



Final-Form Rulemaking - Water Quality Standard for Manganese and Implementation

Environmental Quality Board Meeting

August 9, 2022

Tom Wolf, Governor

Ramez Ziadeh, P.E., Acting Secretary

▶ Water Quality Standard for Manganese

Act 40 of 2017

(j) The board shall promulgate regulations under the act of June 22, 1937 (P.L. 1987, No. 394), known as "The Clean Streams Law," or other laws of this Commonwealth that require that the water quality criteria for manganese established under 25 Pa. Code Ch. 93 (relating to water quality standards) shall be met, consistent with the exception in 25 Pa. Code § 96.3(d) (relating to water quality protection requirements). Within ninety days of the effective date of this subsection, the board shall promulgate proposed regulations.

Water Quality Standard for Manganese

- The Department must review and update water quality standards to reflect current scientific knowledge and understanding (for example, updated national recommendations and published scientific literature).
- The Department published an advance notice of proposed rulemaking (ANPR) on January 27, 2018 to solicit scientific data and other information necessary to prepare the rulemaking documents required by law.
- Information was received from 15 organizations and individuals.

Proposed Rulemaking

The proposed regulation for manganese included recommendations to:

- Delete the existing Potable Water Supply (PWS) criterion of 1.0 mg/L from Table 3, and
- Add a human health toxics criterion of 0.3 mg/L to Table 5.

Proposed Rulemaking

The Environmental Quality Board (Board) also sought public comment on two alternative points of compliance for the proposed human health toxics criterion, including:

- 1st alternative point of compliance would move the point of compliance from the point of discharge to the point of downstream potable water supply withdrawal.
- 2nd alternative point of compliance would maintain the point of compliance at the point of discharge.

Proposed Rulemaking

The proposed regulation was adopted by the Board at its December 17, 2019 meeting and was published in the *Pennsylvania Bulletin* on July 25, 2020 (50 Pa.B. 374)

- 60-day public comment period that ended on September 25, 2020
- 3 public hearings held on September 8, 9 and 10, 2020

Proposed Rulemaking

- The Board received comments from 957 commenters including comments and testimony from:
 - 13 witnesses at the 3 public hearings
 - U.S. Environmental Protection Agency (EPA)
 - Independent Regulatory Review Commission (IRRC)
- The comments received, and the Department's responses, are summarized in the Department's **Comment and Response Document**.
 - The Department considered all public comments received on the proposed rulemaking in preparing the final-form rulemaking.

Proposed Rulemaking

Summary of Major Supportive Comments - Support for the Proposed Criterion and 2nd Alternative and Opposition to the 1st Alternative (point of compliance downstream)

- General support for the 0.3 mg/L criterion and compliance at the point of discharge.
- General opposition to moving the point of compliance downstream from the discharge to the point of potable water supply withdrawal.
- Moving the point of compliance to the point of potable water supply withdrawal shifts the burden of manganese treatment to public water systems and downstream users.
- Source water concentrations of manganese ≥ 0.3 mg/L (EPA's drinking water lifetime health advisory limit) may require treatment to remove the manganese. Public notification requirements may also be triggered.
- Public water systems must also achieve the secondary maximum contaminant level (SMCL) of 0.05 mg/L in the finished water.
- Manganese removal treatment is expensive and will be necessary for many facilities if source water manganese levels increase to 0.3 mg/L or higher.

Proposed Rulemaking

Summary of Major Opposing Comments - Opposition to the Proposed Human Health Criterion and 2nd alternative point of compliance (point of discharge)

- General opposition to the 0.3 mg/L criterion and 2nd alternative (compliance at the point of discharge).
- Proposed manganese criterion of 0.3 mg/L is unnecessary, unsupported and overly protective. (recent PBPK studies)
- The 2nd alternative does not comply with Act 40.
- Moving the point of compliance to the point of potable water supply withdrawal benefits industry with no adverse impact on public water systems.
- Manganese removal to a level of 0.3 mg/L will be challenging and cost millions of dollars.
- The regulation will negatively impact reining/remediation projects and Chapter 102 permits for earth disturbance activities.

Proposed Rulemaking

- IRRC also submitted comments.
- Summary of Public Comments and Testimony

Supportive:	924 (including 869 form letters)
<u>Opposing:</u>	<u>32</u>
Total:	956 plus IRRC comments (957)

Final-Form Rulemaking

- In response to IRRC's comments, the Bureau of Clean Water (BCW) met with the Mining and Reclamation Advisory Board (MRAB) and the Aggregate Advisory Board for input on the proposed and final-form rulemaking. No additional data or information was received.
- BCW met with toxicologists from EPA Headquarters to discuss development of the human health criterion and the toxicology-related comments received. BCW received additional literature citations which were evaluated and incorporated into the criterion rationale document. Overall, EPA commended DEP on its criterion development and its draft responses to comments concerning toxicology.

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The Department consulted the following advisory committees:

- **Water Resources Advisory Committee (WRAC)** (November 18, 2021)
 - Voted to support the draft final-form rulemaking.
- **Agricultural Advisory Board (AAB)** (December 6, 2021)
- **Mining and Reclamation Advisory Board (MRAB)** (January 20, 2022)
 - Voted to recommend the draft final-form rulemaking not move forward.
- **Aggregate Advisory Board** (February 2, 2022)
- **Public Water Systems Technical Assistance Center Board (TAC)** (February 8, 2022)
 - Voted to support the draft final-form rulemaking.

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The Department's Final-Form Recommendation to the Board:

- Delete the Potable Water Supply use criterion of 1.0 mg/L from § 93.7, Table 3.
- Add a Human Health criterion of 0.3 mg/L to § 93.8c, Table 5.
- Maintain the point of compliance in all surface waters (at the point of discharge) in accordance with § 96.3(c).

Changes from Proposed to Final-Form

- No changes were made to Chapter 93 between proposed and final-form rulemaking.
- Changes were made to Chapter 96. The language added to § 96.3(d) in the proposed rulemaking has been removed.

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Projected Impacts to BCW NPDES dischargers

- Not all NPDES permits with Mn limits will be affected. More stringent effluent limitations are most likely for dischargers to waterbodies with an existing metals total maximum daily load (TMDL) or no assimilative capacity, or where the discharge is to a small receiving waterbody. Evaluations of permits are ongoing.
- Many surface water Public Water Systems with NPDES permits are not likely to be affected due to more stringent technology-based limits that currently apply at the end-of-pipe.
- Permits discharging to high quality (HQ) or exceptional value (EV) waters are required under Chapter 93 to maintain existing water quality and will not be affected by this regulation except in limited circumstances relating to social and economic justifications.

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Projected Impacts to active mining NPDES dischargers

- Approximately 706 active mining NPDES permits exist.
- Not all mining permits will be affected by this regulation due to the federal effluent limitation guideline (ELG) of 2.0 mg/L applied at the end-of-pipe (no mixing zone) being more stringent than 0.3 mg/L applied at point of discharge (ex: 12-hour travel time provided for mixing).
- Existing mining permits with water quality-based effluent limitations, which include those permits subject to an approved TMDL, are most likely to be affected by the change in criterion.

Final-Form Rulemaking

Projected Impacts to NPDES discharges associated with remining

- Remining permits account for approximately 150 of the 706 NPDES permits.
- Remining activities will continue to be permitted under the Commonwealth's Office of Surface Mining Reclamation and Enforcement (OSMRE)-approved remining regulations.

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Examples of Economic Impact Estimates associated with the 1st Alternative provided by Public Water Systems*

- **Pennsylvania American Water**
 - 16 of 68 permits affected = \$40-\$60 million in capital costs + \$740,000-\$1.4 million annually
- **Reading Area Water Authority**
 - 1 permit = \$2.1 million in capital costs + \$15.8 million (20 yr. operating costs)
- **City of Lancaster (ANPR)**
 - 1 permit = tens of millions in capital costs + tens of thousands in operating costs (also anticipate millions of dollars in lost efficiency due to lower plant performance and increased membrane filter replacement)

*Cost information was provided by third parties.

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Economic Benefit Estimates of the 1st Alternative Point of Compliance provided by Mining Industry*

- Projected annual savings to the mining industry resulting from moving the point of compliance to downstream potable water supply withdrawals would be upwards of \$1 million (Pennsylvania Coal Alliance).

*Cost information was provided by third parties.

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Summary of Economic Impact Estimates associated with the 2nd Alternative provided by Industry*

- **Pennsylvania Coal Alliance (PCA)(Report by TetraTech)**
 - Overall cost = \$200 million in capital costs + \$44-\$88 million annually
- **New Enterprise Stone & Lime Co.**
 - 6 of 51 permits affected = \$320,000 in capital costs + \$450,000 annually
- **Shenango, LLC**
 - Estimate for all (7) permits affected = \$650,000
- **Talon Energy Supply, LLC**
 - Rushton Mine permit = \$30 million in capital costs + \$2 million annually

*Cost information was provided by third parties.

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Summary of Economic Impact Estimates provided by Penn State University

- Used AMDTreat software to calculate mining related costs.
- Robust analysis considered different percentages of permits affected, multiple treatment options and different types of coal mining discharges based on flow and other water quality characteristics.
- If 75% of mining permits are affected:
 - Overall costs = \$137-\$143 million in capital costs + \$33-\$46 million in annual costs.
- If 50% of mining permits are affected:
 - Overall costs = \$91-\$95 million in capital costs + \$22-\$31 million in annual costs.

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Summary of Economic Impact Estimates provided by Penn State University (continued)

- Actual costs for mining facilities may be substantially lower than these estimates if sites are able to utilize existing treatment infrastructure or if the relatively few deep mines with larger flows are able to remove dissolved manganese using co-precipitation and sorption.
- On an equal flow and manganese load basis, capital and annual operating costs for the drinking water industry and the coal industry would be similar.

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Analysis of Estimated Economic Impact provided by Drexel University

- Qualitative evaluation of the two proposed points of compliance to determine which one is most appropriate.
- The analysis included consideration of treatment techniques and costs.

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Summary of Conclusions - Drexel University

- It is not less costly to remove manganese from diluted sources (surface waters) than it is from concentrated sources (wastewater discharges).
- The need for significant pH adjustments to remove dissolved manganese from water applies equally to the treatment of coal mine drainage and potable drinking water.
- Treatment difficulties associated with the presence of aluminum are not restricted to treatment of coal mine drainage. Aluminum-based coagulants are typically used by public water systems in their treatment processes.
- Public water systems often treat manganese to levels below the SMCL of 0.05 mg/L due to customer complaints.

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Summary of the Economic Benefits of the Final-Form Rulemaking

- A reduction of manganese, a neurotoxin, in surface waters is expected to have a positive effect on the human health of the Commonwealth's residents and may result in a reduction of costs for treatment and caring for persons with diseases and disabilities attributed to manganese exposure.
- Downstream users will not have to bear the costs associated with remediating discharges of manganese from upstream users.
- A reduction of environmental toxins, such as manganese, will benefit aquatic life and wildlife as well as positively affect outdoor recreation activities and ecotourism.
- Industrial land redevelopers will benefit by having clearly defined remediation standards for surface waters and being eligible for liability relief under state law.

Recommendation

The Department recommends the Board adopt this final-form rulemaking.



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