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December 14, 2017

Department of Energy and Environment
Water Quality Division
1200 First Street NE, 5th Floor
Washington, D.C. 20002
Via email to WQS@dc.gov

Re: DOEE Water Quality Standards, Proposed Rule Comments

To Whom It May Concern:

Thank you for the opportunity to comment on the Department of Energy and Environment's ("DOEE") proposed changes to water quality standards, based on the 2016 triennial review. These comments are submitted by: Anacostia Riverkeeper, Anacostia Watershed Society, Audubon Naturalist Society, Clean Water Action, DC Environmental Network, Earthjustice, Natural Resources Defense Council, Potomac Conservancy, Potomac Riverkeeper Network, Rock Creek Conservancy, and Wentworth Green Strategies (collectively "Commenters").

DOEE is proposing changes to the aquatic life criteria for ammonia and cadmium, the human health criteria for ninety-four constituents, and the *E. coli* recreational water quality criteria. Our comments address only the changes proposed to the *E. coli* recreational water quality criteria and the proposed ten percent exceedance allowance for conventional pollutants when assessing water quality standards attainment or impairment status. However, because DOEE must republish its proposed rule with additional supporting documents (as explained in note 22, below), we reserve our right to submit a second comment letter, with any necessary expert reports, at that time.

We appreciate the efforts of DOEE to improve the District's water quality standards with respect to *E. coli*. We are concerned, however, that the proposed rule does not protect the health of members of the public. DOEE's *E. coli* recreational water quality criteria are intended to ensure a level of water quality from which approximately 36 out of 1,000 people recreating on the water will become ill due to contact with pathogens that often co-occur with indicators of fecal contamination, such as *E. coli*. Our comments illustrate why the level of illness risk under DOEE's proposed standards is significantly higher than 36 illnesses out of 1,000 people, and suggest amendments to the proposed rule that would protect public health to DOEE's desired level of illness risk.

I. APPLICABLE LEGAL STANDARDS

A. State Water Quality Standards

The federal Clean Water Act ("CWA") requires that states review, and if appropriate modify, their water quality standards at least once every three years. These standards "shall

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consist of the designated uses of the navigable waters involved and the water quality criteria for such waters based upon such uses.”¹ Moreover, the standards “shall be such as to protect the public health or welfare, enhance the quality of water . . .” and take “into consideration their use and value for . . . recreational purposes.”²

The District’s recreational water quality standards for *E. coli* apply to waters designated as “Class A” (primary contact recreation), which includes all of the District’s surface waters except for wetlands.³ Contrary to DOEE’s assertions that primary contact recreation does not occur in the District,⁴ current and existing uses include swimming, kayaking, canoeing, rowing, and other primary and secondary contact recreation, particularly in the main stem of the Anacostia River, Potomac River, and Rock Creek.⁵ Swimming, kayaking, canoeing, and rowing fit the District’s definition of primary contact recreation because these activities often involve intentional or unavoidable submersion and ingestion of water; as such they are “water contact sports or activities that result in frequent whole body immersion or involve significant risks of ingestion of the water.”⁶ Therefore, these primary contact recreational uses must be taken into consideration by DOEE when adopting water quality standards that are sufficiently stringent to “protect the public health.”⁷

¹ 33 U.S.C. § 1313(c)(2)(A).

² *Id.*

³ 21 DCMR § 1101.2; *see also e.g.*, DOEE Potomac Bacteria TMDL Draft Appendix C, *E. coli Bacteria Allocations and Daily Loads for the Potomac River and Tributaries* at 2.

⁴ 21 DCMR § 1101.2.

⁵ By way of example, the DC Triathlon Club facilitates bi-weekly swims in the Potomac River from May through September (*see* <https://www.dctrclub.org/training/open-water-swimming/>). The “Nation’s Triathlon” is also hosted in the city each year, and it includes a 1.5 kilometer swim in the Potomac, as well as “open water” swim practice sessions in the river during the weeks leading up to the event (*see* <http://nationstri.com/course/swim-1-5k/>; <http://nationstri.com/event-info/swim-clinic/>). The Anacostia Community Boathouse membership includes a number of high school, college, and community crew rowing and paddling groups (*see* <http://www.anacostiaboathouse.org/>). Anacostia Park and Bladensburg Marina also provide public access for community boaters and paddlers (*see* <https://www.nps.gov/anac/planyourvisit/boating-and-fishing.htm>; http://outdoors.pgpark.com/Sites/Bladensburg_Waterfront_Park/Rentals.htm). In addition, numerous schools, clubs and businesses facilitate kayaking, rowing, and other river recreational activities in the Potomac River and Rock Creek (*see* <http://www.rockcreekrowing.org/>; <http://www.potomackayaking.com/>; www.thompsonboatcenter.com/; and <http://www.washingtoncanoecub.org/>).

⁶ 21 DCMR § 1199.1.

⁷ 33 U.S.C. § 1313(c)(2)(A).

B. Federal Water Quality Criteria

Under the CWA, the Environmental Protection Agency (“EPA”) has a duty to, “from time to time,” revise its criteria for water quality.⁸ These “304(a) guidance” criteria constitute EPA’s broadly applicable recommendations to states, but states are not required to adopt the criteria when revising their water quality standards.⁹ Instead, EPA has directed states as follows:

States must adopt those water quality criteria that protect the designated use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use. For waters with multiple use designations, the criteria shall support the most sensitive use.... In establishing criteria, States should:

(1) Establish numerical values based on:

(i) 304(a) Guidance; or

(ii) 304(a) Guidance modified to reflect site-specific conditions; or

(iii) Other scientifically defensible methods....¹⁰

Therefore, states have authority to either modify EPA’s federal 304(a) criteria in order to accommodate their site-specific conditions, or even use other scientifically defensible methods. The overriding regulatory duty for states is to enact “sufficient parameters or constituents to protect the designated use,” with standards “based on sound scientific rationale.”¹¹ States must assess their own site-specific needs in order to fulfill this duty.

In 2012, EPA published revised 304(a) recreational water quality criteria for the first time since 1986, offering nonbinding guidance to states in adopting their own water quality standards for *E. coli*.¹² These criteria recommend that states adopt either an illness risk rate of 36 illnesses per 1,000 “recreators” or a more conservative 32 illnesses per 1,000 recreators, corresponding to an *E. coli* 30-day geometric mean limit of 126 colony forming units (“cfu”)/100 mL, or 100 cfu/100 mL, respectively.¹³ EPA’s criteria also suggest the use of a statistical threshold value

⁸ *Id.* § 1314(a).

⁹ *Id.*; 40 CFR § 131.11(b)(1).

¹⁰ 40 CFR § 131.11.

¹¹ *Id.* § 131.11(a).

¹² EPA, 2012 Recreational Water Quality Criteria, <https://www.epa.gov/sites/production/files/2015-10/documents/rwqc2012.pdf> (“EPA 2012 Recreational Water Quality Criteria”).

¹³ *Id.* at 43.

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(“STV”) of 410 cfu/100 mL, or 320 cfu/100 mL, which only 10% of samples over thirty days may exceed.¹⁴

The 2012 criteria are based on epidemiological studies conducted from 2003-2009 (excluding years 2006 and 2008) at nine locations around the country: seven temperate beaches impacted by wastewater treatment plant (“WWTP”) effluent, one temperate beach with “urban runoff sources” but no WWTP sources, and one tropical beach.¹⁵ These studies, collectively called the “NEEAR” study, queried beach recreators about illnesses they experienced up to twelve days after they recreated at the beach on a given day.¹⁶ The studies compared these illness rates to the bacteria contamination levels measured in the water on the days the recreators were exposed, measured with the geometric mean of 18 samples taken over the course of a single day (a daily geometric mean).¹⁷ The studies were conducted at widely used recreational beaches which generally already met the state water quality standards, were occasionally contaminated by a human source of pollution, and had a swimming season that lasted at least 90 days.¹⁸

II. 2016 TRIENNIAL REVIEW PROPOSED RULE

In its September 15, 2017 Notice of Proposed Rulemaking, DOEE proposed changes to the District’s *E. coli* recreational criteria “based on EPA’s 2012 Recreational Water Quality Criteria.”¹⁹ DOEE explained that the changes include the addition of a new STV of 410 cfu/100 mL, to replace the prior use of a “single sample maximum” measurement of the same value.²⁰ In addition, DOEE announced it was changing the duration of its geometric mean criterion from 30 days to 90 days.²¹ These changes to the *E. coli* criteria were announced without explanation,²²

¹⁴ *Id.*

¹⁵ *Id.* at 16-17.

¹⁶ *Id.* at 14.

¹⁷ *Id.* at 17.

¹⁸ *Id.* at 16.

¹⁹ DOEE, Notice of Proposed Rulemaking at 1 (Sept. 15, 2017), https://doee.dc.gov/sites/default/files/dc/sites/ddoe/release_content/attachments/Proposed%20WQS%202016.pdf (“DOEE Notice of 2016 Triennial Review Proposed Rulemaking”).

²⁰ *Id.*

²¹ *Id.*

²² Unusually, DOEE’s Notice of Proposed Rulemaking contains no explanation for its proposed changes. The changes are not supported by any reasoning, and fail to explain how the changes will better protect water quality, aquatic life, or human health. After seeking an explanation for the changes to the *E. coli* criteria, Commenters received a short, informal memorandum from DOEE. However, this memorandum has not been made public and thus is not available for public comment. Because DOEE must provide “the purpose of the Proposed Rulemaking or why [the rule] is being amended” in the Notice of Proposed Rulemaking, 1 DCMR § 309.3(d), and because this purpose and explanation is lacking in DOEE’s Notice,

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aside from the reference to EPA's 2012 recreational water quality criteria.²³ The implication of this announcement, therefore, is that EPA's 2012 recreational water quality criteria directed the changes proposed by DOEE.

However, EPA's 2012 criteria do not recommend a change from a 30-day geometric mean to a 90-day geometric mean. To the contrary, EPA specifically recommended that states use a 30-day geometric mean when calculating compliance with the *E. coli* criteria.²⁴ Moreover, even if EPA had recommended all of DOEE's proposed changes in its 2012 criteria, DOEE would not be bound to adopt them and would accordingly need to explain why the proposed criteria fully protect the recreational uses of the District's waters.²⁵ DOEE can, and must, assess its own unique needs for water quality standards, and has full authority to depart from EPA's non-binding guidance when it is necessary to protect the designated uses for its waterways. For the reasons discussed below, DOEE should amend its proposed *E. coli* standard in order to achieve the illness rate recommended by EPA.

III. DOEE SHOULD ADOPT A 24-HOUR GEOMETRIC MEAN TO DETERMINE COMPLIANCE WITH THE *E. COLI* NUMERIC CRITERIA.

DOEE has adopted a desired illness rate of 36 illnesses per 1,000 people recreating on its waterways, based on EPA's less conservative illness rate policy recommendation.²⁶ As an initial matter, DOEE must consider the practical effects of this policy choice. Thirty-six ill individuals out of every thousand recreating people is an illness rate of 3.6%. Put another way, out of a classroom of 30 school children recreating on a river, at least one child is estimated to become ill from contact with the water, on average. This high rate of illness risk was selected by EPA as a policy choice without input from the public, and DOEE has adopted it without public comment.

Setting aside the policy merits of the 3.6% illness rate, having chosen it, DOEE has a duty to adopt and implement water quality standards reflecting this rate. Unfortunately, the fundamental flaws in the proposed measurement method allow much higher illness rates for the recreating public. As a result, DOEE must correct the defects in its standards and establish measurement methods that will ensure a 3.6% illness rate.

we request that DOEE re-submit the proposed rule with a complete explanation for its proposed amendments, and for any changes to the proposed amendments in light of public comments.

²³ DOEE Notice of 2016 Triennial Review Proposed Rulemaking at 1.

²⁴ EPA 2012 Recreational Water Quality Criteria at 43; *see also* EPA 2012 Recreational Water Quality Criteria Fact Sheet, <https://www.epa.gov/sites/production/files/2015-10/documents/rec-factsheet-2012.pdf> ("EPA 2012 Recreational Water Quality Criteria Fact Sheet").

²⁵ *See supra* part I.B of these comments.

²⁶ EPA offered states a policy choice of two different numeric criteria, associated with either 32 illnesses per 1,000 people or 36 illnesses per 1,000 people. *See* EPA 2012 Recreational Water Quality Criteria at 43. DOEE chose to utilize the numeric criteria associated with a rate of 36 illnesses per 1,000 people. DOEE Notice of 2016 Triennial Review Proposed Rulemaking at 2.

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In order to achieve an illness rate of 3.6%, DOEE must measure compliance with its *E. coli* criteria using a daily, rather than monthly, figure. A daily measurement is necessary because EPA derived the 3.6% illness rate from epidemiological studies using daily geometric means.²⁷ People who recreate in or on bodies of water generally do so for only minutes or hours at a time. They do not swim or kayak for an entire 24 hours, and they certainly do not stay in the water for thirty or ninety consecutive days. People are exposed to water in moments of time, on a single day at a time. Therefore, unsurprisingly, EPA’s illness risk rate is based on epidemiological studies that asked people whether they had become ill after recreating at a waterway on a specific day.²⁸ The studies correlated those illness rates with the level of bacteria in the water on the day each person swam, using a daily geometric mean from eighteen samples taken on a single day.²⁹ Using the illness rates and daily geometric means from these studies, EPA concluded that approximately 36 per 1,000 recreating people are predicted to become ill when exposed to water with an *E. coli* level of 126 cfu/100 mL. Commenters do not question the accuracy of this statistical estimate. However, any state that measures compliance with this standard over a duration of thirty days or ninety days undermines the statistical rationale supporting the standard and renders the standard essentially meaningless for protecting the public health.

The fatal flaw of a 30-day or 90-day geometric mean for *E. coli* is that routine spikes of bacteria levels much greater than 126 cfu/100 mL are averaged out and hidden in a single number. The level of *E. coli* and other co-occurring pathogens in waterways varies greatly from day to day, due to variability in human inputs, weather, and other factors. The fluctuations are especially severe in waterways that are impacted by combined sewer overflows (“CSOs”), such as DC’s urban, CSO-impacted rivers and tributaries.³⁰ Using a 30-day geometric mean, numerous higher spikes in the *E. coli* levels that are above 126 cfu/100 mL will frequently not affect a water body’s compliance with this standard. To illustrate the extent of the dangerous results permitted under the standard, a hypothetical river would be in compliance with a 126 cfu/100 mL thirty-day geometric mean even if five samples collected over thirty days contained the following results:

*Table 1*³¹

Sample 1:	50 cfu/100 mL
Sample 2:	50 cfu/100 mL
Sample 3:	50 cfu/100 mL
Sample 4:	50 cfu/100 mL
Sample 5:	5,000 cfu/100 mL

²⁷ See EPA 2012 Recreational Water Quality Criteria at 17.

²⁸ *Id.* at 16-17.

²⁹ *Id.* at 17.

³⁰ See *id.* at 41, 44.

³¹ This hypothetical table is based on a thirty-day period during which five samples are taken.

30-day Geometric Mean:	125.59 cfu/100 mL
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It is important to note that while 5,000 cfu/100 mL is an extremely high *E. coli* level, it is not unrealistic for some parts of the Anacostia River, which routinely experiences levels above 2,000 MPN³²/100 mL, and which was contaminated with greater than 4,839 MPN/100 mL at Bladensburg Marina on May 19, 2015.³³ The NRL Pier monitoring site on the Potomac River also recorded an *E. coli* level of 5,748 MPN/100 mL on March 7, 2011, for example.³⁴

Harmfully high spikes of *E. coli* can be further obscured by extending the duration of the geometric mean period from thirty days to ninety days, especially when only once monthly samples are taken (as is the case in the District for most monitoring stations in most months). For example, once monthly *E. coli* samples from the Woodrow Wilson Bridge monitoring station on the Potomac River that were collected from March through May 2015 demonstrate how that river segment would exceed the current 30-day *E. coli* standard if measured on a monthly basis in two months out of three, but would be in full compliance with DOEE’s proposed 90-day *E. coli* standard for the same three samples, effectively excusing the majority of the time when the water body exceeded the standard.³⁵

Table 2

March 9, 2015 sample and 30-day geometric mean:	154 MPN/100 mL → exceeds standard
April 6, 2015 sample and 30-day geometric mean:	8 MPN/100 mL → meets standard
May 18, 2015 sample and 30-day geometric mean:	461 MPN/100 mL → exceeds standard
90-day geometric mean:	82.8 MPN/100 mL → meets standard

This significant data obfuscation is especially inappropriate in the case of the recreational water quality criteria because the purpose of the standard is to protect public health during recreational activities. In a water body that fully meets a 126 cfu/100 mL 30-day geometric mean or 90-day geometric mean standard (and thus is presumed safe for recreation), a recreating person could be exposed to levels of *E. coli* much higher than 126 cfu/100 mL, depending on the day he or she chooses to recreate. Because DOEE’s desired illness rate of 3.6% is based on 126 cfu/100 mL, any time a person happens to recreate on a water body on a day the *E. coli* level is higher than 126 cfu/100 mL, that person would be exposed to an illness risk rate that is greater than 3.6%. In this way, lengthy geometric mean periods expose the public to an illness risk rate much higher than 3.6%.

³² The District previously measured its *E. coli* levels using the “MPN” (“most probable number”) method of enumerating the number of organisms in a cultured sample using statistical probability tables, but it now proposes to use a different culture-based measure called “colony forming units” (“cfu”).

³³ See DOEE *E. coli* monitoring data for Anacostia River locations between 2011 and 2016 (on file with author).

³⁴ See *id.* at Potomac River locations.

³⁵ See *id.*

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The fact that a 30-day or 90-day geometric mean also produces days with an illness risk lower than 3.6% does not offset the elevated illness risk days because the human immune system does not average out its exposures to pathogens. Even if a person decides to recreate every day in a month in a water body meeting the 126 cfu standard, the days the water quality is above 126 cfu/100 mL would subject that daily recreator to the same exact elevated risk of illness as a person who happens to recreate on only the elevated risk days, even though the daily recreator would also be exposed to some reduced risk days when the water quality is below 126 cfu/100 mL.

Fundamentally, a daily geometric mean is based on the idea that deviations from the mean within a given day are drawn from a single underlying set of conditions. This assumption underlies the epidemiological studies used by EPA to develop its 2012 recreational water quality criteria, which were based on daily geometric means. The same assumption simply cannot be made for a thirty-day or ninety-day period because water quality changes significantly over that period of time. Therefore, DOEE may not take daily geometric mean illness data and assume it will hold true over a thirty day or ninety-day geometric mean. The illness rate under both DOEE's current and proposed *E. coli* criteria is accordingly higher than 3.6%. If DOEE intends to expose the public to only a 3.6% illness rate when recreating, it should adopt a 24-hour geometric mean.³⁶

IV. IF DOEE DOES NOT ADOPT A 24-HOUR GEOMETRIC MEAN, DOEE SHOULD AT A MINIMUM RETAIN ITS CURRENT 30-DAY GEOMETRIC MEAN.

A. EPA continues to recommend a 30-day geometric mean.

If DOEE fails to protect the public with a 24-hour geometric mean, it should at a minimum retain its current 30-day geometric mean duration. EPA has repeatedly and consistently recommended the use of a 30-day geometric mean in all documents it has published regarding its 2012 recreational water quality criteria because a shorter duration is more

³⁶ Commenters recognize that geometric means have historically been used by EPA and by DOEE in recreational water quality criteria and standards. However, Commenters request that DOEE explain and justify its use of a geometric mean, as opposed to an arithmetic mean or some other statistical measure. Geometric means are “influenced less” by high values than arithmetic means, and as a result they average out spikes in data more effectively. *See, e.g.,* Centers for Disease Control and Prevention, *Key Concepts About Generating Geometric Means*, <https://www.cdc.gov/nchs/tutorials/environmental/analyses/descriptive/Info3.htm>. While this result may be preferable when an agency desires to limit the statistical effect of inconsequential outliers in a dataset, *see id.*, it is an inappropriate method to use when the “outliers” are highly consequential, as is the case in a human health-based standard where illnesses are easily caused by individual isolated spikes in bacteria concentrations. Commenters urge DOEE to explore the possibility of using a different statistical measure and to explain its chosen statistical method.

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protective of primary contact recreation.³⁷ Therefore, DOEE does not need to adjust its geometric mean duration in order to make its standards consistent with EPA's recommendations.

B. DOEE's reliance on EPA's 2015 memorandum is misplaced.

As previously explained in part II of these comments, DOEE did not publish any rationale supporting its proposed change to a 90-day geometric mean, in contravention of 1 DCMR § 309.3(d). However, Commenters requested an explanation and received an unpublished DOEE memorandum regarding the change to a 90-day geometric mean. This short, unpublished memorandum relies heavily on an EPA memorandum dated October 2015, in which EPA reluctantly conceded that it would deem a 90-day geometric mean "acceptable," in spite of the fact that it believes a 30-day period is "optimal," and in spite of the fact that the agency "is concerned that a very long critical exposure period could allow an excessive number of high exposure events over a shorter term to be 'averaged out' over the long-term."³⁸ In other words, EPA opined that a 90-day averaging period "represent[s] an acceptable critical exposure period" even though it recognized it was less protective of human health.³⁹

EPA's reasoning for considering a 90-day geometric mean is specious at best. EPA reasoned that its epidemiological studies were conducted over 90-day long summer swimming seasons, "thus making durations up to 90 days scientifically defensible."⁴⁰ DOEE should not be confused by this illogical rationale. To assert that a 90-day geometric mean is defensible because the underlying daily geometric mean studies were conducted over periods of 90 days is akin to asserting that a speed limit should be expressed as a 90-day geometric mean of 60 mph because an underlying speed safety study was conducted with daily data collected over a period of 90 days. EPA's reasoning is irrational, and DOEE should reject it.

EPA also asserted in its 2015 memorandum that some unpublished data from New Jersey demonstrates a 98% agreement regarding water quality attainment when calculated using a 30-day geometric mean and a 90-day geometric mean.⁴¹ Without the data EPA relied on, it is impossible to assess the validity of this claim. However, it is statistically possible that some data sets with relatively low variability could produce a 98% agreement between these two duration

³⁷ EPA 2012 Recreational Water Quality Criteria at 43; *see also* EPA 2012 Recreational Water Quality Criteria Fact Sheet; EPA, *Narrative Justification for Longer Duration Period for Recreational Water Quality Criteria* (Oct. 2015), <http://www2.pr.gov/agencias/jca/Documents/Leyes%20y%20Reglamentos/Enmiendas%20y%20Reglamentos%20Propuestos/Reglamento%20de%20Estandares%20de%20Calidad%20de%20Agua/Narrative%20Justification%20for%20Longer%20Duration%20Period%20for%20EPA%202012%20Recreational%20Water%20Quality%20Criteria.pdf> ("EPA 2015 Narrative Justification for Longer Duration").

³⁸ *See* EPA 2015 Narrative Justification for Longer Duration (emphasis in original).

³⁹ *Id.* (emphasis in original).

⁴⁰ *Id.*

⁴¹ *Id.*

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periods. The fact that a 98% agreement result is possible though, does not support an assumption that the two durations will always, or even often, produce such similar results. The amount of agreement between the two durations will depend on each individual data set and the fluctuations that arise in any given time period. Indeed, the actual data from 2011 through 2016 from the Potomac River reveals that attainment rates can be much higher using a 90-day, as opposed to a 30-day, geometric mean.

C. DOEE's proposed change to a 90-day geometric mean constitutes impermissible backsliding.

Using the recorded *E. coli* values from the Potomac River monitoring stations from 2011-2016, approximately 23% of stations are out of attainment during that time period when using a 30-day geometric mean, but only approximately 16% are out of attainment with the same data using a 90-day geometric mean.⁴² This meaningful difference between the two geometric mean durations demonstrates that given the fluctuations in *E. coli* levels in District waters, a change to a 90-day mean would significantly weaken the District's *E. coli* standard.

Indeed, DOEE implicitly admitted that a 90-day geometric mean is less protective of human health in its unpublished memorandum of explanation regarding the change to a 90-day geometric mean.⁴³ In that memorandum, DOEE recognized that a change from 30 days to 90 days constitutes impermissible backsliding under the CWA, stating:

Literature review from other states (Borok, 2016) indicates that even though the standard would allow for a 90-day duration, permit limits may continue to use a 30-day time frame. One of the reasons given is that the regulatory agency 'would likely be unable to allow for a greater duration for attaining effluent limits than is currently used due to anti-backsliding requirements.'⁴⁴

In other words, DOEE may need to continue to use a 30-day geometric mean for *E. coli* in its CWA permitting in order to avoid running afoul of the CWA's prohibition against backsliding (33 U.S.C. § 1342(o)). If a change to 90 days constitutes an impermissible weakening of standards for purposes of permitting, the change also constitutes an impermissible weakening of the standards themselves.

⁴² See DOEE *E. coli* monitoring data for Potomac River locations between 2011 and 2016 (on file with author) (measuring the percentage of samples above 126 MPN/100 mL using a 30-day geometric mean from all samples, versus the percentage of samples above the standard using a 90-day geometric mean).

⁴³ DOEE, unpublished memorandum entitled *Recreational Water Quality Criteria Implementation* (on file with author).

⁴⁴ *Id.*

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D. The District's waters are especially susceptible to the inaccuracies introduced by a 90-day geometric mean.

A shorter duration period is especially important in the District due to the unique circumstances in this area. Unlike all other states, the District is a small, exclusively urban area. As an urban area with combined sewers, the District is heavily impacted by CSOs as well as discharges from the local municipal separate storm sewer system, resulting in large spikes of *E. coli* during rain events. In addition, the District has a large number of waterways that include popular paddling locations. Washington, D.C. is routinely cited as one of the best cities for kayaking in the country, for paddlers ranging from casual tourists to Olympic athletes.⁴⁵ Lastly, unlike states with marine or Great Lakes recreational waters, the District does not operate a beach notification program under the BEACH Act. Therefore, DOEE has not adopted EPA's recommended "beach action value" of 235 cfu/100 mL for *E. coli*, which would operate as a single sample maximum and prevent the public from being exposed to rates of *E. coli* higher than this level.⁴⁶

The use of a single sample maximum like a beach action value is especially important to protect children, and DOEE's lack of a beach notification program makes its waters particularly perilous for this sensitive population. EPA has admitted that its epidemiological studies found a greater association between illness and water quality for children, and accordingly recommended that states provide real-time daily warnings about water quality to families through the use of a beach action value or similar daily notification program.⁴⁷ DOEE has not adopted this type of program to protect children recreating in its waterways. Barring a daily notification program, DOEE should, at a minimum, retain its 30-day geometric mean duration.

E. The effects of climate change will exacerbate the inaccuracies caused by longer duration periods.

The District has not considered the effects of climate change nor accounted for these effects in amending its water quality standard for *E. coli*. According to DOEE, the District's drainage infrastructure is designed to manage a 15-year storm event, defined as 5.5 inches of rain.⁴⁸ By the 2020s, a 15-year storm will bring 6.8 inches of rainfall on average, and 8 inches

⁴⁵ See, e.g., Canoe & Kayak Magazine, "Best Paddle Towns: Washington, D.C.," (May 12, 2015), <https://www.canoekayak.com/travel/best-paddle-towns-washington-d-c/>; NBC News, "U.S. Whitewater Spots Worth a Visit," (Apr. 9, 2009), http://www.nbcnews.com/id/30113362/ns/travel-active_travel/t/us-whitewater-spots-worth-visit/#.WhRLaUqnGUK.

⁴⁶ See, e.g., EPA 2012 Recreational Water Quality Criteria at 44.

⁴⁷ EPA 2012 Recreational Water Quality Criteria at 31-32.

⁴⁸ DOEE, Kate Johnson, *Climate Change Projections for Washington, DC* at 9, http://www.chesapeake.org/stac/presentations/258_KJohnson_Climate%20Projection%20Presentation%20STAC%20Workshop.pdf.

by the 2080s.⁴⁹ DOEE has already recognized that its existing infrastructure will flood more frequently as the amount of precipitation in storm events rises, leading to increases in CSO overflows.⁵⁰ Because CSO overflows cause spikes in *E. coli* levels in the impacted waters, DOEE should anticipate more frequent fluctuations in the data in coming years. These more frequent spikes in *E. coli* levels make the need for a shorter duration period especially critical, as longer geometric means average out the spikes, making them essentially disappear for purposes of water quality assessment.

F. A 90-day period is not needed to obtain a sufficient sampling size.

In its informal memo supporting the change to a 90-day geometric mean, DOEE stated that “[o]ne benefit of utilizing a longer averaging period for calculation of the geometric mean values and STV for *E. coli* is that there is a greater likelihood of having a sufficient number of samples at a given location in a 90-day period than a 30-day period.”⁵¹ Instead of measuring compliance over longer periods of time at its current level of infrequent sampling, DOEE should simply increase the amount of monitoring it conducts. Increasing the sampling frequency will lead to more accurate and protective implementation of the standards.

DOEE appears to be routinely monitoring its river segments for *E. coli* once monthly, with the exception of just three Anacostia locations and three Potomac locations which were monitored somewhat more frequently in June through September of 2014-2017, up to weekly monitoring at the most in those four months at those limited stations.⁵² In other words, in most stations in most months DOEE does not have sufficient data to take a 30-day geometric mean and must instead use a single monthly sample value to measure compliance. DOEE’s proposed rule fails to solve this problem, as it does not prescribe a greater frequency of sampling.⁵³ EPA does not view sampling frequency as an appropriate component of water quality standards, but nonetheless recommends a minimum of weekly sampling because more frequent sampling will lead to more accurate water quality characterizations and will “result in more meaningful

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ DOEE, unpublished memorandum entitled *Recreational Water Quality Criteria Implementation* (on file with author).

⁵² See DOEE *E. coli* monitoring data for Anacostia and Potomac River locations between 2011 and 2016 (on file with author); DOEE Summer 2017 Chart of Measurements from Potomac and Anacostia Rivers, https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/Pot%20%26%20Ana%20Riv%20Summer%202017%20Prime%20Contact_0.pdf; see also District of Columbia, *Final Total Maximum Daily Load for Fecal Coliform Bacteria in Upper Anacostia River, Lower Anacostia River, Watts Branch, Fort Dupont Creek, Fort Chaplin Tributary, Fort Davis Tributary, Fort Stanton Tributary, Hickey Run, Nash Run, Popes Branch, Texas Avenue Tributary* (June 2003) (stating that “[d]ata is collected on fecal Coliform typically monthly.”).

⁵³ DOEE Notice of 2016 Triennial Review Proposed Rulemaking at 2.

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attainment determinations.”⁵⁴ Indeed, DOEE’s current *E. coli* standard is based on five samples a month, and this level of sampling would be an improvement over a once monthly monitoring program.⁵⁵ Regardless of whether a sampling frequency is expressed in the standard, DOEE ought to be monitoring more frequently, and at least weekly at all locations, in order to protect human health and garner more accurate data.⁵⁶ Weekly (or ideally daily) sampling should not place an undue burden on DOEE, as some Riverkeeper nonprofit organizations around the country already voluntarily conduct weekly *E. coli* monitoring at recreational waterways with limited budgets.⁵⁷

Commenters ask that DOEE clarify how it intends to implement its proposed standard, including the frequency of sampling, in a public policy statement or guidance document. Commenters further request that DOEE conduct at least weekly, or ideally daily, sampling at all monitoring locations.

V. THE *E. COLI* STATISTICAL THRESHOLD VALUE SHOULD BE REMOVED OR AMENDED, AND THE GENERAL TEN PERCENT EXCEEDANCE ALLOWANCE FOR CONVENTIONAL POLLUTANTS SHOULD BE REMOVED.

The STV ten percent exceedance allowance in DOEE’s proposed rule weakens DOEE’s *E. coli* standard and should be removed from the final rule. DOEE’s proposed new STV of 410 cfu/100 mL would replace the prior use of a “single sample value” measurement of 410 cfu/100 mL, based on EPA’s 2012 recreational water quality criteria recommendations.⁵⁸ In its 2012 criteria, EPA explained that it used the statistical distribution of the 30-day geometric mean to calculate the sampling result at which an agency can be 90% confident the 30-day geometric mean will be exceeded. This 90% confidence level, which is 410 cfu/100 mL for the 126 cfu/100 mL *E. coli* standard, is the same number that DOEE previously used for its single sample maximum, derived in the same exact way. In other words, DOEE is proposing to simply change this value from a number that should not ever be exceeded to a number that can be exceeded ten percent of the time. This change constitutes impermissible backsliding under the CWA (33 U.S.C. § 1342(o)).⁵⁹ As a result, the STV should be removed from the standard.

⁵⁴ EPA 2012 Recreational Water Quality Criteria at 42.

⁵⁵ 21 DCMR § 1104.8.

⁵⁶ *Id.*

⁵⁷ *See, e.g.*, Coosa Riverkeeper Swim Guide, <https://www.coosariver.org/swimguide/>.

⁵⁸ EPA 2012 Recreational Water Quality Criteria at 1.

⁵⁹ While it is true that DOEE’s current standard states that the single sample value should be used for “assessing water quality trends only,” this current use must at a minimum apply to CWA Total Maximum Daily Load allocations and other measurements needed to protect public health. *See, e.g.*, Anacostia Riverkeeper and Potomac Riverkeeper, Comments on Draft Revisions to Total Maximum Daily Loads for Bacteria in Watersheds in the District of Columbia announced in D.C. Reg. Vol. No. 6, Notice ID: 4175867 (Feb. 8, 2013) (Mar. 25, 2013).

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If DOEE adopts Commenters' proposed amendment of changing the geometric mean duration to 24 hours, the STV could be removed altogether without adverse consequence because the 126 cfu standard would accurately protect human health to an illness rate of 3.6%. However, as EPA recognized in its 2012 criteria, a 30-day geometric mean is "not sensitive to" spikes in *E. coli* data.⁶⁰ Therefore, if DOEE retains its 30-day geometric mean, or changes its mean to a 90-day duration, those spikes will continue to unabatedly endanger aquatic recreators unless a second standard is used in conjunction with the geometric mean. The fundamental flaw in longer-duration geometric means could, accordingly, justify the need for a second standard like a STV.

However, even if DOEE retains a lengthy geometric mean duration and an accompanying STV, the protective effect of the STV will be minimized unless DOEE sets a cap for the acceptable amount of exceedance. For example, if ten samples are taken in a thirty-day period, one sample could be as high as 5,000 cfu/100 mL, and the water body would still be in compliance with the STV standard, provided all other nine samples are below the STV. DOEE cannot adopt a standard that permits these excessive spikes because they endanger human health and therefore do not protect the human contact recreational use. Instead, if DOEE retains a lengthy geometric mean and a STV value, DOEE should cap the allowable amount of exceedances for the STV. This added cap would provide a greater level of protection for the public than the current proposed rule, and would be especially appropriate in the District due to the high frequency of severe *E. coli* spikes from CSO overflows.

Finally, the STV is duplicative of DOEE's new general, catchall 10% exceedance allowance when assessing water bodies' attainment of conventional pollutant standards, as outlined in footnote "a" to Table 1.⁶¹ As such, the STV provision causes confusion regarding whether DOEE will apply two separate ten percent exceedance values when determining attainment for *E. coli*. If DOEE retains the STV in some form, it should amend the standard to clarify that only the STV ten percent exceedance allowance will be applied to sampling data, and only for the purpose of assessing water quality standards attainment, as intended by EPA's 2012 recommendations.⁶²

For all conventional pollutants, including *E. coli*, the generic 10% exceedance allowance in footnote "a" to Table 1 should unequivocally be removed. The addition of this new, catchall exceedance allowance is not based on science, is unexplained, and significantly weakens the District's water quality standards, leading to further backsliding under the CWA (33 U.S.C. § 1342(o)).

⁶⁰ EPA 2012 Recreational Water Quality Criteria at 39.

⁶¹ DOEE Notice of 2016 Triennial Review Proposed Rulemaking at Table 1, n. a.

⁶² EPA 2012 Recreational Water Quality Criteria at 39-40.

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We urge DOEE to address in detail each of the foregoing concerns before finalizing the proposed rule. Any questions regarding these comments may be directed to Anna Sewell asewell@earthjustice.org and 202-797-5233, or Jennifer Chavez at jchavez@earthjustice.org and 202-797-5208.

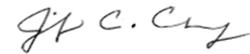
Sincerely,



Anna M. Sewell

Earthjustice

asewell@earthjustice.org



Jennifer C. Chavez

Earthjustice

jchavez@earthjustice.org

together with:

Emily Franc

Anacostia Riverkeeper

riverkeeper@anacostiariverkeeper.org

Jim Foster

Anacostia Watershed Society

jfoster@anacostiaws.org

Bruce Gilmore

Audubon Naturalist Society

Bruce.Gilmore@anshome.org

Brent Bolin

Clean Water Action

bbolin@cleanwater.org

Chris Weiss

DC Environmental Network

cweiss@dcen.net

Rebecca Hammer

Natural Resources Defense Council

rhammer@nrdc.org

Caitlin Wall

Potomac Conservancy

wall@potomac.org

Phillip Musegaas

Potomac Riverkeeper Network

phillip@prknetwork.org

Matthew Fleischer

Rock Creek Conservancy

mfleischer@rockcreekconservancy.org

Marchant Wentworth

Wentworth Green Strategies

marchant_wentworth@msn.com