	< 0.13	
Largemouth bass	257	230	4	Upstream	< 0.13	
Largemouth bass	267	276	4	Upstream	< 0.13	
Largemouth bass	291	355	4	Upstream	< 0.13	
Largemouth bass	314	508	4	Upstream	< 0.13	
Largemouth bass	305	391	4	Upstream	< 0.13	
Largemouth bass	267	291	4	Upstream	0.08	**0.10**
Bluegill	201	205	3	Discharge	0.09	
Bluegill	177	116	3	Discharge	< 0.14	
Bluegill	169	100	3	Discharge	< 0.14	
Bluegill	171	95	3	Discharge	< 0.02	
Bluegill	190	138	3	Discharge	< 0.13	
Bluegill	171	110	3	Discharge	0.18	
Bluegill	176	111	3	Discharge	< 0.14	
Bluegill	212	208	3	Discharge	< 0.13	
Bluegill	198	170	3	Discharge	< 0.14	
Bluegill	219	192	3	Discharge	0.13	
Blue catfish	784	5425	4	Discharge	0.17	
Blue catfish	665	2900	4	Discharge	< 0.12	
Blue catfish	725	5100	4	Discharge	< 0.10	
Blue catfish	645	2800	4	Discharge	0.07	
Blue catfish	548	1600	4	Discharge	< 0.12	
Blue catfish	725	4575	4	Discharge	< 0.13	
Blue catfish	624	2700	4	Discharge	< 0.15	
Blue catfish	647	3125	4	Discharge	0.30	
Blue catfish	627	3000	4	Discharge	0.20	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Blue catfish	644	3500	4	Discharge	< 0.15	
Largemouth bass	371	882	4	Discharge	< 0.14	
Largemouth bass	409	1100	4	Discharge	< 0.17	
Largemouth bass	352	707	4	Discharge	< 0.14	
Largemouth bass	349	697	4	Discharge	< 0.15	
Largemouth bass	345	676	4	Discharge	< 0.15	
Largemouth bass	350	654	4	Discharge	0.21	
Largemouth bass	356	652	4	Discharge	< 0.12	
Largemouth bass	308	438	4	Discharge	< 0.16	
Largemouth bass	395	960	4	Discharge	< 0.16	
Largemouth bass	336	526	4	Discharge	< 0.15	**0.08**
Blue catfish	663	3100	4	Downstream	< 0.11	
Blue catfish	645	2800	4	Downstream	< 0.14	
Blue catfish	830	5900	4	Downstream	0.15	
Blue catfish	650	3150	4	Downstream	0.16	
Blue catfish	720	4900	4	Downstream	< 0.15	
Blue catfish	652	2850	4	Downstream	< 0.12	
Blue catfish	650	3000	4	Downstream	< 0.13	
Blue catfish	887	10500	4	Downstream	0.22	
Blue catfish	678	3800	4	Downstream	< 0.11	
Blue catfish	780	5800	4	Downstream	< 0.12	
Largemouth bass	296	448	4	Downstream	0.06	**0.08**
					2010 Overall Average	**0.09**

[1]Station locations: Upstream = area between 1.5 miles upstream the power plant effluent discharge to the confluence of Indian Creek and Indian Creek, Discharge = effluent discharge area of the power plant to the Cape Fear River, and Downstream = area 1.5 miles downstream of the effluent discharge to the Atlantic Coast Line Railroad bridge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 3. Cape Fear River Mercury Data (continued)

Table 5. Total mercury concentrations in axial muscle of fish from the Cape Fear River, 2011.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Bluegill	166	79	3	Upstream	< 0.16	
Bluegill	164	80	3	Upstream	< 0.14	
Bluegill	205	204	3	Upstream	< 0.15	
Bluegill	187	130	3	Upstream	< 0.17	
Bluegill	192	157	3	Upstream	< 0.14	
Bluegill	195	148	3	Upstream	< 0.14	
Bluegill	206	200	3	Upstream	< 0.14	
Bluegill	192	132	3	Upstream	< 0.16	
Bluegill	190	126	3	Upstream	< 0.14	
Bluegill	190	134	3	Upstream	< 0.14	
Blue catfish	736	4350	4	Upstream	0.47	
Blue catfish	610	2500	4	Upstream	< 0.13	
Blue catfish	716	4750	4	Upstream	0.11	
Blue catfish	708	3700	4	Upstream	< 0.33	
Blue catfish	628	2750	4	Upstream	< 0.13	
Blue catfish	586	2250	4	Upstream	< 0.13	
Blue catfish	650	3700	4	Upstream	0.23	
Blue catfish	721	4500	4	Upstream	< 0.15	
Blue catfish	581	2250	4	Upstream	< 0.14	
Blue catfish	657	3350	4	Upstream	< 0.13	
Largemouth bass	335	482	4	Upstream	< 0.14	
Largemouth bass	290	364	4	Upstream	0.39	
Largemouth bass	325	440	4	Upstream	0.10	
Largemouth bass	347	605	4	Upstream	< 0.15	
Largemouth bass	216	175	4	Upstream	< 0.15	
Largemouth bass	341	570	4	Upstream	< 0.15	
Largemouth bass	343	581	4	Upstream	< 0.15	
Largemouth bass	412	944	4	Upstream	0.18	
Largemouth bass	369	708	4	Upstream	0.27	
Largemouth bass	412	1025	4	Upstream	< 0.17	**0.09**
Bluegill	171	98	3	Discharge	< 0.14	
Bluegill	210	181	3	Discharge	< 0.17	
Bluegill	180	117	3	Discharge	< 0.17	
Bluegill	189	149	3	Discharge	< 0.15	
Bluegill	190	164	3	Discharge	< 0.17	
Bluegill	214	217	3	Discharge	< 0.17	
Bluegill	221	269	3	Discharge	< 0.17	
Bluegill	179	125	3	Discharge	< 0.15	
Bluegill	191	143	3	Discharge	< 0.17	
Bluegill	173	104	3	Discharge	< 0.15	
Blue catfish	782	5650	4	Discharge	< 0.14	
Blue catfish	680	3475	4	Discharge	< 0.15	
Blue catfish	781	4950	4	Discharge	0.44	
Blue catfish	684	3450	4	Discharge	< 0.16	
Blue catfish	625	3150	4	Discharge	0.43	
Blue catfish	607	2550	4	Discharge	< 0.12	
Blue catfish	652	3100	4	Discharge	0.30	
Blue catfish	724	5000	4	Discharge	< 0.15	
Blue catfish	640	2650	4	Discharge	0.07	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Blue catfish	576	1725	4	Discharge	< 0.14	
Largemouth bass	397	921	4	Discharge	< 0.15	
Largemouth bass	443	1325	4	Discharge	< 0.17	
Largemouth bass	352	620	4	Discharge	< 0.13	**0.09**
Bluegill	161	60	3	Downstream	0.19	
Bluegill	162	68	3	Downstream	0.14	
Blue catfish	480	1050	4	Downstream	< 0.16	
Blue catfish	698	3700	4	Downstream	< 0.13	
Blue catfish	728	3950	4	Downstream	< 0.15	
Blue catfish	694	4000	4	Downstream	< 0.15	
Blue catfish	782	5750	4	Downstream	0.19	
Blue catfish	761	5200	4	Downstream	0.55	
Blue catfish	690	3725	4	Downstream	0.17	
Blue catfish	732	5025	4	Downstream	0.15	
Blue catfish	741	4450	4	Downstream	< 0.14	
Blue catfish	701	3700	4	Downstream	< 0.14	
Largemouth bass	297	378	4	Downstream	< 0.14	
Largemouth bass	282	327	4	Downstream	0.12	
Largemouth bass	261	212	4	Downstream	< 0.14	
Largemouth bass	286	313	4	Downstream	< 0.12	
Largemouth bass	282	310	4	Downstream	< 0.14	
Largemouth bass	304	395	4	Downstream	< 0.14	**0.14**
					2011 Overall Average	**0.11**

[1]Station locations: Upstream = area between 1.5 miles upstream the power plant effluent discharge to the confluence of Indian Creek and Indian Creek, Discharge = effluent discharge area of the power plant to the Cape Fear River, and Downstream = area 1.5 miles downstream of the effluent discharge to the Atlantic Coast Line Railroad bridge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 4. French Broad River Mercury Data

Table 1. Total mercury concentrations in axial muscle of fish from the French Broad River, 2006.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	190	143	3	Upstream	< 0.16	
Redbreast	186	137	3	Upstream	< 0.16	
Redbreast	182	110	3	Upstream	0.10	
Redbreast	187	118	3	Upstream	< 0.16	
Redbreast	178	112	3	Upstream	< 0.16	
Redbreast	168	94	3	Upstream	0.29	
Black redhorse	416	780	3	Upstream	0.34	
Black redhorse	428	710	3	Upstream	< 0.18	
Black redhorse	419	652	3	Upstream	< 0.17	
Black redhorse	465	1125	3	Upstream	0.47	
Black redhorse	405	624	3	Upstream	0.34	
Black redhorse	440	1000	3	Upstream	0.47	
Smallmouth bass	298	322	4	Upstream	0.80	
Smallmouth bass	294	354	4	Upstream	0.53	
Smallmouth bass	313	424	4	Upstream	0.63	
Smallmouth bass	264	207	4	Upstream	0.37	
Smallmouth bass	213	134	4	Upstream	0.35	
Largemouth bass	350	608	4	Upstream	0.44	**0.30**
Redbreast	185	128	3	Discharge	< 0.16	
Redbreast	193	120	3	Discharge	< 0.17	
Redbreast	182	118	3	Discharge	< 0.16	
Redbreast	177	112	3	Discharge	< 0.14	
Redbreast	180	126	3	Discharge	< 0.16	
Redbreast	175	104	3	Discharge	< 0.16	
Black redhorse	495	1375	3	Discharge	0.39	
Black redhorse	427	773	3	Discharge	0.54	
Black redhorse	484	1200	3	Discharge	0.23	
Black redhorse	503	1400	3	Discharge	0.35	
Black redhorse	431	818	3	Discharge	0.26	
Black redhorse	438	845	3	Discharge	0.21	
Smallmouth bass	382	777	4	Discharge	0.35	
Smallmouth bass	343	566	4	Discharge	0.29	
Smallmouth bass	424	1250	4	Discharge	0.46	
Smallmouth bass	378	738	4	Discharge	0.61	
Smallmouth bass	390	798	4	Discharge	0.73	
Smallmouth bass	355	664	4	Discharge	0.27	**0.27**
Redbreast	171	104	3	Downstream	< 0.15	
Redbreast	194	122	3	Downstream	< 0.15	
Redbreast	176	98	3	Downstream	< 0.18	
Redbreast	176	98	3	Downstream	< 0.16	
Redbreast	173	103	3	Downstream	< 0.16	
Redbreast	174	99	3	Downstream	< 0.16	
Black redhorse	388	558	3	Downstream	< 0.11	
Black redhorse	493	1375	3	Downstream	0.30	
Black redhorse	448	1050	3	Downstream	0.52	
Black redhorse	433	949	3	Downstream	< 0.17	
Black redhorse	450	1050	3	Downstream	< 0.18	
Black redhorse	381	802	3	Downstream	< 0.16	
Smallmouth bass	460	1300	4	Downstream	0.79	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Smallmouth bass	329	472	4	Downstream	0.45	
Smallmouth bass	426	890	4	Downstream	0.80	
Smallmouth bass	262	209	4	Downstream	< 0.18	
Smallmouth bass	335	403	4	Downstream	0.54	
Smallmouth bass	299	318	4	Downstream	0.33	**0.23**
					2006 Overall Average	**0.26**

[1]Station locations: Upstream = area approximately 3.9 river miles upstream of the effluent discharge, Discharge = effluent discharge area of the power plant to the French Broad River, and Downstream = area approximately 6.7 river miles downstream of the effluent discharge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 4. French Broad River Mercury Data (continued)

Table 2. Total mercury concentrations in axial muscle of fish from the French Broad River, 2007.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	183	178	3	Upstream	< 0.14	
Redbreast	183	159	3	Upstream	0.21	
Redbreast	183	162	3	Upstream	0.08	
Redbreast	183	151	3	Upstream	< 0.14	
Redbreast	183	222	3	Upstream	0.23	
Redbreast	183	193	3	Upstream	< 0.16	
Redbreast	183	206	3	Upstream	< 0.15	
Redbreast	183	187	3	Upstream	< 0.19	
Redbreast	183	161	3	Upstream	< 0.16	
Redbreast	183	202	3	Upstream	0.08	
Black redhorse	480	1040	3	Upstream	0.19	
Black redhorse	453	958	3	Upstream	0.16	
Black redhorse	428	864	3	Upstream	0.51	
Black redhorse	482	1500	3	Upstream	0.42	
Black redhorse	446	988	3	Upstream	0.58	
Black redhorse	426	856	3	Upstream	0.15	
Black redhorse	395	759	3	Upstream	0.44	
Black redhorse	416	805	3	Upstream	0.08	
Black redhorse	448	724	3	Upstream	< 0.17	
Black redhorse	390	760	3	Upstream	< 0.15	
Bluegill	149	68	3	Upstream	< 0.15	
Bluegill	162	88	3	Upstream	< 0.15	
Bluegill	168	101	3	Upstream	< 0.16	
Smallmouth bass	366	586	4	Upstream	0.99	**0.49**
Redbreast	183	126	3	Discharge	< 0.14	
Redbreast	188	124	3	Discharge	< 0.16	
Redbreast	176	95	3	Discharge	< 0.13	
Redbreast	194	132	3	Discharge	< 0.13	
Redbreast	176	106	3	Discharge	< 0.12	
Redbreast	173	98	3	Discharge	< 0.13	
Redbreast	196	164	3	Discharge	< 0.14	
Redbreast	204	169	3	Discharge	< 0.13	
Redbreast	182	108	3	Discharge	< 0.14	
Redbreast	184	116	3	Discharge	< 0.14	
Black redhorse	451	1050	3	Discharge	0.19	
Black redhorse	442	1025	3	Discharge	< 0.16	
Black redhorse	447	868	3	Discharge	0.30	
Black redhorse	433	838	3	Discharge	0.10	
Black redhorse	482	1200	3	Discharge	0.14	
Black redhorse	446	964	3	Discharge	< 0.20	
Black redhorse	492	1525	3	Discharge	0.41	
Black redhorse	481	1250	3	Discharge	0.22	
Black redhorse	472	1175	3	Discharge	< 0.16	
Black redhorse	453	1275	3	Discharge	0.29	
Smallmouth bass	348	560	4	Discharge	0.26	
Smallmouth bass	309	378	4	Discharge	0.31	
Smallmouth bass	457	1400	4	Discharge	1.04	
Smallmouth bass	242	163	4	Discharge	< 0.16	
Smallmouth bass	348	582	4	Discharge	0.30	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Smallmouth bass	283	318	4	Discharge	0.09	
Smallmouth bass	327	467	4	Discharge	0.33	
Smallmouth bass	427	1004	4	Discharge	0.61	
Smallmouth bass	266	247	4	Discharge	0.19	
Smallmouth bass	278	269	4	Discharge	< 0.14	**0.16**
Redbreast	182	111	3	Downstream	< 0.16	
Redbreast	176	94	3	Downstream	< 0.15	
Redbreast	192	134	3	Downstream	< 0.14	
Redbreast	167	76	3	Downstream	< 0.13	
Redbreast	168	78	3	Downstream	0.29	
Redbreast	152	78	3	Downstream	< 0.14	
Redbreast	175	89	3	Downstream	< 0.13	
Redbreast	197	121	3	Downstream	< 0.14	
Redbreast	192	127	3	Downstream	< 0.14	
Redbreast	178	118	3	Downstream	< 0.14	
Black redhorse	507	1400	3	Downstream	< 0.18	
Black redhorse	457	997	3	Downstream	0.10	
Black redhorse	509	1700	3	Downstream	0.13	
Black redhorse	483	1475	3	Downstream	0.51	
Black redhorse	492	1500	3	Downstream	0.19	
Black redhorse	483	1025	3	Downstream	< 0.17	
Black redhorse	456	1200	3	Downstream	0.21	
Black redhorse	460	1175	3	Downstream	< 0.14	
Black redhorse	468	1250	3	Downstream	< 0.16	
Black redhorse	423	907	3	Downstream	< 0.16	
Smallmouth bass	342	591	4	Downstream	0.34	
Smallmouth bass	332	444	4	Downstream	0.16	
Smallmouth bass	296	299	4	Downstream	0.35	
Smallmouth bass	351	528	4	Downstream	0.30	
Smallmouth bass	293	309	4	Downstream	0.19	
Smallmouth bass	312	421	4	Downstream	0.28	
Smallmouth bass	331	627	4	Downstream	0.14	
Rock bass	202	168	4	Downstream	0.12	
Rock bass	172	93	4	Downstream	< 0.16	
Rock bass	186	123	4	Downstream	< 0.14	**0.13**
					2007 Overall Average	**0.26**

[1]Station locations: Upstream = area approximately 3.9 river miles upstream of the effluent discharge, Discharge = effluent discharge area of the power plant to the French Broad River, and Downstream = area approximately 6.7 river miles downstream of the effluent discharge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 4. French Broad River Mercury Data (continued)

Table 3. Total mercury concentrations in axial muscle of fish from the French Broad River, 2008.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	192	135	3	Upstream	< 0.13	
Redbreast	192	125	3	Upstream	< 0.12	
Redbreast	188	131	3	Upstream	< 0.15	
Redbreast	181	120	3	Upstream	0.17	
Redbreast	183	112	3	Upstream	< 0.13	
Redbreast	190	119	3	Upstream	< 0.13	
Redbreast	180	128	3	Upstream	< 0.12	
Redbreast	172	107	3	Upstream	< 0.16	
Redbreast	174	116	3	Upstream	< 0.12	
Redbreast	181	108	3	Upstream	< 0.14	
Redbreast	425	854	3	Upstream	0.30	
Redbreast	394	750	3	Upstream	0.19	
Redbreast	458	1050	3	Upstream	0.20	
Black redhorse	431	818	3	Upstream	< 0.17	
Black redhorse	450	975	3	Upstream	0.54	
Black redhorse	413	840	3	Upstream	0.17	
Black redhorse	445	960	3	Upstream	0.48	
Black redhorse	447	1050	3	Upstream	0.39	
Black redhorse	433	720	3	Upstream	0.30	
Black redhorse	470	872	3	Upstream	0.26	
Smallmouth bass	249	191	4	Upstream	0.22	
Smallmouth bass	305	332	4	Upstream	< 0.15	
Smallmouth bass	243	172	4	Upstream	< 0.16	
Smallmouth bass	382	690	4	Upstream	0.82	
Largemouth bass	312	410	4	Upstream	< 0.15	
Largemouth bass	287	319	4	Upstream	< 0.15	
Rock bass	260	350	4	Upstream	0.53	
Rock bass	245	328	4	Upstream	0.25	
Spotted bass	288	308	4	Upstream	0.10	**0.15**
Redbreast	173	101	3	Discharge	< 0.15	
Redbreast	156	80	3	Discharge	< 0.16	
Redbreast	202	151	3	Discharge	< 0.15	
Redbreast	177	105	3	Discharge	< 0.15	
Redbreast	173	95	3	Discharge	< 0.15	
Redbreast	176	103	3	Discharge	< 0.13	
Redbreast	165	84	3	Discharge	< 0.15	
Redbreast	165	86	3	Discharge	< 0.13	
Redbreast	154	73	3	Discharge	< 0.13	
Redbreast	192	101	3	Discharge	0.20	
Black redhorse	478	1325	3	Discharge	0.23	
Black redhorse	520	1650	3	Discharge	0.39	
Black redhorse	467	1150	3	Discharge	0.32	
Black redhorse	489	1400	3	Discharge	< 0.16	
Black redhorse	465	1100	3	Discharge	< 0.17	
Black redhorse	462	1125	3	Discharge	< 0.18	
Black redhorse	473	1075	3	Discharge	0.21	
Black redhorse	461	1050	3	Discharge	< 0.17	
Black redhorse	446	1100	3	Discharge	0.50	
Black redhorse	445	1050	3	Discharge	0.24	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Smallmouth bass	432	938	4	Discharge	0.68	
Smallmouth bass	205	99	4	Discharge	< 0.17	
Smallmouth bass	215	125	4	Discharge	0.18	
Smallmouth bass	192	94	4	Discharge	< 0.14	
Smallmouth bass	205	104	4	Discharge	0.12	
Smallmouth bass	381	808	4	Discharge	0.52	
Smallmouth bass	408	972	4	Discharge	0.65	
Smallmouth bass	232	169	4	Discharge	0.18	
Smallmouth bass	236	145	4	Discharge	0.36	
Smallmouth bass	233	182	4	Discharge	< 0.15	**0.16**
Redbreast	190	127	3	Downstream	0.42	
Redbreast	186	108	3	Downstream	0.15	
Redbreast	193	140	3	Downstream	< 0.16	
Redbreast	195	130	3	Downstream	< 0.13	
Redbreast	192	132	3	Downstream	0.09	
Redbreast	198	144	3	Downstream	< 0.13	
Redbreast	198	150	3	Downstream	< 0.16	
Redbreast	202	141	3	Downstream	< 0.14	
Redbreast	210	166	3	Downstream	< 0.15	
Redbreast	192	132	3	Downstream	< 0.12	
Black redhorse	402	781	3	Downstream	0.27	
Black redhorse	473	1250	3	Downstream	0.18	
Black redhorse	492	1200	3	Downstream	0.30	
Black redhorse	468	1025	3	Downstream	< 0.16	
Black redhorse	447	924	3	Downstream	0.31	
Black redhorse	438	888	3	Downstream	< 0.15	
Black redhorse	445	1040	3	Downstream	< 0.18	
Black redhorse	465	1038	3	Downstream	0.18	
Black redhorse	507	1375	3	Downstream	< 0.19	
Black redhorse	500	1525	3	Downstream	< 0.13	
Smallmouth bass	355	596	4	Downstream	0.37	
Smallmouth bass	312	365	4	Downstream	< 0.17	
Smallmouth bass	224	160	4	Downstream	< 0.15	
Smallmouth bass	283	273	4	Downstream	0.11	
Largemouth bass	291	300	4	Downstream	< 0.15	
Largemouth bass	210	120	4	Downstream	< 0.13	
Largemouth bass	280	262	4	Downstream	< 0.12	
Largemouth bass	316	418	4	Downstream	< 0.13	
Largemouth bass	231	180	4	Downstream	0.12	
Rock bass	215	208	4	Downstream	0.31	**0.11**
					2008 Overall Average	**0.14**

[1]Station locations: Upstream = area approximately 3.9 river miles upstream of the effluent discharge, Discharge = effluent discharge area of the power plant to the French Broad River, and Downstream = area approximately 6.7 river miles downstream of the effluent discharge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 4. French Broad River Mercury Data (continued)

Table 4. Total mercury concentrations in axial muscle of fish from the French Broad River, 2009.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	164	98	3	Upstream	< 0.15	
Redbreast	188	158	3	Upstream	< 0.16	
Redbreast	172	97	3	Upstream	0.23	
Redbreast	172	124	3	Upstream	0.24	
Redbreast	167	103	3	Upstream	< 0.15	
Redbreast	161	76	3	Upstream	0.08	
Redbreast	178	101	3	Upstream	< 0.15	
Redbreast	155	81	3	Upstream	< 0.14	
Redbreast	196	140	3	Upstream	0.08	
Redbreast	212	196	3	Upstream	< 0.17	
Black redhorse	455	1008	3	Upstream	0.23	
Black redhorse	404	669	3	Upstream	0.36	
Black redhorse	439	750	3	Upstream	< 0.15	
Black redhorse	430	988	3	Upstream	0.32	
Black redhorse	448	984	3	Upstream	0.26	
Black redhorse	435	796	3	Upstream	0.27	
Black redhorse	435	992	3	Upstream	0.32	
Black redhorse	402	701	3	Upstream	0.73	
Black redhorse	424	760	3	Upstream	0.28	
Black redhorse	390	532	3	Upstream	0.33	
Black redhorse	248	189	3	Upstream	< 0.16	
Smallmouth bass	292	332	4	Upstream	0.30	
Smallmouth bass	270	250	4	Upstream	0.45	
Smallmouth bass	259	220	4	Upstream	0.25	
Smallmouth bass	251	185	4	Upstream	0.52	
Smallmouth bass	237	156	4	Upstream	0.44	
Smallmouth bass	249	184	4	Upstream	0.28	
Largemouth bass	526	2275	4	Upstream	0.71	
Largemouth bass	405	1090	4	Upstream	0.37	
Rock bass	177	142	4	Upstream	< 0.14	**0.23**
Redbreast	162	75	3	Discharge	< 0.14	
Redbreast	180	104	3	Discharge	< 0.14	
Redbreast	172	82	3	Discharge	< 0.14	
Redbreast	176	112	3	Discharge	< 0.15	
Redbreast	155	84	3	Discharge	< 0.14	
Redbreast	153	68	3	Discharge	< 0.14	
Redbreast	150	65	3	Discharge	< 0.12	
Redbreast	171	99	3	Discharge	< 0.13	
Redbreast	159	76	3	Discharge	0.09	
Redbreast	171	90	3	Discharge	< 0.13	
Black redhorse	467	1110	3	Discharge	0.39	
Black redhorse	500	1275	3	Discharge	0.26	
Black redhorse	453	1025	3	Discharge	< 0.16	
Black redhorse	438	879	3	Discharge	< 0.14	
Black redhorse	460	1100	3	Discharge	< 0.15	
Black redhorse	453	849	3	Discharge	0.18	
Black redhorse	440	855	3	Discharge	0.13	
Black redhorse	447	860	3	Discharge	0.27	
Black redhorse	407	704	3	Discharge	0.43	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Black redhorse	392	530	3	Discharge	< 0.14	
Smallmouth bass	265	242	4	Discharge	0.22	
Smallmouth bass	237	175	4	Discharge	< 0.16	
Smallmouth bass	238	178	4	Discharge	0.14	
Smallmouth bass	214	141	4	Discharge	0.22	
Smallmouth bass	267	222	4	Discharge	0.18	
Smallmouth bass	236	188	4	Discharge	< 0.16	
Smallmouth bass	267	243	4	Discharge	< 0.16	
Smallmouth bass	214	130	4	Discharge	< 0.13	
Smallmouth bass	262	229	4	Discharge	0.22	
Smallmouth bass	235	157	4	Discharge	< 0.16	**0.11**
Redbreast	169	85	3	Downstream	< 0.15	
Redbreast	180	113	3	Downstream	< 0.15	
Redbreast	165	85	3	Downstream	< 0.14	
Redbreast	156	76	3	Downstream	< 0.15	
Redbreast	212	181	3	Downstream	< 0.13	
Redbreast	170	96	3	Downstream	< 0.13	
Redbreast	163	76	3	Downstream	< 0.15	
Redbreast	179	100	3	Downstream	< 0.14	
Redbreast	171	80	3	Downstream	< 0.15	
Redbreast	167	88	3	Downstream	< 0.14	
Black redhorse	432	876	3	Downstream	< 0.16	
Black redhorse	410	691	3	Downstream	< 0.14	
Black redhorse	438	878	3	Downstream	0.15	
Black redhorse	452	987	3	Downstream	0.29	
Black redhorse	446	968	3	Downstream	0.28	
Black redhorse	420	752	3	Downstream	0.18	
Black redhorse	497	1225	3	Downstream	0.28	
Black redhorse	442	945	3	Downstream	0.48	
Black redhorse	460	950	3	Downstream	0.44	
Black redhorse	421	852	3	Downstream	< 0.14	
Smallmouth bass	237	191	4	Downstream	< 0.16	
Smallmouth bass	237	145	4	Downstream	< 0.14	
Smallmouth bass	301	305	4	Downstream	< 0.14	
Smallmouth bass	231	144	4	Downstream	< 0.15	
Smallmouth bass	280	242	4	Downstream	< 0.16	
Smallmouth bass	341	440	4	Downstream	0.51	
Smallmouth bass	227	143	4	Downstream	< 0.14	
Smallmouth bass	212	172	4	Downstream	0.29	
Largemouth bass	320	424	4	Downstream	< 0.15	
Rock bass	244	180	4	Downstream	0.29	**0.12**
					2009 Overall Average	**0.13**

[1]Station locations: Upstream = area approximately 3.9 river miles upstream of the effluent discharge, Discharge = effluent discharge area of the power plant to the French Broad River, and Downstream = area approximately 6.7 river miles downstream of the effluent discharge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 4. French Broad River Mercury Data (continued)

Table 5. Total mercury concentrations in axial muscle of fish from the French Broad River, 2010.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast	186	132	3	Upstream	< 0.12	
Redbreast	201	168	3	Upstream	< 0.12	
Redbreast	198	136	3	Upstream	< 0.13	
Redbreast	190	128	3	Upstream	0.23	
Redbreast	181	105	3	Upstream	< 0.14	
Redbreast	178	106	3	Upstream	< 0.16	
Redbreast	180	108	3	Upstream	< 0.14	
Redbreast	177	111	3	Upstream	< 0.12	
Redbreast	168	97	3	Upstream	< 0.12	
Redbreast	173	108	3	Upstream	< 0.13	
Black redhorse	472	940	3	Upstream	0.26	
Black redhorse	460	843	3	Upstream	0.27	
Black redhorse	414	846	3	Upstream	0.41	
Black redhorse	439	994	3	Upstream	< 0.16	
Black redhorse	409	836	3	Upstream	0.54	
Black redhorse	483	901	3	Upstream	0.41	
Black redhorse	438	916	3	Upstream	0.44	
Black redhorse	393	728	3	Upstream	< 0.14	
Black redhorse	360	567	3	Upstream	< 0.14	
Black redhorse	445	828	3	Upstream	0.52	
Smallmouth bass	283	264	4	Upstream	0.36	
Smallmouth bass	266	231	4	Upstream	0.16	
Smallmouth bass	204	118	4	Upstream	< 0.15	
Largemouth bass	358	526	4	Upstream	0.39	
Largemouth bass	323	506	4	Upstream	0.27	
Rock bass	197	156	4	Upstream	< 0.15	
Rock bass	211	194	4	Upstream	< 0.14	
Rock bass	233	254	4	Upstream	< 0.16	
Rock bass	178	116	4	Upstream	< 0.15	
Rock bass	202	151	4	Upstream	< 0.15	**0.13**
Redbreast	154	65	3	Discharge	0.11	
Redbreast	182	114	3	Discharge	0.11	
Redbreast	147	60	3	Discharge	0.20	
Redbreast	174	74	3	Discharge	0.17	
Redbreast	150	54	3	Discharge	0.08	
Redbreast	147	54	3	Discharge	0.14	
Redbreast	154	61	3	Discharge	0.12	
Redbreast	154	61	3	Discharge	0.19	
Redbreast	172	84	3	Discharge	0.06	
Redbreast	173	91	3	Discharge	0.04	
Black redhorse	447	796	3	Discharge	0.26	
Black redhorse	483	1050	3	Discharge	< 0.17	
Black redhorse	394	600	3	Discharge	< 0.17	
Black redhorse	410	706	3	Discharge	< 0.15	
Black redhorse	442	797	3	Discharge	0.09	
Black redhorse	394	538	3	Discharge	< 0.13	
Black redhorse	428	774	3	Discharge	< 0.15	
Black redhorse	518	1400	3	Discharge	0.28	
Black redhorse	511	1150	3	Discharge	0.49	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Black redhorse	439	788	3	Discharge	0.48	
Smallmouth bass	281	254	4	Discharge	< 0.18	
Smallmouth bass	290	300	4	Discharge	0.26	
Smallmouth bass	277	271	4	Discharge	0.30	
Smallmouth bass	231	154	4	Discharge	< 0.16	
Smallmouth bass	297	308	4	Discharge	0.38	
Smallmouth bass	273	256	4	Discharge	0.36	
Smallmouth bass	288	244	4	Discharge	0.33	
Smallmouth bass	227	136	4	Discharge	0.26	
Smallmouth bass	228	152	4	Discharge	0.32	
Smallmouth bass	226	138	4	Discharge	0.15	**0.17**
Redbreast	190	125	3	Downstream	< 0.14	
Redbreast	196	146	3	Downstream	< 0.14	
Redbreast	175	102	3	Downstream	< 0.10	
Redbreast	163	102	3	Downstream	< 0.13	
Redbreast	169	100	3	Downstream	< 0.13	
Redbreast	171	92	3	Downstream	< 0.11	
Redbreast	171	89	3	Downstream	0.08	
Redbreast	166	88	3	Downstream	0.07	
Redbreast	177	106	3	Downstream	< 0.11	
Redbreast	171	104	3	Downstream	< 0.13	
Black redhorse	471	1050	3	Downstream	0.18	
Black redhorse	409	666	3	Downstream	< 0.14	
Black redhorse	453	1000	3	Downstream	< 0.15	
Black redhorse	442	920	3	Downstream	0.19	
Black redhorse	384	667	3	Downstream	0.14	
Black redhorse	471	1100	3	Downstream	0.11	
Black redhorse	447	896	3	Downstream	0.20	
Black redhorse	384	661	3	Downstream	< 0.13	
Black redhorse	476	1150	3	Downstream	0.22	
Black redhorse	391	604	3	Downstream	< 0.12	
Smallmouth bass	352	536	4	Downstream	< 0.17	
Smallmouth bass	287	316	4	Downstream	< 0.02	
Smallmouth bass	290	342	4	Downstream	0.17	
Smallmouth bass	287	287	4	Downstream	0.12	
Smallmouth bass	275	238	4	Downstream	0.36	
Smallmouth bass	281	257	4	Downstream	0.37	
Smallmouth bass	260	225	4	Downstream	0.26	
Smallmouth bass	218	120	4	Downstream	< 0.17	
Rock bass	176	102	4	Downstream	0.12	
Rock bass	167	87	4	Downstream	0.21	**0.10**
					2010 Overall Average	**0.13**

[1]Station locations: Upstream = area approximately 3.9 river miles upstream of the effluent discharge, Discharge = effluent discharge area of the power plant to the French Broad River, and Downstream = area approximately 6.7 river miles downstream of the effluent discharge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 4. French Broad River Mercury Data (continued)

Table 6. Total mercury concentrations in axial muscle of fish from the French Broad River, 2011.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Black redhorse	366	568	3	Upstream	< 0.15	
Black redhorse	341	457	3	Upstream	< 0.16	
Black redhorse	310	355	3	Upstream	< 0.14	
Black redhorse	318	377	3	Upstream	< 0.16	
Black redhorse	350	338	3	Upstream	< 0.14	
Black redhorse	344	483	3	Upstream	< 0.15	
Black redhorse	333	456	3	Upstream	< 0.15	
Black redhorse	396	618	3	Upstream	< 0.15	
Black redhorse	366	574	3	Upstream	0.28	
Black redhorse	344	462	3	Upstream	< 0.12	
Redbreast sunfish	203	172	3	Upstream	< 0.14	
Redbreast sunfish	202	164	3	Upstream	< 0.14	
Redbreast sunfish	192	136	3	Upstream	< 0.12	
Redbreast sunfish	185	130	3	Upstream	0.52	
Redbreast sunfish	209	197	3	Upstream	< 0.14	
Redbreast sunfish	207	173	3	Upstream	< 0.14	
Redbreast sunfish	192	132	3	Upstream	< 0.15	
Redbreast sunfish	178	116	3	Upstream	< 0.13	
Redbreast sunfish	185	124	3	Upstream	< 0.12	
Redbreast sunfish	177	121	3	Upstream	< 0.14	
Rock Bass	222	215	4	Upstream	< 0.14	
Rock Bass	198	162	4	Upstream	0.28	
Rock Bass	200	151	4	Upstream	0.41	
Rock Bass	222	189	4	Upstream	< 0.15	
Rock Bass	182	108	4	Upstream	< 0.15	
Smallmouth bass	271	221	4	Upstream	0.53	
Smallmouth bass	321	402	4	Upstream	< 0.17	
Smallmouth bass	334	443	4	Upstream	0.31	
Smallmouth bass	278	250	4	Upstream	0.54	
Smallmouth bass	244	177	4	Upstream	0.27	**0.13**
Black redhorse	436	826	3	Discharge	< 0.16	
Black redhorse	353	510	3	Discharge	< 0.15	
Black redhorse	398	692	3	Discharge	< 0.14	
Black redhorse	354	521	3	Discharge	0.17	
Black redhorse	386	627	3	Discharge	< 0.15	
Black redhorse	407	650	3	Discharge	< 0.16	
Black redhorse	383	670	3	Discharge	< 0.17	
Black redhorse	404	768	3	Discharge	< 0.14	
Black redhorse	388	698	3	Discharge	0.14	
Black redhorse	466	1075	3	Discharge	0.27	
Redbreast sunfish	167	90	3	Discharge	< 0.14	
Redbreast sunfish	173	95	3	Discharge	< 0.14	
Redbreast sunfish	180	109	3	Discharge	< 0.14	
Redbreast sunfish	167	81	3	Discharge	< 0.12	
Redbreast sunfish	170	96	3	Discharge	< 0.14	
Redbreast sunfish	186	134	3	Discharge	< 0.14	
Redbreast sunfish	181	104	3	Discharge	< 0.12	
Redbreast sunfish	178	103	3	Discharge	< 0.11	
Redbreast sunfish	167	94	3	Discharge	< 0.14	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Redbreast sunfish	171	99	3	Discharge	< 0.14	
Rock Bass	166	90	4	Discharge	< 0.14	
Rock Bass	156	72	4	Discharge	< 0.11	
Rock Bass	186	117	4	Discharge	< 0.15	
Chain Pickeral	325	245	4	Discharge	0.22	
Smallmouth bass	280	246	4	Discharge	0.30	
Smallmouth bass	216	131	4	Discharge	0.21	
Smallmouth bass	311	442	4	Discharge	0.27	
Smallmouth bass	210	110	4	Discharge	< 0.15	
Smallmouth bass	317	346	4	Discharge	0.24	
Smallmouth bass	305	388	4	Discharge	0.42	
Smallmouth bass	238	163	4	Discharge	0.58	**0.12**
Redbreast	180	112	3	Downstream	< 0.12	
Redbreast	184	114	3	Downstream	< 0.14	
Redbreast	189	134	3	Downstream	< 0.14	
Redbreast	172	85	3	Downstream	< 0.16	
Redbreast	182	110	3	Downstream	< 0.13	
Redbreast	177	90	3	Downstream	< 0.13	
Redbreast	184	102	3	Downstream	< 0.14	
Redbreast	182	93	3	Downstream	< 0.16	
Redbreast	188	113	3	Downstream	< 0.14	
Redbreast	179	98	3	Downstream	< 0.14	
Black redhorse	485	1050	3	Downstream	< 0.16	
Black redhorse	402	703	3	Downstream	< 0.14	
Black redhorse	370	582	3	Downstream	< 0.14	
Black redhorse	473	1100	3	Downstream	0.17	
Black redhorse	392	568	3	Downstream	< 0.16	
Black redhorse	384	601	3	Downstream	< 0.14	
Black redhorse	377	612	3	Downstream	< 0.16	
Black redhorse	381	560	3	Downstream	< 0.14	
Black redhorse	444	933	3	Downstream	< 0.15	
Black redhorse	474	1150	3	Downstream	0.23	
Smallmouth bass	312	350	4	Downstream	0.35	
Smallmouth bass	285	321	4	Downstream	0.18	
Smallmouth bass	264	220	4	Downstream	0.18	
Smallmouth bass	273	262	4	Downstream	0.53	
Smallmouth bass	330	136	4	Downstream	< 0.16	
Smallmouth bass	247	198	4	Downstream	0.21	
Smallmouth bass	231	158	4	Downstream	< 0.14	
Largemouth bass	255	226	4	Downstream	< 0.14	
Largemouth bass	223	154	4	Downstream	< 0.15	
Largemouth bass	265	207	4	Downstream	< 0.15	**0.10**
					2011 Overall Average	**0.12**

[1]Station locations: Upstream = area approximately 3.9 river miles upstream of the effluent discharge, Discharge = effluent discharge area of the power plant to the French Broad River, and Downstream = area approximately 6.7 river miles downstream of the effluent discharge.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 5. Lake Julian Mercury Data (Asheville Steam Electric Plant)

Table 1. Total mercury concentrations in axial muscle of fish from Lake Julian, 2008.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station	Total Mercury (fresh wt. µg/g)	Weighted Average[1] (mg/kg)
Channel catfish	415	540	4	Lake wide	< 0.11	
Channel catfish	368	348	4	Lake wide	< 0.14	
Channel catfish	399	560	4	Lake wide	< 0.11	
Channel catfish	352	318	4	Lake wide	< 0.11	
Channel catfish	400	650	4	Lake wide	< 0.15	
Channel catfish	429	638	4	Lake wide	< 0.13	
Largemouth bass	319	340	4	Lake wide	< 0.14	
Largemouth bass	405	734	4	Lake wide	< 0.14	
Largemouth bass	327	412	4	Lake wide	< 0.15	
Largemouth bass	329	428	4	Lake wide	< 0.14	
Largemouth bass	276	220	4	Lake wide	< 0.14	
Largemouth bass	319	410	4	Lake wide	< 0.15	**0.07**
					2008 Overall Average	**0.07**

[1]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 5. Lake Julian Mercury Data (continued)

Table 2. Total mercury concentrations in axial muscle of fish from Lake Julian, 2010.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station	Total Mercury (fresh wt. µg/g)	Weighted Average[1] (mg/kg)
Channel catfish	325	292	4	Lake wide	< 0.13	
Channel catfish	332	280	4	Lake wide	< 0.12	
Channel catfish	395	545	4	Lake wide	< 0.13	
Channel catfish	392	505	4	Lake wide	< 0.13	
Channel catfish	392	510	4	Lake wide	< 0.12	
Channel catfish	490	1100	4	Lake wide	< 0.13	
Channel catfish	398	490	4	Lake wide	< 0.13	
Channel catfish	382	385	4	Lake wide	< 0.14	
Spotted bass	297	425	4	Lake wide	< 0.11	
Spotted bass	390	878	4	Lake wide	< 0.13	
Spotted bass	322	550	4	Lake wide	< 0.15	
Spotted bass	382	688	4	Lake wide	< 0.13	
Spotted bass	446	110	4	Lake wide	< 0.15	
Spotted bass	461	1375	4	Lake wide	< 0.15	
Largemouth bass	365	852	4	Lake wide	< 0.15	
Largemouth bass	406	905	4	Lake wide	< 0.12	
Largemouth bass	382	819	4	Lake wide	< 0.12	
Largemouth bass	330	470	4	Lake wide	< 0.14	
Largemouth bass	318	427	4	Lake wide	< 0.14	
Largemouth bass	402	1125	4	Lake wide	< 0.15	
Largemouth bass	418	1100	4	Lake wide	< 0.14	
Largemouth bass	394	982	4	Lake wide	< 0.14	
Largemouth bass	372	791	4	Lake wide	< 0.13	
Largemouth bass	384	862	4	Lake wide	< 0.14	
Largemouth bass	316	453	4	Lake wide	< 0.14	
Largemouth bass	360	708	4	Lake wide	< 0.15	
Largemouth bass	382	890	4	Lake wide	< 0.12	
Largemouth bass	385	770	4	Lake wide	< 0.13	
Largemouth bass	367	780	4	Lake wide	< 0.13	
Largemouth bass	346	600	4	Lake wide	< 0.14	
Largemouth bass	349	667	4	Lake wide	< 0.15	
Largemouth bass	336	670	4	Lake wide	< 0.13	
Largemouth bass	383	680	4	Lake wide	< 0.16	
Largemouth bass	357	760	4	Lake wide	< 0.15	
Largemouth bass	336	610	4	Lake wide	< 0.15	**0.07**
					2010 Overall Average	**0.07**

[1]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 5. Lake Julian Mercury Data (continued)

Table 3. Total mercury concentrations in axial muscle of fish from Lake Julian, 2011.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station	Total Mercury (fresh wt. µg/g)	Weighted Average[1] (mg/kg)
Spotted bass	422	996	4	Lake wide	< 0.14	
Spotted bass	334	569	4	Lake wide	< 0.14	
Spotted bass	423	1250	4	Lake wide	< 0.14	
Spotted bass	338	478	4	Lake wide	< 0.14	
Largemouth bass	275	260	4	Lake wide	< 0.14	
Largemouth bass	415	812	4	Lake wide	< 0.14	
Largemouth bass	368	641	4	Lake wide	< 0.14	
Largemouth bass	444	1325	4	Lake wide	< 0.13	
Largemouth bass	334	710	4	Lake wide	< 0.12	
Largemouth bass	351	630	4	Lake wide	< 0.14	
Largemouth bass	340	552	4	Lake wide	< 0.14	
Largemouth bass	405	1050	4	Lake wide	< 0.12	
Largemouth bass	370	724	4	Lake wide	< 0.15	
Largemouth bass	289	334	4	Lake wide	< 0.14	
Largemouth bass	385	766	4	Lake wide	< 0.15	
Largemouth bass	377	1100	4	Lake wide	< 0.14	
Largemouth bass	418	1225	4	Lake wide	< 0.12	
Largemouth bass	384	708	4	Lake wide	< 0.13	
Largemouth bass	375	972	4	Lake wide	< 0.12	
Largemouth bass	356	738	4	Lake wide	< 0.15	
Largemouth bass	405	1030	4	Lake wide	< 0.15	**0.07**
					2011 Overall Average	**0.07**

[1]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 6. Hyco Lake Mercury Data (Roxboro Steam Electric Plant)

Table 1. Total mercury concentrations in axial muscle of fish from Hyco Lake, 2006.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
White catfish	260	194	3	South Hyco	< 0.14	
White catfish	287	225	3	South Hyco	< 0.15	
White catfish	270	198	3	South Hyco	< 0.15	
White catfish	280	275	3	South Hyco	0.09	
White catfish	262	210	3	South Hyco	< 0.14	
White catfish	290	273	3	South Hyco	< 0.13	
Bluegill	168	90	3	South Hyco	< 0.05	
Bluegill	158	66	3	South Hyco	0.06	
Bluegill	138	43	3	South Hyco	< 0.06	
Bluegill	138	45	3	South Hyco	< 0.06	
Bluegill	117	108	3	South Hyco	< 0.08	
Bluegill	175	98	3	South Hyco	0.14	
Largemouth bass	348	552	4	South Hyco	0.49	
Largemouth bass	308	348	4	South Hyco	< 0.15	
Largemouth bass	335	412	4	South Hyco	< 0.17	
Largemouth bass	312	320	4	South Hyco	< 0.16	
Largemouth bass	354	530	4	South Hyco	0.48	
Largemouth bass	378	784	4	South Hyco	< 0.17	**0.09**
White catfish	242	165	3	Discharge	0.09	
White catfish	255	195	3	Discharge	< 0.12	
White catfish	248	175	3	Discharge	< 0.13	
White catfish	278	238	3	Discharge	< 0.13	
White catfish	280	232	3	Discharge	< 0.12	
White catfish	245	198	3	Discharge	< 0.16	
Bluegill	168	87	3	Discharge	< 0.08	
Bluegill	147	58	3	Discharge	< 0.06	
Bluegill	145	52	3	Discharge	< 0.08	
Bluegill	172	96	3	Discharge	< 0.07	
Bluegill	140	59	3	Discharge	< 0.06	
Bluegill	147	53	3	Discharge	< 0.07	
Largemouth bass	376	698	4	Discharge	< 0.17	
Largemouth bass	293	348	4	Discharge	< 0.17	
Largemouth bass	270	232	4	Discharge	< 0.17	
Largemouth bass	322	410	4	Discharge	< 0.15	
Largemouth bass	232	153	4	Discharge	< 0.16	
Largemouth bass	226	156	4	Discharge	< 0.14	**0.06**
White catfish	427	972	3	City Lake	< 0.15	
White catfish	405	928	3	City Lake	< 0.18	
White catfish	386	804	3	City Lake	< 0.16	
White catfish	401	1075	3	City Lake	< 0.13	
White catfish	376	834	3	City Lake	< 0.15	
White catfish	409	1075	3	City Lake	< 0.13	
Bluegill	198	148	3	City Lake	0.12	
Bluegill	209	184	3	City Lake	0.09	
Bluegill	202	158	3	City Lake	< 0.05	
Bluegill	165	80	3	City Lake	< 0.05	
Bluegill	169	89	3	City Lake	< 0.06	
Bluegill	178	101	3	City Lake	< 0.05	
Largemouth bass	369	560	4	City Lake	0.18	
Largemouth bass	319	453	4	City Lake	0.24	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	371	677	4	City Lake	< 0.17	
Largemouth bass	307	344	4	City Lake	< 0.17	
Largemouth bass	309	324	4	City Lake	< 0.16	
Largemouth bass	309	375	4	City Lake	< 0.17	**0.08**
					2006 Overall Average	**0.08**

[1]Station locations: South Hyco = South Hyco Creek arm of the reservoir, Discharge = effluent discharge area of the power plant to the reservoir, City Lake = Roxboro City Lake is a water supply reservoir on Storys Creek about 5 miles southeast of the Roxboro Steam Electric Plant.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 6. Hyco Lake Mercury Data (continued)

Table 2. Total mercury concentrations in axial muscle of fish from Hyco Lake, 2007.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
White catfish	251	174	3	South Hyco	< 0.15	
White catfish	295	324	3	South Hyco	< 0.14	
White catfish	305	314	3	South Hyco	< 0.11	
White catfish	290	263	3	South Hyco	< 0.12	
White catfish	247	198	3	South Hyco	< 0.15	
White catfish	267	181	3	South Hyco	< 0.13	
Bluegill	162	65	3	South Hyco	< 0.03	
Bluegill	182	100	3	South Hyco	< 0.07	
Bluegill	166	80	3	South Hyco	0.07	
Bluegill	162	68	3	South Hyco	< 0.04	
Bluegill	158	64	3	South Hyco	< 0.04	
Bluegill	156	58	3	South Hyco	< 0.04	
Largemouth bass	330	454	4	South Hyco	< 0.16	
Largemouth bass	325	408	4	South Hyco	< 0.17	
Largemouth bass	321	392	4	South Hyco	< 0.16	
Largemouth bass	311	396	4	South Hyco	< 0.16	
Largemouth bass	341	438	4	South Hyco	< 0.16	
Largemouth bass	311	354	4	South Hyco	< 0.15	**0.06**
White catfish	302	338	3	Discharge	< 0.15	
White catfish	268	208	3	Discharge	< 0.14	
White catfish	280	281	3	Discharge	< 0.15	
White catfish	275	225	3	Discharge	< 0.12	
White catfish	288	236	3	Discharge	< 0.15	
White catfish	260	184	3	Discharge	< 0.11	
Bluegill	167	82	3	Discharge	< 0.04	
Bluegill	172	96	3	Discharge	< 0.05	
Bluegill	157	70	3	Discharge	< 0.07	
Bluegill	153	62	3	Discharge	< 0.06	
Bluegill	153	64	3	Discharge	< 0.06	
Bluegill	163	57	3	Discharge	< 0.04	
Largemouth bass	318	415	4	Discharge	< 0.15	
Largemouth bass	298	338	4	Discharge	< 0.14	
Largemouth bass	385	710	4	Discharge	< 0.17	
Largemouth bass	298	311	4	Discharge	< 0.12	
Largemouth bass	324	358	4	Discharge	< 0.11	
Largemouth bass	351	521	4	Discharge	0.52	**0.06**
					2007 Overall Average	**0.06**

[1]Station locations: South Hyco = South Hyco Creek arm of the reservoir, Discharge = effluent discharge area of the power plant to the reservoir, City Lake = Roxboro City Lake is a water supply reservoir on Storys Creek about 5 miles southeast of the Roxboro Steam Electric Plant.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 6. Hyco Lake Mercury Data (continued)

Table 3. Total mercury concentrations in axial muscle of fish from Hyco Lake, 2008.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
White catfish	315	365	3	South Hyco	< 0.14	
White catfish	287	242	3	South Hyco	< 0.12	
White catfish	290	260	3	South Hyco	< 0.14	
White catfish	260	188	3	South Hyco	< 0.12	
White catfish	270	213	3	South Hyco	< 0.12	
White catfish	314	413	3	South Hyco	< 0.12	
Bluegill	177	106	3	South Hyco	0.02	
Bluegill	170	85	3	South Hyco	0.09	
Bluegill	181	107	3	South Hyco	0.02	
Bluegill	173	96	3	South Hyco	0.08	
Bluegill	172	96	3	South Hyco	0.18	
Bluegill	73	88	3	South Hyco	0.06	
Largemouth bass	319	358	4	South Hyco	< 0.15	
Largemouth bass	306	326	4	South Hyco	< 0.15	
Largemouth bass	300	316	4	South Hyco	< 0.15	
Largemouth bass	349	460	4	South Hyco	< 0.17	
Largemouth bass	320	440	4	South Hyco	< 0.16	
Largemouth bass	318	396	4	South Hyco	< 0.14	**0.07**
Flat bullhead	238	159	3	Discharge	< 0.11	
Flat bullhead	190	84	3	Discharge	< 0.30	
Flat bullhead	193	98	3	Discharge	< 0.14	
Flat bullhead	231	141	3	Discharge	< 0.16	
Flat bullhead	201	93	3	Discharge	< 0.19	
Flat bullhead	186	75	3	Discharge	< 0.12	
Bluegill	165	72	3	Discharge	< 0.02	
Bluegill	168	71	3	Discharge	0.04	
Bluegill	150	54	3	Discharge	0.02	
Bluegill	169	74	3	Discharge	0.04	
Bluegill	154	55	3	Discharge	0.04	
Bluegill	157	70	3	Discharge	< 0.02	
Largemouth bass	350	511	4	Discharge	< 0.16	
Largemouth bass	338	415	4	Discharge	0.18	
Largemouth bass	311	373	4	Discharge	< 0.16	
Largemouth bass	333	371	4	Discharge	< 0.12	
Largemouth bass	333	439	4	Discharge	< 0.13	
Largemouth bass	334	428	4	Discharge	< 0.14	**0.06**
					2008 Overall Average	**0.06**

[1]Station locations: South Hyco = South Hyco Creek arm of the reservoir, Discharge = effluent discharge area of the power plant to the reservoir, City Lake = Roxboro City Lake is a water supply reservoir on Storys Creek about 5 miles southeast of the Roxboro Steam Electric Plant.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 6. Hyco Lake Mercury Data (continued)

Table 4. Total mercury concentrations in axial muscle of fish from Hyco Lake, 2009.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
White catfish	297	343	3	South Hyco	< 0.12	
White catfish	336	515	3	South Hyco	< 0.12	
White catfish	267	255	3	South Hyco	< 0.13	
White catfish	393	696	3	South Hyco	< 0.14	
White catfish	358	644	3	South Hyco	< 0.13	
White catfish	296	348	3	South Hyco	< 0.12	
White catfish	284	320	3	South Hyco	< 0.12	
White catfish	255	152	3	South Hyco	< 0.12	
White catfish	250	143	3	South Hyco	< 0.11	
White catfish	280	188	3	South Hyco	< 0.12	
White catfish	250	176	3	South Hyco	< 0.14	
White catfish	275	188	3	South Hyco	< 0.13	
White catfish	290	278	3	South Hyco	< 0.12	
White catfish	295	302	3	South Hyco	< 0.12	
White catfish	249	161	3	South Hyco	< 0.12	
White catfish	255	183	3	South Hyco	< 0.13	
White catfish	257	180	3	South Hyco	< 0.12	
White catfish	228	115	3	South Hyco	< 0.12	
White catfish	300	324	3	South Hyco	< 0.14	
White catfish	354	544	3	South Hyco	< 0.11	
White catfish	330	430	3	South Hyco	< 0.12	
White catfish	317	403	3	South Hyco	< 0.12	
White catfish	357	572	3	South Hyco	< 0.11	
White catfish	293	304	3	South Hyco	< 0.12	
Bluegill	164	73	3	South Hyco	0.04	
Bluegill	154	68	3	South Hyco	0.06	
Bluegill	173	95	3	South Hyco	0.04	
Bluegill	166	79	3	South Hyco	0.06	
Bluegill	162	70	3	South Hyco	0.04	
Bluegill	179	88	3	South Hyco	0.04	
Bluegill	177	84	3	South Hyco	0.07	
Bluegill	176	96	3	South Hyco	0.16	
Bluegill	175	92	3	South Hyco	0.03	
Bluegill	165	84	3	South Hyco	0.06	
Bluegill	168	85	3	South Hyco	0.07	
Bluegill	173	94	3	South Hyco	0.12	
Bluegill	160	72	3	South Hyco	0.06	
Bluegill	175	90	3	South Hyco	0.05	
Bluegill	170	86	3	South Hyco	0.08	
Bluegill	170	86	3	South Hyco	0.08	
Bluegill	180	93	3	South Hyco	0.12	
Bluegill	165	79	3	South Hyco	0.07	
Bluegill	174	93	3	South Hyco	0.06	
Bluegill	183	104	3	South Hyco	0.06	
Bluegill	187	128	3	South Hyco	0.06	
Bluegill	173	94	3	South Hyco	0.10	
Bluegill	169	81	3	South Hyco	0.06	
Bluegill	172	80	3	South Hyco	0.08	
Largemouth bass	341	547	4	South Hyco	< 0.16	
Largemouth bass	326	454	4	South Hyco	< 0.15	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	366	668	4	South Hyco	< 0.16	
Largemouth bass	325	388	4	South Hyco	< 0.15	
Largemouth bass	323	438	4	South Hyco	0.11	
Largemouth bass	280	244	4	South Hyco	< 0.14	
Largemouth bass	350	505	4	South Hyco	< 0.16	
Largemouth bass	352	538	4	South Hyco	< 0.15	
Largemouth bass	315	376	4	South Hyco	< 0.16	
Largemouth bass	346	468	4	South Hyco	< 0.14	
Largemouth bass	361	610	4	South Hyco	0.19	
Largemouth bass	345	570	4	South Hyco	< 0.14	
Largemouth bass	327	433	4	South Hyco	< 0.17	
Largemouth bass	309	325	4	South Hyco	< 0.14	
Largemouth bass	309	360	4	South Hyco	< 0.14	
Largemouth bass	346	569	4	South Hyco	< 0.14	
Largemouth bass	322	378	4	South Hyco	0.19	
Largemouth bass	316	403	4	South Hyco	< 0.16	
Largemouth bass	365	686	4	South Hyco	< 0.17	
Largemouth bass	308	346	4	South Hyco	< 0.14	
Largemouth bass	307	357	4	South Hyco	< 0.14	
Largemouth bass	288	310	4	South Hyco	< 0.14	
Largemouth bass	285	278	4	South Hyco	< 0.14	
Largemouth bass	284	274	4	South Hyco	< 0.15	**0.07**
Common Carp	512	1750	3	Discharge	< 0.15	
Common Carp	595	3000	3	Discharge	< 0.14	
White catfish	291	329	3	Discharge	< 0.12	
White catfish	278	278	3	Discharge	< 0.11	
White catfish	285	326	3	Discharge	< 0.11	
White catfish	275	262	3	Discharge	< 0.11	
White catfish	276	222	3	Discharge	< 0.12	
White catfish	282	268	3	Discharge	< 0.12	
White catfish	257	180	3	Discharge	< 0.12	
White catfish	272	221	3	Discharge	< 0.11	
White catfish	275	235	3	Discharge	< 0.10	
White catfish	267	200	3	Discharge	< 0.13	
White catfish	250	201	3	Discharge	< 0.62	
White catfish	265	205	3	Discharge	< 0.16	
White catfish	310	362	3	Discharge	< 0.11	
White catfish	285	310	3	Discharge	< 0.12	
White catfish	292	309	3	Discharge	< 0.12	
White catfish	281	278	3	Discharge	< 0.12	
White catfish	296	342	3	Discharge	< 0.10	
White catfish	302	360	3	Discharge	< 0.12	
White catfish	390	766	3	Discharge	< 0.11	
White catfish	267	240	3	Discharge	< 0.12	
White catfish	304	421	3	Discharge	< 0.12	
White catfish	273	224	3	Discharge	0.07	
White catfish	290	336	3	Discharge	< 0.11	
Bluegill	153	59	3	Discharge	0.02	
Bluegill	182	97	3	Discharge	< 0.02	
Bluegill	175	91	3	Discharge	< 0.02	
Bluegill	147	50	3	Discharge	0.04	
Bluegill	184	109	3	Discharge	0.02	
Bluegill	183	104	3	Discharge	< 0.02	
Bluegill	192	128	3	Discharge	0.06	
Bluegill	183	125	3	Discharge	0.02	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Bluegill	187	112	3	Discharge	0.06	
Bluegill	201	138	3	Discharge	0.02	
Bluegill	196	134	3	Discharge	0.02	
Bluegill	186	113	3	Discharge	< 0.02	
Bluegill	164	72	3	Discharge	0.06	
Bluegill	174	90	3	Discharge	0.04	
Bluegill	169	94	3	Discharge	0.04	
Bluegill	171	89	3	Discharge	0.04	
Bluegill	160	87	3	Discharge	0.04	
Bluegill	175	95	3	Discharge	0.07	
Bluegill	161	69	3	Discharge	0.02	
Bluegill	186	98	3	Discharge	0.02	
Bluegill	162	65	3	Discharge	0.06	
Bluegill	185	115	3	Discharge	0.04	
Bluegill	191	112	3	Discharge	0.04	
Bluegill	202	138	3	Discharge	0.04	
Largemouth bass	413	1153	4	Discharge	< 0.12	
Largemouth bass	346	458	4	Discharge	< 0.16	
Largemouth bass	312	326	4	Discharge	< 0.15	
Largemouth bass	326	367	4	Discharge	< 0.14	
Largemouth bass	318	384	4	Discharge	< 0.13	
Largemouth bass	344	456	4	Discharge	< 0.14	
Largemouth bass	345	570	4	Discharge	< 0.14	
Largemouth bass	371	620	4	Discharge	< 0.16	
Largemouth bass	325	420	4	Discharge	< 0.14	
Largemouth bass	341	548	4	Discharge	< 0.15	
Largemouth bass	330	480	4	Discharge	< 0.14	
Largemouth bass	320	408	4	Discharge	< 0.15	
Largemouth bass	301	360	4	Discharge	< 0.15	
Largemouth bass	313	396	4	Discharge	< 0.12	
Largemouth bass	334	423	4	Discharge	< 0.13	
Largemouth bass	324	418	4	Discharge	< 0.15	
Largemouth bass	380	694	4	Discharge	< 0.15	
Largemouth bass	295	337	4	Discharge	< 0.14	
Largemouth bass	342	576	4	Discharge	< 0.16	
Largemouth bass	377	616	4	Discharge	< 0.15	
Largemouth bass	355	572	4	Discharge	< 0.15	
Largemouth bass	318	394	4	Discharge	< 0.15	
Largemouth bass	311	390	4	Discharge	< 0.17	
Largemouth bass	322	415	4	Discharge	< 0.15	**0.05**
					2009 Overall Average	**0.06**

[1]Station locations: South Hyco = South Hyco Creek arm of the reservoir, Discharge = effluent discharge area of the power plant to the reservoir, City Lake = Roxboro City Lake is a water supply reservoir on Storys Creek about 5 miles southeast of the Roxboro Steam Electric Plant.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 6. Hyco Lake Mercury Data (continued)

Table 5. Total mercury concentrations in axial muscle of fish from Hyco Lake, 2010.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
White catfish	279	302	3	South Hyco	< 0.13	
White catfish	397	876	3	South Hyco	< 0.13	
White catfish	326	440	3	South Hyco	< 0.14	
White catfish	296	305	3	South Hyco	< 0.12	
White catfish	331	494	3	South Hyco	< 0.12	
White catfish	268	221	3	South Hyco	< 0.13	
Bluegill	196	136	3	South Hyco	< 0.11	
Bluegill	189	114	3	South Hyco	0.08	
Bluegill	176	94	3	South Hyco	< 0.11	
Bluegill	173	96	3	South Hyco	< 0.13	
Bluegill	173	84	3	South Hyco	< 0.11	
Bluegill	175	82	3	South Hyco	< 0.12	
Largemouth bass	381	647	4	South Hyco	0.17	
Largemouth bass	336	420	4	South Hyco	< 0.14	
Largemouth bass	341	525	4	South Hyco	< 0.16	
Largemouth bass	308	331	4	South Hyco	< 0.14	
Largemouth bass	344	540	4	South Hyco	< 0.13	
Largemouth bass	330	452	4	South Hyco	< 0.14	**0.07**
White catfish	263	172	3	Discharge	< 0.10	
White catfish	286	308	3	Discharge	< 0.11	
White catfish	275	290	3	Discharge	< 0.10	
White catfish	284	296	3	Discharge	< 0.15	
White catfish	281	294	3	Discharge	< 0.15	
White catfish	280	279	3	Discharge	< 0.13	
Bluegill	180	102	3	Discharge	< 0.12	
Bluegill	172	99	3	Discharge	< 0.12	
Bluegill	178	77	3	Discharge	< 0.13	
Bluegill	191	91	3	Discharge	< 0.14	
Bluegill	157	64	3	Discharge	0.02	
Bluegill	161	72	3	Discharge	< 0.13	
Largemouth bass	306	370	4	Discharge	0.25	
Largemouth bass	359	536	4	Discharge	0.21	
Largemouth bass	346	516	4	Discharge	0.21	
Largemouth bass	345	516	4	Discharge	< 0.14	
Largemouth bass	311	325	4	Discharge	< 0.16	
Largemouth bass	310	337	4	Discharge	0.14	**0.09**
					2010 Overall Average	**0.08**

[1]Station locations: South Hyco = South Hyco Creek arm of the reservoir, Discharge = effluent discharge area of the power plant to the reservoir, City Lake = Roxboro City Lake is a water supply reservoir on Storys Creek about 5 miles southeast of the Roxboro Steam Electric Plant.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 6. Hyco Lake Mercury Data (continued)

Table 6. Total mercury concentrations in axial muscle of fish from Hyco Lake, 2011.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
White catfish	366	588	3	South Hyco	< 0.12	
White catfish	335	500	3	South Hyco	< 0.13	
White catfish	295	326	3	South Hyco	< 0.15	
White catfish	319	299	3	South Hyco	< 0.13	
White catfish	314	384	3	South Hyco	< 0.13	
White catfish	302	280	3	South Hyco	< 0.12	
White catfish	315	300	3	South Hyco	< 0.14	
White catfish	272	210	3	South Hyco	< 0.13	
White catfish	279	210	3	South Hyco	< 0.11	
White catfish	294	259	3	South Hyco	< 0.12	
Bluegill	176	95	3	South Hyco	0.04	
Bluegill	184	110	3	South Hyco	0.06	
Bluegill	176	100	3	South Hyco	0.08	
Bluegill	175	94	3	South Hyco	0.04	
Bluegill	156	64	3	South Hyco	0.08	
Bluegill	162	65	3	South Hyco	0.10	
Bluegill	181	95	3	South Hyco	0.10	
Bluegill	168	96	3	South Hyco	0.06	
Bluegill	167	80	3	South Hyco	0.06	
Bluegill	182	104	3	South Hyco	0.06	
Largemouth bass	346	576	4	South Hyco	< 0.16	
Largemouth bass	281	277	4	South Hyco	< 0.15	
Largemouth bass	340	473	4	South Hyco	0.10	
Largemouth bass	292	336	4	South Hyco	< 0.14	
Largemouth bass	362	637	4	South Hyco	< 0.17	
Largemouth bass	348	580	4	South Hyco	< 0.15	
Largemouth bass	281	234	4	South Hyco	< 0.16	
Largemouth bass	312	379	4	South Hyco	< 0.17	
Largemouth bass	307	366	4	South Hyco	0.10	
Largemouth bass	293	322	4	South Hyco	< 0.17	**0.07**
White catfish	278	262	3	Discharge	< 0.14	
White catfish	289	257	3	Discharge	< 0.13	
White catfish	296	281	3	Discharge	< 0.13	
White catfish	277	258	3	Discharge	< 0.12	
White catfish	334	423	3	Discharge	< 0.09	
White catfish	338	433	3	Discharge	< 0.12	
White catfish	325	365	3	Discharge	< 0.12	
White catfish	282	277	3	Discharge	< 0.13	
White catfish	299	272	3	Discharge	0.16	
White catfish	262	185	3	Discharge	< 0.12	
Bluegill	188	116	3	Discharge	0.04	
Bluegill	199	134	3	Discharge	< 0.13	
Bluegill	185	104	3	Discharge	< 0.17	
Bluegill	169	95	3	Discharge	< 0.14	
Bluegill	192	118	3	Discharge	< 0.09	
Bluegill	208	182	3	Discharge	< 0.15	
Bluegill	190	138	3	Discharge	< 0.14	
Bluegill	185	118	3	Discharge	< 0.11	
Largemouth bass	308	312	4	Discharge	< 0.16	
Largemouth bass	333	429	4	Discharge	< 0.16	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	364	670	4	Discharge	< 0.15	
Largemouth bass	335	512	4	Discharge	< 0.13	
Largemouth bass	327	403	4	Discharge	< 0.17	
Largemouth bass	284	218	4	Discharge	0.12	
Largemouth bass	298	245	4	Discharge	0.29	
Largemouth bass	303	284	4	Discharge	< 0.16	
Largemouth bass	312	390	4	Discharge	< 0.23	
Largemouth bass	292	274	4	Discharge	< 0.14	**0.08**
White catfish	365	768	3	City Lake	< 0.14	
White catfish	330	504	3	City Lake	< 0.13	
White catfish	397	893	3	City Lake	< 0.12	
White catfish	375	778	3	City Lake	< 0.13	
White catfish	370	650	3	City Lake	< 0.13	
White catfish	342	630	3	City Lake	< 0.13	
Bluegill	174	93	3	City Lake	< 0.13	
Bluegill	177	90	3	City Lake	< 0.13	
Bluegill	189	124	3	City Lake	< 0.12	
Bluegill	201	150	3	City Lake	< 0.13	
Bluegill	192	115	3	City Lake	< 0.12	
Bluegill	203	157	3	City Lake	< 0.13	
Largemouth bass	320	452	4	City Lake	< 0.16	
Largemouth bass	288	265	4	City Lake	< 0.17	
Largemouth bass	292	318	4	City Lake	< 0.13	
Largemouth bass	261	230	4	City Lake	< 0.16	
Largemouth bass	330	440	4	City Lake	< 0.16	
Largemouth bass	242	202	4	City Lake	< 0.14	**0.07**
					2011 Overall Average	**0.07**

[1]Station locations: South Hyco = South Hyco Creek arm of the reservoir, Discharge = effluent discharge area of the power plant to the reservoir, City Lake = Roxboro City Lake is a water supply reservoir on Storys Creek about 5 miles southeast of the Roxboro Steam Electric Plant.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 7. Mayo Lake Mercury Data (Mayo Steam Electric Plant)

Table 1. Total mercury concentrations in axial muscle of fish from Mayo Lake, 2006.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Brown bullhead	350	698	3	Discharge	< 0.12	
Brown bullhead	350	504	3	Discharge	< 0.15	
Brown bullhead	349	492	3	Discharge	< 0.14	
Brown bullhead	327	406	3	Discharge	< 0.13	
Brown bullhead	320	404	3	Discharge	< 0.13	
Brown bullhead	283	300	3	Discharge	< 0.15	
Bluegill	196	148	3	Discharge	0.10	
Bluegill	182	131	3	Discharge	< 0.07	
Bluegill	159	70	3	Discharge	< 0.06	
Bluegill	159	64	3	Discharge	< 0.05	
Bluegill	153	55	3	Discharge	< 0.05	
Bluegill	147	61	3	Discharge	< 0.06	
Largemouth bass	360	721	4	Discharge	< 0.18	
Largemouth bass	345	564	4	Discharge	< 0.18	
Largemouth bass	310	368	4	Discharge	< 0.16	
Largemouth bass	275	245	4	Discharge	< 0.15	
Largemouth bass	274	243	4	Discharge	< 0.14	
Largemouth bass	260	269	4	Discharge	< 0.14	**0.06**
Yellow bullhead	282	288	3	Across lake	< 0.12	
Yellow bullhead	280	242	3	Across lake	0.21	
Yellow bullhead	270	290	3	Across lake	0.21	
Yellow bullhead	265	265	3	Across lake	< 0.14	
Yellow bullhead	265	238	3	Across lake	< 0.14	
Flat bullhead	305	320	3	Across lake	< 0.13	
Bluegill	150	52	3	Across lake	< 0.07	
Bluegill	220	223	3	Across lake	< 0.06	
Bluegill	183	100	3	Across lake	< 0.05	
Bluegill	168	81	3	Across lake	< 0.05	
Bluegill	168	92	3	Across lake	< 0.06	
Bluegill	155	75	3	Across lake	< 0.06	
Largemouth bass	350	728	4	Across lake	< 0.19	
Largemouth bass	340	550	4	Across lake	< 0.17	
Largemouth bass	305	424	4	Across lake	< 0.15	
Largemouth bass	283	308	4	Across lake	< 0.14	
Largemouth bass	268	356	4	Across lake	0.22	
Largemouth bass	280	348	4	Across lake	< 0.17	**0.07**
White catfish	395	965	3	Mid-lake	< 0.17	
Yellow bullhead	385	845	3	Mid-lake	< 0.15	
Yellow bullhead	382	710	3	Mid-lake	< 0.14	
Yellow bullhead	320	428	3	Mid-lake	< 0.15	
Yellow bullhead	304	388	3	Mid-lake	< 0.13	
Yellow bullhead	270	230	3	Mid-lake	0.17	
Bluegill	175	96	3	Mid-lake	0.11	
Bluegill	158	70	3	Mid-lake	0.10	
Bluegill	157	78	3	Mid-lake	< 0.05	
Bluegill	157	63	3	Mid-lake	0.09	
Bluegill	154	63	3	Mid-lake	0.11	
Bluegill	152	56	3	Mid-lake	0.13	
Largemouth bass	375	732	4	Mid-lake	0.22	
Largemouth bass	368	660	4	Mid-lake	< 0.15	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	360	658	4	Mid-lake	< 0.18	
Largemouth bass	342	630	4	Mid-lake	< 0.17	
Largemouth bass	309	398	4	Mid-lake	< 0.17	
Largemouth bass	306	386	4	Mid-lake	< 0.18	**0.09**
Brown bullhead	330	500	3	South lake	< 0.13	
Brown bullhead	300	372	3	South lake	< 0.14	
Brown bullhead	330	590	3	South lake	< 0.13	
Brown bullhead	315	412	3	South lake	< 0.12	
Brown bullhead	299	410	3	South lake	0.04	
Brown bullhead	292	335	3	South lake	< 0.13	
Bluegill	206	168	3	South lake	< 0.10	
Bluegill	155	58	3	South lake	< 0.12	
Bluegill	153	57	3	South lake	< 0.10	
Bluegill	177	82	3	South lake	< 0.10	
Bluegill	139	37	3	South lake	0.17	
Bluegill	145	46	3	South lake	0.07	
Largemouth bass	389	725	4	South lake	< 0.18	
Largemouth bass	361	604	4	South lake	0.27	
Largemouth bass	359	590	4	South lake	0.55	
Largemouth bass	306	360	4	South lake	< 0.15	
Largemouth bass	284	300	4	South lake	< 0.14	
Largemouth bass	280	300	4	South lake	< 0.17	**0.09**
					2006 Overall Average	**0.08**

[1]Station locations: Discharge = north end of the lake at the power plant ash pond discharge area, Across lake = north end of lake opposite side from the ash pond discharge, Mid-lake = area at mid-lake near SR 1512, South lake = area at the south end of lake near NC 49.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 7. Mayo Lake Mercury Data (Mayo Steam Electric Plant)

Table 2. Total mercury concentrations in axial muscle of fish from Mayo Lake, 2007.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
White catfish	360	572	3	Discharge	< 0.14	
Yellow bullhead	272	243	3	Discharge	< 0.14	
Brown bullhead	315	372	3	Discharge	0.17	
Brown bullhead	315	403	3	Discharge	< 0.13	
Flat bullhead	240	172	3	Discharge	< 0.12	
Flat bullhead	259	230	3	Discharge	< 0.13	
Bluegill	157	69	3	Discharge	< 0.05	
Bluegill	182	100	3	Discharge	< 0.04	
Bluegill	205	178	3	Discharge	< 0.05	
Bluegill	143	52	3	Discharge	< 0.05	
Bluegill	145	54	3	Discharge	< 0.05	
Bluegill	202	166	3	Discharge	< 0.05	
Bluegill	138	43	3	Discharge	< 0.06	
Largemouth bass	388	778	4	Discharge	< 0.17	
Largemouth bass	389	952	4	Discharge	< 0.18	
Largemouth bass	393	844	4	Discharge	< 0.17	
Largemouth bass	346	510	4	Discharge	< 0.15	
Largemouth bass	427	1150	4	Discharge	0.45	
Largemouth bass	330	424	4	Discharge	< 0.15	**0.07**
Flat bullhead	307	378	3	Across lake	< 0.15	
Flat bullhead	292	333	3	Across lake	< 0.15	
Flat bullhead	270	233	3	Across lake	< 0.15	
Flat bullhead	278	248	3	Across lake	< 0.13	
Flat bullhead	265	228	3	Across lake	< 0.13	
Flat bullhead	251	171	3	Across lake	< 0.12	
Bluegill	191	141	3	Across lake	< 0.04	
Bluegill	177	108	3	Across lake	< 0.04	
Bluegill	221	219	3	Across lake	0.05	
Bluegill	187	133	3	Across lake	< 0.07	
Bluegill	176	100	3	Across lake	< 0.06	
Bluegill	187	118	3	Across lake	< 0.06	
Largemouth bass	436	1200	4	Across lake	0.13	
Largemouth bass	403	862	4	Across lake	< 0.16	
Largemouth bass	366	718	4	Across lake	0.31	
Largemouth bass	392	950	4	Across lake	< 0.17	
Largemouth bass	427	1150	4	Across lake	0.31	
Largemouth bass	442	1300	4	Across lake	0.44	**0.10**
Yellow bullhead	270	262	3	Mid-lake	< 0.12	
Flat bullhead	315	450	3	Mid-lake	< 0.15	
Flat bullhead	262	220	3	Mid-lake	< 0.13	
Flat bullhead	284	258	3	Mid-lake	< 0.14	
Flat bullhead	270	210	3	Mid-lake	< 0.12	
Flat bullhead	270	234	3	Mid-lake	< 0.13	
Bluegill	213	208	3	Mid-lake	< 0.05	
Bluegill	200	180	3	Mid-lake	0.09	
Bluegill	167	87	3	Mid-lake	0.08	
Bluegill	140	48	3	Mid-lake	< 0.04	
Bluegill	161	78	3	Mid-lake	0.07	
Bluegill	201	138	3	Mid-lake	< 0.04	
Largemouth bass	326	450	4	Mid-lake	< 0.15	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	345	526	4	Mid-lake	< 0.17	
Largemouth bass	384	905	4	Mid-lake	< 0.18	
Largemouth bass	368	667	4	Mid-lake	< 0.17	
Largemouth bass	300	358	4	Mid-lake	< 0.16	
Largemouth bass	293	330	4	Mid-lake	< 0.16	**0.06**
Yellow bullhead	290	320	3	South lake	< 0.16	
Brown bullhead	281	318	3	South lake	< 0.14	
Flat bullhead	312	399	3	South lake	< 0.12	
Flat bullhead	306	347	3	South lake	< 0.15	
Flat bullhead	283	300	3	South lake	< 0.13	
Flat bullhead	333	592	3	South lake	< 0.14	
Bluegill	134	43	3	South lake	0.09	
Bluegill	183	135	3	South lake	0.07	
Bluegill	132	31	3	South lake	< 0.06	
Bluegill	136	35	3	South lake	< 0.04	
Bluegill	170	96	3	South lake	< 0.05	
Bluegill	183	92	3	South lake	0.09	
Largemouth bass	350	524	4	South lake	< 0.14	
Largemouth bass	433	1150	4	South lake	0.46	
Largemouth bass	383	797	4	South lake	0.69	
Largemouth bass	365	633	4	South lake	< 0.14	
Largemouth bass	377	795	4	South lake	0.13	
Largemouth bass	383	791	4	South lake	< 0.15	**0.10**
					2007 Overall Average	**0.08**

[1]Station locations: Discharge = north end of the lake at the power plant ash pond discharge area, Across lake = north end of lake opposite side from the ash pond discharge, Mid-lake = area at mid-lake near SR 1512, South lake = area at the south end of lake near NC 49.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 7. Mayo Lake Mercury Data (continued)

Table 3. Total mercury concentrations in axial muscle of fish from Mayo Lake, 2008.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Snail bullhead	244	164	3	Discharge	< 0.13	
White catfish	205	92	3	Discharge	< 0.15	
Brown bullhead	357	592	3	Discharge	< 0.14	
Brown bullhead	307	388	3	Discharge	< 0.11	
Brown bullhead	305	384	3	Discharge	< 0.12	
Brown bullhead	328	418	3	Discharge	< 0.12	
Bluegill	193	154	3	Discharge	0.06	
Bluegill	185	122	3	Discharge	0.04	
Bluegill	228	235	3	Discharge	0.08	
Bluegill	215	215	3	Discharge	0.04	
Bluegill	177	105	3	Discharge	0.02	
Bluegill	158	85	3	Discharge	0.04	
Largemouth bass	353	724	4	Discharge	< 0.16	
Largemouth bass	350	690	4	Discharge	< 0.16	
Largemouth bass	396	872	4	Discharge	< 0.15	
Largemouth bass	430	1050	4	Discharge	< 0.15	
Largemouth bass	435	1300	4	Discharge	< 0.13	
Largemouth bass	420	1050	4	Discharge	< 0.17	**0.06**
Yellow bullhead	344	490	3	Across lake	< 0.14	
Yellow bullhead	291	344	3	Across lake	0.13	
Yellow bullhead	288	325	3	Across lake	< 0.12	
Brown bullhead	265	240	3	Across lake	< 0.10	
Brown bullhead	296	408	3	Across lake	< 0.12	
Flat bullhead	315	340	3	Across lake	< 0.15	
Bluegill	182	105	3	Across lake	0.02	
Bluegill	156	70	3	Across lake	0.02	
Bluegill	184	118	3	Across lake	0.02	
Bluegill	155	68	3	Across lake	0.02	
Bluegill	169	89	3	Across lake	0.04	
Largemouth bass	378	750	4	Across lake	< 0.15	
Largemouth bass	340	560	4	Across lake	< 0.15	
Largemouth bass	365	722	4	Across lake	< 0.15	
Largemouth bass	395	720	4	Across lake	< 0.14	
Largemouth bass	396	905	4	Across lake	< 0.15	
Largemouth bass	370	710	4	Across lake	< 0.15	**0.06**
Brown bullhead	343	591	3	Mid-lake	< 0.15	
Brown bullhead	338	530	3	Mid-lake	< 0.13	
Brown bullhead	270	265	3	Mid-lake	< 0.15	
Brown bullhead	340	478	3	Mid-lake	< 0.11	
Brown bullhead	345	597	3	Mid-lake	< 0.12	
Flat bullhead	308	360	3	Mid-lake	< 0.12	
Bluegill	200	145	3	Mid-lake	0.07	
Bluegill	200	142	3	Mid-lake	0.06	
Bluegill	190	130	3	Mid-lake	0.04	
Bluegill	192	162	3	Mid-lake	0.06	
Bluegill	167	85	3	Mid-lake	0.14	
Bluegill	170	94	3	Mid-lake	0.08	
Largemouth bass	395	738	4	Mid-lake	0.46	
Largemouth bass	402	938	4	Mid-lake	< 0.16	
Largemouth bass	388	780	4	Mid-lake	0.12	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	380	838	4	Mid-lake	< 0.15	
Largemouth bass	355	658	4	Mid-lake	< 0.15	
Largemouth bass	360	630	4	Mid-lake	< 0.13	**0.08**
White catfish	430	1150	3	South lake	0.38	
Brown bullhead	335	508	3	South lake	< 0.12	
Brown bullhead	280	300	3	South lake	< 0.13	
Brown bullhead	303	388	3	South lake	< 0.12	
Brown bullhead	333	486	3	South lake	< 0.13	
Brown bullhead	285	328	3	South lake	< 0.12	
Bluegill	213	208	3	South lake	0.04	
Bluegill	208	198	3	South lake	0.06	
Bluegill	153	63	3	South lake	0.08	
Bluegill	178	108	3	South lake	0.07	
Bluegill	180	120	3	South lake	0.04	
Bluegill	178	98	3	South lake	0.06	
Largemouth bass	430	1650	4	South lake	0.48	
Largemouth bass	469	1600	4	South lake	0.41	
Largemouth bass	370	712	4	South lake	< 0.17	
Largemouth bass	430	1200	4	South lake	0.30	
Largemouth bass	420	1150	4	South lake	0.28	
Largemouth bass	429	1250	4	South lake	0.23	**0.15**
					2008 Overall Average	**0.09**

[1]Station locations: Discharge = north end of the lake at the power plant ash pond discharge area, Across lake = north end of lake opposite side from the ash pond discharge, Mid-lake = area at mid-lake near SR 1512, South lake = area at the south end of lake near NC 49.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 7. Mayo Lake Mercury Data (continued)

Table 4. Total mercury concentrations in axial muscle of fish from Mayo Lake, 2009.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Flat bullhead	325	390	3	Discharge	< 0.11	
Flat bullhead	258	208	3	Discharge	< 0.12	
Flat bullhead	224	115	3	Discharge	< 0.13	
Flat bullhead	212	116	3	Discharge	< 0.13	
Flat bullhead	231	155	3	Discharge	< 0.15	
Flat bullhead	220	132	3	Discharge	< 0.12	
Bluegill	203	156	3	Discharge	< 0.02	
Bluegill	205	172	3	Discharge	< 0.41	
Bluegill	211	175	3	Discharge	< 0.42	
Bluegill	188	125	3	Discharge	0.02	
Bluegill	181	99	3	Discharge	0.02	
Bluegill	164	72	3	Discharge	0.04	
Largemouth bass	407	990	4	Discharge	< 0.40	
Largemouth bass	320	440	4	Discharge	< 0.45	
Largemouth bass	350	564	4	Discharge	< 0.41	
Largemouth bass	392	834	4	Discharge	< 0.41	
Largemouth bass	331	576	4	Discharge	< 0.44	
Largemouth bass	359	624	4	Discharge	< 0.43	**0.12**
Flat bullhead	265	212	3	Across lake	< 0.13	
Flat bullhead	300	272	3	Across lake	< 0.11	
Flat bullhead	305	340	3	Across lake	< 0.02	
Flat bullhead	295	300	3	Across lake	< 0.11	
Flat bullhead	280	245	3	Across lake	< 0.10	
Flat bullhead	288	222	3	Across lake	< 0.11	
Bluegill	193	131	3	Across lake	0.04	
Bluegill	210	172	3	Across lake	< 0.14	
Bluegill	195	118	3	Across lake	0.04	
Bluegill	187	119	3	Across lake	0.04	
Bluegill	199	152	3	Across lake	0.02	
Bluegill	200	163	3	Across lake	< 0.14	
Largemouth bass	323	451	4	Across lake	< 0.35	
Largemouth bass	380	801	4	Across lake	< 0.41	
Largemouth bass	333	516	4	Across lake	< 0.42	
Largemouth bass	295	352	4	Across lake	< 0.38	
Largemouth bass	305	364	4	Across lake	< 0.42	
Largemouth bass	354	562	4	Across lake	< 0.14	**0.09**
White catfish	440	1060	3	Mid-lake	< 0.14	
Brown bullhead	358	684	3	Mid-lake	< 0.12	
Brown bullhead	344	520	3	Mid-lake	< 0.01	
Flat bullhead	294	302	3	Mid-lake	< 0.13	
Flat bullhead	300	299	3	Mid-lake	< 0.11	
Flat bullhead	294	250	3	Mid-lake	< 0.11	
Bluegill	200	165	3	Mid-lake	< 0.13	
Bluegill	203	185	3	Mid-lake	< 0.12	
Bluegill	179	108	3	Mid-lake	< 0.14	
Bluegill	205	180	3	Mid-lake	< 0.12	
Bluegill	190	136	3	Mid-lake	0.04	
Bluegill	179	114	3	Mid-lake	0.04	
Largemouth bass	410	1025	4	Mid-lake	< 0.15	
Largemouth bass	380	814	4	Mid-lake	0.08	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	316	452	4	Mid-lake	< 0.14	
Largemouth bass	382	774	4	Mid-lake	< 0.15	
Largemouth bass	350	597	4	Mid-lake	< 0.16	
Largemouth bass	395	1036	4	Mid-lake	< 0.16	**0.06**
Brown bullhead	253	222	3	South lake	< 0.13	
Brown bullhead	272	288	3	South lake	< 0.13	
Brown bullhead	295	378	3	South lake	< 0.13	
Brown bullhead	322	456	3	South lake	< 0.12	
Brown bullhead	280	288	3	South lake	< 0.13	
Brown bullhead	310	368	3	South lake	< 0.13	
Bluegill	160	80	3	South lake	0.04	
Bluegill	154	68	3	South lake	0.04	
Bluegill	195	148	3	South lake	0.04	
Bluegill	212	185	3	South lake	< 0.13	
Bluegill	180	136	3	South lake	0.04	
Largemouth bass	314	408	4	South lake	< 0.15	
Largemouth bass	345	612	4	South lake	< 0.14	
Largemouth bass	310	370	4	South lake	< 0.14	
Largemouth bass	360	708	4	South lake	0.33	
Largemouth bass	367	608	4	South lake	< 0.13	
Largemouth bass	365	748	4	South lake	< 0.14	**0.07**
					2009 Overall Average	**0.09**

[1] Station locations: Discharge = north end of the lake at the power plant ash pond discharge area, Across lake = north end of lake opposite side from the ash pond discharge, Mid-lake = area at mid-lake near SR 1512, South lake = area at the south end of lake near NC 49.

[2] Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 7. Mayo Lake Mercury Data (continued)

Table 5. Total mercury concentrations in axial muscle of fish from Mayo Lake, 2010.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
White catfish	444	1300	3	Discharge	< 0.16	
Flat bullhead	293	302	3	Discharge	< 0.11	
Flat bullhead	231	178	3	Discharge	< 0.13	
Flat bullhead	228	165	3	Discharge	< 0.12	
Flat bullhead	266	244	3	Discharge	< 0.17	
Flat bullhead	240	156	3	Discharge	< 0.12	
Flat bullhead	300	338	3	Discharge	< 0.19	
Bluegill	214	173	3	Discharge	< 0.10	
Bluegill	178	114	3	Discharge	< 0.16	
Bluegill	175	92	3	Discharge	0.04	
Bluegill	157	64	3	Discharge	0.04	
Bluegill	163	70	3	Discharge	0.06	
Bluegill	157	72	3	Discharge	0.03	
Largemouth bass	376	703	4	Discharge	< 0.17	
Largemouth bass	386	849	4	Discharge	< 0.14	
Largemouth bass	391	981	4	Discharge	< 0.18	
Largemouth bass	350	664	4	Discharge	< 0.15	
Largemouth bass	365	776	4	Discharge	< 0.16	
Largemouth bass	386	957	4	Discharge	< 0.15	**0.07**
Flat bullhead	316	389	3	Across lake	< 0.16	
Flat bullhead	288	304	3	Across lake	< 0.14	
Flat bullhead	266	250	3	Across lake	< 0.14	
Flat bullhead	287	294	3	Across lake	< 0.12	
Flat bullhead	301	350	3	Across lake	< 0.12	
Flat bullhead	315	394	3	Across lake	< 0.14	
Bluegill	207	180	3	Across lake	< 0.11	
Bluegill	220	171	3	Across lake	< 0.11	
Bluegill	209	179	3	Across lake	< 0.13	
Bluegill	180	115	3	Across lake	< 0.13	
Bluegill	192	145	3	Across lake	< 0.12	
Bluegill	174	107	3	Across lake	< 0.13	
Largemouth bass	405	1025	4	Across lake	< 0.18	
Largemouth bass	355	550	4	Across lake	< 0.14	
Largemouth bass	325	440	4	Across lake	< 0.15	
Largemouth bass	350	592	4	Across lake	< 0.15	
Largemouth bass	364	788	4	Across lake	< 0.15	
Largemouth bass	382	816	4	Across lake	< 0.14	**0.07**
Flat bullhead	334	542	3	Mid-lake	< 0.12	
Flat bullhead	298	366	3	Mid-lake	< 0.14	
Flat bullhead	308	354	3	Mid-lake	< 0.12	
Flat bullhead	273	252	3	Mid-lake	< 0.13	
Flat bullhead	276	241	3	Mid-lake	< 0.13	
Flat bullhead	251	196	3	Mid-lake	< 0.16	
Bluegill	201	148	3	Mid-lake	< 0.12	
Bluegill	190	136	3	Mid-lake	< 0.15	
Bluegill	166	75	3	Mid-lake	0.04	
Bluegill	201	165	3	Mid-lake	< 0.16	
Bluegill	197	152	3	Mid-lake	< 0.12	
Bluegill	166	93	3	Mid-lake	0.06	
Largemouth bass	415	1125	4	Mid-lake	< 0.15	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	375	647	4	Mid-lake	< 0.16	
Largemouth bass	370	810	4	Mid-lake	< 0.16	
Largemouth bass	416	1008	4	Mid-lake	< 0.15	
Largemouth bass	400	1050	4	Mid-lake	< 0.14	
Largemouth bass	409	964	4	Mid-lake	< 0.17	**0.07**
White catfish	298	331	3	South lake	< 0.13	
White catfish	340	445	3	South lake	< 0.13	
White catfish	345	580	3	South lake	< 0.14	
White catfish	320	460	3	South lake	< 0.12	
White catfish	337	549	3	South lake	< 0.13	
White catfish	303	390	3	South lake	< 0.13	
Bluegill	194	160	3	South lake	< 0.13	
Bluegill	228	224	3	South lake	< 0.14	
Bluegill	166	93	3	South lake	< 0.09	
Bluegill	183	123	3	South lake	< 0.14	
Bluegill	215	201	3	South lake	< 0.13	
Bluegill	194	140	3	South lake	< 0.14	
Largemouth bass	414	1060	4	South lake	< 0.15	
Largemouth bass	370	734	4	South lake	< 0.16	
Largemouth bass	391	936	4	South lake	0.29	
Largemouth bass	352	548	4	South lake	< 0.17	
Largemouth bass	400	847	4	South lake	0.17	
Largemouth bass	371	700	4	South lake	< 0.15	**0.08**
					2010 Overall Average	**0.07**

[1]Station locations: Discharge = north end of the lake at the power plant ash pond discharge area, Across lake = north end of lake opposite side from the ash pond discharge, Mid-lake = area at mid-lake near SR 1512, South lake = area at the south end of lake near NC 49.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Enclosure 7. Mayo Lake Mercury Data (continued)

Table 6. Total mercury concentrations in axial muscle of fish from Mayo Lake, 2011.

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Brown bullhead	345	540	3	Discharge	< 0.11	
Brown bullhead	359	652	3	Discharge	< 0.12	
Brown bullhead	345	515	3	Discharge	< 0.13	
Brown bullhead	330	592	3	Discharge	< 0.12	
Brown bullhead	364	688	3	Discharge	< 0.12	
Brown bullhead	318	465	3	Discharge	< 0.12	
Bluegill	223	221	3	Discharge	< 0.14	
Bluegill	220	222	3	Discharge	< 0.14	
Bluegill	217	218	3	Discharge	< 0.12	
Bluegill	200	166	3	Discharge	< 0.42	
Bluegill	210	168	3	Discharge	< 0.15	
Bluegill	212	193	3	Discharge	< 0.14	
Largemouth bass	412	1150	4	Discharge	< 0.14	
Largemouth bass	468	1450	4	Discharge	0.20	
Largemouth bass	439	1200	4	Discharge	0.26	
Largemouth bass	460	1200	4	Discharge	0.38	
Largemouth bass	490	1700	4	Discharge	0.23	
Largemouth bass	382	770	4	Discharge	< 0.14	**0.11**
White catfish	385	738	3	Across lake	< 0.12	
White catfish	393	799	3	Across lake	< 0.13	
White catfish	404	733	3	Across lake	< 0.12	
Flat bullhead	269	239	3	Across lake	< 0.14	
Flat bullhead	240	172	3	Across lake	< 0.12	
Flat bullhead	242	162	3	Across lake	< 0.10	
Bluegill	185	123	3	Across lake	< 0.02	
Bluegill	180	122	3	Across lake	< 0.02	
Bluegill	170	78	3	Across lake	0.04	
Bluegill	168	112	3	Across lake	0.14	
Bluegill	175	117	3	Across lake	0.04	
Bluegill	158	95	3	Across lake	0.04	
Largemouth bass	414	1150	4	Across lake	< 0.16	
Largemouth bass	365	770	4	Across lake	< 0.15	
Largemouth bass	340	552	4	Across lake	< 0.15	
Largemouth bass	308	364	4	Across lake	< 0.14	
Largemouth bass	453	1250	4	Across lake	0.31	
Largemouth bass	333	532	4	Across lake	< 0.15	**0.06**
Brown bullhead	320	486	3	Mid-lake	< 0.15	
Brown bullhead	392	780	3	Mid-lake	< 0.12	
Brown bullhead	320	448	3	Mid-lake	< 0.14	
Brown bullhead	355	763	3	Mid-lake	< 0.09	
Brown bullhead	350	580	3	Mid-lake	< 0.14	
Brown bullhead	343	458	3	Mid-lake	< 0.15	
Bluegill	218	168	3	Mid-lake	< 0.12	
Bluegill	208	172	3	Mid-lake	< 0.14	
Bluegill	225	220	3	Mid-lake	0.17	
Bluegill	208	183	3	Mid-lake	< 0.14	
Bluegill	213	185	3	Mid-lake	< 0.12	
Bluegill	210	178	3	Mid-lake	< 0.13	
Largemouth bass	380	802	4	Mid-lake	< 0.14	
Largemouth bass	420	1200	4	Mid-lake	< 0.16	

Fish Species	Total Length (mm)	Total Weight (g)	Trophic Level	Station[1]	Total Mercury (fresh wt. µg/g)	Weighted Average[2] (mg/kg)
Largemouth bass	413	982	4	Mid-lake	< 0.17	
Largemouth bass	470	1225	4	Mid-lake	0.61	
Largemouth bass	383	632	4	Mid-lake	< 0.14	
Largemouth bass	362	670	4	Mid-lake	0.11	**0.09**
Brown bullhead	312	449	3	South lake	< 0.17	
Brown bullhead	319	462	3	South lake	< 0.11	
Brown bullhead	370	652	3	South lake	< 0.11	
Brown bullhead	281	308	3	South lake	< 0.11	
Brown bullhead	324	517	3	South lake	< 0.13	
Brown bullhead	304	417	3	South lake	< 0.12	
Bluegill	170	96	3	South lake	0.06	
Bluegill	198	161	3	South lake	0.06	
Bluegill	198	148	3	South lake	0.09	
Bluegill	195	160	3	South lake	0.07	
Bluegill	157	65	3	South lake	0.10	
Bluegill	140	45	3	South lake	0.09	
Largemouth bass	423	1250	4	South lake	0.51	
Largemouth bass	403	1050	4	South lake	< 0.17	
Largemouth bass	410	1075	4	South lake	< 0.15	
Largemouth bass	355	666	4	South lake	< 0.17	
Largemouth bass	355	618	4	South lake	< 0.17	
Largemouth bass	385	1032	4	South lake	0.17	**0.09**
					2011 Overall Average	**0.09**

[1]Station locations: Discharge = north end of the lake at the power plant ash pond discharge area, Across lake = north end of lake opposite side from the ash pond discharge, Mid-lake = area at mid-lake near SR 1512, South lake = area at the south end of lake near NC 49.

[2]Muscle tissue total mercury concentration weighted average of the geometric means for each fish trophic level developed consistent with *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, April 2010, EPA 823-R-10-001.

Historic Valdese

TOWN OF VALDESE

NORTH CAROLINA'S FRIENDLY TOWN

P.O. BOX 339

VALDESE, NORTH CAROLINA 28690-0339

PHONE (828) 879-2120

FAX (828) 879-2139

June 14, 2012

Mr. Jing Lin, Environmental Senior Specialist
NCDENR
DWQ Planning
1617 Mail Service Center
Raleigh, NC 27699-1617

Dear Mr. Lin:

RE: Comments on Draft Mercury TMDL and Post TMDL permitting Strategy

We are writing to convey the comments of the Town of Valdese, on the proposed Mercury TMDL and Permitting Strategy.

The Town of Valdese does not support the considered timeline or actions in implementing the proposed requirements and monitoring of mercury for the TMDL. With the acknowledgement, by the Department, that 98% of the mercury is due to atmospheric deposition, we believe that requiring point source entities to "target" themselves is premature, especially when mercury is not an immediate pollutant of concern within our basin. Furthermore, having all waters of the State listed as "impaired" for mercury due to fish tissue concentrations is also unacceptable. A blanket approach, we believe, is not the answer, rather a site-specific or basin-wide approach, should data warrant such a measure. Furthermore, the Town not only believes in this viewpoint, but supports the ideas and strategies presented to you by the North Carolina Water Quality Association.

We do support the efforts of on-going monitoring requirements of mercury, as currently stated within our permit and long-term monitoring plan, along with other parameters, as a measure of awareness of the Lake Rhodhiss WWTP discharge. We respectfully ask for a revision of the TMDL strategies, for action to be taken in cases where proof supports necessary prudence, such as Reasonable Potential Analysis, on a case-by-case basis. In our situation, we find it difficult to support undue costs of $150 per sampling event, multiple times annually, with low level results and the plant only contributing 2.3% to the overall flow of the river.

We thank you and appreciate the opportunity to be heard, as well as having NCDENR/DWQ Planning consider our position.

Sincerely,

Greg Padgett
Wastewater Treatment Plant Superintendent

Sincerely,

Chris Bortnick
Lab Supervisor/Pretreatment Coordinator

HUNTON & WILLIAMS

HUNTON & WILLIAMS LLP
RIVERFRONT PLAZA, EAST TOWER
951 EAST BYRD STREET
RICHMOND, VIRGINIA 23219-4074

TEL 804 • 788 • 8200
FAX 804 • 788 • 8218

BROOKS M. SMITH
DIRECT DIAL: 804 • 787 • 8086
EMAIL: bsmith@hunton.com

June 18, 2012

FILE NO: 29142.07271

By Email (Jing.Lin@ncdenr.gov) and U.S. Mail

Ms. Jing Lin
NC Department of Environment and Natural Resources
Division of Water Quality
Modeling and TMDL Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

North Carolina Statewide Mercury TMDL

Dear Ms. Lin:

The Utility Water Act Group (UWAG)[1] appreciates this opportunity to comment on the draft statewide mercury TMDL for North Carolina. Several of UWAG's members own and operate facilities that will be directly affected by this TMDL. Other members are interested in how the principles articulated in this TMDL will be applied elsewhere.

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[1] UWAG is a voluntary, *ad hoc*, non-profit, unincorporated group of 183 individual energy companies and three national trade associations of energy companies: the Edison Electric Institute, the National Rural Electric Cooperative Association, and the American Public Power Association. The individual energy companies operate power plants and other facilities that generate, transmit, and distribute electricity to residential, commercial, industrial, and institutional customers. The Edison Electric Institute is the association of U.S. shareholder-owned energy companies, international affiliates, and industry associates. The National Rural Electric Cooperative Association is the association of nonprofit energy cooperatives supplying central station service through generation, transmission, and distribution of electricity to rural areas of the United States. The American Public Power Association is the national trade association that represents publicly-owned (units of state and local government) energy utilities in 49 states representing 16 percent of the market. UWAG's purpose is to participate on behalf of its members in EPA's rulemakings under the CWA and in litigation arising from those rulemakings.

As you well know, the Clean Water Act ("CWA") expresses a national goal of restoring and maintaining the chemical, physical and biological integrity of our waters. In furtherance of this goal, States must adopt water quality standards, assess waters for performance against those standards, list waters that are not meeting standards (*i.e.*, impaired waters), and then develop TMDLs for all impaired waters. TMDLs must be established "at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality."[2]

Water quality standards, impairment listings and TMDLs have profound consequences for regulated dischargers. Those dischargers must obtain permits that contain limits and conditions necessary to protect water quality. For example, if a discharge is deemed to have "reasonable potential" to cause or contribute to an excursion of any applicable water quality standard, then the permit must contain limits calculated to prevent such a perceived excursion.[3] Likewise, once a TMDL has been developed, permits must contain limits that are "consistent with the assumptions and requirements" of the TMDL.[4] If the reasonable potential and TMDL conclusions are premised on incorrect assumptions, then mercury criteria are unlikely to be attained, or dischargers will have needlessly expended money on controlling insignificant inputs of mercury, or both.

Mercury presents particular challenges to States in carrying out their duties under the CWA. Water quality standards applicable to mercury are evolving, and have shifted from general narrative statements (like "all waters shall be free from substances that are inimical to human health or aquatic life"), to water column criteria and, more recently, to fish tissue criteria (although many States, including North Carolina, have not yet adopted fish tissue criteria).

These vagaries in the water quality standards directly affect how States assess and list waters that are impaired due to mercury. In addition, the type and quantity of data necessary to list a water as impaired vary from State to State. Some States compare fish tissue data to the geometric mean of all fish species; others to a single, top predator specie. These differences likely have resulted in the over-listing of waters impaired due to mercury.

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[2] CWA § 303(d)(1)(C).

[3] 40 CFR § 122.44(d)(1)(ii).

[4] 40 CFR § 122.44(d)(1)(vii)(B).

Regardless of how a State expresses its standards, assesses attainment or identifies impairment, the stark reality is that thousands of waterbodies across the country have been identified as impaired due to mercury and, in turn, need TMDLs. The process of developing these TMDLs is complicated by two fundamental issues.

First, atmospheric deposition has been shown to be a predominant cause of mercury impairment in many States, including North Carolina. However, neither the TMDL program, in particular, nor the Clean Water Act, in general, provides any authority over the sources of atmospheric deposition.

Second, the science is imperfect and evolving. While EPA, States and many other interested groups have studied mercury's behavior in the environment and made considerable progress toward a greater understanding of mercury cycling, many uncertainties remain to be addressed, including: (1) the relationship between the chemical state of mercury at issue, the conditions under which it occurs, and the resulting impacts on water quality/biota; (2) the relationship between various source load reductions and discernible water quality/biota improvements; and (3) the relative costs and benefits of reductions from different regulated water dischargers.

Given these complexities and uncertainties, not to mention the jurisdictional limitations EPA and States face in their attempt to deal with a multi-media and multi-jurisdictional issue like mercury within the confines of a domestic statute focused exclusively on water, the TMDL process is more of an *experiment* than a *proven method.*

With that as background, we appreciate that States need to act even in the face of uncertainty and change, and we commend North Carolina for engaging in the experiment of a statewide mercury TMDL. We support some aspects of the draft TMDL but have concerns about others, all as more particularly described below. We urge North Carolina not to proceed further with the TMDL until it has meaningfully resolved these concerns.

1. <u>The water quality target for the TMDL must be the "applicable" water quality criterion, not some other *ad hoc* target devised solely for this particular proceeding</u>.

As a matter of federal law, TMDLs must be "established at a level necessary to implement the applicable water quality standards." CWA §303(d)(1)(C). EPA's implementing regulations clarify and confirm that the "applicable" standards for these purposes are those adopted by the State and approved by EPA. 40 CFR §131.21. In this case, North Carolina has adopted, and EPA has approved, a mercury water column criterion of 12 ng/L. This is the "applicable" criterion. However, instead of applying 12 ng/L as the water quality target for the TMDL, the State devised an *ad hoc* value -- considerably more stringent than 12 ng/L -- using EPA's recommended national criterion of 0.3 mg/kg. The fundamental problem with this approach is that 0.3 mg/kg is not "applicable" in North Carolina for TMDL purposes. The State is free to adopt a fish tissue value as the applicable criterion, but unless and until it does so through the requisite administrative procedures, it simply cannot "borrow" that value for this proceeding.

2. The TMDL must be established at the level "necessary to implement" the applicable water quality criterion.

Congress prescribed a level of precision in its use of the phrase "necessary to implement" in CWA §303 (d)(1)(C) that is neither a minimum bar (*e.g.*, "at least as stringent as necessary…") nor an approximation (*e.g.*, "reasonably calculated to implement…."). In other words, the TMDL must define the precise assimilative cap at which a waterbody will achieve applicable standards and above which the waterbody will exceed those standards.

In this proceeding, even assuming that the State could lawfully substitute EPA's recommended mercury fish tissue criterion for the State's adopted mercury water column criterion (which we dispute above), the State made the target considerably ***more stringent than necessary*** to implement this criterion in each and every waterbody covered by the TMDL. The State concedes this in the TMDL itself, acknowledging that it used the most sensitive waterbodies and the most impacted fish species to derive the target, resulting in a TMDL that is more stringent than necessary for less sensitive waterbodies and less impacted fish species. *See*, *e.g.*, TMDL at p. 5.[5]

[5] We note, as well, that selecting the fish species with the highest mercury fish tissue concentrations -- as the State did here with the 90th percentile of standard-length Largemouth Bass -- is inconsistent with EPA guidance that favors the use of a trophic level weighted mean approach. *See*, *e.g.*, *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health; Technical Support Document Volume 2: Development of National Bioaccumulation Factors*, EPA 822-R-03-030 (2003); *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*, EPA 823-R-10-001 (2010).

3. The point source contribution is insignificant and is properly addressed through the use of mercury minimization plans in lieu of individual wasteload allocations or end-of-pipe limits.

The TMDL acknowledges that the existing point source load for the entire State is approximately 2% of the total baseline mercury source load. Given this insignificant contribution, the TMDL contains a gross, unallocated wasteload allocation for all point sources with the assumption that mercury minimization plans (MMPs) will be used to implement and achieve this allocation.

The MMP approach has proven to be effective in other mercury TMDL proceedings. The use of non-numeric permit requirements like MMPs facilitates adaptive implementation (*i.e.*, progress in the face of uncertainty), and is entirely consistent with applicable federal regulations. *See* 40 CFR § 122.44(k). UWAG strongly supports the MMP approach here, and commends the State for articulating it as an "assumption and requirement" of both the TMDL and the associated "Post TMDL Permitting Strategy."

UWAG is concerned, however, that the State assigned a 67% reduction to the point source category overall. Given the insignificant contribution from point sources, and the complete absence of a record to demonstrate that a 67% reduction would be meaningful, cost-effective or achievable, the State should restore the wasteload allocation to the full baseline condition. There is ample precedent in TMDLs around the country for holding *de minimis* sources at their current loadings, rather than imposing default reductions that have no practical consequence even at a potentially inordinate cost.

4. The TMDL must include an explicit adaptive management method.

Addressing the sources and cycling of mercury in ***all*** waters, river basins and watersheds in the State is a complex and inherently uncertain challenge. The State attempts to meet this challenge through a series of simplified assumptions. We understand the need to make assumptions in the TMDL process, but for this particular TMDL to be meaningful and effective (given its scope and complexity), it needs to embody an adaptive management method that will allow the State and interested stakeholders to periodically validate or correct the assumptions underlying the TMDL.

By way of example, one of the State's fundamental assumptions is that ***all*** waters are impaired and, in turn, subject to the TMDL. However, it is possible -- perhaps even likely --

that one or more individual segments actually meet applicable water quality standards.[6] If so, then those segments cannot lawfully be subjected to a TMDL under CWA §303(d)(1)(C). Ideally, the State would identify and exclude all such segments before finalizing its statewide TMDL. But if that is not possible due to technical or administrative constraints, then the State must provide a process for doing so during the TMDL implementation process (*i.e.*, allowing stakeholders to present data and information demonstrating attainment and/or good cause for delisting, which would have the effect of removing those segments from the TMDL).

5. A technology-based approach cannot be used to implement a water quality-based requirement.

The State's "Post TMDL Permitting Strategy" uses a novel technology-based limit (described as the "TBEL Level Currently Achieved" or "LCA") as a screening tool for determining what types of TMDL-based requirements will be implemented in particular point source permits. The fundamental problem with this approach is that the TMDL is a water quality-based tool that drives water quality-based permitting decisions. A technology-based limit like the LCA is irrelevant to TMDL development or implementation. We urge the State to remove the LCA concept from the Strategy document. It simply does not fit this proceeding and could lead to both unnecessary confusion and flawed permitting decisions.

In place of the LCA, the TMDL already articulates an MMP approach that is solid and defensible. Post-TMDL monitoring will help to ensure that the MMPs are effective in maintaining or reducing the insignificant contribution from point sources.

[6] As case in point, UWAG member Progress Energy, Inc. submitted comments to your attention dated June 11, 2012, in which it summarized extensive fish tissue and water column mercury data demonstrating that the 10-mile segment of the French Broad River in the vicinity of the Company's Asheville Plant is **not**, in fact, impaired.

HUNTON& WILLIAMS

If you have any questions about these comments, please feel free to contact me.

Sincerely,

Brooks M. Smith
Counsel to UWAG

Waterkeepers Carolina
P.O. Box 1854
Washington, NC 27889
252.946.7211

June 18, 2012

Via Electronic Mail

Ms. Jing Lin
Modeling and TMDL Unit
Division of Water Quality
NC Dept. of Environmental and Natural Resources

RE: Waterkeepers Carolina Comments on the Draft NC Mercury TMDL

Dear Ms. Lin:

Thank you for the opportunity to comment on the NC Draft Mercury TMDL proposed by the North Carolina Department of Environment and Natural Resources (DENR). These comments are submitted by Waterkeepers Carolina (WKC), an umbrella group that represents all the Waterkeeper programs in North Carolina, including the Cape Fear Riverkeeper, Catawba Riverkeeper, French Broad Riverkeeper, Haw Riverkeeper, Pamlico-Tar Riverkeeper, Upper & Lower Neuse Riverkeepers, Waccamaw Riverkeeper, Watauga Riverkeeper, White Oak New Riverkeeper & Yadkin Riverkeeper. Additionally, Western North Carolina Alliance joins in these comments as well.

First, we would like to thank you and the staff members at DENR for all the hard work that went into the development of the statewide mercury TMDL and for hosting the public hearings in Hickory and Wilmington. Several of our Riverkeepers attended these hearings and appreciated the opportunity to ask detailed questions about the methodology used to develop the TMDL, how the reduction targets proposed by the TMDL might be implemented and the process for EPA review of the TMDL. We have met and discussed the proposed mercury TMDL and it's implications for eastern, central and western North Carolina. These comments represent our statewide concerns. Individual Waterkeeper programs may submit additional comments that represent concerns specific to their particular water bodies.

Second, we would like to offer our comments on this TMDL based on our decades of experience with many other TMDL's developed across the state of North Carolina. This letter includes our comments on the draft TMDL; it does not include comments on the Reduction Options for Nonpoint Sources document. Comments on that document will be submitted at a later date. However, we will recommend to the Environmental Management Commission (EMC) that North Carolina require maximum mercury reductions for North Carolina emitters and avoid implementation of any trading scheme.

In summary, our recommendations on the TMDL include:

- Approve a modified TMDL
- Remodel to account for hot spots
- Develop site specific TMDL's for those waters where local sources contribute to impairment

- Run a response model to determine TMDL outcomes
- Comply with mercury water quality standard

Background:

Through our member programs and co-signers to this letter, Waterkeepers Carolina represents more than 10,000 NC voters and tax payers living in twelve major watersheds across the state. All our programs have decades of experience focusing on the preservation, protection and restoration of water quality and quantity of these watersheds. From the cold mountain waters of Fontana Lake in the west to the storied Pamlico Sound in the east, fish in North Carolina are contaminated with mercury. As little as 50 years ago a grandparent could show their grandchild how to catch a largemouth bass, clean it and eat it without worry that it would affect the grandchild's learning ability. Today, high mercury levels make it unsafe for children to eat largemouth bass caught from any waterway in North Carolina.

There is no disputing that methylmercury is a potent neurotoxin that places the mental development and health of children at risk. Exposure to levels of mercury in the womb and during childhood can lead to severe developmental abnormalities such as mental retardation, seizures, cognitive delays, reduced IQ, and other learning disabilities. Based on Centers for Disease Control data, the North Carolina Department of Health and Human Services recently estimated that "at least 13,677 children per year" are born in NC with blood mercury levels that place them at risk for lifelong learning disabilities, fine motor and attention deficits, and lowered IQ. The largest source of that mercury contamination comes from burning coal. From 2007-2010, eight of the top ten mercury emitters in North Carolina were coal-fired power plants.

In 2006, the NC Department of Health and Human Services revised the mercury fish consumption advisory and greatly expanded the number of species woman of childbearing age and children under 15 should not consume. The advisory currently lists 25 freshwater and saltwater species found to have elevated levels of methylmercury in waters east and south of Interstate 85. Another significant change in 2006 listed largemouth bass statewide, the first ever such statewide listing for any contaminant.

We are deeply appreciative of DENR's recognition that mercury is a statewide problem for almost every watershed in North Carolina and the agency's attempt to create a comprehensive TMDL that covers the state. However, we have several concerns about the draft TMDL and offer our recommendations below.

1. DENR did not use a response model to analyze whether reductions will eliminate impairments across the state:

In the development of other TMDLs in the United States, state agencies have completed water quality modeling that analyzed whether the wasteload allocation, load allocation and margin of safety proposed by a TMDL will in fact eliminate the pollution impairment. In place of a response model, DWQ determined a reduction factor based on a simple calculation utilizing the 90th percentile of largemouth bass. We are concerned that the 67% reduction target is inadequate to reduce fish tissue contamination and restore our waters from an impaired status. The TMDL does not rely on a scientific basis to predict whether the 67% reduction targets will be effective in eliminating or reducing mercury impairments across the state. Therefore, we recommend that a response model be run to determine the outcomes of a 67% reduction.

If the Division ultimately decides to not run a response model, then we further recommend that the reduction target be raised to account for the fact that North Carolina residents catch and consume fish at greater rates than other states, especially in the eastern portion of the state where fish tissue contamination is greatest. This increase in the reduction factor will provide a greater margin of safety.

2. The TMDL won't result in reductions in mercury from 98.5% percent of point sources in the state:

The Draft Mercury Post TMDL Permitting Strategy Document states:

> "The TBEL Level Currently Achieved (LCA) was determined by evaluating North Carolina discharger mercury monitoring data from the last five years in order to establish a level that is currently achieved by wastewater treatment facilities in our state. The evaluation indicated that 98.5 percent of effluent data was below 47ng/L and that 93 % of facilities with mercury monitoring or limits could regularly comply with this limit without the addition of new treatment technology."
>
> "The permit writer will calculate a facility's effluent annual average mercury concentration from each of the last five years of monitoring. If all the averages are less than the current water quality standard of 12 ng/L times 100% divided by the Instream Waste Concentration (IWC) and no single daily value is greater than the Level Currently Achieved (LCA) of 47ng/L, the permit would contain only a monitoring requirement."

The document goes on to propose permit effluent limits for major facilities only if they exceed the Level Currently Achieved (LCA) of 47 ng/L of mercury and that those limits will be phased in over 5 years. Only in the last year would a technology-based limit be applied. The net result of this strategy is that the TMDL won't result in mercury reductions from 98.5 % of point sources in the state regardless of whether they discharge into a water body severely impaired by mercury or whether that water body has fish populations that are exceedingly high in mercury. This blanket statewide approach fails to apply a much needed water quality based mercury limit for those specific water bodies in the state of NC that are particularly high in mercury and heavily used for commercial and/or recreational fishing. There are many water bodies in NC that need more specific mercury TMDLs that reduce mercury from all sources and therefore complement and enhance the proposed statewide TMDL.

The TMDL relies on an overly simplistic model that fails to capture which pollution sources are driving "hot spots" of contamination. As a result, the TMDL does not identify whether aggressive cuts from specific sources could improve conditions in the watersheds with higher levels of mercury contamination or even result in a delisting of a river system from the impaired list for mercury. Therefore we recommend that the Division remodel utilizing the CMAQ 5.0 model to account for hot spots. In those watersheds where local sources/deposition play a greater role, those waters should be excluded from the statewide TMDL and a site-specific TMDL should be developed.

3. The draft TMDL doesn't address site-specific problem areas:

The CMAQ model calculated the 16% in state mercury contribution by zeroing out all the NC sources and doing a modeling run to see what the out-of-state contribution was when NC sources contributed nothing. Page 39 of the draft TMDL contained the following maps:

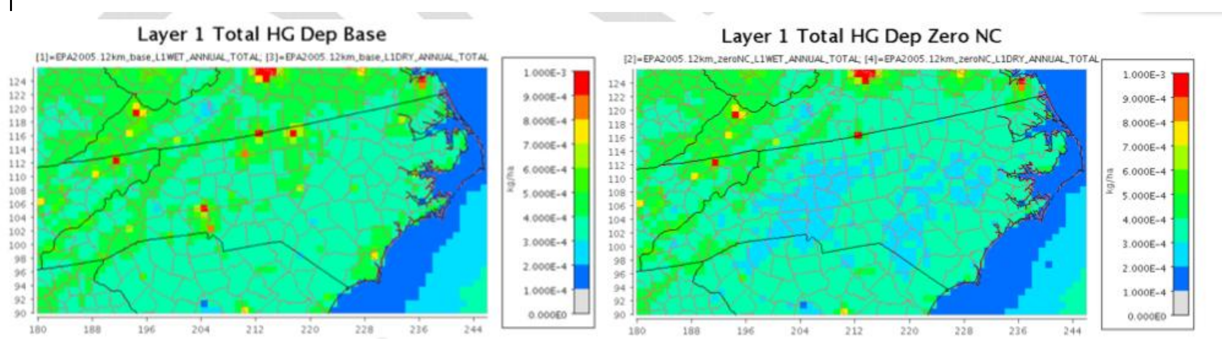

Figure 5-3 CMAQ simulated total mercury deposition in 2005 with all emission sources (left and with emission sources outside NC (right).

The map on the left is the mercury load from all sources including NC in-state sources. The map on the right is the mercury load from emission sources outside of NC. In the map on the right, there are big swaths of ***LOWER*** mercury levels (represented in blue) across the piedmont and along the I-95 corridor in the east when all in state sources are zeroed out. This is powerful evidence that our own in-state sources are contributing a significant mercury load to the heartland and eastern portions of North Carolina. The CMAQ model predicts that a big part of the state would have much lower mercury loads if we significantly reduced our own in-state mercury emissions. This clearly illustrates that certain in-state air emission sources may be responsible for site-specific mercury problems or hot spots. Additional studies should be completed using site-specific response models to identify additional in-state mercury reductions for hot spots. A blanket 67% statewide cut in mercury from all sources as proposed by the draft TMDL is not sufficient to address mercury hot spots.

The TMDL dismisses the evidence for hot spots based on the Sackett study which correctly identifies that waters closer to power plants have higher levels of mercury. Fish tissue levels of mercury are lower, but as the study noted, those lower levels are due to the fact that power plants also emit amounts of selenium that limits the uptake of mercury in fish tissue.

Furthermore, evidence from recent studies clearly demonstrates that local/regional deposition may in fact be responsible for a significant portion of mercury impairment in North Carolina. Data from a study in Steubenville Ohio shows that approximately 70% of mercury wet deposition is attributable to local/regional fossil fuel combustion sources.

Another 8-year study conducted in Pennsylvania by Penn State University revealed a 47% higher wet deposition of mercury in a town situated adjacent to a coal-fired power plant compared to a town further away.

4. The TMDL must also include water column mercury standard

The Sackett study clearly demonstrates that water concentrations of mercury may be higher near coal-fired power plants, even though fish tissue levels may meet criteria, as noted above. Therefore, the TMDL must also incorporate the mercury water quality standard as well as the fish tissue criteria in order to be protective of public health. To assure that fish tissue stay below 0.3 mg/kg, the TMDL points out that a water column standard of 0.005 µg/l is needed. This is more restrictive of the current standard of 0.012 ug/L. We recommend that the Division include the lower standard in the TMDL implementation plan and prepare to update the standard during the next triennial review.

5. The TMDL does not propose any additional reductions of mercury from air emission sources even though they are the largest source of impairment:

The draft TMDL does a good job of providing data indicating that 98% of the mercury problem in waterways across NC comes from air emitters of mercury. However the NC Mercury Reduction Options for Nonpoint Sources that accompanies the Draft TMDL says,

> "The Department of Environment and Natural Resources (DENR) does not believe that the mercury reduction strategy requires additional mercury air emission reductions from existing industrial facilities in North Carolina. The combination of the co-benefits of mercury emission reductions from implementation of the 2002 Clean Smokestacks Act, USEPA's Mercury and Air Toxics Standards for electric generating units, and the recently finalized maximum achievable control technology standards for industrial boilers, will result in an overall 70 percent reduction in total mercury and an 81 percent reduction in emissions of deposition prone mercury. Since North Carolina facilities contribute only 16 percent to the overall mercury deposition in the state, the department does not believe that existing industrial facilities should be required to achieve further reductions."

Air emissions control technology that reduces mercury by more than 95% has been required in many other states in order to protect their waterways and human health from the devastating effects of mercury contamination. The 2002 Clean Smokestacks Act fell short of achieving this level of reduction. This law wasn't even designed to address mercury issues at air emission sources. It was designed to address other air pollution problems.

The USEPA's Mercury and Air Toxics Standards for electric generating units is currently undergoing a legal challenge by industry. It has not been implemented and because it is mired in the judicial process, there is no guarantee it will be implemented any time soon or if the legal process will require significant changes to the MATs rule. DENR's reliance on a 2002 NC law that did not specifically require any mercury reductions and a federal rule that hasn't been implemented yet is not sufficient to yield meaningful mercury reductions that will lift mercury impairments in waterways across North Carolina or make our fish safe to eat. In fact, this over-reliance on an old NC law not designed to address the mercury problem and a federal rule not yet in effect functions to give the largest sources of mercury problems a complete pass from doing anything to reduce their toxic mercury pollution.

Conclusion:

The proposed draft TMDL is not adequate to clean up the mercury contamination problem in North Carolina nor is it protective of public health. It should include maximum mercury reductions from both point and nonpoint sources as well as include a detailed analysis of contributions to hot spots. North Carolina waterways need serious reductions in order to be in compliance with the Clean Water Act and to ensure that the health of the citizens of the state is protected. The current TMDL appears to be little more than a paperwork exercise that contains few if any meaningful mercury reductions.

Therefore, we recommend that the Environmental Management Commission (EMC) require additional studies of hot spots within North Carolina, utilizing a more sophisticated air model that is readily available that can account for local deposition. Furthermore, the TMDL cannot demonstrate that a 67% reduction from all sources is the correct amount for reducing fish tissue contamination and restoring the health of North Carolina's waters as is required by the Clean Water Act. Thus, the EMC should require the additional studies and develop an action plan to implement stronger controls if the study shows that stronger controls will meet the goal of the TMDL to reduce mercury fish tissue contamination and delist waters from an impaired status.

As a final note, Waterkeepers Carolina does not support any scenario that allows trading of mercury "credits" either between air sources, or between air and water sources. The scientific information is clear that hot spots are a significant problem and trading could result in significant deterioration of mercury content in fish tissue, thereby exposing some populations to even greater public health threats.

Sincerely,

David Emmerling
Waterkeepers Carolina

Julie Mayfield
Western North Carolina Alliance

Kemp Burdette
Cape Fear Riverkeeper

Rick Gaskins
Catawba Riverkeeper

Hartwell Carson
French Broad Riverkeeper

Elaine Chiosso
Haw Riverkeeper

Heather Jacobs Deck
Pamlico-Tar Riverkeeper

Alissa Bierma
Neuse Riverkeeper Foundation

Christine Ellis
Waccamaw Riverkeeper

Donna Lisenby
Watauga Riverkeeper

Sheena Woods
White Oak New Riverkeeper

Dean Naujoks
Yadkin Riverkeeper