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June 15, 2018

Dr. Jamie Bartram, Chair
NC DEQ and DHHS Secretaries' Science Advisory Board
217 W. Jones Street
Raleigh, NC 27603

Dr. Bartram and Science Advisory Board members,

We appreciate the Science Advisory Board members' attention to contaminants currently unregulated in public drinking water supplies and groundwater supplies in the state. Duke Energy shares your interest in ensuring safe drinking water and in protecting North Carolina's water resources.

We understand that advisory board members expressed interest at the April 30 meeting in receiving data related to hexavalent chromium. We wanted to make a few documents available to you that have been part of a body of work we've provided to previous administrations at the Department of Environmental Quality (DEQ) and the Department of Health and Human Services (DHHS.) We felt it was important to share some of the most salient science and ensure your advisory board has the benefit of this research.

As part of the N.C. Coal Ash Management Act, the company has conducted some of the most extensive and thorough groundwater studies in the state's history, if not the nation. The 100 to 200 monitoring wells at each of our 14 plant sites provide significant data that we submit to DEQ and that are informing groundwater corrective action steps and ash basin closure decisions. We're partnering with a number of outside environmental engineering firms and have convened a National Ash Management Advisory Board to develop and vet our recommendations.

These studies and the research from a number of outside experts continue to show that plant neighbors' well water has not been affected by ash basin operations. In one case at the Sutton Plant, our monitoring identified that groundwater was beginning to migrate in the direction of public wells near the plant, unrelated to hexavalent chromium. We worked proactively in 2013 to address it and ensure the community had safe water for the future.

From our perspective, a thoughtful and holistic approach is critical in determining standards for hexavalent chromium in North Carolina groundwater. Safety standards and guidance should apply consistently to all North Carolinians regardless of their water source—not to just a small subset of a few hundred Duke Energy plant neighbors who happened to be among the first tested for this substance.

Increasing data demonstrate hexavalent chromium occurs naturally at varying levels in North Carolina groundwater. Based on limited background testing to date, many well owners in the

state far from ash basins would not meet the 2015 DHHS health screening level of 0.07 parts per billion. Similarly, many regulated public water supplies, particularly those sourced from groundwater, exceed the 2015 DHHS health screening level. This is not surprising since the U.S. EPA's drinking water standard for chromium is 100 ppb, currently under review. We respectfully defer to state officials on how best to reconcile this as you continue to work through this complex issue.

Of key importance to us is helping to resolve the substantial confusion our plant neighbors experienced in 2015-2016 regarding guidance on their well water safety. Some of that concern persists even today, despite our best efforts to voluntarily provide bottled water deliveries and support state legislation to install alternative water supplies—all when their water supplies show no signs of coal ash impacts.

We offer a few key observations from the volumes of groundwater data we've submitted since 2015 and summarized in this information packet:

- Duke Energy's ash basins are unlined because they were constructed many years ago before regulations required the lining systems you'd see today. Because of this, we see limited groundwater impact under and downgradient from the ash basins. This will be addressed through a combination of safely closing ash basins and implementing appropriate groundwater corrective action steps.
- Groundwater studies confirm that very few private wells are downgradient from ash basins. The vast majority of plant neighbors' wells are upgradient, meaning groundwater influenced by ash basins is flowing away from their wells toward the nearby surface water.
- Ongoing monitoring of those surface waters shows rivers and lakes are well protected for drinking supplies, recreation and their other uses.
- Elevated levels of boron and sulfates in tandem are leading indicators of potential coal ash influence. The state's testing of neighbors' wells near our facilities showed no elevated levels of boron and sulfates in their well water.
- Neighbors' well water is consistent with background testing DEQ and other agencies have performed and does not exhibit a coal ash signature.
- A Duke University study in October 2016 determined that hexavalent chromium in well water is not originating from ash basins but from volcanic rocks and natural geology. This is consistent with Duke Energy data showing hexavalent chromium levels in ash basins themselves are quite low or at non-detectable levels.
- Because geology is driving the low levels of hexavalent chromium in drinking water supplies, groundwater tends to exhibit higher amounts than surface waters: "A Water Research Foundation (WaterRF) funded study (Frey 2004) investigated occurrence of chromium (both individual species and total) in 407 source waters of the U.S. The study found that total chromium occurs both in surface and groundwaters; however, hexavalent chromium was not found in surface waters to the same degree as in groundwaters. Total chromium in surface waters, with a few exceptions, was primarily composed of trivalent chromium. A significant fraction of groundwater results showed that the total chromium concentrations were composed exclusively of hexavalent chromium" (AWWA, Chromium in Drinking Water, 2013.)

In our view, all North Carolinians deserve the same level of protection related to hexavalent chromium. Any standard should be uniformly applied to drinking water supplies in the state, based on the latest available science and cognizant of natural background conditions.

We appreciate the opportunity to share the attached documents that provide more detail. As you continue to explore this issue, please feel free to call on us if we can assist with groundwater data from our sites or any other questions you may have.

Sincerely,

Mark McIntire, PE, BCEE

Cc: Sheila Holman, DEQ
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