

Basis for Update of Acrolein, Phenol and Copper Criteria

Acrolein: Proposed criteria revisions

- Idaho previously used the RfD that was in the IRIS database as of May 17, 2002.
- This previous value was **0.02 mg/kg-day**.
- EPA revised the RfD in June 2003. Current value: **0.0005 mg/kg-day**.
- The critical effect observed in an oral exposure rat study was decreased survival.

Human Health Criteria Formulas

Noncancer Effects²

$$AWQC = \text{RfD} \cdot RSC \cdot \left(\frac{BW}{DI + \sum_{i=2}^4 (FI_i \cdot BAF_i)} \right)$$

Cancer Effects: Linear Low-Dose Extrapolation

$$AWQC = RSD \cdot \left(\frac{BW}{DI + \sum_{i=2}^4 (FI_i \cdot BAF_i)} \right)$$

Acrolein: Existing Human Health Criteria

	<u>Water + Organisms</u>	<u>Organisms Only</u>
EPA previous* :	190 µg/L	290 µg/L
EPA current:	6 µg/L	9 µg/L
Idaho current:	320 µg/L	780 µg/L

*Adopted by Idaho in 2006; disapproved by EPA in 2012

The Idaho values are based on a fish intake of 6.5 g/day; the EPA values are based on a fish intake of 17.5 g/day.

Phenol: Proposed criteria revisions

- Idaho previously used the RfD that was in the IRIS database as of May 17, 2002.
- This previous value was **0.6 mg/kg-day**, based on a 1983 developmental toxicity study.
- EPA revised the phenol RfD in September, 2002. Current value: **0.3 mg/kg-day**.
- The new RfD is based on a 1997 developmental toxicity study.
- A Benchmark Dose Low (BMDL) was used rather than a No Observed Adverse Effect Level (NOAEL) to derive the RfD.

Phenol: Existing Human Health Criteria

	<u>Water + Organisms</u>	<u>Organisms Only</u>
EPA previous* :	20,700 µg/L	1,700,000 µg/L
EPA current:	10,000 µg/L	860,000 µg/L
Idaho current:	21,000 µg/L	4,600,000 µg/L

* Adopted by Idaho in 2006; disapproved by EPA in 2012

The Idaho values are based on a fish intake of 6.5 g/day; the EPA values are based on a fish intake of 17.5 g/day.

Relative Source Contribution

- EPA has recommended that Idaho use an RSC value of 20% for acrolein and phenol.
- This is a default value to be used when information is unavailable regarding the contribution from exposure routes other than water and fish ingestion.
- The recommendation applies to criteria for a number of other chemicals in addition to acrolein and phenol.

Human Health Criteria Formulas

Noncancer Effects²

$$AWQC = RfD \cdot \text{RSC} \cdot \left(\frac{BW}{DI + \sum_{i=2}^4 (FI_i \cdot BAF_i)} \right)$$

Cancer Effects: Linear Low-Dose Extrapolation

$$AWQC = RSD \cdot \left(\frac{BW}{DI + \sum_{i=2}^4 (FI_i \cdot BAF_i)} \right)$$

Acrolein: Existing Human Health Criteria

	<u>Water + Organisms</u>	<u>Organisms Only</u>
EPA previous* :	190 µg/L	290 µg/L
EPA current:	6 µg/L	9 µg/L
EPA with 20% RSC:	1.2 µg/L	1.8 µg/L
Idaho current:	320 µg/L	780 µg/L

*Adopted by Idaho in 2006; disapproved by EPA in 2012

The Idaho values are based on a fish intake of 6.5 g/day; the EPA values are based on a fish intake of 17.5 g/day.

Phenol: Existing Human Health Criteria

	<u>Water + Organisms</u>	<u>Organisms Only</u>
EPA previous* :	20,700 µg/L	1,700,000 µg/L
EPA current:	10,000 µg/L	860,000 µg/L
EPA with 20% RSC:	2,000 µg/L	172,000 µg/L
Idaho current:	21,000 µg/L	4,600,000 µg/L

*Adopted by Idaho in 2006; disapproved by EPA in 2012

The Idaho values are based on a fish intake of 6.5 g/day; the EPA values are based on a fish intake of 17.5 g/day.

Copper: Proposed water + organism criterion

- Currently Idaho does not have human health criteria for copper.
- EPA recommended “water + organism” criterion is **1,300 $\mu\text{g}/\text{L}$** .
- This concentration is the drinking water criterion under SDWA.
- The criterion does not utilize a fish consumption rate, as copper health risk is primarily from drinking water.