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Via www.regulations.gov

Water Docket
Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

RE: Nominations to the Drinking Water Contaminant Candidate List 5
Docket ID No. EPA-HQ-OW-2018-0594

To whom it may concern:

The Southern Environmental Law Center offers the following nominations to the Drinking Water Contaminant Candidate List 5:

- 1,4-dioxane (CAS # 123-91-1)
- Perfluorooctanoic acid (CAS # 335-67-1)
- Perfluorooctane sulfonic acid (CAS # 1763-23-1)
- Per- and polyfluorinated substances
- Hexavalent chromium (CAS # 18540-29-9)
- Brominated haloacetic acids known as "HAA6Br"

These nominations are submitted on behalf of Cape Fear River Watch, Clean Cape Fear, Environment North Carolina, Haw River Assembly, North Carolina Coastal Federation, North Carolina League of Conservation Voters, and Sound Rivers. We are nominating these chemicals because they are known to occur in our drinking water at levels that present serious risks to public health, and it is the EPA's obligation to protect the public from such harm.

A. Introduction

Under the Safe Drinking Water Act Amendments of 1996 ("SDWA"), EPA is required to publish, every five years, a list of unregulated contaminants that are known or anticipated to occur in public water systems and may require regulation under the SDWA.[1] The Agency must then make a decision about whether or not to regulate at least five of the contaminants on the list.[2]

[1] 42 U.S.C. § 300g–1(b)(1)(B)(i).
[2] *Id.* § 300g–1(b)(1)(B)(ii).

Since 1998, when Contaminant Candidate List 1 was published, EPA has decided to regulate just two chemical contaminants—perchlorate and strontium—out of the numerous chemical and microbial contaminants added to Contaminant Candidate Lists 1-4. After determining that these chemicals adversely impacted human health and occur with a frequency and at levels of public health concern in public water systems, EPA concluded that regulation of perchlorate and strontium presented a "meaningful opportunity for health risk reduction."[3] After having determined to regulate perchlorate and strontium, in 2011 and 2014, respectively, EPA was required to publish a proposed maximum contaminant level goal ("MCLG") and national primary drinking water regulation within 24 months,[4] and promulgate a final MCLG and national primary drinking water regulation within 18 months thereafter.[5] To date, however, EPA has done neither. It must do so now.

In preparing the fifth Contaminant Candidate List, we urge EPA to continue to list 1,4-dioxane, perfluorooctanoic acid ("PFOA"), and perfluorooctane sulfonic acid ("PFOS"); and to add per- and polyfluorinated substances ("PFAS") as a contaminant class, hexavalent chromium, and the brominated haloacetic acids known as "HAA6Br" to the List. Federal regulation of these chemicals is woefully inadequate, and EPA must add these chemicals to the Contaminant Candidate List 5 and promptly develop drinking water standards for these chemicals.

B. Nominations

1. 1,4-Dioxane

1,4-dioxane is toxic to humans.[6] It causes liver and kidney damage.[7] And, EPA has classified 1,4-dioxane as a "likely human carcinogen."[8] California listed 1,4-dioxane on its official registry of chemicals *known* to cause cancer.[9] 1,4-dioxane cannot be removed from drinking water through conventional treatment systems,[10] and it is pervasive in our drinking water supplies at extremely high concentrations.[11] EPA included 1,4-dioxane on the Final Contaminant Candidate List 4 because "based on [Toxics Release Inventory] data and

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[3] EPA, Fact Sheet: Final Regulatory Determination for Perchlorate (February 2011), https://www.epa.gov/sites/production/files/2015-08/documents/epa815f11003.pdf; EPA, Announcement of Preliminary Regulatory Determinations for Contaminants on the Third Drinking Water Contaminant Candidate List; Proposed Rule, 79 Fed. Reg. 62, 716, 62,736-62,739 (Oct. 20, 2014).
[4] 42 U.S.C. § 300g–1; 40 C.F.R. § 141.2.
[5] 42 U.S.C. § 300g–1.
[6] EPA, Technical Fact Sheet – 1,4-Dioxane, 1 (Nov. 2017), https://www.epa.gov/sites/production/files/2014-03/documents/ffrro_factsheet_contaminant_14-dioxane_january2014_final.pdf.
[7] *Id.*; EPA, Integrated Risk Information System, Chemical Assessment Summary: 1,4-dioxane, 2 (2010), https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/0326_summary.pdf.
[8] EPA, Technical Fact Sheet – 1,4-Dioxane at 1.
[9] California Water Boards, 1,4-Dioxane, https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/14-Dioxane.html.
[10] *Id.*
[11] *See* North Carolina Department of Environmental Quality, 1-4, Dioxane Monitoring in the Cape Fear River Basin of North Carolina: An ongoing screening, source identification, and abatement verification study, 2-4 (2017) ("North Carolina 1,4-dioxane study"), https://files.nc.gov/ncdeq/Water%20Quality/Environmental%20Sciences/Dioxane/DioxaneYear2ReportWithMemo_20170222.pdf.

supplemental drinking water data, it is known or anticipated to occur in drinking water and may require regulation."[12] These circumstances still exist, and we urge EPA to continue to list 1,4-dioxane on its Contaminant Candidate List 5 and to promptly establish an applicable maximum contaminant level ("MCL").

1,4-dioxane has historically been used as a stabilizer in chlorinated solvents, and is currently used for a wide variety of industrial and manufacturing purposes. The compound can be found in industrial solvents, paints, varnishes, stains, lacquers, and paint and varnish removers.[13] It is also used in the manufacture of deodorant fumigants, cosmetics, drugs, cleaning preparations, plastic, rubber, insecticides, and herbicides.[14] Based on data from the 2016 Chemical Data Reporting, the production volume of 1,4-dioxane is approximately 1 million pounds per year.[15] The most recent data on environmental releases, according to the Toxics Release Inventory, indicate that approximately 675,000 pounds of 1,4-dioxane were released to the environment in 2015.[16] Releases are reported to all types of environmental media: air, water and land.[17]

Although the EPA does not have an established MCL for 1,4-dioxane in drinking water, it has established a drinking water health advisory with an associated estimated lifetime cancer risk of one in one million at a concentration of 0.35 μg/L.[18] North Carolina has a calculated human health criterion for 1,4-dioxane of 0.35 μg/L in water supplies and 80 μg/L in all other waterbodies.[19]

The Third Unregulated Contaminant Monitoring Rule ("UCMR3") included 1,4-dioxane for sampling and evaluation during January 2013-December 2015 at water utility systems serving more than 10,000 people.[20] 1,4-Dioxane was detected in samples from 21% of 4,915 public water supplies, and was in exceedance of EPA's drinking water health advisory (0.35μg/L) —indicating a cancer risk for one in a million people—at 6.9% of these systems.[21] Results also indicated the presence of 1,4-dioxane in three North Carolina river basins, with the highest concentrations measured in the Cape Fear River basin in central North Carolina.[22] The Cape Fear River basin supplies drinking water to more than 250,000 North Carolinians.[23] According to UCMR3 data, this basin also exhibits some of the highest measured concentrations

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[12] EPA, Comment Response Document for the Fourth Drinking Water Contaminant List (Categorized Public Comments), 59 (Nov. 2016), https://www.regulations.gov/document?D=EPA-HQ-OW-2012-0217-0100.
[13] Department of Health and Human Services, National Toxicology Program, Report on Carcinogens, Fourteenth Edition: 1,4-Dioxane, 1 (Nov. 2016), https://ntp.niehs.nih.gov/ntp/roc/content/profiles/dioxane.pdf.
[14] *Id.*
[15] EPA, Scope of the Risk Evaluation for 1,4-Dioxane, EPA Document EPA-740-R1-7003, 9 (June 2017), https://www.epa.gov/sites/production/files/2017-06/documents/dioxane_scope_06-22-2017.pdf.
[16] *Id.*
[17] *Id.*
[18] EPA, Office of Water, 2018 Edition of the Drinking Water Standards and Health Advisories, 1 (2018), https://www.epa.gov/sites/production/files/2018-03/documents/dwtable2018.pdf.
[19] North Carolina Department of Environmental Quality, NC_StdsTable_09222017, https://deq.nc.gov/nc-stdstable-09222017.
[20] North Carolina 1,4-dioxane study at 1-2.
[21] EPA, The Third Unregulated Contaminant Monitoring Rule ("UCMR3"): Data Summary, 11 (January 2017), https://www.epa.gov/sites/production/files/2017-02/documents/ucmr3-data-summary-january-2017.pdf.
[22] North Carolina 1,4-dioxane study at 2.
[23] *See id.*

of 1,4-dioxane in finished drinking water in North Carolina and in the United States.[24] In response to the UCMR3 data, the North Carolina Division of Water Resources began monitoring 1,4-dioxane in surface waters throughout North Carolina. During this study, 1,4-dioxane concentrations as high as 1,030 µg/L were measured within the Cape Fear River Basin.[25]

1,4-dioxane is persistent and does not biodegrade in water.[26] 1,4-dioxane also does not stick to soil particles, so it can move from soil into groundwater.[27] Municipal water and wastewater treatment facilities are generally not equipped to remove 1,4-dioxane through their treatment processes.[28]

1,4-dioxane presents a considerable risk to human health. EPA must add 1,4-dioxane to Contaminant Candidate List 5, and promptly adopt an MCL.

2. Per- and Polyflouroalkyl Substances

Per- and polyfluoroalkyl substances ("PFAS") are human-made chemicals not naturally found in the environment.[29] They have traditionally been used in a variety of industrial and consumer products, such as carpet and clothing treatments and firefighting foams.[30] Studies have found PFAS "in the blood samples of the general human population and wildlife, indicating that exposure to the chemicals is widespread."[31] EPA included perfluorooctanoic acid ("PFOA") and perfluorooctyl sulfonate ("PFOS") on the Final Contaminant Candidate List 4 "because these contaminants are known to occur in drinking water, are persistent in the environment and in the human body, have shown to be toxic in animal studies and may require regulation."[32] These circumstances still exist, and we urge EPA to continue to list PFOS and PFOA on the Contaminant Candidate List 5, and to add the full range of PFAS found in drinking water and in people, including (but not limited to) PFBA,[33] PFNA,[34] and GenX.[35]

It is well established that PFAS are a threat to the health and safety of the public. They are toxic and bioaccumulative, and they persist in the environment and in our bodies. Of the commonly studied PFAS, PFOA and PFOS have been found to cause developmental effects to fetuses and infants, kidney and testicular cancer, liver malfunction, hypothyroidism, high

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[24] *Id.*
[25] *Id.* at 4.
[26] ATSDR, Public Health Statement - 1,4-Dioxane, 2 (April 2012), https://www.atsdr.cdc.gov/ToxProfiles/tp187-c1-b.pdf.
[27] *Id.*
[28] North Carolina 1,4-dioxane study at 5.
[29] EPA, Technical Fact Sheet - PFOS and PFOA, 1 (November 2017), https://www.epa.gov/sites/production/files/2017-12/documents/ffrrofactsheet_contaminants_pfos_pfoa_11-20-17_508_0.pdf.
[30] *Id.*
[31] *Id.* at 3.
[32] EPA, Drinking Water Contaminant Candidate List 4 – Final (EPA-HQ-OW-2012-0217), 81 Fed. 81,099, 81,107 (Nov. 17, 2016), https://www.federalregister.gov/documents/2016/11/17/2016-27667/drinking-water-contaminant-candidate-list-4-final.
[33] Perfluorobutyric acid (PFBA) (CAS # 375-22-4).
[34] Perfluorononanoic acid (PFNA) (CAS # 375-95-1).
[35] Ammonium salt of hexafluoropropylene oxide dimer acid (HFPO-DA) (CAS # 13252-13-6).

cholesterol, ulcerative colitis, lower birth weight and size, obesity, decreased immune response to vaccines, and reduced hormone levels and delayed puberty.[36] Epidemiological studies suggest that many of these same health outcomes result from exposure to other PFAS,[37] including:

- Ammonium salt of hexafluoropropylene oxide dimer acid, or GenX (HFPO-DA) (CAS # 13252-13-6)[38]
- Perfluorobutyric acid (PFBA) (CAS # 375-22-4)[39]
- Perfluorobutanesulfonic acid (PFBS) (CAS # 375-73-5)[40]
- Perfluorohexanoic acid (PFHxA) (CAS # 307-24-4)
- Perfluoroheptanoic acid (PFHpA) (CAS # 375-85-9)
- Perfluorononanoic acid (PFNA) (CAS # 375-95-1)
- Perfluorodecanoic acid (PFDeA) (CAS # 335-16-2)
- Perfluoroundecanoic acid (PFUA) (CAS # 2058-94-8)[41]
- Perfluorobutane sulfonic acid (PFBuS) (CAS # 375-73-5)[42]
- Perfluorohexane sulfonic acid (PFHxS) (CAS # 355-46-4)
- Perfluorododecanoic acid (PFDoA) (CAS # 307-55-1)
- Perfluorooctane sulfonamide (PFOSA) (CAS # 754-91-6)
- 2-(N-Methyl-perfluorooctane sulfonamide) acetic acid (Me-PFOSA-AcOH) (CAS # 2355-31-9)
- 2-(N-Ethyl-perfluorooctane sulfonamide) acetic acid (Et-PFOSA-AcOH) (CAS # 2991-50-6)[43]

These and other PFAS have been found in the air and dust, surface water and groundwater, and soil and sediment.[44] They are extremely resistant to breaking down in the

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[36] Arlene Blum, et al., "The Madrid Statement on Poly- and Perfluoroalkyl Substances (PFASs)," 123 *Environ. Health Perspectives* 5, A 107 (May 2015) ("The Madrid Statement"), https://www.researchgate.net/publication/275663380_The_Madrid_Statement_on_Poly-_and_Perfluoroalkyl_Substances_PFASs/download; EPA, Fact Sheet on PFOA & PFOS Drinking Water Health Advisories, 2, (2016), https://www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf.
[37] ATSDR, Toxicological Profile for Perfluoroalkyls, Draft for Public Comment, at 5-6, 25-26 (June 2018) ("Draft 2018 Toxicological Profile for Perfluoroalkyls"), https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf.
[38] *See generally* EPA, Draft Human Health Toxicity Values for GenX (November 2018) ("EPA Toxicity Assessment: GenX"), https://www.epa.gov/sites/production/files/2018-11/documents/genx_public_comment_draft_toxicity_assessment_nov2018-508.pdf.
[39] Draft 2018 Toxicological Profile for Perfluoroalkyls at 1.
[40] *See generally* Minnesota Department of Health, Toxicological Summary for: Perfluorobutane sulfonate (Dec. 2017), http://www.health.state.mn.us/divs/eh/risk/guidance/gw/pfbssummary.pdf.
[41] Draft 2018 Toxicological Profile for Perfluoroalkyls at 1.
[42] *See generally* EPA, Draft Human Health Toxicity Values for PFBS (November 2018) ("EPA Toxicity Assessment: PFBS"), https://www.epa.gov/sites/production/files/2018-11/documents/pfbs_public_comment_draft_toxicity_assessment_nov2018-508.pdf.
[43] Draft 2018 Toxicological Profile for Perfluoroalkyls at 1.
[44] *Id.* at 2.

environment, can travel long distances, and have even been found in the Arctic and in the open ocean.[45] They take years to leave the human body, and instead slowly accumulate over time.[46]

Concerned about the extensive health effects of PFOA and PFOS, in 2016, the EPA established a lifetime health advisory of 70 parts per trillion ("ppt") for the combined concentrations of PFOA and PFOS in drinking water.[47] Since then, in June 2018, the Agency for Toxic Substances and Disease Registry released an updated Draft Toxicological Profile for PFOA, PFOS, and other PFAS. The report suggested that many of the chemicals are much more harmful than previously thought. For instance, the minimum risk levels, or the amount of a chemical a person can eat, drink, or breathe each day without a detectable risk to health, was determined to be only 11 ppt for PFOA, and 7 ppt for PFOS.[48]

Within the past several decades, companies like DuPont and Chemours have replaced PFOA with "short-chain" PFAS, like GenX and PFBS, which have fewer carbons.[49] These "short-chain" PFAS are less effective than their "long-chain" counterparts, so industry has to use more of them, meaning more of them are being released into the environment.[50] In May of 2015, two hundred researchers and scientists warned government officials, manufacturers, and the public not to underestimate the danger of short-chain PFAS alternatives.[51] These short-chain PFAS are equally persistent and more mobile in the environment than the chemicals they are replacing.[52] They could be as harmful as PFOA and PFOS, if not more harmful.[53] Indeed, EPA's

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45 *Id.*; *see also* EPA, Technical Fact Sheet - PFOS and PFOA at 3; The Madrid Statement at A 107.
46 Draft 2018 Toxicological Profile for Perfluoroalkyls at 4.
47 EPA, Fact Sheet on PFOA & PFOS Drinking Water Health Advisories at 2.
48 CFPUA Statement on Recently Released DHHS Report (June 21, 2018), https://www.cfpua.org/civicalerts.aspx?AID=893; *see also* Draft 2018 Toxicological Profile for Perfluoroalkyls.
49 *See* Melisa Gomis et al., "Comparing the toxic potency in vivo of long-chain perfluoroalkyl acids and fluorinated alternatives, *Environment International* 113, 1-9 (2018) ("Gomis 2018 Study"), https://hero.epa.gov/hero/index.cfm/reference/download/reference_id/4220321.
50 The Madrid Statement at A 107.
51 *Id*; *see also* Scheringer et al., "Helsingør Statement on poly- and perfluorinated alkyl substances (PFASs)," *Chemosphere* 114, 337-339, (2014), https://www.researchgate.net/profile/Ian_Cousins/publication/263204348_Helsingor_Statement_on_poly-_and_perfluorinated_alkyl_substances_PFASs/links/5433b46d0cf294006f71b2a5/Helsingor-Statement-on-poly-and-perfluorinated-alkyl-substances-PFASs.pdf?origin=publication_detail.
52 California Department of Toxic Substances Control, "Product – Chemical Profile for Perfluoroalkyl and Polyfluoroalkyl Substances (PFASs) in Carpets and Rugs" 6, 29 (2018), https://www.dtsc.ca.gov/SCP/upload/Product-Chemical-Profile-PFAS-Carpets-and-Rugs.PDF.
53 *See, e.g., generally* Gomis 2018 study; Gloria Post et al., "Key scientific issues in developing drinking water guidelines for perfluoroalkyl acids: Contaminants of emerging concern," 15 *PLoS Biol* e2002855 (2017), https://journals.plos.org/plosbiology/article/file?id=10.1371/journal.pbio.2002855&type=printable; *see also* Nan Sheng et al., "Cytotoxicity of novel fluorinated alternatives to long chain," 92 *Archives of Toxicol.* 359 (2017), https://www.researchgate.net/profile/Nan_Sheng5/publication/319431536_Cytotoxicity_of_novel_fluorinated_alternatives_to_long-chain_perfluoroalkyl_substances_to_human_liver_cell_line_and_their_binding_capacity_to_human_liver_fatty_acid_binding_protein/links/5b5adc78aca272a2d66d4828/Cytotoxicity-of-novel-fluorinated-alternatives-to-long-chain-perfluoroalkyl-substances-to-human-liver-cell-line-and-their-binding-capacity-to-human-liver-fatty-acid-binding-protein.pdf.

recent toxicity assessment for GenX and PFBS confirms that these chemicals cause similar health harms as the longer-chain PFAS they replace.[54]

Risks of PFAS exposure to human health are extensive. Conventional drinking water treatment fails to remove PFAS.[55] Based on the Unregulated Contaminant Monitoring Rule 3 data, PFAS[56] were detected at or above the minimum reporting levels in at least 194 of 4,864 public water supplies, serving over 16.5 million residents in 33 states, three American territories, and the Salt River Pima-Maricopa Indian Community.[57] Drinking water from 13 states accounted for 75% of detections, including, by order of frequency of detection, California, New Jersey, North Carolina, Alabama, Florida, Pennsylvania, Ohio, New York, Georgia, Minnesota, Arizona, Massachusetts, and Illinois.[58] Many detectable PFAS concentrations in the UCMR3 database are above chronic drinking water and water quality standards for other regions (*i.e.*, above the drinking water standard of State of Vermont, which is <20 ng/L for the sum of PFOS and PFOA).[59]

Six million people were served by 66 public water supplies that have at least one sample at or above the EPA's 2016 health advisory for PFOS and PFOA (70 ng/L individually or combined).[60] Concentrations ranged as high as 349 ng/L for PFOA, 1,800 ng/L for PFOS, and 56 ng/L for PFNA.[61] Approximately 44.5 million U.S. individuals rely on private drinking water wells, and 52 million individuals rely on smaller public water supplies (<10000 served).[62] The UCMR3 program includes a mere 0.5% testing incidence for smaller public water supplies and no testing of private wells, meaning that information about drinking water PFAS exposures is therefore lacking for almost one-third of the U.S. population.[63]

The risk to the public from PFAS cannot be disputed. To adequately protect the public, EPA must regulate PFAS as a class, and must adopt an MCL applicable for all PFAS.

3. <u>Hexavalent Chromium</u>

Hexavalent chromium is a heavy metal that occurs throughout the environment, and is used in various industrial processes, including in the production of leather tanning, metal

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[54] EPA Toxicity Assessment: PFBS; EPA Toxicity Assessment: GenX.
[55] EPA, Technical Fact Sheet - PFOS and PFOA.
[56] During UCMR3, the following PFAS were monitored: PFOA, PFOS, PFBS, PFHpA, PFNA, and PFHxS. EPA, UCMR3 Data Summary (January 2017) ("UCMR3 Data Summary"), https://www.epa.gov/sites/production/files/2017-02/documents/ucmr3-data-summary-january-2017.pdf.
[57] Xindi C. Hu et al. "Detection of Poly- and Perflouoroalkyl Substances (PFASs) in U.S. Drinking Water Linked to Industrial Sites, Military Fire Training Areas, and Waste Water Treatment Plants," *Environ. Sci. Technol. Lett.*, 346 (2016) ("Hu 2016 Study"), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5062567/pdf/ez6b00260.pdf; *see also* UCMR3 Data Summary.
[58] Hu 2016 Study at 345-346.
[59] *Id.* at 346.
[60] *Id.*
[61] *Id.*
[62] *Id.*
[63] *Id.*

finishing, and textile-dyeing.[64] It is toxic, and causes liver damage and cancers of the digestive system.[65] According to the National Toxicology Program in 2016, hexavalent chromium compounds "are known to be human carcinogens based on sufficient evidence of carcinogenicity from studies in humans."[66] Yet there is no federal MCL for hexavalent chromium. The only federal MCL is for *total* chromium, and it was set over 25 years ago. This MCL is badly outdated and numerous studies, including those by the National Toxicology Program[67] and the California Office of Health Hazard Assessment,[68] demonstrate that this level is far too high to protect human health against the risks posed by hexavalent chromium.

The federal MCL for total chromium does not protect human health because it was determined by the EPA over two decades ago, and fails to take into account later-discovered information on the carcinogenicity of hexavalent chromium. The MCL is also under-protective because it is for *total* chromium, not just hexavalent chromium. Hexavalent chromium (i.e., chromium-6) is far more toxic than trivalent chromium (i.e., chromium-3), the other commonly occurring form of the chemical.[69] EPA has stated that "Chromium-6 and chromium-3 are covered under the total chromium drinking water standard because these forms of chromium can convert back and forth in water and in the human body, depending on environmental conditions."[70] However, "there is abundant evidence that hexavalent chromium is not completely converted to less harmful trivalent chromium in the human stomach."[71] Thus, setting an MCL for these two kinds of chromium combined allows for legally permissible hexavalent chromium levels that do not adequately protect public health. EPA should set an MCL specifically for hexavalent chromium to reflect the heightened level of risk posed by hexavalent chromium alone.

EPA included hexavalent chromium in the list of pollutants tested under the Unregulated Contaminant Monitoring Rule 3. The results of those tests revealed that hexavalent chromium contaminates drinking water supplies serving millions of Americans in all 50 states, including in over 65% of the samples taken in North Carolina.[72] Yet the process of setting a federal MCL for hexavalent chromium in drinking water remains stalled in the Integrated Risk Information

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[64] Department of Health and Human Services, National Toxicology Program, Report on Carcinogens, Fourteenth Edition: Hexavalent Chromium Compounds, 1-2 (Nov. 2016) ("NTP Report on Carcinogens"), https://ntp.niehs.nih.gov/ntp/roc/content/profiles/chromiumhexavalentcompounds.pdf.

[65] *See id*; Hong Sun et al, Oral Chromium Exposure and Toxicity, *Curr. Environ. Health Rep.*, 1-2 (Sept. 2015), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4522702/.

[66] NTP Report on Carcinogens at 1.

[67] *Id.*; *see also* National Toxicology Program, NTP Technical Report on the Toxicology and Carcinogenesis Studies of Sodium Dichromate Dihydrate (CAS No. 7789-12-0) in F344/N Rats and B6C3F1 Mice (Drinking Water Studies, NTP TR 546(2008), https://ntp.niehs.nih.gov/ntp/htdocs/lt_rpts/tr546.pdf.

[68] Office of Environmental Health Hazard Assessment of the California Environmental Protection Agency, Final Technical Support Document On Public Health Goal For Hexavalent Chromium In Drinking Water 2011) ("OEHHA Public Health Goal: Hexavalent Chromium"), http://www.oehha.ca.gov/water/phg/072911Cr6PHG.html.

[69] California Office of Environmental Health Hazard Assessment, Public Health Goals for Chemicals in Drinking Water: Hexavalent Chromium (Cr VI), 1-2 (July 2011), https://oehha.ca.gov/media/downloads/water/chemicals/phg/cr6phg072911.pdf; NTP Report on Carcinogens.

[70] EPA, Chromium in Drinking Water, https://www.epa.gov/dwstandardsregulations/chromium-drinking-water.

[71] OEHHA Public Health Goal: Hexavalent Chromium at 2.

[72] EPA, Monitoring the Occurrence of Unregulated Drinking Water Contaminants, http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/.

System.[73] EPA must resume that process, and set a protective MCL for hexavalent chromium.

4. **Brominated Haloacetic Acids (HAA6Br)**

Water disinfection kills disease-causing organisms in a drinking water supply to achieve safe consumption.[74] An undesired consequence of the water disinfection process, however, is the formation of a large number of unintended compounds from chemicals and organic material in the water. These unintended chemicals include brominated haloacetic acids, which pose serious public health concerns. Brominated HAA occurrence is increasing likely due to elevated bromide levels in the source waters from industrial sources (*e.g.*, coal-fired power utilities, hydraulic fracturing).[75]

In 1998, EPA first regulated five haloacetic acids (HAA5) in drinking water: chloroacetic acid, bromoacetic acid, dichloroacetic acid, dibromoacetic acid, and trichloroacetic acid. In 2016, EPA required monitoring for four additional haloacetic acids, collectively referred to as "HAA6Br," in the Fourth Unregulated Contaminant Monitoring Rule (UCMR4).[76] We urge EPA to add this latter group to Contaminant Candidate List 5 and to promptly promulgate an associated MCL for:

- Bromochloroacetic acid (BCAA) (CAS # 5589-96-8)
- Bromodichloroacetic acid (BDCAA) (CAS # 71133-14-7)
- Chlorodibromoacetic acid (CDBAA) (CAS # 5278-95-5)
- Tribromoacetic acid (TBAA) (CAS # 75-96-7)

According to the National Toxicology Program, each of the HAA6Br is *reasonably anticipated to be human carcinogens.*[77] In addition, Bromochloroacetic acid has been found to cause reproductive abnormalities in laboratory animals.[78] Moreover, HAA6Br is prevalent in our drinking water systems. As part of the Disinfection By-Product Information Collection Rule in 1997-1998,

- Bromochloroacetic acid was detected in 263 out of 291 water systems.
- Bromodichloroacetic acid was detected in 90 out of 102 water systems.
- Chlorodibromoacetic acid was detected in 66 out of 101 water systems.

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[73] EPA, IRIS Assessment Status: Chromium (VI), https://cfpub.epa.gov/ncea/iris2/chemicalLanding.cfm?substance_nmbr=144.

[74] Hongyan Zhai et al, "Formation of Brominated Disinfection Byproducts during Chloramination of Drinking Water: New Polar Species and Overall Kinetics," *Environmental Science & Technology*, 2579 (2014), https://pdfs.semanticscholar.org/81d1/434675b9959670a686581a61820e0f715e70.pdf.

[75] EPA, UCMR 4 Candidate Contaminants – Information Compendium, EPA 815-B-15-005, 25 (Nov. 2015) ("UCMR4 Information Compendium"), https://www.regulations.gov/document?D=EPA-HQ-OW-2012-0217-0090.

[76] *Id.* at 25.

[77] U.S. Department of Health and Human Services, National Institute of Environmental Health Sciences, Division of the National Toxicology Program, Office of the Report on Carcinogens, " Draft Report on Carcinogens Monograph on Haloacetic Acids Found as Water Disinfection By-Products (June 2017), https://ntp.niehs.nih.gov/ntp/about_ntp/monopeerrvw/2017/july/haadraftmonograph20171030.pdf.

[78] UCMR4 Information Compendium at 26.

- Tribromoacetic acid was detected in 15 out of 98 water systems.[79]

Additional occurrence information is being evaluated under the UCMR4. Initial results reported in October 2018 indicate that HAA6Br were detected in 3,429 samples, including in samples from 19 public water systems in North Carolina.[80] HAA6Br are pervasive in drinking water, which poses an unreasonable risk to the public. To eliminate this risk, EPA must add HAA6Br to Contaminant Candidate List 5, and promptly adopt an MCL for the compounds.

C. Conclusion

Far too many communities like those in North Carolina have been harmed by 1,4-dioxane, PFAS, hexavalent chromium, and HAA6Br. EPA is fully aware of the extent of destruction that these chemicals can cause to our bodies and the environment. The agency must add these chemicals to Contaminant Candidate List 5 and promptly adopt MCLs for the contaminants. Its current regulations are insufficient to protect our communities throughout the country, and EPA has a legal and moral obligation to act here.

Thank you for considering these comments. Please contact us at 919-967-1450 if you have any questions regarding this letter.

Sincerely,

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[79] *Id.*

[80] EPA, The Fourth Unregulated Contaminant Monitoring Rule (UCMR 4): Data Summary, October 2018, https://www.epa.gov/sites/production/files/2018-10/documents/ucmr4-data-summary.pdf.