

Lake Norman water quality update

Key points

- Drinking water supplies near Lake Norman and lake water quality remain safe.
 - Testing through a well-respected, third-party lab in April 2018 has verified that Lake Norman, Mountain Island Lake and Lake Wylie do not have elevated radium levels. Those who recreate on these lakes and use them for drinking supplies can continue these activities with confidence.
- Recent testing of groundwater near coal ash basins helps inform which ash basins should close nationwide. But Duke Energy had already committed to closing all our ash basins – regardless of the test results.
- Work is well underway to close our basins in ways that protect communities and the environment, including the continued protection of drinking water supplies.

Background

Duke Energy had already done extensive groundwater monitoring for the North Carolina coal ash law. The testing described in recent news stories is a separate effort required under the EPA's federal coal ash rule (Coal Combustion Residuals or CCR rule).

What's new?

- The EPA's coal ash rule lays out a specific process for monitoring groundwater. This involves first reporting raw (not yet analyzed) baseline data, then taking additional samples and analyzing data to determine next steps. Duke Energy completed these raw reports for each of our sites and posted them to our [CCR compliance website](#) on Feb. 6.
- These monitoring wells for the federal CCR rule are located immediately next to our ash basin or landfill and do not reflect groundwater conditions off plant property where neighbors are located. We continue to see no concerns for nearby drinking water wells or lake water quality.
- The trace elements you find in coal ash also occur naturally in North Carolina's rocks and soils. So our next step is to determine how much is naturally occurring at each site from Mother Nature and how much may be added by the basins. We expect that work to conclude in late summer.
- The amounts of substances in groundwater are very small. Most elements are measured in parts per billion – the equivalent of one second in 32 years, or one penny in \$10 million.

Radium

- According to the U.S. Geological Survey: "*Radioactive elements in coal and fly ash should not be sources of alarm. The vast majority of coal and the majority of fly ash are not significantly enriched in radioactive elements, or in associated radioactivity, compared to common soils or rocks.*"

- In the Carolinas, geology often includes granite and other rock formations that naturally include uranium, which degrades as radium.
- At Marshall Steam Station, of the 350 samples we've taken on plant property for the federal CCR rule so far, about 30 groundwater samples showed elevated radium levels. The vast majority do not show elevated radium.
- We do not detect elevated radium in ash pore water or in many shallow wells. This suggests the site's natural geochemistry may be more of a driver of radium than the ash itself.
- In addition to sampling lake quality itself, routine sampling of the Marshall plant's permitted outfalls for permit renewals shows no elevated radium levels. This demonstrates nearby lakes are well-protected.

Bottom line

- While this additional groundwater data is useful, we are not waiting for further analysis to act – we have already committed to closing ash basins in ways that protect the environment and communities. Work is well underway to ensure we meet state and federal closure deadlines.
- As our basin closure work proceeds, we will continue to comply with all state and federal standards for protecting groundwater. Drinking water supplies near Lake Norman remain safe.

Additional resources

- Public water supplies monitor for radium and many other parameters in their treated drinking water. Those with questions related to their public drinking water or community well quality may wish to contact their water supplier for more details.
- Duke Energy reports its data to state regulators at the N.C. Department of Environmental Quality. Those with questions related to Marshall Steam Station may wish to contact the NCDEQ Mooresville Regional Office for details on coal ash and water quality.
- McGuire Nuclear Station operates within the strict rules set by the Nuclear Regulatory Commission (NRC). Duke Energy's long-standing radiological monitoring program has been in place for more than three decades and includes both off-site and on-site sampling. Each nuclear station in the U.S. is required to submit a report to the NRC on its environmental monitoring programs and sampling results. Continued monitoring shows plant operations are safe, and McGuire had no incidents reportable to the NRC, state or local agencies in recent years. Reports are available to the public on the NRC website: <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-info.html>
- USGS fact sheet FS-163-97, Radioactive Elements in Coal and Fly Ash: <https://pubs.usgs.gov/fs/1997/fs163-97/FS-163-97.html>
- N.C. Division of Water Resources, Susceptibility to elevated radon in groundwater map: https://files.nc.gov/ncdeq/Energy%20Mineral%20and%20Land%20Resources/Geological%20Survey/Photos_Images_Geologic/geology_matters/Radon%20in%20Groundwater%20in%20NC%20-%20Draft%20map.pdf
- N.C. Department of Health and Human Services, Radiation Protection Section, Radon map in NC: <http://www.ncradon.org/ncradon/#>
- Duke University, Naturally occurring contaminants in North Carolina: <https://dukewater.cee.duke.edu/Radium>