



Human Health Criteria and State Water Quality Standards AML Feb 2024

Alaska Department of Environmental Conservation
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Human Health Criteria (HHC)



<https://glacierbayalaska.com/alaska-fishing/fish-species-guide/>



- A human health criterion is the highest concentration of a pollutant in surface water that is not expected to pose a significant risk to human health
 - designed to **minimize the risk** of adverse effects from exposure to different contaminants
 - Based on a **chronic (lifetime) exposure** to contaminants
 - Includes **the ingestion of drinking water** from surface water sources and/or
 - The **consumption of aquatic life** obtained from surface waters.



Historical Context

- 2000 - New EPA HHC methodology was published.
 - Provides a formal equation and language for states to follow
- 2002 to 2023 - EPA issues updates various HHC and introduces new pollutants to the list (116 total pollutants).
 - 2015 EPA updates HHC criteria inc. exposure inputs
 - Multiple states (and lawsuits) occur to address HHC update
 - EPA promulgates/rescinds/re-promulgates HHC for Washington



Historical Context - Continued

ALASKA 2012-2022

- DEC/ADF&G actively reviews available research and policy issues
 - Literature Review
 - Engagement with ADF&G-Division of Subsistence
 - Jim Fall (ADF&G) publishes multiple papers pertaining to subsistence and fish consumption
 - HHC Technical Workgroup and Report
 - Reviews all aspects of HHC formula and potential inputs
 - Issues Recommendations and dissenting opinions
 - Staff engage with other states conducting HHC rulemaking
- 2022 - EPA and DEC engage on a formal timeline for HHC rulemaking

HHC Equations

BAF: Bioaccumulation

BW: Body Weight

CRL: Risk Level

CSF: Cancer Slope Factor

DI: Drinking Water

FCR: Fish Consumption Rate

RfD: Reference Dose

RSC: Relative Source Contribution

Consumption of Organisms and Water

Consumption of Organisms Only

Criteria for Carcinogens

$$\frac{CRL \times BW}{CSF \times [(FCR \times BAF) + DI]}$$

$$\frac{CRL \times BW}{CSF \times FCR \times BAF}$$

Criteria for Non-Carcinogens

$$\frac{RfD \times RSC \times BW}{(FCR \times BAF) + DI}$$

$$\frac{RfD \times RSC \times BW}{FCR \times BAF}$$



Existing Values and Workgroup Recommendations

	Current Value	Workgroup Recommendations
BAF	BCF-values applied (1992)	Apply Trophic Level 4 BAF (top of food web)
BW	70 kg (~154 lb.)	Update to 80 kg (~176 lb.)
CRL	1 in 100,000 (1997)	Majority recommended to retain 1 in 100,000
CSF	EPA values	Apply EPA values
DI	2.0 liters/day	Update to 2.5 liters/day
FCR	6.5 g/day. Does not include anadromous fish and other marine species	Majority recommended: Anadromous and non-anadromous local fish, and use rural consumers as target population
RfD	EPA values	Apply EPA values
RSC	N/A	Apply EPA values (did not deliberate on the adjustment of RSCs to account for inclusion of marine species)



Alaska's six regions, rural communities, all ages;	No. of households responding+	Mean (grams (g)/day)	90 th Percentile (grams (g)/day)
Salmon, Halibut, Herring, Non-marine Fish, and Marine Invertebrates			
Total Rural AK	6,632	149	308
Southeast	499	152	217
Southcentral	1,218	113	287
Southwest	645	145	379
Western	1,550	190	291
Arctic	1,663	125	246
Interior	1,057	127	308

EPA-contracted
Mountain
Whisperlight
Statistics of ADF&G
2019

weighted on # of
responses

Marine Mammals?

- Marine mammals are not referenced in the EPA 2000 guidance nor included by any other states.
- Bioaccumulation of pollutants is highly variable
- USFWS and other programs already have consumption advisories for certain species and body parts.
- The Relative Source Contribution is designed to account for marine mammal consumption.

Nutrition Facts	
Beluga whale meat, raw	
Serving Size: 3oz (85g)	
Amount per Serving: 1	
Calories 94	Calories from Fat 4
% Daily Value*	
Total Fat 0.4g	1%
Saturated Fat 0.08g	0%
Cholesterol 68mg	23%
Sodium 66mg	3%
Total Carbohydrate 0g	0%
Dietary Fiber 0g	0%
Sugars 0g	
Protein 23g	45%
Vitamin A 6%	Vitamin C 0%
Calcium 0%	Iron 122%

*Percent Daily Values are based on a 2000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Source: U.S. Department of Agriculture, Agricultural Research Service, 2012



Implementation

Future options-proposed

- MDL limits a permit limits
- Intake Credits
- Methylmercury-
Fish tissue/water column converter

Current Options

- Compliance Schedules
- WQS Variance
- Reclassification
- Site specific criteria
- Mixing Zones

Evaluating

- Monitoring only limits for new permit, 5 years
- Identify permit modifications that may be needed
 - Mixing Zone sizing
 - Source Control
 - Additional Treatment
- Other reg approaches



Schedule

February-March, 2023

Public scoping and comment solicitation

Summer 2023

Develop draft rulemaking and guidance

Fall/Winter 2024

Agency review of draft rulemaking and guidance

Spring 2024

Public notice for draft regulations

Fall 2024

State adoption of new HHC; submission to EPA



Sources of Information

<https://dec.alaska.gov/water/water-quality/human-health-criteria/>

- ADF&G Fish Consumption Rate Analysis (2019)
- DEC Human Health Criteria Technical Workgroup Report
- EPA-contracted statistical analysis of ADF&G Fish Consumption Rate Analysis (2019)
- HHC Factsheet (2023)

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