



Water Quality Standards Regulation (9 VAC 25-260) Rulemaking: Bacteria, Ammonia, Human Health and Aquatic Life Criteria

**Department of Environmental Quality
Regulatory Advisory Panel Meeting**

June 13, 2016

DEQ Central Office



Agenda:

- Roll Call
- Purpose – focus on:
 - Bacteria criteria
 - Human Health criteria
- Potential Changes and Discussion of Issues
- Wrap-Up, Plan for Next Meeting



Recreational (Bacteria) WQ Criteria

Federal BEACH Act requires adoption of new bacteria criteria within 36 months of release by EPA (Oct. 2012)

“(B) NEW OR REVISED CRITERIA AND STANDARDS.—Not later than 36 months after the date of publication by the Administrator of new or revised water quality criteria under section 304(a)(9), each State having coastal recreation waters shall adopt and submit to the Administrator new or revised water quality standards for *the coastal recreation waters* of the State for all pathogens and pathogen indicators to which the new or revised water quality criteria are applicable.

“(2) FAILURE OF STATES TO ADOPT.—

“(A) IN GENERAL.—If a State fails to adopt water quality criteria and standards in accordance with paragraph (1)(A) that are as protective of human health as the criteria for pathogens and pathogen indicators for coastal recreation waters published by the Administrator, **the Administrator shall promptly propose regulations for the State setting forth revised or new water quality standards for pathogens and pathogen indicators described in paragraph (1)(A) for coastal recreation waters of the State.**”

Criteria Elements	EPA Recommendation 1	Theoretical Illness Rate (STV) (36/1000 illness rate)	Alternate EPA Recommendation 2	Theoretical Illness Rate (STV) (32/1000 illness rate)
Indicator (<u>freshwater</u>)	Geometric Mean (cfu/100 ml)	Statistical Threshold Value (cfu/100 ml) 10% exceedence	Geometric Mean (cfu/100 ml)	Statistical Threshold Value (cfu/100 ml) 10% exceedence
Current VA Criterion E. coli	126	235		
EPA 2012 E. coli	126	410	100	320
Indicator (<u>marine water</u>)	Geometric Mean (cfu/100 ml)	Statistical Threshold Value (cfu/100 ml) 10% exceedence	Geometric Mean (cfu/100 ml)	Statistical Threshold Value (cfu/100 ml) 10% exceedence
Current VA Criterion Enterococci	35	104		
EPA 2012 Enterococci	35	130	30	110



Statistical Threshold Value and Beach Action Value are Based on Distribution

- STV is set at the 90th percentile of the expected distribution for bacterial cell counts around the mean criterion value
- Beach Action Value (70 cfu *Enterococci*) is set at the 75th percentile of the expected distribution for bacterial cell counts around the mean criterion value



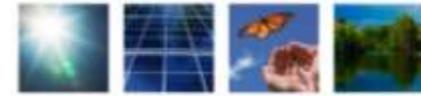
Issues:

- Where to apply revised criteria:
 - “Coastal recreation waters”
 - All State waters (primary contact use)
- Implications for assessments
- Others?



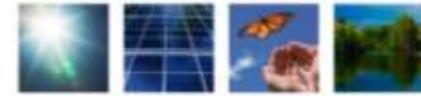
Human Health Criteria

- EPA updated HH criteria for 94 pollutants on 6/29/15; list included 8 parameters under consideration during TR
- EPA also updated:
 - fish consumption rate
 - body weight
 - drinking water intake
 - health toxicity values
 - bioaccumulation factors, and
 - relative source contributions
- 120 values decreased, 50 increased, 4 equivalent



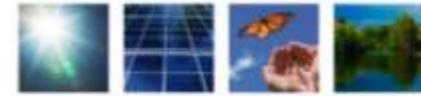
EPA's 2015 Human Health Criteria Changes

Factor	Old Default	New Default	Effect on Criterion
Toxicity Value	Listed in IRIS	Listed in IRIS & newer assessments	variable
Body Weight	70 kg. (154 lbs.)	80 kg. (176 lbs.)	≈ +14%
Drinking Water Consumption Rate	2.0 L. per day	2.4 L. per day	≈ - 3% (in PWS only)
Fish Consumption Rate	17.5 gm. per day (28.2 eight-ounce meals per year)	22 gm. per day (35.4 eight-ounce meals per year)	≈ - 14 % (PWS) to -18% (nonPWS)
Bioconcentration Factor (BCF)	BCF calculated from water-only lab test	Bioaccumulation factor (derived from lab, field or model)	variable
Relative Source Contribution	Not used previously for most criteria	0.2 (most), 0.5 (1), 0.8 (4)	≈ - 80%



EPA Updated 8 Criteria not in Virginia's Current Regulation

Parameter	CAS Number	Criterion (µg/L) for Public Water Supply	Criterion (µg/L) for All Other Waters
Bis (chlormethyl) Ether (carcinogen)	542881	0.0015	0.17
Dinitrophenols	25550587	10	1000
Hexachlorocyclohexane (HCH) – Technical (carcinogen)	608731	0.066	0.1
3-Methyl-4-Chlorophenol*	59507	500	2,000
Pentachlorobenzine	608935	0.1	0.1
1,2,4,5-Tetrachlorobenzene	95943	0.03	0.03
1,1,1-Trichloroethane*	71556	10,000	200,000
2,4,5-Trichlorophenol	95954	300	600



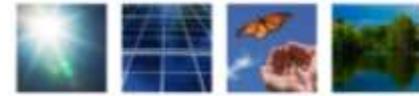
Newly Classified Carcinogens

Pollutant	VA PWS	EPA PWS	VA Other Waters	EPA Other Waters
Butyl Benzyl Phthalate	1,500	1.0	1,900	1.0
1,2,4-Trichlorobenzene	35	0.071	70	0.076



Benzene: a Criterion Range?

- EPA's recommended criterion for benzene is shown as a range:
 - PWS = 5.8 to 21 $\mu\text{g}/\text{L}$
 - Non-PWS = 160 to 580 $\mu\text{g}/\text{L}$



Cancer Oral-Slope Factor for Benzene Based on Occupational Exposure Studies

- Industrial workers exposed to benzene over many years (inhalation), exhibited increased risk of leukemia
- Inherent imprecision in estimating years of exposure via air that could be the cause of the increased leukemia rates



A Range of Criterion Concentrations can't be Implemented

- In the past, EPA generally recommended a single criterion concentration, which Virginia adopted:
 - 22 $\mu\text{g}/\text{L}$ in PWS and 510 $\mu\text{g}/\text{L}$ in non-PWS
- Now, a range of criterion concentrations is acknowledged as being equally scientifically valid:
 - 5.8 to 21 $\mu\text{g}/\text{L}$ in PWS
 - 160 to 580 $\mu\text{g}/\text{L}$ in non-PWS