Delaware River Basin Commission

Ammonia Criteria for the Interstate Waters of the Delaware River

Toxics Advisory Committee

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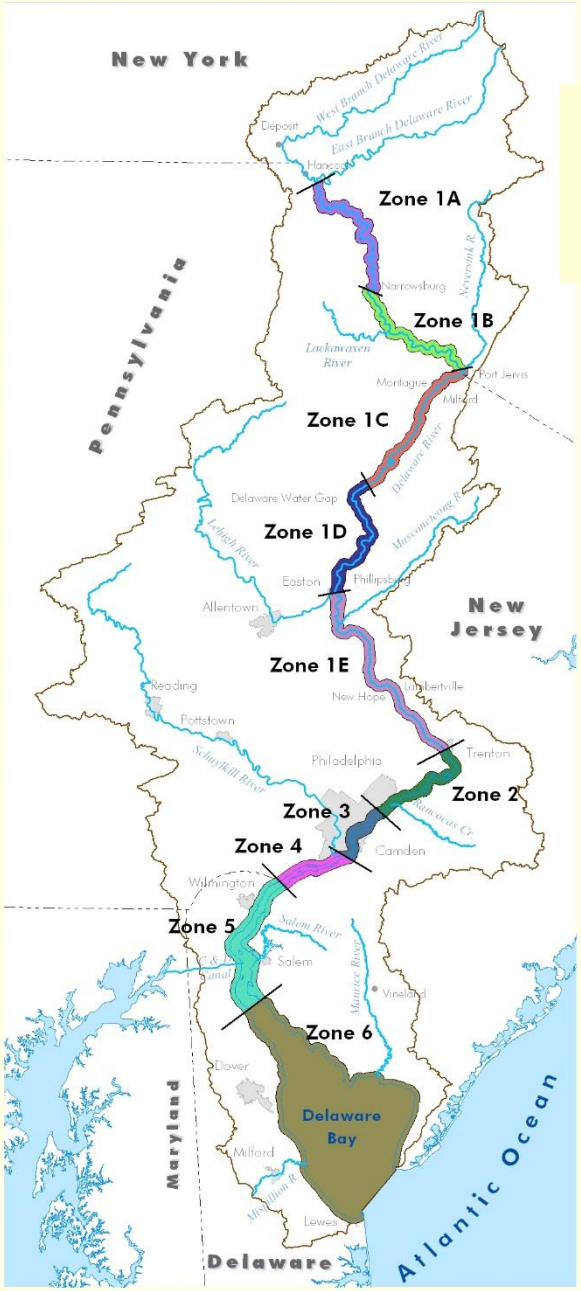

Delaware River WQ Management Zones

Map Key

Assessment Unit

Source:
DRBC 2008 Integrated List

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N

0 15 30
Miles

Outline

- Current DRBC Regulations re Ammonia
- 2013 National Criteria & Basin State Standards
- TCS update

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Current DRBC Regulations

- Article 3 Water Quality Standards
  - **No** ambient or effluent requirements either basin-wide or by individual Zones in Article 3.
  - Anti-degradation Existing Water Quality Parameters (Zones 1A to 1E):
    - Ammonia and Ammonium – means range between 15 to 41 µg/L from Hancock, NY to Delaware Water Gap.
    - Ammonia – medians range between <50 and 50 µg/L from Portland, PA to Trenton, NJ.

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Current DRBC Regulations

- Best Demonstrable Technology (BDT) 30 average effluent quality of 1.5 mg/L of Ammonia-N apply to Outstanding Basin Waters or Significant Resource Waters

- Article 4 Application of Standards - contain effluent requirements for ammonia
  - Section 4.30.5 – Other Substances in Effluents
    - In non-tidal waters, not to exceed a 30 day average of 20 mg/L ammonia as nitrogen.
    - In tidal waters, not to exceed a 30 day average of 35 mg/L ammonia as nitrogen.

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Updated EPA Acute Criteria

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Class	Criteria (mg/L – Total Ammonia)	Value at pH=7 and T=20°C
Full Equation	$CMC = MIN [(0.275/1+10^{7.204-pH}) + (39.0/1+10^{pH-7.204}), (0.7249 * ((0.0114/1+10^{7.204-pH}) + 1.6181/1 + 10^{pH-7.204})) * (23.12 * 10^{0.036 * (20-T)})]$	17.0
Criteria frequency: Not to be exceeded more than once in three years on average.		

Updated EPA Chronic Criteria

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Class	Criteria (mg/L – Total Ammonia)	Value at pH=7 and T=20°C
Full Equation	$CCC = 0.8876 * (0.0278/1+10^{(7.688-pH)} + 1.1994/1+10^{(pH-7.688)}) * (2.126*10^{(0.028*(20-MAX(T,7))}$	1.9
Additional Requirement	Not to exceed 2.5 times the CCC as a 4 day average within the 30 day duration more than once every 3 years.	4.8

Ammonia Criteria DRBC Perspective

- Uniform criteria for shared waters.
  - States are considering options for state-wide adoption of the new criteria.
  - Implementation policies utilized by states could result in differing criteria.
  - Differing criteria hampers cumulative assessment of multiple discharges.

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Application of Ammonia Criteria

- pH data or value to be used
- temperature data or value to be used
- design flows
- mussels
- salmonids

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Marine Criteria for Ammonia

- Only three of the five signatory parties have water quality criteria for un-ionized ammonia. PA and DE do not have criteria.
- EPA and NY have the same criteria. NJ's criteria are somewhat lower.
- Total ammonia criteria vary depending on the pH, temperature and salinity. U.S. EPA (1989) provides conversion tables. Total ammonia criteria are lower at higher salinities.

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Federal/State Marine Criteria Comparisons

Agency	Class	Acute (mg/l)	Chronic (mg/l)
U.S. EPA (un-ionized)		0.233	0.035
DE	-	-	-
NJ (un-ionized)	SE	0.115	0.030
	SC	0.094	0.024
PA	-	-	-
NY (un-ionized)	SA, SB, SC, I, SD	0.23	-
	SA, SB, SC, I	-	0.035

Toxics Criteria Subcommittee Feb 23, 2017 mtg

Twenty-two participants representing:

Basin States	USEPA	DRBC
Frank Klapinski – NJDEP	Kuo Liang Lai – EPA-R3	Dr. Ron MacGillivray – DRBC
Steve Seeberger – NJDEP	Brent Gaylord - EPA-R2	John Yagecic, P.E. – DRBC
Scott Stoner - NYDEC	Wayne Jackson – EPA-R2	Dr. Thomas Fikslin - DRBC
Jason Fagel – NYDEC	Angela McFadden – EPA- R3	Dr. Namsoo Suk - DRBC
Dr. Yu Chen - NY Div of Fish and Wildlife	**Stakeholders**	**Environmental**
Tom Barron – PADEP	Bart Ruiter – Chemours	Maya van Rossum - DRN
Dr. Matthew Kundrat - PADEP	Josef Kardos - PWD	Dr. Erik Silldorff - DRN
Rodney McCallister - PADEP	Jay Cruz - PWD	
Rick Greene - DNREC		

Toxics Criteria Subcommittee Feb 23, 2017 mtg update

- Task: TCS recommendations on freshwater and/or marine criteria for ammonia in DRBC Water Quality Management Zones 1 through 6.
- TCS Identified Actions:
  - Clarification on ammonia criteria in waters outside of pH range 6.5 to 9.0 in EPA document
  - Use paired ambient data to calculate ammonia CMC and CCC distribution in Delaware River
  - Review mussel and trout information
  - Additional evaluation of mixing zone temperature calculations

Discussion

- Linkage between nitrogenous oxygen demand and ammonia
- Parallel development of information for DO requirements in estuary and ammonia criteria implementation

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