


Office of Water Management

Water Quality Standards
Site-Specific Criteria and Development

Draft Proposed Rulemaking

Water Resources Advisory Committee
March 16, 2023

Josh Shapiro, Governor

Richard Negrin, Acting Secretary

Purpose of the Rulemaking

Update the Commonwealth's water quality standards to reflect current scientific methods and guidance with respect to the development of site-specific criteria.

Update the mercury water quality criterion for Ebaughs Creek

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Site-Specific Criteria Development

Site-specific criteria afford the most appropriate level of protection to specific waterbodies.

Pennsylvania's current site-specific criteria development process was established in 1979.

Proposed updates will provide clarification on how to request site-specific criteria and when site-specific criteria may or may not be requested.

Site-Specific Criteria Development

Summary of updates to § 93.8d(a):

- Addition of “aquatic life” to (1).
- Addition of Table 5 and language regarding threatened and endangered species to (2).
- Addition of Table 3 to (3).

Site-Specific Criteria Development

§ 93.8d. Development of site-specific water quality criteria.

(a) The Department will consider a request for site-specific criteria, **or the Department may develop site-specific criteria on its own initiative,** when one or more of the following apply:

(1) There exist site-specific biological or chemical conditions of receiving waters which differ from conditions upon which the **aquatic life** water quality criteria were based.

(2) More stringent criteria are needed for a **[parameter]pollutant** listed in § 93.7**, Table 3 (relating to specific water quality criteria) or § 93.8c, Table 5 (relating to water quality criteria for toxic substances)** to protect more sensitive, intervening uses.

(3) There exists a need for a site-specific criterion for a **[substance]pollutant** not listed in **§ 93.7, Table 3 or** § 93.8c, Table 5**[(relating to water quality criteria for toxic substances)]**.

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Site-Specific Criteria Development

Addition of a new § 93.8d(a.1) identifies the conditions under which site-specific criteria may not be requested and include the following:

- A substance is a cause of nonattainment or would interfere with attainment of protected water uses.
- A waterbody where an aquatic life use is not attained unless all causes of nonattainment are due to causes other than pollutants.
- A waterbody with an existing or designated use of High Quality Waters (HQ) or Exceptional Value Waters (EV).

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Site-Specific Criteria Development

§ 93.8d(b) describes the information to be submitted regarding requests for site-specific criteria.

Requests must include the following, at a minimum:

- Identification of pollutant of concern.
- Identification of the qualifying factor in § 93.8d(a).
- Identification of the receiving waterbody.
- Scientific studies, data or information to demonstrate the qualifying factor in § 93.8d(a) is met.
- Information that demonstrates the factors in § 93.8d(a.1) are not applicable.
- Information that demonstrates a water-quality-based effluent limitation based on a Table 3 or Table 5 criterion is not achievable.

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§ 93.8d(c) describes additional information that may need to be submitted regarding requests for site-specific criteria, including:

- Definition of the aerial boundaries for the site-specific criterion.
- Identification of all potentially affected National Pollutant Discharge Elimination System (NPDES)-permitted discharges, water withdrawals, total maximum daily loads (TMDLs) and surface water assessments.
- All peer-reviewed scientific literature or other DEP-approved data to be used in criterion development.
- Signed copies of all reports, if applicable.
- Any additional data or information requested by DEP.

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Site-Specific Criteria Development

The new § 93.8d(c.1) states the following:

(e) If the required data and information is submitted, the Department will evaluate the information and may develop site-specific criteria for the receiving waterbody(s) or waterbody segment(s) that protect the appropriate existing and designated uses of the surface water(s) in accordance with the criteria development methodologies outlined in § 93.8d(c)(3), or other EPA-approved guidance and methods.

Site-Specific Criteria Development

The new § 93.8d(c.2) and (c.3) will appear in Chapter 93 as follows:

(c.2) The Department will incorporate all approved site-specific criteria into this chapter and maintain a publicly available table of all EPA-approved site-specific criteria.

(c.3) Site-specific criteria are not effective for Clean Water Act purposes until approved by EPA.

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Site-Specific MeHg Criteria – Ebaughs Creek

Site-Specific Methylmercury (MeHg) Criterion – Ebaughs Creek

(York County)

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Site-Specific MeHg Criteria – Ebaughs Creek

In 2015, York County Solid Waste and Refuse Authority (YCSWRA) initiated a request for site-specific criteria.

- Owns and operates the York County Sanitary Landfill.
- Discharges to an unnamed tributary (UNT) to Ebaughs Creek in York County (CWF, MF) under NPDES permit PA 0081744.
- Request satisfies § 93.8d(a)(3).
- Deletion of the statewide total mercury criterion of 0.05 µg/L.
- Addition of a site-specific dissolved methylmercury criterion.

Site-Specific MeHg Criteria – Ebaughs Creek

- YCSWRA submitted a study plan to DEP for review and approval in 2015.
- DEP approved a revised study plan in 2016.
- YCSWRA collected monthly water quality samples from Ebaughs Creek between October 2016 and September 2017 (1 year). Fish tissue samples were collected twice during the study in October 2016 and September 2017.
- YCSWRA submitted a final study report in December 2017.
- DEP reviewed the results of the final study report and developed a dissolved methylmercury water quality criterion recommendation to protect human health using site-specific bioaccumulation factors (BAFs).

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Site-Specific MeHg Criteria – Ebaughs Creek

Bioaccumulation is the process of a chemical moving from the external environment into an organism.

A BAF is a measure of how much a chemical accumulates within an organism.

BAFs are generally determined for higher trophic level organisms within an ecosystem (Ex: fish vs. aquatic bugs).

YCSWRA collected fish tissue data for brown trout and American eel.

Site-Specific MeHg Criteria – Ebaughs Creek

DEP calculated individual BAF values for each set of monthly fish tissue data collected. Values ranged between 2,110,000 L/kg and 11,900,000 L/kg.

$$\text{BAF} = \frac{\text{concentration of total mercury in fish tissue (mg/kg)}}{\text{concentration of dissolved methylmercury in water (mg/L)}}$$

A final BAF was determined by calculating the geometric mean of the individual BAF values:

Final $\text{BAF}_{(\text{Ebaughs})}$ = geometric mean of individual BAFs for Ebaughs Creek

= 5,882,398 L/kg

= 5.882398×10^6 L/kg

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Site-Specific MeHg Criteria – Ebaughs Creek

DEP used USEPA's *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion* (2010) to develop the proposed recommendation for Ebaughs Creek, which provides the following equation:

$$AWQC_{MeHg} = [BW \times (RfD\text{-}RSC)]/[DI + (FI \times BAF)]$$

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Site-Specific MeHg Criteria – Ebaughs Creek

$$AWQC_{MeHg} = [BW \times (RfD\text{-}RSC)]/[DI + (FI \times BAF)]$$

Where: $AWQC_{MeHg}$ = methylmercury ambient water quality criteria

- BW = human body weight, 80 kg
- RfD = reference dose, (0.0001 mg/kg-d)
- RSC = relative source contribution, (0.000027 mg/kg-d)
- DI = drinking water intake, 2.4L/day
- FI = fish intake, current USEPA recommended value, 0.022 kg/day
- BAF = bioaccumulation factor in L/kg, (5882398 L/kg)

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Site-Specific MeHg Criteria – Ebaughs Creek

$AWQC_{MeHg(Ebaughs)}$ = [80 kg x (0.0001mg/kg-d-0.000027 mg/kg-d)]
/[2.4 L + (0.022 kg x 5882398 L/kg)]

= [0.00584 mg]/[129415 L]

= 0.000000045 mg/L

= 4×10^{-8} mg/L

$AWQC_{MeHg(Ebaughs)}$ = 4×10^{-5} µg/L

= 0.00004 µg /L

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Site-Specific MeHg Criteria – Ebaughs Creek

§ 93.9o. Drainage List O.

Susquehanna River Basin in Pennsylvania

Susquehanna River

Stream	Zone	County	Water Uses Protected	Exceptions To Specific Criteria
3—Stone Run	Basin (all sections in PA)	Chester	TSF, MF	None
2—Deer Creek	Basin (all sections in PA)**, Source to Ebaughs Creek**	York	CWF, MF	None
3—Ebaughs Creek	**Basin (all sections in PA)**	**York**	**CWF, MF**	***Delete* Mercury HH = 0.05 µg/L, *Add* MeHg *HH* = *0.00004 µg/L;***
2—Deer Creek	**Basin (all sections in PA), Ebaughs Creek to Mouth**	**York**	**CWF, MF**	**None**
1—Chesapeake Bay (MD)				

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Tentative Timeline

Rulemaking Activity	Date
Agricultural Advisory Board (AAB) Presentation – Draft Proposed Rulemaking	March 15, 2023
Water Resources Advisory Committee (WRAC) Presentation – Draft Proposed Rulemaking	March 16, 2023
EQB Presentation – Proposed Rulemaking	3rd Qtr. 2023
Publish in *Pennsylvania Bulletin* – Proposed Rulemaking *	3rd Qtr. 2023
45-day Public Comment period ends	3rd -4th Qtr. 2023

Request for WRAC Support

DEP requests WRAC's concurrence on this draft proposed rulemaking.


Kristen Schlauderaff
Water Quality Division
Bureau of Clean Water
kschlauder@pa.gov
717-772-4010