



PAT MCCRORY  
*Governor*

DONALD R. VAN DER VAART  
*Secretary*

## MEMORANDUM

TO: ENVIRONMENTAL REVIEW COMMISSION  
The Honorable Jimmy Dixon, Co-Chair  
The Honorable Chuck McGrady, Co-Chair  
The Honorable Trudy Wade, Co-Chair

JOINT LEGISLATIVE OVERSIGHT COMMITTEE ON HEALTH AND HUMAN SERVICES  
The Honorable Marilyn Avila, Co-Chair  
The Honorable Josh Dobson, Co-Chair  
The Honorable Louis Pate, Co-Chair

FROM: Mollie Young, Director of Legislative Affairs

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

DATE: April 1, 2016

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 final 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 [mollie.young@ncdenr.gov](mailto:mollie.young@ncdenr.gov).

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



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

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*Report from 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)*

*April 1, 2016*

## **Reporting Requirement**

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 groundwater quality standards and interim maximum allowable concentration levels established in state rule 15A NCAC 02L, as well as the DHHS health screening levels for hexavalent chromium and vanadium. The study compared NC's criteria other southeastern states' standards and the federal maximum contaminant levels under the Safe Drinking Water Act. The goal of the study was to assist in identifying the "... appropriate standards to protect public health, safety and welfare; the environment; and natural resources." This section of the session law directed the Department to evaluate "background standards" for these contaminants where they naturally occur in groundwater. DEQ, including its Division of Water Resources (DWR) and Division of Waste Management (DWM) respectfully submits this final report to the N.C. Environmental Review Commission and the state Joint Legislative Oversight Committee on Health and Human Services to complete the study required by Section 4.8A of S.L. 2015-286.

## **Groundwater Quality Standards are established by EMC**

North Carolina's groundwater in its natural state is overwhelmingly a high-quality resource, generally potable without significant treatment when obtained from a properly constructed and disinfected well. In accordance with 15A NCAC 02L .0103, the NC Environmental Management Commission (EMC) establishes the best usage of groundwaters as a source of drinking water. Historically and currently, roughly half of North Carolinians rely on the state's groundwater resources for their drinking water, whether from public supplies or private wells and thousands of new private wells are installed each year.

The EMC is directed to adopt classifications and water quality standards for protection of waters of the state under G.S. 143-214.1. In assigning classifications, the EMC is directed by G.S. 143-214.1(d)(5) to consider "the natural quality of the water below land surface and the condition of occurrences, recharge, movement and discharge, the vulnerability to pollution from wastewaters and other substances, and the potential for improvement of the quality and quantity of the water."

Under direction of statutory authority, the EMC has established classifications and groundwater quality standards in 15A NCAC 02L .0202 that recognize (1) the natural high quality of the groundwater

resources of the state, (2) the existing and potential future uses of the state's groundwater as a source of drinking water, (3) the vulnerability of the groundwater to contamination, and (4) the difficulty of restoring the groundwater once contaminated. The groundwater standards in 15A NCAC 02L recognize and protect the natural quality of groundwater as a drinking water resource by establishing the levels to which discharged contaminants may be tolerated without creating a threat to human health or render the groundwater unsuitable for its best intended use.

Groundwater 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-one-million;
3. The taste threshold limit value;
4. The odor threshold limit value;
5. The Maximum Contaminant Level (MCL)<sup>1</sup>; or
6. The National Secondary Drinking Water Standard

Further, 15A NCAC 02L .0202 requires that the following references, in order of preference, be used in establishing concentrations of substances which correspond to levels described above:

1. Integrated Risk Information System (US EPA)
2. Health Advisories (US EPA Office of Drinking Water)
3. Other health risk assessment data published by the US EPA
4. Other relevant, published health risk assessment data, and scientifically peer-reviewed published toxicological data.

For those substances where no standard has been established, the default standard is the practical quantitation limit (PQL), which is the lowest concentration of a substance that can be reliably achieved by a laboratory using approved analytical methods as directed by 15A NCAC 02L .0112.

A critical inter-agency communication step occurs before rulemaking is initiated to adopt new or revised groundwater quality standards. In 2007, the DEQ DWR with input from DHHS and DEQ DWM, established a policy document entitled the "Groundwater Standards Development Standard Operating Procedure". It was last revised in 2011, and is referred to as an "SOP". The DEQ DWR notifies DHHS Division of Public Health and DEQ DWM of a proposal, providing them supporting information for the scientific basis used to develop the proposal in accordance with rule. The purpose of this communication is to request input and a review of the proposal(s). DHHS and DEQ DWM provides input in accordance with the "Groundwater Standards Development SOP" prior to DWR's initiation of rulemaking recommendations for EMC consideration

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<sup>1</sup> 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 than the federal MCL. Where 1,1 DCE impacts a private well, the Director shall apply the federal MCL.

### **Interim Maximum Allowable Concentrations (IMACs) are established by DEQ**

When no groundwater standard has been set for a particular chemical, rule 15A NCAC 02L .0202 provides an avenue for an alternative to the PQL-based default standard while still maintaining health-based protections for groundwater as a source of drinking water. The PQL-based default is any reliably quantifiable amount of a substance. Under paragraph (c) of the rule, any person may petition the DWR Director to establish an interim maximum allowable concentration (IMAC) for a substance for which a standard has not been established under the rules. 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. 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. If, after review by DEQ and DHHS using the SOP procedures mentioned above, staff may recommend that the Director of DWR establish an IMAC. The IMACs are temporary numbers. Established IMACs are provided to the EMC and publicly noticed in the *North Carolina Register*. The IMAC is considered for adoption as a groundwater standard during the next triennial review and re-adoption of the groundwater standards.

The current IMAC for vanadium was approved by the DWQ Director on October 1, 2010 following SOP protocol. It was presented to the EMC on September 8, 2010, and subsequently noticed in the *NC Register* (September 15, 2010). The non-cancer reference dose used to develop this value has since been updated and the revised information could be applied in a revised IMAC. This reevaluation would be performed on the basis of current published and peer-reviewed toxicity information that has become available since 2010. Staff have reviewed the toxicity information for potential revisions, prompted by this legislative report, and would currently advise a revised criterion of ~ 20 µg/L.

### **Background Standards are established by DEQ**

North Carolina's groundwater standards recognize that some substances may occur naturally in the groundwater at levels above the established groundwater standard in 15A NCAC 02L .0202. Where naturally occurring substances exceed any established standard or IMAC, the standard becomes the naturally occurring concentration as determined by the DWR Director. 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 DWR from ambient groundwater quality monitoring.

### **Health Screening Levels are established by DHHS**

Health screening levels for private drinking water wells are established by 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, DHHS relies on available scientific information including the same information that may form the basis of federal drinking water standards and North Carolina groundwater quality standards. DHHS health screening levels for vanadium and hexavalent chromium were calculated using methodology and toxicity values selected according to the precedence outlined in an agreement between DHHS and DEQ Division of Waste Management (DWM) for development of

Health Risk Evaluations (HREs) for private well users. The establishment of North Carolina groundwater standards and IMACs must follow the requirements outlined in 15A NCAC 02L .0202, however, health screening levels are not limited to a defined set of preferential toxicity criteria.

The practice of evaluating private wells is as follows: DWR collects private well water sample results and sends them to DHHS for review. The analytical results are compared to health screening levels for any contaminants that have been detected in the sample. The results of this review are sent to the well owner and local health department in a communication referred to as a health risk evaluation (HRE). HREs serve as a tool for informing individual North Carolina households about potential health risks associated with the use of their private well water. The HREs offer residents a risk characterization of the chemicals present in their wells.

DHHS issued “do not drink” advisories to private well owners after test results indicated an exceedance of a DHHS health screening level. The “do not drink” recommendation from DHHS is based on the health screening level calculated by DHHS. DEQ recommends that DHHS include additional clarifying information in the issuance of HREs, that explains that both bottled water, regulated by the US Food and Drug Administration (FDA) and water supplied by a public water supply regulated by the US EPA may potentially, and legally, contain up to 100 ug/L of hexavalent chromium, measured as total chromium. If this additional information is provided in the HRE, then an HRE measuring hexavalent chromium with a lab result that is higher than 0.07 ug/L, but less than 100 ug/l, will allow for a more informed health risk conclusion by the private well owner.

### **Maximum Contaminant Levels are established by 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 (PWSs). 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 federal Safe Drinking Water Act (SDWA) requires the US Environmental Protection Agency (US 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 or revised MCLs are typically only developed once a contaminant has been detected in finished drinking water supplies.

To assure examination of additional chemical constituents occurs, the 1996 federal Safe Drinking Water Act (SDWA) amendments require that once every five years US EPA issues a new list of no more than 30 unregulated contaminants to be monitored by public water systems. The third “Unregulated Contaminant Monitoring Rule” (UCMR 3) list was published under *Federal Register* notice on May 2,

2012. UCMR 3 requires monitoring for 30 contaminants (28 chemicals and two viruses) between 2013 and 2015 using analytical methods developed by US EPA, consensus organizations or both. This monitoring provides a basis for future regulatory actions to protect public health, including potential modifications to the published enforceable federal MCLs. The UCMR 3 sample collection was completed in December of 2015. According to a US EPA October 2015 update, analytical results may be submitted through summer of 2016, the completed data set will be publicly available in late 2016. Public Water Systems serving greater than 10,000 people were required to participate. Eight hundred facilities (across the United States) serving 10,000 or fewer were also included in the UCMR 3. Of the smaller NC facilities, six were required to analyze for both vanadium and chromium VI, three were required to analyze only chromium VI and three additional facilities analyzed vanadium only. The DEQ DWR will adopt any new or revised public drinking water regulations promulgated by EPA as a result of the UCMR3 monitoring data.

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

The following Table No. 1 summarizes the current groundwater standards, IMACs, federal MCLs, and DHHS health screening levels for total chromium, hexavalent chromium and vanadium:

<b>Table No. 1 Regulatory Mechanism</b>	<b>*Total Chromium</b>	<b>Hexavalent Chromium (Cr VI)</b>	<b>Vanadium</b>
<b>EMC 15A NCAC 02L Groundwater Standard (serves to protect GW as a public resource)</b>	10 µg/L**	included in total chromium	No groundwater standard
<b>DEQ 15A NCAC 02L IMAC</b>	n/a	n/a	0.3 µg/L
<b>SDWA Maximum Contaminant Level (Public Drinking Water)</b>	100 µg/L	Included in total chromium	No MCL
<b>DHHS Health Screening Level (used for HRE notifications to private well owners)</b>	n/a	0.07 µg/L	0.3 µg/L
<b>µg/L = micrograms per liter or parts per billion (ppb)</b>			
<b>*Total Chromium is analytically measured as a complex of Chromium III (Cr III) &amp; Chromium VI (Cr VI).</b>			
<b>**The chromium groundwater standard was calculated as if it consisted entirely of the more toxic Cr VI using US EPA toxicity data values developed in 1998</b>			

## Survey of Other States' Criteria

NC DEQ has reviewed the environmental and public health regulations, policies and guidance of the southeastern states of the US, including Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, Virginia and West Virginia. The state agency reviewed other states' regulations for information pertaining to evaluation of total chromium, hexavalent chromium and vanadium contamination. Most states do not have criteria adopted into state regulations, many have policies and evaluation levels used only for clean-up goals, and others have guidance with no concrete regulatory effect. The following provides more detailed information on these various levels:

Seven of ten southeastern states have groundwater criteria that are based upon the federal Maximum Contaminant Level (MCL) of 100 µg/L for *total chromium* as established in the National Primary Drinking Water Regulations (40 CFR 141.151) and two have general narrative statements in lieu of specific numerical groundwater standards for *total chromium*. North Carolina, with a *chromium* groundwater standard of 10 µg/L, has a groundwater standard that is more protective than the federal MCL. In accordance with G.S. 143-214.1(d)(5) this state standard is designed to prevent the degradation of the groundwater as a resource. "The State of North Carolina (the State) relies on groundwater for approximately 50 percent of its drinking (potable) water use. In addition, the State has thousands of agricultural and industrial groundwater users" according to the DWR Groundwater Management Branch "2015 Annual Report"<sup>2</sup>.

None of the southeastern states have groundwater standards in regulation for *hexavalent Cr (Cr VI)*. However, Alabama has a "protective value", identified as a "Risk Assessment Preliminary Screening Value" (11 µg/L) for *Cr VI*. It is only used for site specific risk management purposes. It is important to note that although North Carolina does not have a groundwater standard or protective value specifically designated for *Cr VI*, the chromium groundwater standard of 10 µg/L was calculated as if it consisted entirely of the more toxic *Cr VI* using US EPA toxicity data values developed in 1998. The US EPA Integrated Risk Information System (IRIS) is currently evaluating the toxicity of *hexavalent chromium (Cr VI)* and indicates that they are in step one of a seven step public review process. Catherine Gibbons, with the IRIS Program (National Center for Environmental Assessment, US EPA Office of Research and Development), was contacted by DEQ DWR and she indicated that, as best case scenario, IRIS hopes to "provide the public with a draft to review as early as the end of 2016."

None of the southeastern states have adopted vanadium criteria in regulation. NC's IMAC was established at the request of the DEQ DWM in 2010. This IMAC of 0.3 µg/L could be revised on the basis of published and peer-reviewed toxicity information that has become available since 2010. As a function

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<sup>2</sup> [http://www.ncwater.org/Reports\\_and\\_Publications/GWMS\\_Reports/Network\\_Annual\\_Reports/fy2014-15\\_network\\_ann\\_report.pdf](http://www.ncwater.org/Reports_and_Publications/GWMS_Reports/Network_Annual_Reports/fy2014-15_network_ann_report.pdf)

of this report, staff have reviewed the newly available toxicity information for vanadium and could currently recommend a revised criterion of ~ 20 µg/L. To proceed with that potential revision, DEQ DWR staff would first collect input from DHHS and DEQ DWM, in accordance with the Groundwater Standards SOP, before providing a staff recommendation to the DEQ DWR Director.

### Study Results for S.L. 2015-286:

Many states do not establish regulatory “standards” or “criteria”, the control of contaminants is performed on a case-by-case basis by waste management programs, health departments, or water quality programs. The criteria used by each state may be identified by numerous names such as: “risk based corrective action level”, “screening value”, “clean-up value”, “health risk limits”, etc. The following Table No. 2 summarizes all the information DWR was able to collect:

<b>Table No. 2 – Study Results for S.L. 2015-286</b>			
Criteria used by each state is not uniformly identified. Names such as: “risk based corrective action level”, “screening value”, “clean-up value”, “health risk limits”, etc. are used and these reported values may not be adopted as a regulatory mechanism for the identified state, and may only exist in policy or guidance.			
State	Total Chromium (µg/L)	Hexavalent Chromium (Cr VI) (µg/L)	Vanadium (µg/L)
Alabama	100	11	3.6
Florida	100	NA	49
Georgia	100	NA	NA
Kentucky	100	NA	NA
Mississippi	Narrative <i>“Significant deficiencies, as determined by the Department utilizing current EPA guidance...”</i>	Narrative <i>“Significant deficiencies, as determined by the Department utilizing current EPA guidance...”</i>	Narrative <i>“Significant deficiencies, as determined by the Department utilizing current EPA guidance...”</i>
North Carolina	10 <i>Based on Cr VI toxicity</i>	<i>Included in Total Chromium</i>	0.3
South Carolina	100	NA	NA
Tennessee	Narrative <i>...“shall contain no other constituents at levels and conditions which pose an unreasonable risk to the public health or the environment.”</i>	Narrative <i>...“shall contain no other constituents at levels and conditions which pose an unreasonable risk to the public health or the environment.”</i>	Narrative <i>...“shall contain no other constituents at levels and conditions which pose an unreasonable risk to the public health or the environment.”</i>
Virginia	100	NA	86
West Virginia	100	NA	NA



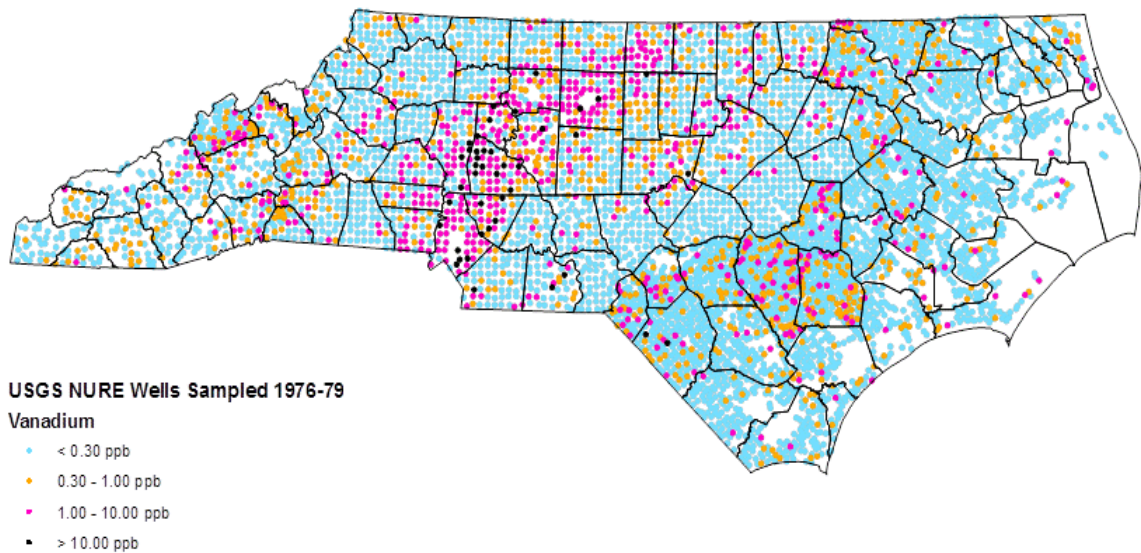
## Naturally Occurring Concentrations

Vanadium (V) and hexavalent chromium (Cr VI) are metals that occur naturally in geologic materials throughout North Carolina. Modern analytical techniques are capable of quantifying concentrations of these two elements in the parts per trillion range, and it is not unusual to detect vanadium and hexavalent chromium in groundwater over a wide area at extremely low concentrations. The DWR is currently reviewing available data, specific to NC, to better understand naturally occurring groundwater quality. This effort includes a review of existing information related to vanadium and hexavalent chromium in groundwater. One past effort to study vanadium in groundwater occurred during the National Uranium Resource Evaluation (NURE) Program conducted by the US Department of Energy and US Geological Survey from 1976 to 1979.<sup>3</sup> Sample results of groundwater suggest that Vanadium varies significantly across areas of North Carolina, with higher concentrations typically found in the Western Piedmont.

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<sup>3</sup> US Geological Survey, 2004, National Uranium Resource Evaluation (NURE) Hydrogeochemical and Stream Sediment Reconnaissance Data: US Geological Survey, Denver, CO.

USGS National Uranium Resource Evaluation Program  
Groundwater Samples 1976-1979  
Vanadium



Source: USGS National Uranium Resource Evaluation (NURE) program database, <http://mrddata.usgs.gov/nure/water/>. Accessed April 15, 2015.

DEQ DWR is currently evaluating naturally occurring or “background” concentrations at all Duke Energy coal ash sites across North Carolina as part of the Comprehensive Site Assessment report reviews. These site assessment reports to be provided by Duke include a review of background concentrations of vanadium and hexavalent chromium for each of the 14 facilities. The data recently collected from wells at each of these sites represents a very small sample set over a relatively short period of time, rendering it currently insufficient for use to accurately determine a naturally occurring site-specific “background” value. Additional groundwater monitoring required for each site coupled with a review of existing information will be needed to establish scientifically defensible concentrations believed to be representative of naturally occurring or background conditions.

Under North Carolina General Statute 87-97, newly constructed private drinking water wells are required by local health departments to be sampled for 20 parameters before use. Analysis for total chromium is required, but not vanadium or hexavalent chromium. If the latter parameters were

included in the required sampling, several thousand new groundwater data sources per year would be added to our understanding of the occurrence of these elements across North Carolina.

North Carolina G.S. 143-214.1(d)(5) mandates the consideration of “the natural quality of the water below land surface and the condition of occurrences, recharge, movement and discharge, the vulnerability to pollution from wastewaters and other substances, and the potential for improvement of the quality and quantity of the water.” DEQ monitors human health effects data bases and on-going work at the national level with the purpose of providing information for revised standards for consideration by the EMC. The DWR has just obtained permission to establish a position to facilitate review of IMACs, as well as making recommendations to the EMC for new/revised groundwater quality standards.

## Additional Information on National Efforts and Other US States’ Criteria

### CHROMIUM

*National:* As noted above, the US EPA is currently evaluating the toxicity of *chromium VI* with respect to carcinogenic and non-carcinogenic effects. US EPA is on Step 1 of a 7 step process to modify the current IRIS recommendation and expect that revised information will be available for public review in late 2016.<sup>4</sup> This effort began in early 2000, with a draft assessment released in 2010. Of major consideration for the IRIS review is a potential for reclassification of the chemical to include human carcinogenicity by the oral route of exposure (drinking water). Additional research into how hexavalent chromium causes cancer by the chemical industry had begun at approximately the same time as the US EPA IRIS review, subsequently, based on a recommendation by the US EPA’s Peer Review Panel and on extensive comment from the chemical industry, the US EPA withdrew its 2010 draft document until new research was completed and the additional data could be carefully considered. The chemical industry-sponsored research was transmitted to US EPA in 2013 and the US EPA is evaluating those results. EPA is also conducting additional pharmacokinetic modeling for ingestion of hexavalent chromium as part of the IRIS assessment. At present, a number of federal agencies, including the National Toxics Program (NTP) at National Institutes of Environmental Health Sciences (NIEHS) are aiding in this examination of current literature and running toxicity studies. As the outcome of this work could have a significant impact on public water supplies, remediation efforts and private drinking water regulations across the US, many states, like North Carolina, are awaiting the EPA’s final scientific peer-reviewed decisions to be issued before moving forward with modifications of a state’s regulations.

*California:* This NTP work resulted in modifications to California Drinking Water Standards as the NTP studies indicated that chromium VI causes cancer in laboratory animals following oral ingestion. California is the first state to establish public drinking water standards for *hexavalent chromium*. It was

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<sup>4</sup> [https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance\\_nmbr=144](https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=144)

established at 10 µg/L in July 2014 after a 10 year review process including a cost/benefit analysis of various potential concentrations.<sup>5</sup>

*New Jersey:* New Jersey Department of Environmental Protection (NJ DEP) formed a workgroup in 2004 to examine chromium and the potential for deriving applicable standards for soil and water. Throughout the period of 2004 to present, the NJ Chromium workgroup: followed the NTP studies published in 2008; published their own risk assessment utilizing the NTP data; and reviewed the US EPA draft IRIS support document for chromium (2010). At this time, the NJ DEP is awaiting US EPA's reconsideration of the carcinogenicity of hexavalent chromium under the US EPA's IRIS process before deciding how to proceed with the development of appropriate standards.<sup>6</sup>

## Recommendations:

1. DHHS should include an improved risk communication plan in its Health Risk Evaluations (HREs). DHHS recommendations for public and private water well use should be uniformly based upon the federal MCLs established by the Safe Drinking Water Act.
2. DWR should plan to adopt any new or revised public drinking water regulations when promulgated by EPA as a result of the UCMR3 monitoring data.
3. DWR should proceed to evaluate and revise the vanadium IMAC on the basis of current published and peer-reviewed toxicity information.
4. DWR will continue to stay in contact with key representatives at the IRIS Program (National Center for Environmental Assessment, US EPA Office of Research and Development) and await the US EPA Integrated Risk Information System (IRIS) evaluation of the toxicity of *hexavalent chromium (Cr VI)*.
5. DWR should continue with groundwater monitoring needed to establish scientifically defensible concentrations believed to be representative of naturally occurring or background conditions.

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<sup>5</sup> [http://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/Chromium6.shtml](http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Chromium6.shtml)

<sup>6</sup> <http://www.state.nj.us/dep/dsr/chromium/>

# Addendum to Final Report on the Study of Standards and Health Screening Levels for Hexavalent Chromium and Vanadium

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

## **Health Screening Levels are established by DHHS**

The Department of Health and Human Services (DHHS) submits this addendum to reflect the current status in order to fully satisfy the legislative purpose of this study pursuant to Section 4.8A of S.L. 2015-286.

Page four of the report reads:

*“DHHS issued ‘do not drink’ advisories to private well owners after test results indicated an exceedance of a DHHS health screening level. The ‘do not drink’ recommendation from DHHS is based on the health screening level calculated by DHHS. DEQ recommends that DHHS include additional clarifying information in the issuance of HREs that explains that both bottled water, regulated by the US Food and Drug Administration (FDA) and water supplied by a public water supply regulated by the US EPA may potentially, and legally, contain up to 100 ug/L of hexavalent chromium, measured as total chromium. If this additional information is provided in the HRE, then an HRE measuring hexavalent chromium with a lab result that is higher than 0.07 ug/L, but less than 100 ug/l, will allow for a more informed health risk conclusion by the private well owner.”*

On page eleven under “Recommendations” DEQ notes:

*“DHHS should include an improved risk communication plan in its Health Risk Evaluations (HREs). DHHS recommendations for public and private water well use should be uniformly based upon the federal MCLs established by the Safe Drinking Water Act.”*

Based on the above provisions, and acknowledging there are no agreed upon and established federal or national standards for vanadium and recognizing other states have not issued “do not drink” recommendations for Health Risk Evaluations for water that contains similar levels of hexavalent chromium, DHHS issued letters to well owners lifting the “do not drink” recommendations (see attached letter). This update impacts only well owners who have received health risk evaluations for private wells showing higher levels of hexavalent chromium and/or vanadium.