

**Study on the Socioeconomic,
Institutional, Technological, and
Environmental (SITE) Impacts of
Applying and Enforcing Updates to
Water Quality Standards**

**Department of Energy and
Environment
Natural Resources Administration
Water Quality Division**

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Executive Summary

This 2021 Socioeconomic, Institutional, Technological, and Environmental (SITE) impacts study contains the District Department of Energy and Environment's (DOEE's) periodic review of its water quality standards (WQS). The purpose of this triennial review is to ensure that the District maintains up to date WQS that are reflective of the most recent information on pollutant impacts, while also recognizing and addressing the distinctive nature of the District's waters.

After review of the existing WQS, DOEE proposes to make several revisions through this triennial review, including:

Proposed revisions to the District's criteria:

- Turbidity
 - Retain the increase of 20 NTU above ambient criterion and via a footnote establish numeric ambient equivalents for the District's two ecoregions, Piedmont and Coastal Plain.

Proposed additions to the District's numeric criteria:

- Diazinon
 - Add the diazinon, an organophosphate pesticide, criteria of 0.3397 micrograms per liter ($\mu\text{g/L}$) for the freshwater acute criterion and 0.1699 $\mu\text{g/L}$ for the freshwater chronic criterion.

Proposed correction to metal criteria conversion factor reference:

- Section 1105.10
 - Correct the oversight of mercury's omission in the metal criteria that require a conversion factor from total recoverable to dissolved metal.

Proposed revisions to the District's ground water criteria:

- Table in Section 1155.3
 - Update the arsenic ground water criterion from 0.05 milligrams per liter (mg/L) to 0.01 mg/L and the early warning value from 0.01 mg/L to 0.002 mg/L.
 - Correct an error in the table and the footnotes for the silver and mercury criteria.

This document is designed to inform the public and stakeholders regarding proposed revisions to WQS. It includes a detailed technical discussion of the proposed revisions to water quality standards that are expected to be promulgated in the 2021 triennial review. It also:

- Provides an informative forecast of proposed revisions to District WQS and potential impacts in adopting them.

- Educates the public and stakeholders by providing technical, scientific, and regulatory background on the proposed revisions.
- Explains the rationale for each of the proposed revisions.
- Fosters a better public understanding of the triennial review process.
- Promotes intergovernmental coordination with local, District, and federal agencies.
- Documents the details of the proposed revisions in a thorough manner.

This document provides an explanation of the triennial review process and the specific revisions proposed for the 2021 triennial review.

Introduction

The District is required by the federal Clean Water Act (U.S. Congress 1972)¹ and the District's Water Pollution Control Act² to conduct a review of water quality standards and the classification of beneficial (designated) uses at least once every three years. This process is called a triennial review.

Per § 8-103.04. (c) of the District's Water Pollution Control Act of 1984, the District is required to consider the socioeconomic, institutional, technological, and environmental (SITE) impacts of applying and enforcing changes to the classifications, criteria, and guidelines before promulgating changes to the water quality standards. The four separate categories of SITE impacts are closely interrelated. Therefore, for the purposes of this study, they are consolidated into "economic impacts" and "environmental impacts" to eliminate overlap and redundancy. "Economic impacts" are the overall effect that costs and spending related to the proposed revisions have on the local economy. For example, economic impacts might occur where the proposed actions are substantial and affect factors such as employment, income, and property values. Smaller economic impacts could occur if there are increased or decreased costs incurred by DOEE or dischargers that may be related to monitoring or complying with the proposed revisions. "Environmental impacts" are the overall effects that the proposed revisions have on the quality of the aquatic and human environment. For example, proposed changes in water quality standards are designed to improve protection of aquatic life and improve public confidence in the District's water quality program.

Triennial Review

As described in EPA's Water Quality Standards Handbook (U.S. EPA, 2014), the CWA requires states and authorized tribes to periodically review and, as appropriate, adopt new or revised WQS to meet the requirements of the CWA. States and tribes must submit any new or revised

¹ EPA's implementing regulations for the CWA are found in 40 CFR 131.20

² D.C. Official Code 8-103.04(a)

WQS resulting from such a review to the EPA for review and approval under CWA Section 303(c). DOEE utilizes the triennial review process to evaluate potential revisions to its WQS to further the District's water quality objectives.

For each triennial review, the general process includes the following steps:

- Evaluate existing WQS, program needs, and new/updated information on various water quality criteria. This evaluation can take place over multiple triennial review cycles and may result in proposals for WQS revisions in different triennial review cycles.
- Identify potential WQS revisions for the individual triennial review cycle. Gather data on the impacts of the proposed revision, as well as information justifying the proposed revision. Utilize technical support resources, such as internal DOEE staff, U.S. EPA staff, water quality staff from other states in the region, and outside technical experts, as needed, to provide feedback on proposed revisions.
- Prepare the SITE document.
- Prepare a redline/strikeout version of the proposed changes, as well as any support material necessary, and submit redline/strikeout version of proposed WQS revisions, along with technical support material as necessary, for required review and approval. Review by and approval from the following groups is required before next steps can be taken:
 - DOEE Water Quality Division
 - DOEE Office of General Counsel
 - District's Office of Policy and Legislative Affairs
 - District's Office of Attorney General
- Incorporate changes/comments required after review in the previous step and develop a preamble and an updated redline strikeout version of the proposed revisions for publication in the *DC Register* as a proposed rulemaking.
- Address comments on the proposed rulemaking as necessary.
- Publish the rulemaking in the *DC Register* as a final rulemaking.
- EPA review and approval.

Study Objective

The objective of this study is to satisfy the legal requirement in the District's Water Pollution Control Act that, before promulgation, potential impacts of applying and enforcing the water quality standards on public and private sector entities in the District, the general public, and the aquatic life found in District waters are considered. In addition, the study will specifically evaluate the potential SITE impacts that the proposed revisions to the water quality standards would have on water quality, pollution control, National Pollutant Discharge Elimination System (NPDES) permittees, and the designated uses of District waters.

Methodology

The SITE study was carried out by DOEE's Water Quality Division staff and their contractors, and focused on review of available regulatory documents, District water quality data, and NPDES permittee discharge data. The study does not undertake new research or collect new data connected to the proposed revisions. No additional consultations with District residents or stakeholders were conducted. However, opportunity for public comment will be available upon DOEE's issuance of the Notice of Proposed Rulemaking for the 2021 triennial review.

The document and data review process examined the proposed revisions to the District's water quality standards with respect to consistency with federal and District regulations; protectiveness of human health and aquatic life; and clarity for the general public, stakeholders, and regulated entities. Existing water quality data were also evaluated for the presence of pollutants for which revised criteria are being proposed. Findings concerning the proposed revisions were documented and summarized whenever found.

The principal regulatory documents reviewed included:

- District water quality regulations (DCMR Chapter 21-11. Water Quality Standards)
- Federal water quality regulations (i.e., CWA)
- Federal technical documents (EPA guidance, EPA criteria fact sheets, etc.)
- Water quality standards regulations for other states
- NPDES permits and permit applications
- NPDES Discharge Monitoring Reports
- TMDLs
- The collection of information assembled from on-line searches
- Information from DOEE staff.

The principal water quality data reviewed included:

- Ambient water quality monitoring (including data from DOEE and USGS)
- NPDES permittee Discharge Monitoring Report (DMR) data

Document Review and Comment

DOEE and its contractors developed a series of technical memoranda and other documents summarizing the proposed revisions to regulatory text and numeric criteria. These documents were then circulated to a select group of staff at DOEE and EPA Region 3 for review and comment. The goal of the review and comment process was to validate impacts found through the document and data review process, gain new insights into impacts, and uncover unanticipated potential impacts based on anecdotal evidence and the opinions, thoughts, and

experiences of key staff to solicit their expertise in their respective areas of work. They have direct local experience with water quality issues, are knowledgeable about existing data and research initiatives, and can foresee potential impacts associated with the proposed revisions. The information gained through this process strengthened and added depth to the information obtained through the document and data review process.

The revisions that are examined in this analysis of SITE impacts are:

- Revision of the turbidity criteria to include numeric equivalents for ambient;
- Addition of numeric criteria for diazinon;
- Revision of the arsenic ground water quality criteria; and
- Correction of the omitted mercury reference in the metal criteria that require a conversion factor from total recoverable to dissolved metal.

Clarification of Turbidity Criteria

Background

The District's current turbidity criteria in the District's water quality standards need to be clarified as the criteria have been inconsistently interpreted.

For example, the criteria have been interpreted to mean that the turbidity criteria are 20 Nephelometric Turbidity Units (NTU), as opposed to 20 NTU above ambient. Also, permit applicants are confused about what the criteria is and how to comply with the criteria.

The turbidity criteria are interpreted correctly for water quality certifications, which DOEE issues. Permittees may be required to take water samples 25 feet upstream and downstream of their project's limit of disturbance in surface waters to ensure that their project complies with the turbidity criterion. In these cases, the criterion is interpreted to mean that if the downstream measurement is 20 NTU above the upstream measurement, then the project is out of compliance.

To help clarify the turbidity criteria, DOEE proposes to numerically define "ambient" using an evidence-based approach that protects the surface water's designated use. The ambient equivalent for Piedmont river mainstems and tributaries (i.e., Potomac River west of Rock Creek and Rock Creek) is one (1) NTU. The ambient equivalent for Coastal Plain river mainstems and tributaries (i.e., Potomac River east of Rock Creek and Anacostia River) is six (6) NTU.

Rationale

EPA suggested that DOEE use Ambient Water Quality Criteria Recommendations, Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion IX (EPA, 2000a, [EPA 822-B-00-019](#)), to find a scientifically defensible section methodology to determine a numeric equivalent of ambient that is protective of the use, such

as recreational and aquatic life use. The aquatic life use in District water quality standards is Class C waters.

EPA (2000a) recommends that reference site data is necessary to establish protective nutrient criteria, of which turbidity is considered a response variable to increased nutrient loading. There are no reference site data in the District as all 39 miles of surface waters are impaired (DOEE, 2020, [Integrated Report](#)). As a result of those impairments, DOEE considered an alternative approach provided by EPA (2000a) when reference streams are not identified.

“When reference streams are not identified, the second method is to determine the lower 25th percentile of the population of all streams within a region. The 25th percentile of the entire population was chosen by EPA to represent a surrogate for an actual reference population. Data analyses to date indicate that the lower 25th percentile from an entire population roughly approximates the 75th percentile for a reference population (see case studies for Minnesota lakes in the Lakes and Reservoirs Nutrient Criteria Technical Guidance Document [U.S. EPA, 2000a], the case study for Tennessee streams in the Rivers and Streams Nutrient Criteria Technical Guidance Document [U.S. EPA, 2000b], and the letter from Tennessee Department of Environment and Conservation to Geoffrey Grubbs [TNDEC, 2000]). New York State has also presented evidence that the 25th percentile and the 75th percentile compare well based on user perceptions of water resources (NYSDEC, 2000).”

Page 11 of EPA (2000a).

To further prove the link between the above percentile approach and protecting aquatic life and recreational uses, EPA states the following:

“EPA’s ecoregional nutrient criteria are intended to address cultural eutrophication—the adverse effects of excess nutrient inputs. The criteria are empirically derived to represent conditions of surface waters that are minimally impacted by human activities and protective of aquatic life and recreational uses. The information contained in this document represent starting points for States and Tribes to develop (with assistance from EPA) more refined nutrient criteria.” Page v of EPA (2000a).

Proposed Changes

Table 3 explains the proposed changes for the turbidity criteria.

Table 3. Turbidity

Current Text	Proposed Revision	Rationale
<p>Addition DOEE is proposing to add a footnote to the numeric criteria for turbidity, while keeping the current criteria of 20 NTU above ambient.</p>	<p>^f The ambient equivalent for Piedmont river mainstems and tributaries (i.e., Potomac River west of Rock Creek and Rock Creek) is 1 NTU. The ambient equivalent for Coastal Plain river mainstems and tributaries (i.e., Potomac River east of Rock Creek and Anacostia River) is 6 NTU.</p>	<p>Adding an ambient equivalent to turbidity will clarify the District's current turbidity criteria in the District's water quality standards, as the criteria have been inconsistently interpreted.</p>

Supporting Data Analysis to Refine and Clarify Criteria

DOEE analyzed 20 years' worth of data generated by DOEE's Monitoring and Assessment Branch. The data set includes over 11,000 samples taken from over 50 sites across the District's rivers and streams. DOEE performed an analysis to identify outliers. An outlier analysis was performed using the following equation:

$$75th\ percentile + (1.5 \times (75th\ percentile - 25th\ percentile)).$$

Values greater than 41 NTU were identified as outliers. Approximately seven percent (7%) of the data set were identified as outliers. Rather than delete outliers, DOEE kept outliers in the data set, but censored data greater than 800 NTU. 800 NTU is an impossibly high turbidity value and values greater than this represents one-tenth of one percent (0.1%) of the data set. The summary statistics in Table 4 below represent 99.9 percent of the 20 years' worth of data. More detailed data information can be found [here](#).

All turbidity data for District rivers and streams were grouped into two ecoregions. The first region was the Piedmont, which is in the northwest of the District. The second region, the Coastal Plain, is located east of the Fall Line. Piedmont river mainstems and tributaries are the Potomac River northwest of the Theodore Roosevelt Bridge and its tributaries, and Rock Creek. The Coastal Plain river mainstems and tributaries are the Potomac River east of the Theodore Roosevelt Bridge and the Anacostia River and its tributaries. Summary statistics that include the 25th percentile of each ecoregion were calculated for river mainstems and tributaries.

Table 4. Summary statistics for turbidity collected from District rivers and streams (CP = Coastal Plain and P = Piedmont).

Turbidity (NTU)							
Count of data	Avg.	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile	
11,350	17.54	2.10	5.00	10.00	18.80	33.34	

Turbidity (NTU) by Region							
Region	Count of data	Avg.	10th percentile	25th percentile	50th percentile	75th percentile	90th percentile
CP	9,066	18.99	3.64	6.39	11.01	20.00	35.00
P	2,284	11.82	0.20	1.11	4.40	10.00	20.00

Turbidity (NTU) - By Region and Trib/main								
Trib	Region	Count o..	Avg.	10th pe..	25th pe..	50th pe..	75th pe..	90th pe..
Mainstem	CP	7,435	19.69	4.98	7.65	12.43	20.00	35.00
	P	1,606	14.50	1.48	3.00	5.60	11.81	25.00
Tributary	CP	1,631	15.80	0.67	2.80	5.25	12.60	29.82
	P	678	5.46	0.00	0.18	0.46	2.35	7.91

Economic Impacts

Economic impacts associated with the clarification of the turbidity criteria would occur if the revised criteria resulted in large-scale changes in the management of the District’s waterways, or in changes to the management of permits, processes, or projects for discharges into the District’s waterways. However, because the proposed revisions only modify existing water quality criteria, they are not expected to require the implementation of major new water or discharge management strategies. At most, they may require modification of existing processes and procedures for monitoring or controlling turbidity for entities already required to monitor or control turbidity. However, we expect that the addition of the numeric equivalents for ambient will clarify monitoring and permitting processes for both the regulated community and the regulating programs. The proposed revisions are not expected to have direct impacts on major economic drivers such as employment, income, or property values in the District. In addition, the revisions to the turbidity criteria are expected to impose minimal additional cost burden, if any, on industry, utilities, government agencies, or NPDES permittees because the proposed revisions will not change the ability of permittees or projects to discharge and may

require only minor modifications in turbidity monitoring or control. Therefore, economic impacts associated with the revision of numeric criteria for turbidity are expected to be minimal.

Costs to DOEE to implement the updated criteria are expected to be minimal. The equipment used to monitor turbidity in the District will not need to be replaced. In addition, the monitoring and reporting efforts required to produce water quality assessments and the biennial Integrated Water Quality Assessment reports in the District will not need much modification.

Some cost benefits might be realized because of the revision. First and foremost, the proposed revision clarifies how the turbidity criteria are supposed to be interpreted and applied. This revision can lead to a more accurate assessment of impairments. For example, the District of Columbia Water Quality Assessment 2018 Integrated Report notes five (5) Category 5 water bodies for which a designated use is not being supported or is threatened based on turbidity data (DC DOEE, 2018). They are:

- Upper Rock Creek – segment 1
- Lower Rock Creek – segment 2
- Melvin Hazen Valley Branch
- Dalecarlia Tributary
- Oxon Run

If these impairment determinations were based on misapplication of the current criterion, this will lead to a reduction in Category 5 impairment listings and the number of scheduled turbidity-based total suspended solids TMDLs. This, in turn, would provide administrative cost savings as well as pollution reduction cost savings.

Environmental Impacts

The addition of a numeric equivalent for ambient in the turbidity criteria is expected to have a positive impact on the environment. It is expected that this revision will clarify the use of turbidity criteria for assessment purposes, leading to more accurate and meaningful assessments of water clarity.

The impact of proposed revisions to turbidity criteria were also evaluated with respect to impairment assessment and TMDL development and implementation. As discussed earlier, the District uses water quality criteria for turbidity as one of its measures for water clarity, along with Secchi depth and chlorophyll-*a*. However, TMDLs associated with water clarity are typically developed for total suspended solids (TSS). The District does not have any TMDLs for turbidity, but it does have TMDLs for TSS. Analysis of existing TSS TMDLs was conducted to determine how the proposed revisions to turbidity criteria would impact these TMDLs. The focus of this analysis was an evaluation of the impairment listing and the TMDL endpoints for TSS TMDLs.

With respect to TMDL development and TMDL implementation, revision of the turbidity criteria will have no impact because none of the TMDLs are based on turbidity water quality criteria, nor are any TMDLs dependent on turbidity endpoints.

Addition of Diazinon Criteria

Background

Diazinon is an insecticide that can be detrimental to human health and aquatic life. EPA banned the use of diazinon for residential purposes in 2004. Diazinon is still used for agricultural purposes, but less so following EPA's ban.

As described by the U.S. Department of Health and Human Services (DHHS, 2008):

Diazinon is the common name of an organophosphorus insecticide used to control pest insects in soil, on ornamental plants, and on fruit and vegetable field crops.

The National Pesticide Information Center (NPIC) provides a more current (2021) description:

Diazinon is an insecticide that belongs to a group of chemicals known as organophosphates. Diazinon is used in agriculture to control insects on fruit, vegetable, nut and field crops. It is also used to make ear tags for cattle. Diazinon has been used in the United States since 1956. Before the cancellation of residential uses in 2004, diazinon was used for household insects, lawn and garden insect control, and to control insects on pets.

Rationale

In previous public comments on the District's water quality standards updates, EPA Region 3 encouraged the District to adopt the nationally recommended aquatic life ambient water quality criteria for diazinon ([EPA-822-R-05-00](#)).

Pesticide use within the District is regulated by DOEE under [DCMR Title 20, Chapters 22-25](#). Currently, there are no reports of diazinon-based pesticide products for sale in the District. Similarly, none of the certified pesticide applicators in the District report the use of diazinon in their practices.

One diazinon-based pesticide product, Corathon, is registered in the District. Corathon has very specific veterinary uses for beef and dairy cattle. Cattle ear tags containing Corathon are used to control flies and ticks in cattle. Despite the registration of Corathon in the District, the absence of beef and dairy cattle makes it unlikely that Corathon is used or applied in the District.

EPA and USGS sponsored several regional and national surveys of pesticides, include the 1998 *USGS Study of Water Quality in the Potomac River Basin Maryland, Pennsylvania, Virginia, West Virginia and the District of Columbia, 1992–96* (USGS, 1998), and the 2017 USGS report on

Water Quality Trends in the Nation's Rivers and Streams, 1972-2012-Data Preparation, Statistical Methods, and Trend Results (USGS, 2017). Neither survey had any specific information on the presence of diazinon or the concentration of diazinon in District waters.

The USGS conducted a separate study focused on Rock Creek that investigated the presence of diazinon and other water quality parameters and observed trends (USGS, 2002). This study refers to the detection of diazinon in 1999 and 2000 at four of five stations along Rock Creek in the District. The concentration of diazinon at the lower most station above Q Street was judged to exceed the established freshwater criteria for diazinon. This report finds that:

The Rock Creek Basin is a mixture of urban/suburban and agricultural land use. Other studies generally show that urban/suburban areas tend to have higher insecticide concentrations, and agricultural areas tend to be higher in herbicides. Approximately equal total concentrations of herbicides and insecticides (over the 20-month sampling period) were found during this study, indicating that the water quality in Rock Creek is affected by the surrounding land use.

Data retrieved from the National Water Quality Monitoring Council (NWQMC) Water Quality Data Portal (NWQMC, 2021) documented that diazinon was detected in 24 samples at USGS stations along Rock Creek and in smaller tributaries within the District over the period 1994 to 2000 (Table 1). A “not detected” finding was found in a single USGS sample taken at the Blue Plains WWTP outfall in 2002. The USGS also reported that diazinon was not detected in 40 samples taken at Rock Creek and tributary stations during 2007-2008. No other recent diazinon data is reported.

Table 1 Summary of USGS Diazinon Results 1994 to 2000

Date	USGS Station	Station Location	Detection Result	Result (ug/L)
8/24/1994	01648000	Rock Creek at Sherril Drive, Washington, DC	Detected	0.210
9/19/1994	01651805	Watts Branch near Washington, DC	Detected	0.065
9/21/1994	01648015	Broad Branch at Washington, DC	Detected	0.024
9/20/1994	0165258860	Oxon Run at Washington, DC	Detected	0.009
2/18/1999	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.007
3/9/1999	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.003
5/4/1999	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.006
5/23/1999	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.120
5/24/1999	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.127
5/24/1999	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.152
6/23/1999	01648998	Rock Creek above Q St, Washington, DC	Detected	0.083

Date	USGS Station	Station Location	Detection Result	Result (ug/L)
6/23/1999	01647998	Rock Creek below W. Beach Dr, Washington, DC	Detected	0.063
6/24/1999	01648004	Pinehurst Br at Oregon Ave, Washington DC	Detected	0.036
6/25/1999	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.038
7/14/1999	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.028
10/13/1999	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.060
1/10/2000	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.019
2/9/2000	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.011
3/21/2000	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.054
5/16/2000	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.028
6/22/2000	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.307
7/26/2000	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.079
9/11/2000	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.035
9/26/2000	01648010	Rock Creek at Joyce Rd, Washington, DC	Detected	0.106

Proposed Changes

The District does not currently have numerical water quality criteria for diazinon in its WQS (DCMR Title 21, Chapter 11). The District plans to add the EPA-recommended water quality criteria for diazinon for protection of the Class C Aquatic Life designated use.

The proposed District water quality criteria for diazinon are presented in Table 2.

Table 2. Proposed Numeric Criteria for Diazinon

Constituent	Criteria for Class C	
	CCC 4-Day Avg	CMC 1-Hour Avg
Diazinon	0.17 ug/L	0.17 ug/L

Economic Impacts

Economic impacts refer to costs and benefits associated with the revision of the District's WQS. Economic costs are expected to be minimal because the revision adds one new organic compound to the large list of regulated organic compounds for which there are numeric criteria. No capital investments in pollution equipment are envisioned. Similarly, no significant investment in instrumentation or analytical capacity is expected. The proposed criteria for diazinon are not expected to have any impact on known impairments and existing TMDLs. Given that the presence of diazinon in District waters has not been documented recently and that there are no diazinon-based products for sale within the District following the EPA ban in

2004, there are no expected impacts to the federal government, the District government, DC Water, WMATA, or businesses.

There are no new costs to the public or to NPDES permit holders beyond the minor administrative costs that accrue for including diazinon in the District's WQS.

Environmental Impacts

Environmental impacts consider the overall effect that the proposed revision to District WQS has on the quality of the aquatic and human environment.

No current NPDES permits in the District contain effluent limits for diazinon, nor do any permits have monitoring requirements for diazinon. There is no evidence that diazinon is present in the discharge of NPDES permit holders in the District. EPA's Enforcement and Compliance History Online (ECHO) database was accessed to search for diazinon records associated with NPDES permits and effluent monitoring in the District. No records of diazinon were found.

Certified pesticide applicators in the District are subject to the District's Pesticide General Permit (PGP) (DOEE, 2012b), which regulates pesticide application, and includes requirements to implement technology-based effluent limitations and develop and implement a Pesticide Discharge Management Plan. The District's PGP requires compliance with the EPA PGP. Under EPA's PGP, diazinon is listed in the National Marine Fisheries Service's biological opinion as a pesticide as its "use would jeopardize the continued existence of ESA-listed species and/or adversely modify designated critical habitat." Thus, any applicators would need to determine if they are eligible for coverage for diazinon use under the PGP before applying it.

There is only one diazinon-based pesticide product (Corathon) registered in the District. It is unlikely that this product is utilized in the District based on its intended agricultural use. In addition, all pesticide use is covered under the District's PGP. Therefore, use of diazinon by pesticide applicators would need to conform to the requirements of the District's PGP.

Adding the EPA recommended water quality criteria for diazinon to its Water Quality Standards is not expected to affect permitting and compliance.

The proposed revision to WQS is expected to provide improved protection of human health and aquatic life and improved public confidence in the District's water quality program. No negative environmental impacts are expected.

Correction of Metals Conversion Factor Reference

Background

During the triennial review, the omission of mercury in the list of metals that require a conversion factor from total recoverable metal into dissolved metal was noted.

Rationale

To correct the oversight, mercury will be added into subsection 1105.10 of metals that require a conversion factor that is listed in Table 2b of subsection 1104.8.

Proposed Changes

The current subsection 1105.10 wording is as follows:

The numerical criteria for dissolved cadmium, hexavalent chromium, trivalent chromium, copper, lead, nickel, silver, and zinc shall be calculated by multiplying the criteria for these metals as specified in Table 2 of subsection 1104.8 by the EPA Conversion Factors specified in Appendix B of the EPA National Recommended Water Quality Criteria: 2002, EPA-822-R-02-047, November 2002. This conversion is required because the numerical values for these metals in Table 2 of this Chapter were established for total recoverable metals, but are being used for dissolved metals.

The proposed subsection 1105.10 wording is as follows:

The numerical criteria for dissolved cadmium, hexavalent chromium, trivalent chromium, copper, lead, mercury, nickel, silver, and zinc shall be calculated by multiplying the criteria for these metals as specified in Table 2 of subsection 1104.8 by the EPA Conversion Factors specified in Appendix B of the EPA National Recommended Water Quality Criteria: 2002, EPA-822-R-02-047, November 2002. This conversion is required because the numerical values for these metals in Table 2 of this Chapter were established for total recoverable metals but are being used for dissolved metals.

Economic Impacts

There are no foreseen negative impacts to this correction. The increased consistency within the WQS is benefit.

Environmental Impacts

There are no foreseen negative impacts to this correction. The increased consistency within the WQS is benefit.

Revision of Ground Water Quality Standards

Background

DOEE is proposing to update Section 1155.3 in the District's ground water standards. DOEE is updating the arsenic criterion for the groundwater quality standards. The current standard of 0.050 milligrams per liter (mg/L) was promulgated in 1993. The change is to update the value based on EPA's maximum contaminant level for arsenic in drinking water of 0.010 mg/L ([40 CFR 141.11\(a\)](#)).

There are also errors in the current table. The footnote for the silver ground water criterion is being deleted since it was originally placed there in error as no footnote is needed for silver, and the incorrect footnote for the mercury criteria is being deleted and being replaced with the correct footnote.

Rationale

DOEE is updating the arsenic criteria for the groundwater quality standards (GWQS). The GWQS are used to protect groundwater for its beneficial uses, thereby minimizing harm to human and ecological receptors. The District uses EPA's drinking water standards as groundwater is protected as a raw drinking water source. Arsenic is classified as a Class A human carcinogen by EPA (EPA, 2000b, [EPA 815-R-00-026](#)), and the current arsenic standard of 0.050 milligrams per liter (mg/L) was promulgated in 1993 based on EPA's drinking water standard at the time. Subsequently, EPA updated the arsenic standard based on health benefits, including reductions in the numbers of fatal and non-fatal lung and bladder cancers in a year, and the costs of implementation by the regulated community (EPA, 2001, [EPA 816-F-01-004](#), and 2000b). The change to District WQS is to update the groundwater quality standard for arsenic to EPA's current maximum contaminant level for arsenic at 0.010 mg/L ([66 FR 6976](#) and [40 CFR 141.62](#)). Following the procedure established in the Groundwater Regulations to determine the Early Warning Value (EWV) for inorganics, the EWV for arsenic will be 0.002 mg/L.

These changes are proposed to provide clarity and to correct previous oversights. The proposed table formatting will better differentiate the categories. Silver is not a synthetic chemical and should not have the current footnote referencing synthetic chemicals. The original footnote was placed there in error. The mercury footnote was incorrect in its symbology and text and is being replaced with the correct footnote, which states the correct detection limit, minimum level of quantitation, and the EPA method.

Proposed Changes

Current Ground Water Quality Standards

Constituent	Criterion	Early Warning Value
Trace Metals & Inorganics (maximum mg/L unless noted otherwise)		
Primary		
Arsenic	0.05	0.01 **
Mercury	0.002	0.0005 +
Silver	0.05	0.05 +

** : Early Warning Value is 20% of criterion.

* : Early Warning Value is 50% of criterion.

* : Early Warning Value for synthetic chemicals that have no natural source is at the practical quantitation limit.

NA: Not Applicable.

Proposed Ground Water Quality Standards

Constituent	Criterion	Early Warning Value
Trace Metals & Inorganics (maximum mg/L unless noted otherwise)		
Primary		
Arsenic	0.01	0.002 **
Mercury	0.002	0.0005 ‡
Silver	0.05	0.05

Notes:

** : Early Warning Value is 20% of criterion.

* : Early Warning Value is 50% of criterion.

+ : Early Warning Value for synthetic chemicals that have no natural source is at the practical quantitation limit.

‡ : The detection limit and minimum level of quantitation using EPA Method 1631.E, usually are dependent on the level of interferences rather than instrument limitations. The method detection limit (MDL; 40 CFR 136, Appendix B) for mercury has been determined to be 0.2 nanogram per liter (ng/L) when no interferences are present. The minimum level of quantitation (ML) has been established as 0.5 ng/L. An MDL as low as 0.05 ng/L can be achieved for low mercury samples by using a larger sample volume, a lower bromium chloride level (0.2%), and extra caution in sample handling (EPA Method 1631.E, Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry EPA-821-R-02-019 dated August 2002 at https://www.epa.gov/sites/default/files/2015-08/documents/method_1631e_2002.pdf).

NA: Not Applicable.

Economic Impacts

Economic impacts associated with these revisions of the groundwater standards are expected to be minimal. There should be minimal costs to implement the arsenic criteria update as sampling and treatment technologies to achieve the standard have been in use since EPA required them to be implemented after 2006.

The proposed text revisions will not require large-scale changes in the management of the District's waterways, or changes to the management of permits, processes, or projects with discharges into the District's waterways. These revisions are proposed solely to increase clarity and understanding. Therefore, no direct impacts to employment, income, or property values in the District are expected due to these proposed revisions. In addition, the revisions are not

expected to impose any additional cost burden on industry, utilities, government agencies, or NPDES permittees.

Several of the expected socioeconomic benefits associated with the revision of the text can be viewed as positive indirect impacts.

Environmental Impacts

Revision of the groundwater standards is expected to have a beneficial impact on the environment, primarily with respect to streamlining the management of the District's water resources and clarifying and unifying the regulations to the current policy.

SITE Conclusions

The District reviewed potential socioeconomic, institutional, technological, and environmental impacts associated with the proposed revisions to the District's water quality standards. No significant conflicting or detrimental impacts of the proposed revisions were identified. No major economic impacts resulting from the proposed changes were identified. In contrast, several positive socioeconomic and environmental impacts are expected because the proposed revisions add clarity to WQS and designated uses. Benefits to water quality assessment practices and communication with the residents of the District and stakeholders will likely result from the revisions and the added clarity about WQS they provide.

The District believes that adoption of the proposed addition of diazinon, the proposed revision for turbidity, the correction to the metals conversion factor reference, and the proposed updates to the ground water quality criteria will enhance the protection of water bodies and accelerate attainment of designated uses.

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