

Before the Committee on Agriculture, Environment, and Natural Resources
North Carolina State Senate

Portland Cement Manufacturing: Pollution and Public Health Risks

Testimony of
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Distinguished members of the Committee - thank you for allowing me to testify this morning. My name is Martha Keating and I am Director of Research Translation at Duke University's Children's Environmental Health Initiative where my research focuses on addressing the impacts of environmental exposures on vulnerable populations, environmental justice, and regulatory policy development.¹ My comments this morning will address the pollutants emitted by cement plants, including health impacts and how people may be exposed.

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. They include particulate matter, sulfur dioxide gas, sulfate particulate matter, nitrogen oxides, carbon dioxide, hydrochloric acid, mercury 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.²

Children are particularly susceptible to the effects of air pollution.³ Their defense mechanisms have not yet fully developed; they 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 of particular concern when schools are located near industrial facilities. In fact, because of a recent study highlighting high levels of air pollution around some of the nation's schools, the U.S. EPA has just announced a new initiative to measure levels of toxic air pollution near schools, especially those schools located near large industries and in urban areas.⁴

Mercury emissions are a particular concern both from a public health and environmental standpoint. Industrial mercury emissions ultimately deposit from the air into water where, once converted to methylmercury by bacteria, concentrate in fish to levels that make the fish unsafe to eat.⁵ Humans are exposed to methylmercury almost exclusively from eating fish. 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.⁶

¹ <http://www.nicholas.duke.edu/cehi/index.html>

² <http://www.epa.gov/tri/>

³ 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>

⁴ <http://yosemite.epa.gov/opa/admpress.nsf/d985312f6895893b852574ac005f1e40/46a04c8cef0cfa8a8525756d005dd486!OpenDocument>

⁵ U.S. EPA, 1997a. Mercury Study Report to Congress, Volume I, Executive Summary. EPA-452/R-97-003.

⁶ Toxicological Effects of Methylmercury, National Academy Press, Washington, DC, 2000. <http://www.nap.edu>

Pollutants are emitted from a cement plant from numerous sources, not just the smokestack. Other sources include the mining operation, the manufacturing process, waste disposal, and from the transportation of raw materials and finished product to and from the site.⁷

Waste disposal can be especially problematic. Where there are cement kilns, there is cement kiln dust (CKD), the fine dust that is captured by the air pollution control devices. CKD is highly alkaline and is enriched with numerous metals, including mercury, manganese, lead, and chromium. The EPA has found that CKD is typically dumped into a retired portion of the existing limestone quarry, or dumped onsite in unlined and uncovered landfills and piles.⁸ At 16 cement kiln sites, EPA documented groundwater and surface water contamination, and 36 air violations (due to the waste pile, not the kiln). The EPA has specifically identified the potential for groundwater contamination from CKD disposal in karst (or limestone) terrain. Numerous communities where cement plants are located have organized to protest the pollution from CKD piles and landfills.⁹

The NC 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 and underestimates population exposure to toxic air pollutants because only the pollution concentration at a facility's fence line 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, the permitting process doesn't take into consideration the water and terrestrial impacts of air emissions or the CKD disposal concerns and is structured so that consideration of conventional pollutants like sulfur dioxide is entirely separate from consideration of the toxic air pollutants.

Given the magnitude of emissions from these types of facilities, the toxicity of the pollutants emitted, and the multiple ways that people are exposed, it is essential to allow time to conduct a comprehensive risk analysis prior to allowing the construction, let alone the operation, of a new facility. The legislation introduced today does just that.

Thank you again for the opportunity to testify.

⁷ <http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s06.pdf>

⁸ U.S. EPA, Report to Congress – Cement Kiln Dust Waste, 1993.
<http://www.epa.gov/osw/nonhaz/industrial/special/ckd/cement2.htm>

⁹ See for example: Blowing in the wind: Cemex's toxic dust is found in Lyons homes, May 5, 2006.
<http://www.gcmonitor.org/article.php?id=533>