North Carolina Department of Environmental Quality

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

November 4, 2015

MEMORANDUM

TO: ENVIRONMENTAL REVIEW COMMISSION
The Honorable Mike Hager, Co-Chair
The Honorable Brent Jackson, Co-Chair

JOINT LEGISLATIVE OVERSIGHT COMMITTEE ON HEALTH AND HUMAN SERVICES
The Honorable Justin Burr, Co-Chair
The Honorable Ralph Hise, Co-Chair

FROM: Matthew Dockham, Director of Legislative Affairs

SUBJECT: Interim Report on the Study of Standards and Health Screening Levels for Hexavalent Chromium and Vanadium

DATE: November 4, 2015

Pursuant to S.L. 2015-286, section 4.8A(b), "the Department [of Environmental Quality, in conjunction with the Department of Health and Human Services] shall submit an interim report no later than November 1, 2015, and a final report no later than April 1, 2016, to the Environmental Review Commission and the Joint Legislative Oversight Committee on Health and Human Services on its activities conducted pursuant to subsection (a) of this section, together with any pertinent findings or recommendations, including any legislative proposals that it deems advisable." The attached report satisfies this interim reporting requirement.

If you have any questions or need additional information, please contact me by phone at (919) 707-8618 or via e-mail at matthew.dockham@ncdenr.gov.

cc: Tom Reeder, Assistant Secretary for Environment, NCDEQ
Dr. Megan Davies, Acting State Health Director, State Epidemiologist and Chief, NCDHHS

Interim Report on the Study of Standards and Health Screening Levels for Hexavalent Chromium and Vanadium

Report of the N.C. Department of Environmental Quality to the N.C. Environmental Review Commission and the state Joint Legislative Oversight Committee on Health and Human Services under S.L. 2015-286, Section 4.8A(b)

October 16, 2015

Executive Summary

Section 4.8A of S.L. 2015-286 directed the N.C. Department of Environment and Natural Resources (named changed by 2015 legislation to N.C. Department of Environmental Quality, DEQ), in conjunction with the Department of Health and Human Services (DHHS), to study the state's groundwater standards under 15A NCAC 2L, or state interim allowable maximum contaminant levels (IMAC), as applicable, as well as state health screening levels, for hexavalent chromium and vanadium relative to other southeastern states' standards for these contaminants and the federal maximum contaminant levels (MCLs) for these contaminants under the Safe Drinking Water Act, in order to identify appropriate standards to protect public health, safety and welfare; the environment; and natural resources. This section of the session law also directed the department to evaluate "background standards" for these contaminants where they naturally occur in groundwater in the state. This interim report is submitted to provide background about the framework of the various standards involved and the status of the two departments' work on the study.

Background

Groundwater Standards

The N.C. Environmental Management Commission (EMC) is directed to adopt classifications and water quality standards for waters of the state under G.S. 143-214.1. In accordance with this directive, the EMC has established groundwater quality standards in 15A NCAC 02L .0202. The standards are established according to the lowest of the following six criteria:

1. A concentration protective of the non-cancer or systemic effects of a contaminant;
2. A concentration which corresponds to an incremental lifetime cancer risk of one-in-a-million;
3. The taste threshold limit value;
4. The odor threshold limit value;
5. The National Drinking Water Maximum Contaminant Level (MCL) [1]; or

[1] The Commission may also establish groundwater standards less stringent than the existing maximum contaminant levels (MCL) for public water systems or national secondary drinking water standards noted above when the MCL or secondary standard is based on outdated risk assessment information. Currently only one contaminant, 1,1 Dichloroethylene (1, 1 DCE), has a groundwater standard that is less stringent the federal MCL.

6. The National Secondary Drinking Water Standard (SDWS)

For those substances where no standard has been established, the default standard is the practical quantitation limit (PQL). The practical quantitation limit is the lowest concentration of a substance that can be reliably achieved by a laboratory. The practical quantitation limit may vary slightly from lab to lab due to sample matrix interference, dilution and other factors. The PQL-based default standard provides protection against potential health effects of drinking water contaminated by chemicals about which little may be known.

Interim Maximum Allowable Concentrations

Rule 15A NCAC 2L .0202 provides an avenue for relief from the PQL-based default standard while still maintaining health-based protections for groundwater as a source of drinking water. Under paragraph (c) of the rule, any person may petition the N.C. Division of Water Resources' director to establish an interim maximum allowable concentration (IMAC) for a substance for which a standard has not been established under the rules. The petitioner is required to submit relevant toxicological and epidemiological data, study results, and calculations necessary to establish a standard in accordance with the groundwater rules in 15A NCAC 2L .0202. If the information submitted is adequate, the director of the state Division of Water Resources may establish an enforceable IMAC. The IMAC is considered for adoption during the next triennial review and re-adoption of the groundwater standards. Petitioners commonly represent persons owning or controlling a property where groundwater is contaminated above the PQL by one or more chemicals with no groundwater standard.

Background Standards

North Carolina's groundwater standards recognize that some contaminants occur naturally in the groundwater at levels above the established groundwater standard in 15A NCAC 2L .0202. Where naturally occurring substances exceed the established standard, the standard becomes the naturally occurring concentration as determined by DEQ. Such determinations are typically made on a site-specific basis by evaluating site-specific data and studies provided by the person who owns or controls the site in question, along with groundwater information available to DEQ from ambient groundwater quality monitoring where available.

Health Screening Levels

Health screening levels for drinking water wells are established by the DHHS to communicate to private well users the level of risk associated with drinking, bathing and other uses of their well water. In making this determination of risk, the DHHS relies on available scientific information including the same information that forms the basis of federal drinking water standards and North Carolina groundwater quality standards. Well water sample results sent to DHHS for review are compared to health screening levels for any contaminants that have been tested. The results of this review are sent to the well owner and local health department in a health risk evaluation. Health risk evaluations (HREs) serve as the main tool for informing North Carolina residents about potential health risks associated with their private well water. The HREs provide residents a risk characterization of the chemicals present in their wells. Accompanying the risk characterization, the HRE provides recommendations for well water use to the well owner based upon the chemicals identified in the sample. These recommendations are made with

the purpose of mitigating health risks from well water. These HREs do not regulate private wells and are not enforceable, but provide information so that well owners understand the health risks associated with their well water. The recent HREs issued in conjunction with the well water testing around coal ash facilities were based on public health practices that ascertain the lifetime risks of developing cancer. The "do not drink" advisory was recommended after test results indicated an exceedance of a DHHS health screening level. The "do not drink" recommendation is based on an increased one-in-a-million risk of an average person developing cancer as a result of consuming well water over a lifetime of approximately 70 years. After receiving this information, well owners and local health departments can work together to reduce the health risks identified in the HRE. Both entities are encouraged to contact the state Office of Environmental Epidemiology Branch (OEEB) with any question related to the risks outlined in the HRE. Providing residents with this health risk information allows residents to determine what risks are acceptable to them and make informed decisions concerning their health and drinking water.

Maximum Contaminant Levels under the Safe Drinking Water Act

"Maximum contaminant level" is defined in G.S. 130A-313 as the maximum permissible level of a contaminant in water that is delivered to any user of a public water system. Maximum contaminant levels (MCLs) are enforceable standards applicable to public water systems. The state Commission for Public Health is directed by G.S. 130A-315(b) to establish MCLs for the quality of water provided by public water systems. The state Commission for Public Health has adopted MCLs by reference from federal drinking water standards in 15A NCAC 18C.

The MCLs represent values for which the costs of additional treatment by the public water system are not justified when compared to the public health benefits. The Safe Drinking Water Act requires the EPA to review each National Primary Drinking Water Regulation (NPDWR) at least once every six years and revise them, if appropriate, based on health effects assessments, changes in technology, or other factors that provide a health or technical basis to support a revision. New MCLs are typically only developed once a contaminant has been detected in finished drinking water supplies.

Current NC Standards and Screening Levels for Chromium, Hexavalent Chromium, and Vanadium

The following table summarizes the current groundwater standards, IMACs, MCLs, and DHHS health screening levels for chromium, hexavalent chromium and vanadium.

Standard	**Total Chromium**	**Hexavalent Chromium**	**Vanadium**
15A NCAC 2L Groundwater Standard	10 ug/L	included in total chromium	No groundwater standard
15A NCAC 2L IMAC	n/a	n/a	0.3 ug/L
Maximum Contaminant Level	100 ug/L	covered as total chromium	No MCL
DHHS Health Screening Level	n/a	0.07 ug/L	0.3 ug/L

ug/L = micrograms per liter

Study Status

Survey of Other States' Standards

DEQ has reviewed the environmental and public health regulations of the southeastern states of the United States, including Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia. The state agency reviewed other states' regulations to compare each state's groundwater standards for total chromium, hexavalent chromium and vanadium. This review is being finalized and is expected to be complete by the end of November 2015.

Interdepartmental Workgroup

The N.C. Department of Environmental Quality will work with the DHHS to establish an interdepartmental work group to conduct the study required by Section 4.8A of S.L. 2015-286. The interdepartmental workgroup is expected to include representatives from the Occupational and Environmental Epidemiology Branch of DHHS, the DEQ's Division of Waste Management, and the DEQ's Division of Water Resources. DEQ is fully committed to delivering the final report of the work group to the N.C. Environmental Review Commission and the state Joint Legislative Oversight Committee on Health and Human Services by the deadline of April 1, 2016.