

*AF&PA/EPA Meeting on Human Health Water
Quality Criteria*

Introduction – General Concerns

- Use of treaty rights claims to change CWA requirements
- Major change in risk policy, with potential impacts for other programs and agencies.
- Use of new “suppression effect” theory to radically increase fish consumption levels used to calculate standards; much more stringent and expensive permit limits.
- Washington rule could cost over \$1B, with no measurable benefits. OIRA should request that EPA submit the rule for review.
- Washington rule is less stringent than Maine rule, because the Washington rule is based on a Fish Consumption Rate of 175 g/d v. 286 g/d for Maine.

Legal Issues

- EPA does not have authority to go beyond CWA, irrespective of tribal treaty rights.
NAHB; AF&PA
- Creating a new designated use—not allowed under CWA, EPA regulations, Maine law
- Major change from existing policy (2000 Methodology)—violates APA

Policy Issue: Risk Levels

- 2000 Methodology (and NTR, GLI)—State discretion
 - General population: 10^{-5} or 10^{-6} , as long as subpopulation at 10^{-4}
- Policy Rationale
 - “Given the wide variations in consumption patterns, it would *not seem to be possible for States and Tribes to provide the same level of protection from contaminated fish for all consumers.*” 63 Fed. Reg. 36,742, 36,775 (July 7, 1998). Methodology states, “[t]he point is that the *risks for different population groups are not the same.*” Methodology at 2-7 (emphasis added)
 - 10^{-6} is **not the only protective risk level** for high consumers
 - Methodology: 10^{-6} , 10^{-5} , and 10^{-4} for high consumers are all *de minimis* risk
 - Long-standing EPA risk policy
 - Precedent for other EPA programs and agencies.

HHWQC Criteria: Three Elements

HHWQC =

Health Protection Target

- excess cancer risk
or
- hazard quotient

Substance Toxicity

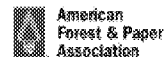
- risk specific dose
or
- reference dose

Exposure Scenario

- body weight
- AND**
- drinking water intake
- AND**
- fish consumption rate
- AND**
- biological accumulation
- AND**
- water column concentration
- AND**
- cooking loss
- AND**
- duration of exposure
- AND**
- other exposures

Source: NCASI

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Human health water quality criteria (HHWQC) are derived using three components: a health protection target; a toxicity value for the substance, and; an exposure scenario

The exposure scenario contains both explicit parameters (i.e., those that are visible in the criteria derivation equation) and implicit parameters (i.e., assumptions that influence the calculated criteria but do not appear in the published equation)

EPA has recently encouraged states to alter past practices with respect to the fish consumption rate and "other exposures" (i.e., relative source contribution, or RSC) values used in the criteria derivation equation

EPA HHWQC Exposure Assumptions

Everyone has all of the following characteristics:

Parameter	National Default Value	Proposal for Washington	Proposal for Maine (Indian Lands)
Weighs...	80kg (176 lbs)	Same	Same
Every Day for 70 Years Drinks Water From the Same Location That is...	<ul style="list-style-type: none"> •2.4 L/day (2.5 quarts). •Unfiltered and Untreated <i>and</i> •From Surface Water (lakes, streams, etc.) <i>and</i> •Contaminated at the HHWQC Level 	Same	Same
<u>AND</u> Every Day for 70 Years Consumes Fish From the Same Location That is ...	<ul style="list-style-type: none"> •22 g/day (.8 oz): •From Local Waters, Grocery Stores, Aquaculture, Foreign Countries (excluding marine) <i>and</i> •From Waters Contaminated at the HHWQC Level <i>and</i> •Contaminated with Pollutants from the Water to the Maximum Extent Possible <i>and</i> •Contaminated with the Same Amount of Pollutants Despite Reductions from Cooking 	175 g/d (.39 lbs) All Other Assumptions Are The Same	286 g/d (.63 lbs) (the rate that is unsuppressed by concerns about the safety of available fish) All Other Assumptions Are The Same

Risk Choices

Impact of EPA Choosing 10^{-6} v. 10^{-5} v. 10^{-4} Excess Lifetime Cancer Risk Level

" 10^{-6} means the "risk of developing cancer...would be one in a million on top of the background risk of developing cancer from all other exposures." (emphasis added)*

If Everyone has ALL of the Equation Characteristics:

Background Risk of Developing Cancer	Theoretical Risk with 10^{-4}	Theoretical Risk with 10^{-5}	Theoretical Risk with 10^{-6}
4 in 10, or .40000	.4001	.40001	.400001

* EPA Proposed Criteria for Maine, 81 *Fed. Reg.* 23243 (4/20/16)

Risk Comparison

Risk Level	Risk of Death	Allowable Risk (Cancer Risk)						US FDA on Dietary Supplement Safety
		EPA 2000 Methodology	Washington Water Quality	Florida Proposed Water Quality	EPA Drinking Water	EPA Superfund & State Cleanups	Federal OSHA on Workplace Standards	
1 in 10 (1×10^{-1})	High Voltage Lines							N O R E G U L A T I O N
	High Voltage Lines (cont.)							
1 in 100 (1×10^{-2})	High Voltage Lines							
	Falls (1 in 200)						Benzene (1 in 100)	
1 in 1,000 (1×10^{-3})	Casino worker (1 in 250)						Asbestos (1 in 300)	
	Acrylamide in food (1 in 1,000)						Ethylene Oxide (1 in 500)	
1 in 10,000 (1×10^{-4})	Bike accident (1 in 5,000)						1,3-Bisphenol A (1 in 750)	
	Lightning (1 in 60,000)	Sub-populations (1 in 10,000)		Sub-populations (1 in 10,000)	Arsenic (5 in 10,000)	1 in 10,000		
1 in 100,000 (1×10^{-5})	Asbestos (1 in 500,000)	1 in 100,000			EPA Drinking Water	EPA Superfund Range		
		General Population (1 in 1,000,000)	Sub-population (1 in 1,000,000)	Average population (1 in 1,000,000)		1 in 1,000,000		
1 in 1,000,000 (1×10^{-6})						No action needed		
			General population (1 in 20,000,000)					
1 in 10,000,000 (1×10^{-7})								
1 in 100,000,000 (1×10^{-8})								

Decreasing Risk

Impacts for Other Programs and Agencies

- Superfund
 - ARARs
 - NCP: “For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper bound lifetime cancer risk to an individual of between 10^{-4} and 10^{-6} using information on the relationship between dose and response.”
- CAA:
 - MATS cites tribal treaty rights

Tribal Consumers as Target Population

- New policy to protect tribal consumers as the target population
 - Contrary to 2000 Methodology, and has not been properly adopted as policy change under APA
 - The existing methodology to protect general population already provides sufficient protection of high consumers
 - Targets the general population at levels of 10^{-7} or lower, depending on the exact assumptions used to represent the tribe.

“Unsuppressed” FCR of 286 Grams/Day

- New policy to base FCR on high consumers, instead of general population;
 - Not needed to be protective
 - Violates APA
- To protect the designated use, the FCR must represent “sustenance level of consumption unsuppressed by pollutant concerns.”
 - “Scientific and policy judgment” is “necessary and appropriate”
 - Based on an FAQ document. 81 FR 23245.
 - Wabanki study : “describe the lifestyle that was universal when resources were in better condition and that some tribal members practice today (and many more that are waiting to resume once restoration goals and protective standards are in place.)” 81 FR 23245 (emphasis added)

“Unsuppressed” FCR of 286 Grams/Day

- 1991 Maine licensed anglers study
 - 95% of anglers consumed 26 g/d or less. Virtually no fish advisories, so it is an “unsuppressed rate” (no fear of contamination)
 - 148 Native Americans included in survey. 95th percentile was 51 g/d. Max was 182 g/d. But only 6% consumed > than Maine FCR of 32.4 g/d.
- Subsistence lifestyle no longer necessary for survival in Maine
- Tribal members not likely “waiting to resume” the traditional lifestyle. Studies show when commercial food is available, tribal members consumption patterns evolve.

Legal/Policy Issues: CWA and EPA Regulations

- States are the primary authority to set criteria under the CWA
- State criteria must protect the designated use and be based on “sound scientific rationale”(40 C.F.R. § 131.11(a))
- State criteria can deviate from federal criteria (40 C.F.R. § 131.11(b))
 - Can modify to reflect “site-specific conditions “
 - Can use “other scientifically defensible methods”
- State criteria can vary from EPA guidance or recommendations and still be scientifically defensible and protective, particularly in light of the conservative nature of criteria derivation and EPA’s own recognition that risks at 10^{-6} , 10^{-5} , or 10^{-4} are *de minimis*
- State criteria that are scientifically defensible comply with the Act and EPA regulations, and must be approved by EPA, even if they are not consistent with EPA recommendations, guidance or policy.
- Called for by the CWA—Cooperative federalism

Wastewater Treatment Technology Review For WA State Standards

- **Even if standards were an order of magnitude less stringent (10x), and if advanced treatment technology were economically feasible, standards could not be met for PCB's and arsenic with available technology.**
- **Conclusion: EPA's proposed WQS for WA are neither technically nor economically feasible.**
- **Source: HDR Engineering, Inc. Report**

Anticipated Costs to Address EPA PCB Criterion

Table 10. Treatment Technology Total Project Costs in 2013 Dollars for a 0.5 mgd Facility and a 25 mgd Facility

Alternative	Total Construction Cost, 2013 dollars (\$ Million)	O&M Net Present Value, 2013 dollars (\$ Million)*	Total Net Present Value, 2013 dollars (\$ Million)	NPV Unit Cost, 2013 dollars (\$/gpd)
0.5 mgd:				
Baseline (Conventional Secondary Treatment)	15 - 32	0.5 - 1.1	15 - 33	31 - 66
Advanced Treatment – MF/RO**	27 - 58	3.2 - 6.8	30 - 65	60 - 130
Advanced Treatment – MF/GAC	33 - 70	5 - 10.0	36 - 81	76 - 162
Incremental increase to Advanced Treatment MF/RO	12 - 26	2.7 - 5.7	15 - 32	30 - 64
Incremental increase to Advanced Treatment MF/GAC	18 - 36	4.6 - 9.8	22 - 48	45 - 96
25 mgd:				
Baseline (Conventional Secondary Treatment)	166 - 335	25 - 54	182 - 389	7 - 16
Advanced Treatment – MF/RO**	283 - 606	157 - 336	440 - 942	18 - 38
Advanced Treatment – MF/GAC	343 - 735	252 - 541	595 - 1276	24 - 51
Incremental increase to Advanced Treatment MF/RO	127 - 272	131 - 281	258 - 553	10 - 22
Incremental increase to Advanced Treatment MF/GAC	167 - 401	226.9 - 486	414 - 887	17 - 35

* Does not include the cost for labor.

** Assumes zero liquid discharge for RO brine management, followed by evaporation ponds. Other options are available as listed in Section 4.4.2.

MF/RO=membrane filtration/reverse osmosis

MF/GAC=membrane filtration/granulated activated carbon

O&M=operations and maintenance cost/dollars per day