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**VIA U.S. MAIL & ELECTRONIC MAIL**

Donald van der Vaart  
Chief, Air Permits Section  
NC Division of Air Quality  
1641 Mail Service Center  
Raleigh, NC 27699-1641

Re: Comments on Draft Permit No. 07200R08 for proposed Titan Cement Plant

Dear Dr. van der Vaart:

Thank you for the opportunity to provide technical and legal comments on the Division of Air Quality's (DAQ) draft air quality permit for the proposed Titan Cement Plant in Castle Hayne. These comments supplement those made during the public hearing on October 20, 2009, and are submitted on behalf of PenderWatch & Conservancy and the North Carolina Chapter of the Sierra Club. PenderWatch is a non-profit, grass-roots organization with approximately 440 members whose mission is to protect the environment of Pender County. Their members reside, work, attend school and recreate in Pender and New Hanover Counties, specifically including the environs of the Northeast Cape Fear River. The Sierra Club is a not-for-profit, grass-roots organization with members throughout the state, whose mission is to advocate for the protection and wise stewardship of the state's natural resources and heritage.

In sum, PenderWatch & Conservancy and the Sierra Club have identified several significant shortcomings in the draft air permit, ranging from the agency's failure to comply with proposed EPA regulations concerning Portland Cement Kilns and greenhouse gases to the integrity of the modeling processes and calculations used to estimate the emissions from the kiln. These shortcomings are not only legally deficient; they also represent a political determination that it is more expedient to violate the public trust than to use the full power and discretion vested in the agency by law to protect them for the use of future generations.

The objections to these aspects of the draft permit are significant not only when one considers the *direct* impacts to air quality, but also when one considers the *cumulative* impacts associated with the number of other sources of hazardous emissions and polluting industries in this corridor, which is populated predominately by low-income people of color. In addition, PenderWatch & Conservancy and the Sierra Club are disturbed by the agency's refusal to analyze the impacts of the plant's air emissions on the Northeast Cape Fear River, which borders the site proposed for development. Such problems are compounded by the agency's decision to issue the draft permit prior to the completion of a full environmental review of the facility's impact, in direct violation of both the North Carolina Environmental Policy Act and the National Environmental Policy Act. These concerns are set forth in more detail below.

### **I. Overview of Cement Plant Air Pollutants and Their Impacts**

The chemicals released from a cement plant comprise a large group of diverse pollutants with a number of health and environmental effects. Some are known to cause cancer, others impair reproduction and the normal development of children, and still others damage the nervous and immune systems. Many are respiratory irritants that can worsen already existing respiratory conditions such as asthma, which leads to lost school days, emergency room visits, and hospitalizations.

Air pollutants released by cement plants are pervasive and harmful, and are emitted in significant quantities. They include particulate matter, sulfur dioxide gas,<sup>1</sup> sulfate particulate matter, nitrogen oxides, carbon dioxide, hydrochloric acid, mercury, lead and a host of other air toxics. According to the EPA's Toxics Release Inventory, cement plants self-reported releases to the air and land (in the form of waste disposal) of 142 different air toxics (see Appendix A).<sup>2</sup> The table below lists just a sample of pollutants emitted by Portland Cement plants and their associated health effects.

<b>Pollutant</b>	<b>Health Effects</b>
Sulfur dioxide	Respiratory irritant and exacerbates asthma. Increases risk of low birthweight.
Particulate matter	Inflames cardiac system and linked to low birthweight, pre-term birth, and chronic airway obstruction.
Nitrogen oxides	Decreases lung function and is associated with respiratory disease in children.
Ozone	Formed when nitrogen oxides reacts with other pollutants in the

<sup>1</sup> It is significant to note that earlier this week, the U.S. EPA announced that it would strengthen the nation's sulfur dioxide air quality standard to protect public health for the first time since the standard was enacted forty years ago. Exposure to SO<sub>2</sub> can aggravate asthma, cause respiratory difficulties, and result in emergency room visits and hospitalization. People with asthma, children, and the elderly are especially vulnerable to SO<sub>2</sub>'s effects. EPA intends to finalize the new standards in June, 2010.  
<http://www.epa.gov/air/sulfurdioxide/actions.html#nov09>.

<sup>2</sup> <http://www.epa.gov/tri/>.

	presence of sunlight. Respiratory irritant, exacerbates asthma. May be related to premature birth, cardiac birth defects, low birth weight and stunted lung growth.
Chromium and compounds	Known human carcinogen of high potency (Chromium VI) Respiratory system is target organ for acute inhalation exposure.
Manganese and compounds	Neurotoxin
Mercury and compounds	Methylmercury is a known human neurological and developmental toxin and a possible human carcinogen. Elemental mercury is a neurotoxin. Inorganic mercury can cause kidney damage and is a possible human carcinogen.
Hydrogen chloride	Strong respiratory irritant
Benzene	Known human carcinogen of high potency (leukemia). Long-term exposure affects bone marrow and the immune system.
Formaldehyde	Probably carcinogenic to humans. Respiratory irritant, exacerbates asthma.
Ammonia	Respiratory irritant

Children are particularly susceptible to the effects of air pollution.<sup>3</sup> Their defense mechanisms have not yet fully developed; they also breathe more rapidly and have more lung surface area for their body size. Because exercise increases the penetration of pollutants into the lungs, our children's outdoor activities make adverse health effects more likely. This is a particular concern when, as here, schools and day care centers are located near industrial facilities. The Titan facility would be located within 8 miles of several area schools that serve more than 14,000 children. *See* Maps 1 and 2 at Appendix B. The North Carolina Public Schools Facilities Guidelines,<sup>4</sup> which are to be used by municipalities when planning the siting and construction of new schools, specifically state the following factors should be considered during the evaluation of existing or potential school sites:

- Noise/Air pollution (airport; traffic; industrial)
- Noise levels that are generated by on-site mechanical equipment or by nearby industries or transportation systems can interfere with communication or create a hazard to hearing and should be avoided.
- To reduce potential injury from industrial accidents, avoid locating schools near industries that utilize hazardous materials or processes or that generate hazardous by-products or discharges.

<sup>3</sup> Thurston, G. D., 2000. Particulate matter and sulfate: Evaluation of current California air quality standards with respect to protection of children; California Air Resources Board, Office of Environmental Health Hazard Assessment; September 1, 2000. <http://www.arb.ca.gov/ch/ceh/airstandards.htm>.

<sup>4</sup>North Carolina Public Schools Facilities Guidelines, September 2003,Public Schools of North Carolina, State Board of Education,Department of Public Instruction.

If a new school should not be located near an industrial facility, it follows that a new industrial facility should not be located near existing schools.

A recent study highlights the issue of high levels of air pollution around some of the nation's schools on account of school proximity to industry. Sadly, New Hanover County schools – the same schools that will be affected by emissions from Titan Cement, are already among the 9<sup>th</sup> percentile of schools with air quality concerns due to proximate industries.<sup>5</sup> ***This means that 91% of the 128,000 schools in the United States are predicted to have better air quality than New Hanover schools in the Castle Hayne area.*** The construction of the 4<sup>th</sup> largest cement plant in the country would worsen this situation. To address the issue of air quality around schools near industrial areas, the U.S. EPA launched a \$2.25 million program to examine levels of toxic air pollution near schools, especially those schools located near large industries and in urban areas.<sup>6</sup> A U.S. Senator has termed the issue of air pollution around America's schools “a shocking story of child neglect.”<sup>7</sup>

Mercury emissions are a particular concern to both public health and the environment. Industrial mercury emissions ultimately deposit from the air into water where, once converted to methylmercury by bacteria, they concentrate in fish to levels that make the fish unsafe to eat.<sup>8</sup> Humans are exposed to methylmercury almost exclusively from eating fish. Again, children are the most vulnerable to mercury's effects, whether exposed in utero or as young children, because methylmercury disrupts the orderly development of the brain and nervous system. Mercury's effects may manifest in school-age children as vision and hearing difficulties, delays in language acquisition and fine motor skills, lower IQ, and memory and attention deficits. These effects translate into a wide range of learning difficulties in the classroom. According to the National Academy of Sciences, children so affected will likely have to struggle to keep up in school and might require remedial classes or special education.<sup>9</sup>

## **II. The Draft Air Permit Violates the Clean Air Act and the North Carolina Water and Air Resources Act**

### **A. The Draft Permit Violates the Goals of the Regulatory Programs**

When it enacted the Clean Air Act (“CAA”), Congress stated that a primary goal of the legislation was to “protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare . . . of its population.”<sup>10</sup> The EPA has

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<sup>5</sup> <http://content.usatoday.com/news/nation/environment/smokestack/index>.

<sup>6</sup> <http://yosemite.epa.gov/opa/admpress.nsf/d985312f6895893b852574ac005f1e40/46a04c8cef0cfa8a8525756d005dd486!OpenDocument>

<sup>7</sup> [http://www.usatoday.com/news/nation/environment/2008-12-09-toxic\\_N.htm](http://www.usatoday.com/news/nation/environment/2008-12-09-toxic_N.htm)

<sup>8</sup> U.S. EPA, 1997a. Mercury Study Report to Congress, Volume I, Executive Summary. EPA-452/R-97-003.

<sup>9</sup> Toxicological Effects of Methylmercury, National Academy Press, Washington, DC, 2000. <http://www.nap.edu>.

<sup>10</sup> 42 U.S.C. § 7401 (b)(1) (2006).

promulgated a copious body of regulations to effectuate the mandates of the CAA. Consistent with the purpose of the CAA, the EPA has set regulatory limits for a variety of conventional and hazardous air pollutants that are intended to protect the public health and welfare.

DAQ implements the CAA pursuant to delegation from the EPA for facilities located in North Carolina.<sup>11</sup> Pursuant to that delegated authority, DAQ is obligated to enforce the terms and limits of the CAA and its implementing regulations. Although it may adopt more stringent regulatory limits, it may not weaken these federal standards.<sup>12</sup> In this way, EPA's regulations establish an absolute floor and set minimum standards for protecting public health and the environment.

In addition to these federal constraints, DAQ is governed by duties imposed by the state General Assembly to "achieve and to maintain for the citizens of the State a total environment of superior quality."<sup>13</sup> The Water and Air Resources Act makes clear that the "air resources . . . belong to the people," and the agency's responsibility to preserve and utilize those resources in a manner beneficial to all citizens is "essential to the general welfare."<sup>14</sup> This mandate is echoed in the state's Constitution.<sup>15</sup> DAQ is bound to uphold this responsibility to protect the public trust in its permitting actions.

Despite this charge, DAQ has issued a draft air permit for the proposed Titan cement plant that flouts the purpose, intent and letter of the law. As written, the draft air permit neither protects nor enhances air quality, and in fact would endanger public health and welfare and essential natural resources – a perspective EPA evidently shares. DAQ must honor its overarching duty of environmental protection and withdraw the draft permit.

#### **B. DAQ Has Not Evaluated the Impacts of Mercury Emissions From the Cement Plant**

The sole analysis conducted on the risks Titan's mercury emissions would pose to Castle Hayne's residents and natural resources is contained in a report funded by Titan and prepared by Intertox, Inc. The report contains many scientifically significant oversights and flaws and therefore cannot be relied upon for any decision making purposes. Detailed comments on this report, prepared by Martha Keating, are attached as Appendix C.

At best, the Intertox analysis can be considered a screening analysis of the public health risks that may result from mercury emissions from the proposed Carolinas Cement Company facility. The analysis provides insight into relevant mercury exposure pathways

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<sup>11</sup> 42 U.S.C. § 7410 (2006).

<sup>12</sup> 42 U.S.C. § 7410(2)(a) (2006).

<sup>13</sup> N.C. GEN. STAT § 143-211(a) (2008).

<sup>14</sup> *Id.*

<sup>15</sup> NC CONST. ART. 14 § 5.

and populations of concern, but not definitive results. This analysis is a snapshot of the effects of an estimated emission rate for one year. The cumulative impacts of the predicted 30-year lifespan of the proposed cement kiln are not considered in this risk assessment, but should be considered by risk managers. The risk assessment also does not account for the total risk to public health and the environment when mercury is transported and deposited locally, regionally, and globally.

Specific modeling approaches and assumptions of the Intertox analysis that may collectively contribute to modeling results that are biased low include:

- ◆ A calculated average deposition rate that is lower than might be expected in the predominant path of the facility's plume because the modeled grid encompasses a large area of significantly lower deposition.
- ◆ An underestimate of the amount of mercury available to bioaccumulate in fish in the Northeast Cape Fear River because the simplifying assumption that mercury deposition is linear to mercury deposition ignores the potential influence of the extensive wetlands located in the areas of highest predicted mercury deposition.
- ◆ An underestimate of the mercury exposure of consumers who eat fish species with higher mercury levels (e.g., largemouth bass) than the average mercury level of sunfish and catfish, which were used in this analysis to represent all of the fish species consumed by anglers.
- ◆ Intertox incorrectly calculated the fish ingestion rate for the fisher child and child of resident consuming trophic level 4 fish. This calculation is critical to estimating how much methylmercury is consumed per day. Correcting this error results in a fish consumption rate and hazard index for these children that are double the ingestion rate and hazard index calculated by Intertox.

Alternate modeling platforms that represent the state of the science for mercury modeling could have been used. Specifically, EPA's SERAFM (Spreadsheet Ecological Risk Assessment for the Fate of Mercury) model could have been used to estimate the effect of extensive wetlands on mercury methylation. The EPA model TRIM.FaTE was developed specifically to model mercury emissions in a multi-pathway risk assessment. This model is considered the state of the science mercury model and incorporates the latest scientific findings regarding mercury fate and transport in the environment.

Using the Intertox assumptions about current fish consumption and average fish mercury levels, we calculated a hazard index of 8.6 and 10.9 for adult fishers and for the fisher child, respectively. This hazard index represents the level of mercury exposure currently experienced by anglers and their families consuming sunfish and catfish from the Northeast Cape Fear River on a regular and frequent basis. A hazard index of 10 means that current exposures are estimated to be 10 times higher than the reference dose for methylmercury. The risk of adverse effects from methylmercury exposure increases

with exposure above the reference dose, although it is uncertain whether this relationship is linear.

Using Intertox modeling results, we estimate that incremental increases in methylmercury exposure from the proposed facility could potentially increase the current hazard index to 10.3 for the adult and to 13.54 for the child, increases of 20% to about 25%, respectively. **These incremental exposures are significant, both on their own and considering the high level of current exposure.**

While all risk assessments have scientific uncertainties, we can be confident of at least one finding of the Intertox report: mercury emissions that deposit in the Cape Fear River and its associated watershed will increase the mercury concentration in fish and subsequently in people and animals that consume these fish.

The solution to this issue is not just a matter of better risk communication. Fish consumption advisories are an interim step. The fish contamination problem can be fixed only when less mercury is added to the ecosystem, not more. As the National Research Council concluded in their review of the toxicological effects of methylmercury:

“Because of the beneficial effects of fish consumption, the long-term goal needs to be a reduction in the concentrations of methylmercury in fish rather than a replacement of fish in the diet by other foods.”<sup>16</sup>

### C. **The Draft Permit Violates Current EPA Regulations**<sup>17</sup>

#### 1. **Estimated Mercury Emissions from the Proposed Facility Would Exceed Ambient Limits**

Our review reveals that the potential mercury emission rate proposed by Titan is not an accurate estimate of mercury emissions. Although the draft permit does not specify how the rate was developed, it likely was derived by back-calculating the maximum amount of mercury that could be emitted and still meet (at least on paper) the current regulatory limit of 41 ug/dscm. The first clue to this sleight of hand is found in the table entitled “Toxics Modeling Results” (page 55 of Review 07300R08). The footnote for the mercury emission rate reads “Emission rate selected by applicant that keeps mercury below the MACT/NESHAP limit.” In another section of the permit – nearly 20 pages earlier – Titan presents, and DAQ affirms, a series of calculations that result in an emission rate that barely meets the 41 ug/dscm rate. The derivation of these calculations and an analysis of why they underestimate the mercury emission rate are discussed below.

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<sup>16</sup> National Research Council/National Academy of Sciences, Committee on Toxicology of Methylmercury. *Toxicology of Methylmercury*, National Academy of Sciences Press (2000).

<sup>17</sup> It is important to note that we were not able to open any of the modeling files DAQ provided in response to requests for public information. In addition, several of the copied files were corrupted. The comments herein thus are limited to the computations provided in the text of the draft air permit.

Titan Cement and DAQ estimated the amount of mercury emitted from the facility by adding the amount of mercury released from the raw material (102.96 lbs), the mercury in the coal fired in the kiln (64.6 lbs), and the mercury contained in bottom ash or fly ash (159.66 lbs) (see page 39 of Review 07300R08). The sum of these inputs totaled 327.22 pounds per year. DAQ estimated a 20% reduction in emissions with a fabric filter for a total of 261.8 lbs/year. This analysis was described as “using the most conservative values.”

These calculations are in error and underestimate the emissions of mercury from the coal. No explanation is provided for the use of data from the LV Sutton coal-fired power plant to estimate mercury emissions from the proposed cement kiln. (It is nowhere stated that the cement kiln will use the same source of coal as the power plant, and the amount of mercury contained in the coal varies depending on the source.) A more justifiable approach would be to use EPA data for typical mercury content in coal. Doing so, however, results in higher estimates of mercury emissions.

Assuming that the cement kiln would fire bituminous coal (a reasonable assumption given the facility’s proximity to available coal sources), alternate calculations are presented for the mercury content of coal that will potentially be fired at the plant. According to EPA,<sup>18</sup> the 90<sup>th</sup> percentile mercury concentration in bituminous coal (as calculated from coal samples collected for a year from every power plant burning bituminous coal), is 0.2 ppm. Using these data, the following mercury emission rate can be calculated:

Mercury emission rate using Hg concentration in coal:

$$570,000,000 \text{ lbs coal/year} \times 0.2 \text{ lb/1} \times 10^6 \text{ lbs coal} = \mathbf{114 \text{ lbs Hg input from coal}}$$

Thus, total emissions would be:

$$102.96 + 114 + 159.66 = 376.62 \text{ lbs}$$
$$376.62 \text{ lbs} \times (1 - 0.20) \text{ (fabric filter efficiency)} = \mathbf{301.30 \text{ lbs mercury emitted}}$$

*Converting 301.30 lbs mercury emitted per year to ug/dscm results in an emission rate of 43.53 ug/dscm.* This rate violates the current mercury allowable limit of 41 ug/dscm or less.

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<sup>18</sup> Memorandum from William H. Maxwell to Robert Wayland, U.S. Environmental Protection Agency. May 31, 2006. Revised new source performance standards (NSPS) statistical analysis for mercury emissions. [epa.gov/ttn/atw/utility/NSPS-053106.pdf](http://epa.gov/ttn/atw/utility/NSPS-053106.pdf) (last visited Nov. 17, 2009).

## 2. Chromium VI Emissions from the Proposed Facility are Vastly Underestimated

It is illogical to think that a coal-fired facility burning 570 million pounds of coal each year would emit a mere 2.29 lbs of chromium VI per year. Modeling results that indicate **zero** emissions of chromium VI from the kiln stack should certainly have raised a red flag at DAQ, yet it appears that the numbers provided by Titan were simply accepted at face value. Indeed, Titan's reference for speciated chromium emissions was a single stack test at a different cement kiln. This reference was not available for review in the public record, and we would like to see DAQ's analysis of the information. For example, did the tested facility bear any resemblance to the proposed facility? We raise this question because we calculate a vastly different emission rate for chromium VI than does Titan.

Using the EPA's Summary of Non-criteria Pollutant Emission Factors for Portland Cement Kilns,<sup>19</sup> we find that the emission rate for chromium, with fabric filters installed, is 0.00014 lb/ton of clinker. Using Titan's estimate of 2,190,000 tons of clinker per year results in an annual emission rate of 306.6 lbs/year of chromium.

EPA's Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units<sup>20</sup> considered chromium speciation in extensive modeling of coal-fired power plants. Data on chromium speciation were available from 11 test sites. Between 0.4% and 34% of the emitted chromium was chromium VI. The average chromium VI (as a percentage of total chromium) from coal-fired utilities was 11%. This value is applicable to the cement kiln because coal is the primary fuel being burned. Using 11% as an average, the quantity of chromium emitted as chromium VI would be 33.73 lbs/year, in contrast to the 2.29 lbs/year estimated by Titan. In fact, if a conservative approach were used, as claimed by Titan for their estimates, we would use a chromium VI speciation percentage of 34%, for an emission rate of 104.24 lbs/year.

Thus, estimates of chromium VI emissions range from 1.23 to 104.24 lbs/year. The average estimate of 33.73 lbs/year is more than 15 times higher than Titan's estimate of 2.29 lbs/year. Even at the low emission rate of 2.29 lbs/year, the modeled ambient concentration was 55% of the AAL. **An emission rate more than 10-fold higher than modeled would exceed the AAL.**

## 3. Emissions of Benzene are Five-Fold Higher than Estimated by Titan

Titan made a significant error in calculating benzene emissions from the proposed facility. As stated by Titan, an emission factor from EPA's Summary of Non-criteria

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<sup>19</sup> <http://www.epa.gov/ttnchie1/ap42/ch11/final/c11s06.pdf>.

<sup>20</sup> U.S. EPA, Study of Hazardous Air Pollutant Emissions from Electric Utility Steam Generating Units – Final Report to Congress, Volume 1. 453/R-98-004a, Feb. 1998, at 6-45.

Pollutant Emission Factors for Portland Cement Kilns was used to calculate benzene emissions. However, Titan used the wrong emission factor to calculate a benzene emission rate of 6789 lbs/year. Titan's estimate is apparently based on an emission factor of 0.0031 lbs benzene/ton of clinker. This value is incorrect as it represents use of an electrostatic precipitator for particulate control. The correct emission factor for a fabric filter (from the same EPA source) is 0.016 lbs benzene/ton of clinker. **This results in an emission rate of 35,040 lbs/year of benzene – an estimate more than 5-fold higher than reported by Titan.** DAQ must conduct additional modeling using the correct value for estimated emissions of this known human carcinogen.

#### **4. DAQ's Regulatory Program for Industrial Sources is Flawed**

North Carolina's permitting process for new industrial facilities is not sufficiently protective because it doesn't account for multiple exposure routes to many pollutants at the same time. Also, the screening analyses conducted by the state prior to issuing a construction permit underestimate population exposure to toxic air pollutants because only the pollution concentration at a facility's fenceline is considered. For large industrial facilities with high stacks, such as cement plants, pollutants will disperse and deposit at distances far from the fence line. Furthermore, this modeling represents only a snapshot in time and in no way represents the risk to the public from exposure to persistent metals emitted from the facility and its operations over a projected 30-year lifespan.

In short, North Carolina's Toxic Air Pollutant (TAP) program is inadequate to assess the impacts of the proposed cement plant because:

- ◆ Not all of the pollutants that will be emitted by the facility have allowable ambient limits.
- ◆ The modeling protocol only assesses inhalation exposure, not the critically important indirect exposure pathways for mercury and dioxins, and other metals such as manganese and arsenic that will be emitted by the plant.
- ◆ Even for covered pollutants, the TAP program considers only concentrations at fenceline. Given the high stack (400+ feet) of the proposed facility and its relatively small footprint, exceedances at the fenceline are unlikely. However, this does not mean that there are no downwind impacts.
- ◆ The TAP assessment does not consider cumulative risk for persistent, bioaccumulative pollutants (e.g., metals, mercury, dioxins) that will be emitted by the facility.

#### **D. The Draft Permit Violates Proposed EPA Regulations**

The draft permit raises two distinct categories of concern regarding new proposed limits for Portland cement facilities. The first category is non-compliance with proposed

New Source Performance Standards (NSPS)<sup>21</sup> and the second is non-compliance with proposed National Emission Standards for Hazardous Air Pollutants (NESHAPs).<sup>22</sup> EPA's proposed regulations are long-overdue: they were promulgated in response to a court order issued more than ten years after Congress directed the development of stricter standards for the cement industry. *See National Lime Association v. EPA*, 233 F.3d 625 (D.C. Cir. 2000). As proposed, the regulations would significantly reduce toxic pollution from cement kilns: mercury emissions would be reduced by more than 13,800 lbs/year; particulate matter by more than 10,600 tons/year; and total hydrocarbons (including benzene) by more than 13,000 tons/year. 74 Fed. Reg. at 21164-65. A coincidental benefit of these stricter limits would be the reduction of sulfur dioxide emissions by more than 100,000 tons/year. These reductions would be achieved mainly from the installation of available and effective technologies such as wet scrubbers and activated carbon injection. The associated savings in terms of improved human health and air and environmental quality would be tremendous. It is therefore disturbing that DAQ has declined to enforce these proposed federal standards.

### **1. New Source Performance Standards**

The draft permit completely disregards the proposed NSPS standards. Although not yet final, NSPS regulations provide that a covered facility, like proposed Titan cement plant, will be treated as a "new" facility if construction begins after publication of the proposed rule.<sup>23</sup> New facilities are expected to comply with the new standards as soon as the facility is operational. Consequently, if Titan does not comply with the standards before it begins operation, it will be in violation of the NSPS and subject to appropriate penalties, including but not limited to daily fines for each infraction.<sup>24</sup>

The NSPS regulations were intended to stop exactly what Titan is attempting to do: rush a permit approval before stricter regulations are enacted. Because the NSPS regulations do not "grandfather" compliance, the proposed standards are *de facto* limits with which an applicant must comply and which DAQ must enforce. Titan and DAQ have previously acknowledged this fact, and Titan publicly stated its intent to obey the proposed standards and asked DAQ to hold them to the law.

Inexplicably, DAQ issued a draft permit that ignores the limits. Not only has DAQ ignored EPA's comments on this point, made in reference to Titan's permit application,<sup>25</sup> it has not even offered an explanation for doing so. In its most recent comments on the draft permit, EPA again questions DAQ's non-compliance with

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<sup>21</sup> 73 Fed. Reg. 34072 (proposed June 16, 2008).

<sup>22</sup> 74 Fed. Reg. 21136 (proposed May 6, 2009).

<sup>23</sup> 40 C.F.R § 60.1 (2008).

<sup>24</sup> 42 U.S.C. § 7413(b) (2006).

<sup>25</sup> Letter from John Calcagni, US EPA to Booker Pullen, NC DAQ (Feb. 2009).

proposed standards.<sup>26</sup> EPA's continued insistence on compliance with proposed limits is especially relevant because a permit cannot be approved without its consent.<sup>27</sup>

EPA's limits are not arbitrary restrictions, but are based on the agency's determinations – made after significant scientific research and study – of what it is required to protect public health and welfare. Yet the limits in the draft permit are more lenient than EPA's proposed standards, therefore endangering the public health and welfare in the eyes of the law. If finalized, the draft permit would actually permit actions that undermine the goals of the very same agency and legislation that has delegated DAQ the ability to issue a permit.

The specific pollutant limits that violate the proposed NSPS are below and are also outlined in the October 23, 2009 letter from the EPA.<sup>28</sup> The pollutants and associated inconsistencies are:

<b>Pollutant</b>	<b>Draft Permit Limit</b>	<b>Proposed EPA Limit</b>	<b>Difference</b>
Particulate Matter	663 tn/yr	87.6 tn/yr	575.4 tn/yr (657% increase)
Sulfur Dioxide	1456 tn/yr	299 tn/yr	1157 tn/yr (387% increase)
Nitrogen Oxides	2135 tn/yr	1642.5 tn/yr	492.5 tn/yr (30% increase)

## **2. NESHAPs**

The second category of non-compliance concerns EPA's proposed NESHAP limits. NESHAP regulations pertain to hazardous air pollutants that are considered "toxic" or "hazardous" to human health even in very small doses. This non-compliance is indefensible when one considers the devastating effects that hazardous pollutants have on humans and the environment. Non-compliance with the proposed rules poses a significant danger to the welfare of countless North Carolina citizens and the environment.

Titan has publicly pledged to comply with finalized NESHAP regulations, but has not said when or how it will do so. Corporations often spend years objecting to regulations in order to keep them from being finalized. DAQ's duty is to protect the air resources for the welfare of North Carolinians, not to acquiesce to a corporation's promise that someday in the future it will possibly take these air resources into account. It is DAQ's duty to protect the region's residents and natural resources now. Additionally, Titan has not said how it will comply, and as the following data shows, it will take a complete change in processing techniques to reduce emissions from their current astronomical values.

<sup>26</sup> Letter from John Calcagni, US EPA to Booker Pullen, NC DAQ (Oct. 26, 2009).

<sup>27</sup> 40 CFR § 51.161 (2008).

<sup>28</sup> Letter from John Calcagni, US EPA to Booker Pullen, NC DAQ (Oct. 26, 2009).

The specific pollutants and associated problems are:

- Mercury – the draft permit allows 263 lb/yr of mercury, whereas the EPA proposed limits would limit emissions to 30.66 lb/yr. (As noted above, Titan cannot comply with the *current* NESHAP standards for mercury.<sup>29</sup>) If DAQ issues a draft permit that violates the NESHAP, then not only will Titan be subject to applicable fines, but DAQ may also be subject to penalties.<sup>30</sup> EPA’s possible remedies against DAQ for unlawful permitting are: halting the permitting in violation, administrative penalties, civil actions (including the same level of fines applicable to permittees), and criminal enforcement.<sup>31</sup> To prevent such penalties, DAQ should base calculations on the national average and not Titan’s handpicked estimates.
- Additionally, the EPA has developed a model, REMSAD, for DAQ to use to determine the effect and location of mercury deposition,<sup>32</sup> but DAQ has not used the REMSAD model.
- Hydrochloric Acid – the draft permit imposes no controls for hydrochloric acid and would allow 62,900 lb/yr; the proposed EPA standards are 628 lb/yr.
- Total Hydrocarbons – the draft permit would allow 20 ppmv of total hydrocarbons; the proposed EPA standards limit the emissions to 6 ppmv.

In addition to disregarding proposed EPA limits, the draft MACT analysis does not explain various decisions made on specific technologies. Without this analysis, it is impossible for the public to make informed comment.

#### **E. DAQ Failed to Consider Secondary/Cumulative Impacts**

As proposed, the Titan cement plant would be the 4<sup>th</sup> largest cement plant in the country, and would impose enormous secondary, i.e., additional or cumulative, impacts such as increased vehicle traffic and widening of roads. An increase in general commercial activity around such a large plant also would be likely. These secondary effects would have air quality ramifications from increased stationary exhausts, construction, and traffic.

CAA regulations state that the agency must consider secondary impacts in the permitting process.<sup>33</sup> An analysis must be conducted of additional impacts to air quality,

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<sup>29</sup> 40 C.F.R. § 63.1343 (2008).

<sup>30</sup> 42 U.S.C. § 7413(a)(5) (2006).

<sup>31</sup> *Id.*

<sup>32</sup> U.S. E.P.A., NEW TOOLS FOR MERCURY TMDL SUPPORT - BASIC PROJECT INFORMATION (2008) available at <http://www.epa.gov/owow/tmdl/techsupp.html>.

<sup>33</sup> 40 C.F.R. §51.166(o) (2008).

vegetation, soils, and visibility due to “the source . . . and general commercial, residential, industrial, and other growth associated with the source.” In violation of this mandate, DAQ did not consider additional impacts to any of the required categories.<sup>34</sup>

If DAQ issues a final permit without considering secondary or cumulative effects, and the ACOE relies on the DAQ for the air portion of a federal EIS, then Titan’s plant could be permitted without ever having to consider the additional air impacts it will undoubtedly bring with it. The draft air permit is therefore the appropriate, and necessary, vehicle for conducting the analysis.

#### **F. The Draft Permit Does Not Account for Fuel Source Changes**

The draft permit also lacks control for future changes in the fuel source. Titan’s permit application is based on the plant burning coal/COKE, but the facility is not confined to this fuel source in the future. Other portland cement plants, some of which are owned by Titan, use various other fuel sources, such as tires and hazardous waste, that would change the emissions profile in significant ways. Indeed Titan does not rule out using whole tires as fuel, or “containerized waste” in a process called mid-kiln firing (a potential NOx reduction technology. Titan describes the process of mid-kiln firing as one that has been successfully managed at many cement plants, and poses no significant adverse impacts on operations. Titan states that “. . . Because an adequate supply of tires is uncertain in the area, mid-kiln firing is not planned at the current time.” Titan is clearly open to other fuel sources, which have not been considered in the draft permit.

Another possibility that has been mentioned is using cement kiln dust, or fly ash, in the fuel, which could result in increased mercury emissions. This is especially true with fly ash, which contains mercury captured by the scrubbers used in coal fired power plants. In fact:

“The result can be the emission of more mercury of power plant origins via cement pyroprocessing than from the power plants [themselves].”<sup>35</sup>

State regulations require that the facility apply for an additional permit if there is any change that will increase the emissions of a hazardous air pollutant.<sup>36</sup> Because the emissions authorized in the draft permit are just under the current emissions limit for many pollutants, including mercury, a change in fuel source could trigger enhanced technology requirements. Consequently, the permit should either require these technologies or constrain the fuel source. Because it is unlikely that DAQ – or EPA – would shut down of a multi-million dollar facility based on a change in fuel, failure to

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<sup>34</sup> Cumulative effects would also be considered by the NCEPA/NEPA process, which DENR has decided not to undertake.

<sup>35</sup> Alvaro A. Alvaro and David L. Read, *Will the Hg Cycle be Unbroken? An Air and Waste Management Issue!* (Fla. Dep’t. of Env’tl. Prot. Paper #658) (attached as Appendix D).

<sup>36</sup> 15 N.C. ADMIN. CODE 02Q .0706 (2008).

impose these additional limits creates a potential loophole. At the very least, the permit should mention that any changes in fuel source will necessitate an additional permit.

### **III. The Draft Permit Imposes No Controls on Greenhouse Gases**

In addition to mercury and other hazardous air pollutants, Titan will emit an enormous<sup>37</sup> volume of greenhouse gases (GHG), contributing to the harm that global climate change is anticipated to cause. While climate change is a global concern, scientists have predicted significant impacts in North Carolina, especially along the coast. DAQ should consider these emissions before issuing a permit for Titan for three key reasons. First, the U.S. EPA recently issued a new rule that, within the next six months, will require DAQ to evaluate the GHG emissions from Titan and other sources of air pollution. In order to conserve resources, DAQ should proactively proceed with this evaluation at the present time, or delay issuance of any permit until the evaluation requirement takes effect in early 2010.

Second, the GHG emissions from Titan can be linked to specific negative effects on North Carolina, affecting human welfare and the economy as well as the environment. Finally, Governor Perdue promised the people of North Carolina that she would develop a green economy in this state and make it a leader in the reduction of GHG emissions. As a state executive agency, DAQ should adhere to those promises, by evaluating Titan's GHG emissions and requiring that they be minimized in accordance with the use of BACT, either now or when GHGs become a regulated pollutant under the CAA in early 2010.

#### **A. Cement Kilns Are Significant Sources of GHGs**

If built as proposed, Titan will be a major emitter of the GHGs that cause anthropogenic climate change. GHGs are gases that trap heat inside the atmosphere.<sup>38</sup> Specific GHG types include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), ozone (O<sub>3</sub>), and several classes of halogenated substances containing fluorine, chlorine,

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<sup>37</sup> Titan's specific GHG emissions load is presently unknown, because it depends upon the plant's final design, technology and operating practices. However, an estimated value is possible. In 2007, on average, North American cement facilities participating in the World Business Council for Sustainable Development's "Getting the Numbers Right" program for tracking the GHG emissions from clinker and cement production reported 933 kg of CO<sub>2</sub> per metric ton (tonne) of clinker produced per year. World Business Council for Sustainable Development, GNR Project Reporting CO<sub>2</sub>, [http://wbcsdcement.org/GNRv2/geo/GNR-Indicator\\_321-geo.html](http://wbcsdcement.org/GNRv2/geo/GNR-Indicator_321-geo.html) (last visited Nov. 18, 2009). Appendix E. This converts to approximately .846404 metric tons of CO<sub>2</sub> per short ton (ton) of clinker produced per year. Titan has requested an annual clinker production ceiling of 2,190,000 tons clinker per year. Carolinas Cement Application Forms, B9 (Apr. 8, 2008), [http://daq.state.nc.us/permits/psd/docs/titan/Carolinas\\_Cement\\_Application\\_Forms.pdf](http://daq.state.nc.us/permits/psd/docs/titan/Carolinas_Cement_Application_Forms.pdf). Multiplying this average GHG emissions rate by Titan's maximum clinker production rate produces an estimated GHG emissions rate for Titan of approximately 1,853,624 metric tons of GHGs per year.

<sup>38</sup> U.S. Department of State, *U.S. Climate Action Report 2002*, May 2002, at 5, available at <http://www.gcric.org/CAR2002/>.

or bromine.<sup>39</sup> Among these, CO<sub>2</sub> is emitted in the largest volumes in the United States.<sup>40</sup> It is also “the most important anthropogenic greenhouse gas.”<sup>41</sup>

Cement production is a significant source of CO<sub>2</sub> emissions in the United States, in part due to reliance on fossil fuels to power the kilns used for clinker production.<sup>42</sup> Cement production also emits CO<sub>2</sub> through a chemical reaction which converts limestone, which is added to the clinker, into calcium oxide and CO<sub>2</sub>.<sup>43</sup> In 2001, the cement industry was responsible for approximately 5% of the total industrial CO<sub>2</sub> emissions in the United States. In 2005, the EPA estimated these emissions to total 81.4 million metric tons of CO<sub>2</sub> and CO<sub>2</sub> equivalent GHGs.<sup>44</sup> The specific GHG emissions of any individual cement plant depend upon its design, use of technology and operating practices. By considering Titan’s GHG emissions in its permitting process, DAQ could ensure that these variables are tuned to best protect North Carolina from global climate change.

## B. Proposed EPA Regulations for GHGs

Within the next six months, DAQ will be required to evaluate the GHG emissions from Titan and similar operations pursuant to the CAA, in response to EPA rulemaking in accordance with direction from the U.S. Supreme Court. In 2007, the Supreme Court of the United States ruled that GHGs were air pollutants, triggering a statutory obligation for EPA to determine whether they cause or contribute to a reasonable anticipation of endangerment to human “health” or “welfare.”<sup>45</sup> In compliance with the Court’s order,

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<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> IPCC, 2007: Summary for Policymakers, at 2. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>. Appendix F.

<sup>42</sup> Lisa J. Hanle et al., *CO<sub>2</sub> Emissions Profile of the U.S. Cement Industry*, at 2, available at <http://www.epa.gov/ttnchie1/conference/ei13/ghg/hanle.pdf> (last visited Nov. 18, 2009).

<sup>43</sup> *Id.*

<sup>44</sup> EPA, *Technical Support Document for the Advanced Notice of Proposed Rulemaking for Greenhouse Gases; Stationary Sources, Section VII* (hereinafter TSD ANPR) at 22 (June 5, 2008), <http://www.regulations.gov/search/Regs/home.html#documentDetail?R=09000064806693e5>. Appendix G XX. CO<sub>2</sub> equivalent (CO<sub>2</sub>e) is a standardized unit for measuring total GHG emissions from a given facility or industry category. CO<sub>2</sub> is the primary GHG emitted by the cement industry; however, it also adds some N<sub>2</sub>O to the atmosphere. Portland Cement Association, *2008 Report on Sustainable Manufacturing*, at 11-12, [http://www.cement.org/smreport08/images/shared\\_images/SustainReport08.pdf](http://www.cement.org/smreport08/images/shared_images/SustainReport08.pdf) (last visited Nov. 18, 2008). Appendix H. Titan expects to emit 1,921 tons of N<sub>2</sub>O into the atmosphere each year. This is doubtless far less than the quantity of CO<sub>2</sub> that Titan will produce. See *supra* note 37. However, it is important to note that N<sub>2</sub>O has a global warming potential (GWP) 310 times greater than that of CO<sub>2</sub>, so relatively small quantities produce relatively large effects on global climate change. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007* at 1-6 (April 15, 2009), available at <http://www.epa.gov/climatechange/emissions/downloads09/InventoryUSGhG1990-2007.pdf>.

<sup>45</sup> *Mass. v. EPA*, 549 U.S. 497 (2006).

EPA issued a proposed finding that “greenhouse gases in the atmosphere threaten the public health and welfare of current and future generations.”<sup>46</sup>

On its own, this finding does not impose any requirements on any entity.<sup>47</sup> However, on September 22, 2009, EPA issued a final rule that requires sources releasing more than 25,000 metric tons of CO<sub>2</sub> per year to collect and report data on these emissions.<sup>48</sup> This rule categorically applies to cement production facilities.<sup>49</sup>

EPA anticipates further rule-making to regulate the GHG emissions of light-duty vehicles in March of 2010.<sup>50</sup> This has direct implications for Titan, because when EPA regulates a type of pollutant under the Clean Air Act in any way, that pollutant is then subject to additional New Source Review (NSR) regulation for stationary sources of pollutants. As soon as EPA issues the new rule, state permitting agencies such as DAQ will immediately be required to enforce the regulation against these sources, under the Prevention of Significant Deterioration (PSD) and Title V elements of their State Implementation Plans (SIPs) for the CAA.<sup>51</sup> The most significant requirement of this regulation and permitting will be ensuring that the facility is minimizing its GHG emissions through the application of Best Available Control Technology (BACT).<sup>52</sup> The specific BACT requirements will be determined on a case-by-case basis.<sup>53</sup> The EPA expects that Portland cement plants, as “among the largest emitting GHG source categories,” are likely to exceed the 25,000 ton emission threshold for regulation and permitting.<sup>54</sup>

Under current rules, the regulation extends to any emission of NSR pollutants from a new source or a source conducting a major modification. It is unlikely that Titan will be under construction prior to the anticipated promulgation of the EPA’s light vehicle GHG rule in March of 2010. Consequently, Titan would be subject to these

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<sup>46</sup> EPA, *Overview of EPA’s Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act* (April 17, 2009), <http://www.epa.gov/climatechange/endangerment/0downloads/Determination.pdf>. Appendix I.

<sup>47</sup> *Id.*

<sup>48</sup> Mandatory Reporting of Greenhouse Gases; Final Rule, 74 Fed. Reg. 56,259, 56,266-27 (Oct. 30, 2009) (to be codified at 40 C.F.R. pts. 86, 87, 88, 89 et al.).

<sup>49</sup> *Id.*

<sup>50</sup> Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule (hereinafter “Tailoring Rule”), at 14-15 (proposed Sept. 30, 2009) (to be codified at 40 C.F.R. pts. 51, 52, 70, and 71).

<sup>51</sup> *Id.* at 15.

<sup>52</sup> *Id.* at 33.

<sup>53</sup> EPA, *Fact Sheet – Proposed Rule: Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule* (Sept. 30, 2009), available at <http://www.epa.gov/NSR/fs20090930action.html>. Appendix J. For analysis of energy-efficient practices and technologies for use in cement production, see Nathan Martin et al., *Energy Efficiency and Carbon Dioxide Emissions Reduction Opportunities in the U.S. Cement Industry* (Sept. 1999). Appendix K.

<sup>54</sup> Tailoring Rule, at 307. Because so many sources produce GHGs, this regulatory mandate would be practically impossible for state regulatory agencies to fulfill. With this in mind, and to prepare for its expected light-duty vehicle rule, the EPA on September 30 of 2009 issued a “Tailoring Rule” clarifying that the regulation of GHGs will be applicable only to sources producing at least 25,000 tons of CO<sub>2</sub> per year, or sources making a change that will increase emissions by 10,000-25,000 tons per year.<sup>54</sup> *Id.* at 16.

requirements pursuant to North Carolina's PSD and Title V programs, under which DAQ is proceeding with the issuance of the draft air permit. If a final permit issued by DAQ does not consider Titan's GHG emissions and require the application of BACT, then the permit will not be legally sufficient for construction,<sup>55</sup> and Titan will have to return to DAQ for amendment of the permit to address and control GHG emissions. This would be an inefficient use of the agency's limited resources. As such, DAQ should either require submission of GHG emissions data under the current permit application and permit those emissions in conformity with the PSD rules for BACT application, or delay issuing any permit until the EPA finalizes its proposed rule as anticipated in early 2010. This latter course of action is preferable, with regard to efficient use of DAQ resources, because at that time "EPA plans to compile and make available technical and background information on relevant GHG emission factors, control technologies, strategies and measurement and monitoring methodologies – to assist permitting authorities [such as DAQ] in making BACT determinations."<sup>56</sup>

### C. GHGs Pose a Significant Threat to North Carolina

DAQ also should regulate Titan's GHG emissions because global climate change poses a significant threat to North Carolina, and Portland cement plants such as Titan are significant sources of GHG emissions. Carbon dioxide occurs naturally in the atmosphere, but since pre-industrial times its concentration in the atmosphere has increased by 31%. This has likely affected, and will continue to affect, the global climate system.<sup>57</sup> According to the Intergovernmental Panel on Climate Change (IPCC), "the understanding of anthropogenic warming and cooling influences on climate has improved since [IPCC's Third Assessment Report], leading to *very high confidence* that the global average net effect of human activities since 1750 has been one of warming" (emphasis in original).<sup>58</sup> "Very high confidence" expresses an expert judgment that there is at least a nine out of ten chance that this phenomenon of anthropogenic global warming is real.<sup>59</sup>

Since 1970, the annual average temperature of the Southeast has risen approximately 2°F, with the greatest proportion of this increase occurring during the winter months.<sup>60</sup> The U.S. Global Change Research Program has prepared a thorough set of assessments on how global climate change will affect the United States. In doing so, it relied upon values from the middle of ranges prepared by the Intergovernmental Panel on Climate Change (IPCC) for the extent of future global warming and sea level rise. These median values indicate future global warming of 5.4°F, and sea level rise of 19 inches.

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<sup>55</sup> See 40 CFR 51.21(r), incorporated into NCAC at 15A NCAC 02D .0530(1).

<sup>56</sup> Tailoring Rule, at 306-07.

<sup>57</sup> U.S. Department of State, *supra* note 38, at 81.

<sup>58</sup> IPCC, 2007: Summary for Policymakers, at 3. Appendix F.

<sup>59</sup> *Id.*

<sup>60</sup> U.S. Global Change Research Program, GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES, 111, (Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson eds., Cambridge University Press 2009) available at <http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf>.

According to the IPCC, by the end of the 21<sup>st</sup> century, the changes may go as high as a 10.4°F increase in temperature, and a sea level rise of 35 inches.<sup>61</sup>

It is with respect to these forecasts of rising sea levels that Army Corps of Engineers recently issued a guidance document requiring its personnel to consider the effects of sea-level change in every coastal activity in which it is involved, as far inland as the extent of estimated tidal influences.<sup>62</sup> The Corps is planning to apply analysis of sea-level effects to its regulatory programs “in the fairly near future.”<sup>63</sup>

These changes, along with other anticipated effects, will likely have significant negative impacts on North Carolina, particularly its coastal communities. Higher temperatures contribute to greater evaporation rates,<sup>64</sup> which will remove water more quickly from the soil and reservoirs. Additional watering will be required to maintain soil moisture for agriculture and residential/commercial lawns, placing additional pressure on public water supplies drawing from open reservoirs. Higher temperatures can increase the frequency of illnesses and deaths due to summer heat stress, for humans, plants and animals.<sup>65</sup> It is anticipated that increased thermal stress will contribute to a decline in both agricultural crop production and forest growth.<sup>66</sup> For humans, at minimum, the anticipated rise in absolute humidity will “make summer conditions feel much more uncomfortable, particularly across the southern and eastern United States.”<sup>67</sup> Furthermore, the combination of increased heat and decreased soil and plant moisture will lead to more frequent and intense wildfires,<sup>68</sup> endangering communities and requiring more resources for fire management.

Global climate change is also likely to cause southeastern forests to experience major shifts in the species they support, or to break up all together.<sup>69</sup> In the water, heat-related de-oxygenation will contribute to loss of aquatic life diversity and fish kills.<sup>70</sup> Loss of wetlands to rising seas and surge damage will destroy coastal birdlife habitat. These effects, will in turn, cause harm to the recreational and aesthetic interests of North Carolina’s citizens, as well as its environmental and beach tourism industries.

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<sup>61</sup> U.S. Department of State, *supra* note 38, at 13.

<sup>62</sup> Department of the Army, *Water Resource Policies and Authorities Incorporating Sea-Level Change Considerations in Civil Works Programs* at 1-2 (July 1, 2009), <http://140.194.76.129/publications/eng-circulars/ec1165-2-211/ec1165-2-211.pdf>. Appendix L.

<sup>63</sup> Taryn Luntz, *New Army Corps Policy Forces Project Designers to Consider Rising Seas*, N.Y. Times, Nov. 11, 2009, available at <http://www.nytimes.com/gwire/2009/11/11/11greenwire-new-army-corps-policy-forces-project-designers-7288.html>. Appendix M.

<sup>64</sup> U.S. Global Change Research Program, *supra* note 60, at 112.

<sup>65</sup> *Id.* at 113.

<sup>66</sup> *Id.* at 113.

<sup>67</sup> U.S. Department of State, *supra* note 38, at 5, 81.

<sup>68</sup> U.S. Global Change Research Program, *supra* note 60, at 112.

<sup>69</sup> U.S. Department of State, *supra* note 38, at 89.

<sup>70</sup> U.S. Global Change Research Program, *supra* note 60, at 113.

More dramatically, rising sea surface temperatures since 1970 correlate to increases in the destructive power of Atlantic hurricanes.<sup>71</sup> “The intensity of Atlantic hurricanes is likely to increase during this century with higher peak wind speeds, rainfall intensity, and storm surge height and strength.”<sup>72</sup> The increased short-term precipitation during these extreme weather events, coupled with the general trend towards increased drought incidence, will contribute to increased fertilizer and manure run-off into surface waters.<sup>73</sup> Even absent these harms from specific weather events, rising ocean levels will permanently inundate a swath of the NC coast.<sup>74</sup> “Wetlands will be inundated and eroded away, and low-lying areas including some communities will be inundated more frequently – some permanently – by the advancing sea.”<sup>75</sup>

#### **D. Governor Perdue Pledged to Reduce Emissions of GHGs**

Beyond protecting North Carolina from the harmful effects of global climate change, and proactively fulfilling its legal obligations as the administrator of North Carolina’s SIP in order to maximize resource efficiency, DAQ should evaluate and regulate Titan’s greenhouse gas emissions during the permitting process in order to adhere to the promises made by Governor Perdue during her campaign. Concerning the debate about permitting Duke Energy’s Cliffside facility, Governor Perdue said, “I believe North Carolina should . . . be a national leader in a movement to reduce our greenhouse gas emissions in this country by 80% by the year 2050 . . . .”<sup>76</sup> Furthermore, “North Carolina’s priority must be on creating long-range goals for reducing greenhouse gas emissions, with a focus on increasing energy efficiency and conservation. As Governor, a particular emphasis of mine will be developing a green economy to help North Carolina achieve those goals.”<sup>77</sup>

When she made these statements, Governor Perdue correctly articulated the importance of reducing North Carolina’s greenhouse gas emissions, and focusing economic development on environmentally friendly projects. This is an opportunity for DAQ, as a state executive agency, to show the citizens of North Carolina that our government takes its promises seriously.

Although the wheel of anthropogenic global warming has already been set in motion, it is not too late to minimize future harm, provided that agencies such as DAQ use their authority to regulate the greenhouse gas emissions from facilities such as Titan. If greenhouse gas emissions are lessened, the effects of climate change will also be reduced; conversely, if greenhouse gas emissions increase, the pace of global climate

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<sup>71</sup> *Id.* at 112.

<sup>72</sup> *Id.* at 112.

<sup>73</sup> U.S. Department of State, *supra* note 38, at 95.

<sup>74</sup> U.S. Global Change Research Program, *supra* note 60, at 112.

<sup>75</sup> *Id.* at 114.

<sup>76</sup> Governor Beverly Perdue, *Beyond Cliffside: Making North Carolina a National Green Energy Leader* (Feb. 8, 2008), [http://www.beyperdue.com/release\\_details.asp?id=1017](http://www.beyperdue.com/release_details.asp?id=1017).

<sup>77</sup> Ryan Teague Beckwith, *Perdue: Cliffside can wait*, Raleigh News & Observer, Jan. 23, 2008, [http://projects.newsobserver.com/under\\_the\\_dome/perdue\\_cliffside\\_can\\_wait](http://projects.newsobserver.com/under_the_dome/perdue_cliffside_can_wait).

change will accelerate.<sup>78</sup> The cement industry is particularly ripe for increased carbon efficiency, because their rate of CO<sub>2</sub> emissions relative to units of energy consumed is far above the industrial average.<sup>79</sup> This indicates that there is much potential for the cement industry to reduce its carbon intensity, if held accountable for doing so by agencies such as DAQ.

#### **IV. The Draft Air Permit Violates the Clean Water Act**

The mercury emissions authorized by the draft air quality permit present both regulatory and health problems. The regulatory structure is such that pollutants are controlled at their source and divided into two categories – air and water. Toxins that are emitted into the ambient air are governed by the CAA, while those same toxins discharged into the water are governed by the CWA. Without a mechanism to integrate the two, the regulatory chasm threatens significant harm to communities such as those surrounding the proposed Titan cement plant. This is especially true for mercury, a potent neurotoxin that is most dangerous when it enters swamps and water. In fact, the Northeast Cape Fear River has already fallen prey to this regulatory gap. The area where Titan proposes to build is classified as mercury impaired.<sup>80</sup>

In the CWA, Congress attempted to provide a solution for this problem by delegating the regulation of non-point source discharges (such as airborne discharges) to the states and instituting a TMDL program.<sup>81</sup> As discussed below, state regulation has been unsuccessful in North Carolina, and if DAQ finalizes the air permit it would cement that lack of success far into the future.

##### **A. The Draft Air Permit Will Impair Water Quality and Endanger Human Health and Aquatic Life**

EPA acknowledges that “[m]ercury in the air may settle into water bodies and affect water quality.”<sup>82</sup> Titan’s own consultant, Intertox, Inc., also recognizes this problem in its report. This aerial deposition of mercury can fall both onto water bodies, such as rivers and wetlands, and also land. Land-based runoff, in turn, transports this atmospherically deposited mercury into water bodies.

DAQ well understands this connection. DAQ has studied the impacts of atmospheric deposition of mercury into Lake Waccamaw, which is characterized by some of the highest levels of mercury in fish in the State. Lake Waccamaw is affected by

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<sup>78</sup> U.S. Department of State, *supra* note 38, at 82.

<sup>79</sup> Mark Schipper, EIA, *Energy Related Carbon Dioxide Emissions in U.S. Manufacturing* at 4 (2006), available at [http://www.eia.doe.gov/oiaf/1605/ggrpt/pdf/industry\\_mecs.pdf](http://www.eia.doe.gov/oiaf/1605/ggrpt/pdf/industry_mecs.pdf).

<sup>80</sup> N.C. DIV. WATER QUALITY, DRAFT 2008 303(D) LIST (2008), available at [http://h2o.enr.state.nc.us/tmdl/General\\_303d.htm](http://h2o.enr.state.nc.us/tmdl/General_303d.htm).

<sup>81</sup> 33 U.S.C. §1329(a) (2006).

<sup>82</sup> U.S. E.P.A., *Mercury: Environmental Effects*, <http://www.epa.gov/mercury/eco.htm> (last visited 10/7/2009).

several large mercury emission sources located northeast of the lake, including two coal-fired utility boilers, a municipal waste incinerator, and a mercury cell chlor-alkali facility. DAQ noted that for several periods during the study, significantly elevated levels of total gaseous mercury were measured at the Lake Waccamaw site, which coincided with winds originating from the east-northeast. The study also noted significant improvements in the level of total gaseous mercury once the chlor-alkali facility substantially reduced its mercury emissions. Thus, the study concluded that air deposition “could result in substantial direct and indirect inputs of mercury into waterways located near mercury emission sources” and that “the identification of atmospheric inputs to this area could aid in ameliorating this situation if proper steps are taken to reduce mercury emissions.”<sup>83</sup>

It is logical for water quality impacts to be considered in air permitting processes, especially where mercury is concerned. Airborne emissions of mercury are most detrimental to humans and the environment through a waterborne pathway, not an ambient air pathway. Once in a water body, mercury is converted to methylmercury through biological processes carried out by sulfur-reducing bacteria.<sup>84</sup> Although the methylation of mercury can occur by both biotic and abiotic processes, sulfur reducing bacteria are the prime converters in rivers and wetlands. “The methylation of inorganic Hg(II) is the most toxicologically significant transformation in the environmental mercury cycle” because it readies the mercury for biological uptake.<sup>85</sup>

Mercury methylation occurs at highest rates by sulfur-reducing bacteria in anoxic environments. Aquatic systems that exhibit characteristics for high mercury methylation are considered to be “mercury sensitive.” Such systems include “wetlands, low alkalinity or low pH lakes, surface waters with upstream or adjoining wetlands, waters with adjoining or upstream terrestrial areas subjected to flooding, and dark-water lakes and streams.”<sup>86</sup> Wetlands are thought to be the most mercury sensitive waters, since their characteristics allow for enhanced mercury methylation. These characteristics include “an abundance of labile carbon substrates and dissolved organic matter, anaerobic sediments, high microbial activity, and seasonal water-level fluctuations.”<sup>87</sup> Re-wetting cycles associated with flooding greatly increase rates of methylation. This “reservoir effect” causes temporary increases in mercury methylation due to enhanced microbial activity.<sup>88</sup>

The Northeast Cape Fear River displays all of the characteristics that result in high mercury methylation. As a black-water river with adjoining wetlands, and adjoining

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<sup>83</sup> N.C. Div. Air Quality, *Wet Deposition*, [http://daq.state.nc.us/toxics/studies/mercury/wet\\_dep.shtml](http://daq.state.nc.us/toxics/studies/mercury/wet_dep.shtml) (last visited Nov. 16, 2009).

<sup>84</sup> United States Geological Survey – Toxic Substances Hydrology Program. 2009. *Methylmercury*. <http://toxics.usgs.gov/definitions/methylmercury.html> last updated 5/2009.

<sup>85</sup> J.G. Weiner et al., *Handbook of Ecotoxicology: Ecotoxicology of Mercury* 407–61(2d ed. 2003).

<sup>86</sup> *Id.*

<sup>87</sup> *Id.*

<sup>88</sup> Brigham, M.E., Krabbenhoft, D.P., Olson, M.L., and Dewild, J.F.. 2002. *Methylmercury in Flood-Control Impoundments and Natural Waters of Northwestern Minnesota, 1997-99*. Water, Air, and Soil Pollution. Vol. 138 pp.61-78. Appendix at N.

and upstream terrestrial habitats subject to flooding, the northeast Cape Fear River is most definitely mercury sensitive. Additionally, daily tidal fluctuations will add to the increased “reservoir effect.” The river has all of the characteristics needed for enhanced mercury methylation. An addition of Titan’s proposed 263 pounds of mercury deposited into the atmosphere annually will result in dangerously high rates of mercury methylation.

“Methylmercury is the primary and most toxic form of mercury in the diets of piscivores and other top mammalian predators that are associated with aquatic food webs.”<sup>89</sup> Laboratory studies have shown that fish exposed to large amounts of dietary methylmercury exhibit symptoms of starvation, such as low levels of glucose and total protein.<sup>90</sup>

The mercury found in the River also endangers human health and safety. Fish caught in the Northeast Cape Fear River are contaminated with methylmercury due to the impairment. Methylmercury is a neurotoxin, and is harmful to adults, children, infants, and fetuses. Exposure to large amounts of methylmercury can result in neurological and kidney disorders. “Impacts on cognitive thinking, memory, attention, language, and fine motor and visual spatial skills have been seen in children exposed to methylmercury in the womb.”<sup>91</sup>

In addition to the devastating effects that methylmercury can have on existing populations, the biomagnification of this toxin results in a multitude of affects that have at least a decadal lifespan. While demethylation also occurs in a natural environment, the presence of positive amounts of methylmercury in fish in the Northeast Cape Fear River indicate that methylation is occurring at a greater rate than demethylation in this water body.

#### **B. Models Are Available to Evaluate the Impacts of Air Emissions on Water Quality**

EPA has actively worked to address the deposition of airborne mercury into local water bodies. In January of 2001, the EPA announced a progressive plan between the Office of Air & Radiation and the Office of Water that aimed to give states the tools to evaluate atmospheric deposition of mercury into water bodies, thus allowing them to incorporate air emissions into TMDLs and other water quality analysis.<sup>92</sup> In January 2001, EPA commissioned two major case studies, one in Devils Lake, Wisconsin, and one in the Florida Everglades.

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<sup>89</sup> *Id.*

<sup>90</sup> *Id.*

<sup>91</sup> U.S. E.P.A., *Mercury – Health Effects*, <http://www.epa.gov/mercury/effects.htm> (last visited Nov. 15, 2009).

<sup>92</sup> U.S. E.P.A., OAR Policy and Guidance Metarecord: Air-Water Interface Work Plan Documents, <http://www.epa.gov/ttncaaa1/t3/meta/m10050.html> (last visited Nov. 15, 2009).

EPA published the results of the Florida study in November of 2003<sup>93</sup> and the results of the Devils Lake study in March 2006.<sup>94</sup> These studies demonstrate that states can accurately track airborne mercury emissions to determine where they will be deposited. The REMSAD model used for the Devils Lake study has been peer reviewed and deemed capable of accurately predicting (“tagging”) wet deposition of individual mercury sources.<sup>95</sup> Based on these studies, EPA now recommends that states use REMSAD to integrate atmospheric loading into TMDL decisions.<sup>96</sup>

**C. DAQ May Not Issue a Final Permit Until DWQ Develops a Plan to Restore Water Quality in the Northeast Cape Fear River**

The Clean Water Act mandates that all states set Water Quality Standards (WQS) for “all waters of the United States” and requires all states to monitor those waters to determine if those standards are met.<sup>97</sup> WQS are determined based on a waterbody’s designated uses. If a waterbody does not meet its WQS, it is listed as impaired pursuant to section 303(d) of the CWA. States are required to submit a 303(d) list, which lists all impaired waters, every two years to the EPA.<sup>98</sup> The CWA then mandates that the State develop a Total Maximum Daily Load (TMDL) for all pollutants responsible for the impairment, in order to restore the waterbody to its designated uses. A TMDL is the maximum amount of a pollutant a waterbody can receive and still meet the WQS necessary to maintain its designated uses. Once a TMDL is established, this “total load” of the pollutant is allocated among the various point and non-point sources that discharge the pollutant into the waterbody.

In North Carolina, waterbodies are grouped into certain classes based on their designated uses. The State then sets WQS for each classification. The Northeast Cape Fear River is classified as Class B or Primary Recreation.<sup>99</sup> This means the water is protected for uses such as fishing, wildlife, fish consumption and primary recreation activities. Primary recreation activities include swimming, skin diving, water skiing, and similar uses involving human body contact with the water on a frequent basis.<sup>100</sup>

The WQS established for mercury for Class B waters is 0.012 ug/l. In 2006, DWQ monitoring revealed that the level of mercury found in the Northeast Cape Fear River exceeded this standard. Therefore, as required by the CWA, DWQ placed the

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<sup>93</sup> FLORIDA DEPT. ENVTL. PROT., INTEGRATING ATMOSPHERIC MERCURY DEPOSITION WITH AQUATIC CYCLING

IN SOUTH FLORIDA (2003), *available at*

<ftp://ftp.dep.state.fl.us/pub/labs/assessment/mercury/tmdlreport03.pdf>.

<sup>94</sup> <http://www.epa.gov/owow/tmdl/mercury/pdf/devilslakefinalreport.pdf>

<sup>95</sup> *Id.*

<sup>96</sup> U.S. E.P.A, NEW TOOLS FOR MERCURY TMDL SUPPORT - BASIC PROJECT INFORMATION (2008)

*available at* <http://www.epa.gov/owow/tmdl/techsupp.html>

<sup>97</sup> CWA § 304(a)(1)

<sup>98</sup> 40 CFR § 130.7

<sup>99</sup> 15A NCAC 2B .0300

<sup>100</sup> 15A NCAC 02B .0101

River on North Carolina's 303(d) list as mercury impaired.<sup>101</sup> The mercury impairment violates the river's designated use, because it prevents the public from safely consuming fish caught in its waters. Consequently, the state is required to set a TMDL for mercury. This TMDL is necessary to restore the designated uses of the Northeast Cape Fear River, which include fish consumption and frequent human body contact with the water.

North Carolina's 303(d) list does not identify any source responsible for the mercury contamination of the Northeast Cape Fear River. However, several mercury emitting sources are located in the area to the area surrounding the River.<sup>102</sup> In addition, the site on which Titan proposes to build the cement plant was formerly occupied by the Ideal Cement plant, an historic source of mercury emissions that closed more than twenty years ago.

DWQ has not yet set a mercury TMDL for the Northeast Cape Fear River. However, this does not mean the river isn't severely impaired or that the state may allow sources to continue to add mercury and worsen the river's impairment. Due to the complexity of developing a TMDL and the limited resources of the state, DWQ is able to set only a small fraction of needed TMDLs each year. If the state allows more mercury to enter the water, through point or non-point sources, not only will the water quality worsen to the detriment of public health and safety, but DWQ's mandate to restore the river to its designated uses will be more costly and difficult, if not impossible.

Yet this is exactly what DAQ has done by issuing a draft permit that would allow Titan to emit 263 pounds of mercury annually. The Titan facility is considered a non-point source of mercury due to air deposition.<sup>103</sup> Air deposition of mercury is a problem DAQ has itself recognized. In a study completed by DAQ, the Division concluded that air deposition could "result in substantial direct and indirect inputs of mercury to waterways located near mercury emission sources."<sup>104</sup> It has further noted that "it may be beneficial to identify and reduce airborne emissions near aquatic systems that efficiently move atmospheric inputs of mercury into the aquatic food chain."<sup>105</sup>

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<sup>101</sup> N.C. DIV. WATER QUALITY, 2006 303(D) LIST (2006), *available at* [http://h2o.enr.state.nc.us/tmdl/General\\_303d.htm#Downloads](http://h2o.enr.state.nc.us/tmdl/General_303d.htm#Downloads).

<sup>102</sup> These sources include the Carolina Power and Light Company's Electric Plant located in Wilmington, NC and Elementis Chromium located in Castle Hayne, NC. U.S. E.P.A., TOXIC RELEASE INVENTORY, RELEASES: FACILITY REPORT FOR NEW HANOVER COUNTY, NORTH CAROLINA (2007) [http://www.epa.gov/cgi-bin/broker?view=COFA&trilib=TRIQ1&sort=\\_VIEW\\_&sort\\_fmt=1&state=37&county=37129&chemical=\\_ALL\\_&industry=ALL&year=2007&tab\\_rpt=1&fld=RELLBY&ONDISPD=Y&OTHDISP=Y&\\_service=oiiaa&\\_program=xp\\_tri.sasmacr.tristart.macro](http://www.epa.gov/cgi-bin/broker?view=COFA&trilib=TRIQ1&sort=_VIEW_&sort_fmt=1&state=37&county=37129&chemical=_ALL_&industry=ALL&year=2007&tab_rpt=1&fld=RELLBY&ONDISPD=Y&OTHDISP=Y&_service=oiiaa&_program=xp_tri.sasmacr.tristart.macro) (last visited Nov. 16, 2009).

<sup>103</sup> U.S. E.P.A., *What is Nonpoint Source Pollution?*, <http://www.epa.gov/owow/nps/qa.html> (last visited Nov. 15, 2009).

<sup>104</sup> N.C. Div. Air Quality, *Mercury Wet Deposition*, [http://daq.state.nc.us/toxics/studies/mercury/wet\\_dep.shtml](http://daq.state.nc.us/toxics/studies/mercury/wet_dep.shtml) (last visited Nov. 15, 2009).

<sup>105</sup> J. HAYWARD, K. CLEVINGER AND T. CRAWFORD, NC DIV. OF AIR QUALITY, LONG-TERM ATMOSPHERIC MERCURY TRENDS IN EASTERN NORTH CAROLINA: RELATIONSHIPS BETWEEN LOCAL SOURCE ACTIVITIES AND AMBIENT AIR MERCURY CONCENTRATIONS, *available at* <http://daq.state.nc.us/toxics/studies/mercury/aq2final.pdf>. Attached as Appendix O.

However, DAQ made no analysis of this issue in the draft air permit. As of now, DAQ is the only agency in a position to regulate the emissions of mercury, which, if allowed as proposed, will further degrade the water quality of the river. It makes no sense for DAQ to frustrate the goal of clean water by permitting non-point sources that will further degrade the water quality of already impaired rivers.

Last week, EPA issued a statement urging states to redouble their efforts in looking for opportunities to reduce mercury discharges . . . ."<sup>106</sup> EPA made this statement in response to findings from a national study of pollution in lakes and reservoirs that showed mercury concentrations in game fish exceed EPA recommended limits in nearly 50% of the country's lakes and reservoirs.<sup>107</sup> DAQ should heed EPA's call and withdraw the draft permit, and then coordinate with DWQ to determine how to reduce mercury loadings into the Northeast Cape Fear River and other state waters.<sup>108</sup>

## V. Environmental Injustice

As indicated by Maps 3 -6 contained in Appendix B, the area in which the Titan cement plant would be built has high concentrations of poor people and people of color. Census data indicates that areas of highest poverty – between 20% and 40% -- and highest minority residents – between 30 and 50% -- are immediately adjacent to the proposed site. The residents of this community may be expected to suffer disproportionately from the impacts associated with a cement plant, from exposure to polluted air to ingestion of contaminated fish.

The location of a cement plant in this location would add to the environmental burdens already suffered by the community. As indicated by Map 7, this area is already contaminated by other industrial processes. There are twelve sites listed on the federal Toxic Release Inventory, which provides information to the public about chemical hazards in their communities pursuant to the Emergency Planning and Community Right-to-Know Act (EPCRA). These facilities include General Electric (which emits acetone, cobalt, diisocyanates, ammonia, nickel, chromium, and hydrogen fluoride, among other hazardous chemicals), Elementis Chromium (which emits dioxin, lead, sulfuric acid and mercury, among other pollutants), and Adams Products Company (which emits lead).

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<sup>106</sup><http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/62b53c67bc92ef878525766a004b3456!OpenDocument>.

<sup>107</sup> EPA currently is conducting a similar assessment of contaminants in the nation's rivers and streams, and will soon begin its assessments of the country's coastal waters.

<sup>108</sup> The creation of a TMDL in response to atmospheric deposition of mercury into a water body is not unprecedented. Minnesota established a "Statewide Mercury Total Maximum Daily Load" in response to large amounts of atmospherically deposited mercury in Minnesota waters. Minnesota Pollution Control Agency, *Statewide Mercury Total Maximum Daily Load (TMDL)* (2009), <http://www.pca.state.mn.us/water/tmdl/tmdl-mercuryplan.html#final> (last visited Nov. 15, 2009). The "Northeast Regional Mercury Total Maximum Daily Load", modeled after Minnesota's TMDL, created a TMDL based off of mercury concentrations found in fish tissues. NORTHEAST REGIONAL TMDL (2007), available at <http://www.mass.gov/dep/water/resources/mertmdl.pdf>.

There are also six sites listed on the state Inactive Hazardous Waste List (including Reesor Chemical and Diamond Shamrock), one Superfund/National Priorities List site, and one unpermitted landfill. Most residents in this corridor derive their drinking water from groundwater wells, as indicated in Appendix B, Map 8, raising significant concerns about impacts to the health of the community's residents.<sup>109</sup>

In addition, as indicated by Maps 1 and 2, there are approximately ten public schools within this same area, two of which are within one to two miles downwind of the site, and several day care facilities. As detailed above, children are extremely sensitive to the pollutants that would be emitted by the cement plant. The location of a facility that would emit such significant amounts of pollution in the midst of the most vulnerable of our society is unjustifiable. DAQ must document and evaluate the disproportionate impacts to the community and its children posed by these cumulative sources before it can issue a final permit.

## **VI. The Draft Air Permit Contradicts and Undermines Important State Policies**

### **A. Investments in Conservation**

In addition to being legally mandated, the cross-media, ecosystem-based approach provided by SEPA and NEPA makes economic and political sense. In the past nine years, the state and federal government, as well as private landowners, have made substantial investments aimed at restoring and protecting water quality, wetlands and stream buffers in the Northeast and Lower Cape Fear region, and at protecting important conservation and game lands. Attached at Appendix B is a map (Map 9) documenting the lands and water bodies that have been put into conservation.

The state alone has appropriated \$42,981,581 in public funds for conservation lands within a 25 mile radius of the proposed Titan cement plant. Most of this funding has been provided by the Clean Water Management Trust Fund (CWMTF), including the initial investment in 1998 of \$20,000 for the North Carolina Coastal Land Trust (NCCLR) to prepare the Riparian Corridor Conservation Plan for the Northeast Cape Fear River. This Plan provided the framework for more than 40 million dollars of additional CWMTF money over the next decade to prioritize and purchase lands within this corridor for clean water. CWMTF money was used to acquire lands across the river from the site of the proposed cement plant; the NCCLT also has acquired land directly across the river from the site. The *total* investment in these various projects, which include matching amounts from federal and other sources, is \$111,382,696.<sup>110</sup> These investments would be squandered and gains in improved water quality lost by the deposition and discharge of pollutants emitted from the proposed Titan plant.

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<sup>109</sup> Contamination of groundwater with chromium from the Elementis Chromium plant is a serious concern due to the large quantities of groundwater the Titan facility would need to extract to dewater the quarries, which has the potential to mobilize the plume.

<sup>110</sup> Cape Fear River Projects Funded by CWMTF (1998-2007), attached as Appendix P,

In addition, the North Carolina Natural Heritage Program has identified the Northeast Cape Fear River Floodplain and the river marshes in Castle Hayne as federally important natural heritage areas.<sup>111</sup> The Natural Heritage Program made this designation because these areas are among “the best representatives known of the natural diversity of the state,” in accordance with the authority set forth in the state’s Nature Preserves Act, N.C. Gen. Stat. § 113A-164. In accordance with this statute, these areas are prioritized for acquisition and further protection. DAQ’s action in issuing the draft air permit thus undermines the integrity of several important and popular state programs and pits one resource agency against several others.

## **B. The Draft Air Permit Violates the Coastal Habitat Protection Plan**

The Coastal Habitat Protection Plan (CHPP), developed by the Coastal Resources Commission/Division of Coastal Management in 2005, and the Cape Fear Basin Plan, developed by the Division of Water Quality in 2005, represent the efforts of several state agencies to develop a holistic vision for protection and development of coastal resources. Through the development of these plans, the state dedicated substantial time and financial resources. DAQ has ignored these critical resource plans, and the draft air permit violates their objectives.

### **1. Improve effectiveness of existing rules and programs protecting coastal fish habitats**

Citizen comments on the CHPP identified implementation and enforcement of existing rules as the most pressing concern in coastal management. The CHPP team concurred with this comment, stating in response that the regulatory mechanisms already exist for complete stewardship of the state’s coastal areas but are not usually implemented in a comprehensive manner. Therefore, the laws are not necessarily effective in preventing environmental degradation. The Titan permitting process, in which the water quality permits and NEPA will not be investigated until after construction is completed, serves as a prime example of this concern: the laws on the books regulating the industry do not play a role in the permitting process until too late to prevent serious damage to the environment. Also, the state loses the confidence and ability to deny further permits for operation once the plant is already built.

### **2. Identify, designate, and protect strategic habitat areas**

The main stem of the Cape Fear River is already designated as a Primary Nursery Area and the interface between the freshwater stretch of the river and the saltwater delta is an important area, especially for the endangered anadromous sturgeon that live in the region. The state uses such designations as a way to identify and target management toward habitat areas that are particularly important to support biodiversity in the region.

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<sup>111</sup> NC Natural Heritage Program Biennial Protection Plan: List of Significant Natural Heritage Areas, at p. 88 (2009).

DCM is creating a network of such areas, generally termed strategic habitat areas (SHA). The designation process is ongoing and the state is making rapid progress. Therefore, development that threatens potential SHA should be postponed until the analysis is finished. The CHPP also recommends that the CAMA protected areas be extended upstream and landward, as these areas are recognized as critical for the health of the downstream estuaries and open ocean. Titan's lands lie within these protected areas and are critical for the health of downstream habitat.

The state has already designated the floodplain of the Northeast Cape Fear as a Significant Natural Heritage Area (SNHA) (Basin Plan 2005) because it houses unique blackwater tidal swamps containing a number of threatened and endangered species such as the lyre goby. The area remains largely unexplored and therefore there may be other federally and state listed species present that have yet to be documented. Unfortunately, SNHA designation currently offers no protection, but would through the CHPP implementation plan under SHA management. Ideally, such management would involve a species census, baseline conditions surveys, and a prohibition on major development in the area (such as the Titan plant).

### **3. Enhance habitat and protect it from physical impacts**

Despite the state's history of enhancing and protecting the habitat through state funds and conservation trusts, the Titan plant threatens to undermine the conservation efforts in the area, removing and polluting the estuarine habitat for a long stretch on one side of the river, mostly for mining activities. The CHPP recognizes the potential threat from mining production and specifically calls for the "continued cooperation between COE, DWQ 401 staff, CAMA, and others responsible for review of mining projects [as] necessary to protect and mitigate against soft bottom and other habitat impacts."<sup>112</sup>

Cooperation implies a comprehensive review of impacts with protection and restoration as the ultimate goal, not continued impact. Mining activities are recognized as particular threats as they have the greatest magnitude and mined lands take a long time to recover, sometimes never returning to the original community. Consequently, the CHPP recommends a comprehensive review of impacts pursuant to SEPA or NEPA before approving such activities. According to studies referenced in the CHPP, the area Titan plans to mine may never recover once operations cease, especially since the habitat involved is particularly vulnerable. This concern is quite real, as the areas previously mined for the Ideal Cement Plant more than twenty years ago have yet to recover. Titan plans to drain the aquifer in order to access the limestone, and would permanently remove the soil base and seed bank that would be necessary for recovery.

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<sup>112</sup> Coastal Habitat Protection Plan at p. 389.

#### **4. Enhance and protect water quality**

One of the most significant concerns with Titan's proposal is the air-water interface regulatory gap described above. Such interactions between different natural resources are precisely the type of threats that CHPP and the Basin Plans are meant to address. The CHPP cites the Air Quality/Electric Utilities Act as requiring DENR to evaluate issues specifically related to the control of mercury and make recommendations for control.<sup>113</sup> Consistent with this recommendation, DAQ has the responsibility to consider mercury deposition in its permitting process rather than deferring the question of impacts from air emissions to the Division of Water Quality, which may never have the opportunity to address this concern in its own permitting process.

#### **C. The Titan Cement Plant and Draft Air Permit Threaten Valuable Ecosystem Services**

Although a relatively new concept for regulatory agencies, scientists and economists have long recognized the societal and economic services provided by critical ecosystem functions. Appendix Q provides a brief overview of the services provided by the Northeast Cape Fear River and surrounding lands, and their associated economic benefits.

This region has some distinct direct use values. Fisheries, both commercial and recreational, are quite important to the state's economy. The commercial fishery in the state brought in \$82.3 million in 2007<sup>114</sup> and the recreational fishery adds millions of dollars more. It also supports the outdoor recreation and fishing shops and charters. The most immediate threat to the fishery is mercury accumulation, which, as discussed above, would be accelerated as a result of Titan's emissions.

Also important in the region are salt-tolerant, sun-loving crops such as blueberries. Blueberries sell for approximately \$3 per pint and support a number of farmers in the area, including one directly across the street from the proposed plant and the planned mining operations. The blueberry plants would absorb heavy metals deposited in the soil and water from the cement plant as well as suffer decreased yield from a coating of dust from both the production and transport processes at the plant.<sup>115</sup>

While these direct use values are significant, the indirect uses show the primary value of the Northeast Cape Fear, even if exact valuation of the services is difficult, if not impossible. (Indirect uses are benefits to humans that depend on the estuary at some point but may not directly provide a service, such as providing refuge for juvenile fish.) Many of these services are not easily provided by any human-engineered creation, and therefore the true cost of such losses is quite high. For example, provision of nursery grounds for commercial fishery species is an important ecosystem service that cannot be

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<sup>113</sup> *Id.* p. 96.

<sup>114</sup> NCDMF <http://www.ncdmf.net/statistics> Accessed 3/9/09.

<sup>115</sup> Chapin et al 2004 *Plant Physiological Ecology*.

replaced. Like most of the other services in this category, the most immediate threat to nursery grounds is physical removal or alteration of habitat, followed closely by direct toxicity of effluents and atmospheric deposition of emissions.

Other indirect use values provided by the Northeast Cape Fear River and surrounding lands include the following:

- ◆ habitat for important terrestrial species such as bees, which are important for crop pollination in the area.
- ◆ wetlands, which absorb extra water from storms and provide a critical flood barrier, especially when hurricanes come through the area. Using damage caused by Hurricane Floyd, the value of this service is estimated at \$8240 per hectare annually.<sup>116</sup> This is probably the single largest value per area in the long list of services the area provides.
- ◆ wetlands also have significant filtration capacity, and have been shown to reduce nitrates by up to 80%.<sup>117</sup> This filtration also is important for protecting the groundwater system that local residents rely on for drinking water. These services would have to be replaced by costly and less effective wastewater treatment plants should the wetlands be removed.
- ◆ aesthetic value, which increases property values and is listed among the main reasons people choose to live in Castle Hayne.<sup>118</sup> People also come here from other parts of the state and the country, especially for paddling and fishing trips.
- ◆ habitat value. The area that would be affected by the cement plant encompasses some of the most unique blackwater habitat in the world. In fact, the Nature Conservancy has identified the Coastal Region of the Cape Fear River Watershed as a biodiversity hotspot, one of only two identified along the East Coast. Unique habitat brings with it unique species, more comprehensively termed biodiversity, which is a mixed indirect use/nonuse value and therefore deserves separate treatment from the other categories of services. Perhaps most importantly, biodiversity increases system resilience to protect all the other services that are provided.<sup>119</sup>

Although the exact numbers are difficult, if not impossible, to assign to the services offered by this ecosystem, there nonetheless are present uses of the area that Titan's plan would exclude. The relative costs of this project far exceed the benefits it can provide to the community. It makes no economic sense to allow the project to proceed as planned.

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<sup>116</sup> Costanza et al 2008.

<sup>117</sup> UN Millenium Ecosystem Assessment, <http://www.millenumassessment.org> (last visited Apr. 2, 2009)

<sup>118</sup> Public Comments on Draft Air Quality permit (Oct. 20, 2009).

<sup>119</sup> Peterson, Allen, and Holling 1997

## **VII. The Draft Air Permit Was Issued in Violation of SEPA and NEPA**

Many, if not all, of the issues raised in these comments would be addressed through a full review of environmental impacts, as anticipated by the North Carolina Environmental Policy Act (SEPA)<sup>120</sup> and the National Environmental Policy Act (NEPA).<sup>121</sup> The purpose of such a review is to evaluate a facility's impact on the ecosystem, so that pollutants from one part of the process – such as air emissions – do not violate environmental standards in another media – such as groundwater. By forcing an agency to “look before it leaps,” these statutes aim to improve the quality of agency decisions. As detailed more fully in letters sent to Robin Smith, Assistant Secretary of DENR, in March 2009 concerning Titan's permit application, and in a Petition for Declaratory Ruling filed with the Secretary of Administration, both these statutes apply to Titan's project and prohibit DAQ from issuing an air permit until an environmental impact statement (EIS) has been finalized. A summary of this argument is presented below.

### **A. SEPA and NEPA Apply To Titan's Proposed Project**

As Titan has acknowledged, it plans to mine more than 600 acres of wetlands on its property to obtain limestone for the kiln. Because these wetlands are protected by the federal Clean Water Act, Titan must obtain a wetlands permit pursuant to Section 404 of the Clean Water Act (Section 404). The Army Corps of Engineers (Corps) has confirmed that the Section 404 permit constitutes a “major federal action” that will have “significant environmental impacts,” and as such triggers the application of NEPA.<sup>122</sup>

SEPA is triggered when an “action involv[es] expenditure of public moneys or use of public land for projects and programs significantly affecting the quality of the environment of this State . . . .”<sup>123</sup> It is not disputed that Titan's proposed project would significantly affect the environment of North Carolina. Thus, the only question in determining the applicability of SEPA is whether the project involves the use of public moneys or land. According to state regulations, public moneys include “all expenditures in support of the proposed activity by federal, state or local or quasi-public entities from whatever source derived, but does not include resources used solely for processing a license, a certificate, or a permit; the lending of credit; or the resources used for the provision of technical services.”<sup>124</sup> Further, the North Carolina tax code defines an

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<sup>120</sup> N.C. Gen. Stat. §§ 113A-1 – 20 (2008).

<sup>121</sup> 42 U.S.C. §§ 4321-70 (2008).

<sup>122</sup> See Permitting Process, [http://www.carolinacementproject.com/permitting\\_process/](http://www.carolinacementproject.com/permitting_process/) (last visited Nov. 8, 2009) (discussing the required permits and acknowledging that Titan must obtain a federal wetlands permit before constructing its plant); Titan America Proposed Carolinas Cement Production Facility, <http://www.saw.usace.army.mil/wetlands/projects/titan/> (last visited Nov. 8, 2009) (Army Corps's discussion of the Section 404 permitting requirement as it relates to Titan).

<sup>123</sup> N.C. Gen. Stat. § 113A-4(2) (2008).

<sup>124</sup> 1 N.C. Admin. Code 25.0108.

expenditure as any device “that reduces the amount of tax revenue that would otherwise be available to the State.”<sup>125</sup>

The \$4.5 million in economic incentives that New Hanover County and the State have contractually agreed to provide to Titan plainly fits within either of these definitions. The incentives were offered “in support of” Titan's proposed project because the incentives are what induced Titan to locate its new facility in New Hanover County in the first place. Additionally, grants and tax credits reduce the amount of tax revenue that would otherwise be available to the government. Finally, Titan will be receiving many of these economic incentives while the new plant is still under construction, making it highly implausible that none of the money received through these incentives will be used for the construction of the facility. Thus, SEPA applies to the proposed project.

Each of these statutes independently requires the completion of a full EIS, although the federal EIS will suffice to satisfying the requirements of SEPA.<sup>126</sup> Pursuant to NEPA, the scope of the EIS review for the Section 404 permit must include the entire proposed project, and will not be limited to the part of the project that has an immediate effect on wetlands.<sup>127</sup> Consequently, the EIS will be comprehensive, evaluating all of Titan's potential impacts on the environment—including adverse effects on air quality and water quality. This review will be far more complete than any other study of the project, and will enable state and federal agencies to conduct more thorough reviews of permit applications.

For example, the EIS will be helpful to DAQ in determining (1) whether it should issue an air permit at all, and (2) what the technical details of that air permit should be. If DAQ waits to issue a final permit until after the EIS has been completed, it will have access to significantly more information about the effects that Titan's proposed facility will have on air quality. DAQ will therefore be able to develop an air permit that incorporates the best available data, ensuring that the air permit adequately addresses the possible environmental problems associated with the proposed project. Thus, it would be highly beneficial for DAQ to wait until the EIS has been completed before issuing an air permit for the facility.

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<sup>125</sup> N.C. Gen. Stat. § 105-256(a)(2).

<sup>126</sup> Major projects are exempt from ordinances adopted under SEPA when “a detailed statement of the environmental impact of the project or a functionally equivalent permitting process is required by federal or State law . . . .” See N.C. Gen. Stat. § 113A-8(b). Thus, if the Army Corps completes a full EIS in connection with Titan's Section 404 wetlands permit application, then that EIS will suffice for the purposes of satisfying SEPA's EIS requirement. See *id.*; see also 1 N.C. Admin. Code 25.0402. Effectively, then, the cost to the state of complying with SEPA is almost negligible.

<sup>127</sup> *New River Valley Greens v. United States Dep't of Transp.*, No. 97-1978, 1998 U.S. App. LEXIS 22127, at \*9 (4th Cir. Sept. 10, 1998) (citing *Maryland Conservation Council, Inc. v. Gilchrist*, 808 F.2d 1039 (4th Cir. 1986)).

**B. NEPA and SEPA Prohibit DAQ from Issuing a Permit Prior to the completion of an EIS**

In evaluating the environmental impacts of a proposed project, the Corps must compare the environmental impacts of the proposed project with the impacts of all reasonable alternatives.<sup>128</sup> To protect the alternatives analysis from undue influence, NEPA prohibits government agencies from taking any action that would “[l]imit the choice of reasonable alternatives.”<sup>129</sup> This prohibition is not limited to federal agencies; it also applies to state agencies when those agencies have taken any action that has a “direct and substantial probability of influencing” the federal decision-making process.<sup>130</sup>

For example, a state agency might substantially raise the cost of an alternative by issuing an important permit before the completion of the EIS. Issuing an essential permit before the EIS has been completed would encourage the permit applicant to continue investing in the project and signal to the agency conducting the EIS that the state is committed to allowing the permit applicant to proceed with the proposed project. Thus, the federal agency would be placed under enormous pressure to reject the alternative, since the alternative would require a permit applicant to forfeit all of the sunk costs that it has already committed to the project. Effectively, then, the pressure resulting from such an action would “make a sham of the reconsideration [of reasonable alternatives] required by federal law.”<sup>131</sup>

It is improper for DAQ to issue a final air permit to Titan because doing so will interfere with the EIS alternatives analysis. First, the air permit is an essential step toward Titan's ability to construct its new facility, and obtaining an air permit in a different state would be very costly. Second, issuance of an air permit will induce Titan to continue heavily investing in the construction project, sinking more capital expenditures into an already expensive project. Third, by issuing a final air permit, DAQ will signal to the Army Corps that the state is committed to allowing Titan to continue with the project, exerting significant political pressure on the Army Corps to reject the “no action” alternative. Thus, issuing a final air permit before the Corps has issued the final EIS is precisely the kind of agency action that NEPA expressly prohibits.

Pursuant to NEPA and Fourth Circuit law, DAQ is prohibited from taking any action that is likely to influence the Army Corps's consideration of reasonable alternatives to the proposed project. Issuing the final air permit before the Army Corps's EIS has been issued would directly violate this prohibition. Thus, until this comprehensive environmental review is complete, DAQ may not issue any permits for the project.

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<sup>128</sup> 40 C.F.R. § 1502.14 (2009).

<sup>129</sup> 40 C.F.R. § 1506.1 (2009). For this reason, SEPA also prohibits the issuance of state permits pending the completion of an EIS. N.C. Gen. Stat. § 113A-4(2).

<sup>130</sup> *North Carolina v. City of Virginia Beach*, 951 F.2d 596, 603 (4th Cir. 1991).

<sup>131</sup> *S.C. Wildlife Fed'n v. Limehouse*, 549 F.3d 324, 330 (4th Cir. 2008) (internal citations omitted).

## CONCLUSION

For the reasons detailed above, the Division of Air Quality should – and indeed must – withdraw the draft air quality permit pending completion of a comprehensive and integrated analysis of impacts to the environment and public health pursuant to the State and National Environmental Policy Acts. Before proceeding with further review of Titan’s application for an air quality permit, DAQ must obtain additional – and accurate – data and modeling of regulated pollutants, fully consider the impact of those pollutants on the surrounding population and ecology, and conduct a legally sufficient determination of BACT and MACT. Until these steps are completed, any action taken to issue a final air permit for the proposed Titan cement plant will be vulnerable to legal challenge.

Thank you again for the opportunity to provide these comments. I welcome any questions or comments you might have.

Sincerely,

Michelle B. Nowlin  
Supervising Attorney

### Attachments

cc:\* Governor Beverly Perdue  
Tate Johnson, Eastern Representative for Governor Perdue  
Steven Smith, Chair, Environmental Management Commission  
Dr. Charles “Pete” Peterson, Environmental Management Commission  
Marion Deerhake, Environmental Management Commission  
Dee Freeman, Secretary, Department of Environment and Natural Resources  
Keith Overcash, Director, Division of Air Quality  
Coleen Sullins, Director, Division of Water Quality  
Bob Emory, Chair, Coastal Resources Commission  
Gregg Worley, EPA Region 4  
John Calcagni, EPA Region 4  
Henry Wicker, U.S. Army Corps of Engineers  
Doug Springer, Cape Fear River Watch  
Mike Giles and Tracy Skrabal, North Carolina Coastal Federation  
Geoff Gisler, Southern Environmental Law Center  
John Runkle, Conservation Council of North Carolina

\* cc list provided copy of comments without attachments