

Ecology is proposing a new arsenic human health criterion of 10 µg/L, the same concentration used to regulate arsenic exposure under the Safe Drinking Water Act (SDWA).

Ecology is proposing the following two specific rule changes for arsenic:

1. Surface water human health criteria for total arsenic at the SDWA MCL of 10 µg/L.
2. Pollution prevention requirements to reduce anthropogenic inputs of arsenic in discharges to surface waters.

Ecology wants to ensure that anthropogenic sources of arsenic from industrial dischargers are controlled and prevented from getting into surface waters. The following draft language was developed to address discharges of arsenic from industrial sources:

“When Ecology determines that an indirect or direct industrial discharge to surface waters designated for domestic water supply may be adding arsenic to its wastewater, Ecology will require the discharger to develop and implement a pollution prevention plan to reduce arsenic through the use of AKART (All Known and Reasonable Treatment). Indirect discharges are industries that discharge wastewater to a privately or publicly owned wastewater treatment facility.”



Why is Arsenic being considered separately from the other toxics?

Arsenic is a naturally occurring element present in the environment in both inorganic and organic forms.

Arsenic is present in rocks, soils, and the waters in contact with them. Inorganic forms of arsenic are considered to be the most toxic, and are found in groundwater and surface water, as well as in many foods. A wide variety of adverse health effects, including skin and internal cancers, and cardiovascular and neurological effects, have been attributed to chronic arsenic exposure, primarily from drinking water (NAS, 1999; CTD, 2013).

There are also anthropogenic sources of arsenic in the environment, which include pesticides and herbicides, pressure treated lumber (a legacy source, as production of new pressure treated lumber treated with an arsenic compound has been phased out), fertilizers, pharmaceuticals, electronic semiconductors, automobile lead-acid batteries, lead bullets and shot, and metal smelting.

In Washington waters, naturally high levels of arsenic frequently exceed the criteria that are calculated using risk-based equations.

In Washington, natural levels of inorganic arsenic in surface freshwaters most frequently fall below the Safe Drinking Water Act maximum contaminant level (MCL) of 10 µg/L total arsenic, but are frequently higher than criteria that are calculated using the human health criteria risk-based equations. In situations where natural conditions result in ambient concentrations that are greater than the risk-based arsenic criteria currently applied in Washington (see table at right), Ecology uses the “natural conditions” provision in the water quality standards at WAC 173-201A-260 rather than the numeric criteria. This situation makes for a more confusing and uncertain regulatory environment for dischargers. This proposal to use the SDWA regulatory level for arsenic is based on a consideration of the continued uncertainty around the long-term reassessment of the EPA IRIS cancer potency factor for arsenic, EPA’s CWA-approval of the of the SDWA MCL for arsenic for other states, and the presence of naturally occurring arsenic in Washington.

Current Human Health Criteria for arsenic applied in Washington

Federal National Toxics Rule (NTR)
- Human Health Criteria (1992)

Organism + Water (µg/L)	Organism Only (µg/L)
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0.018 (inorganic)	0.14 (inorganic)
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Where does the drinking water MCL of 10µg/L come from?

EPA establishes MCLs for arsenic under the federal Safe Drinking Water Act. Up until 2001, the drinking water MCL for arsenic was 50 µg/L. EPA lowered the arsenic MCL to 10 µg/L in 2001, following an extensive public process. The new standard is based on cancer effects, and went into effect for public supplies of drinking water nationwide in 2006. Drinking water standards for arsenic in Washington are under the authority of the Washington Department of Health (WDOH).

Why not propose a criterion that is developed using the cancer risk-based criterion equations?

Ecology has determined that use of the EPA cancer potency factor would introduce a significant amount of uncertainty if used to develop human health criteria for arsenic. The inorganic arsenic cancer potency factor has been under reassessment by EPA for many years, and a date for finalization is not available. Using older cancer potency factors, either: (1) the cancer potency factor (1.75 per (mg/kg)/day) derived from the drinking water unit risk (5E-5 per (µg/L) that was used to calculate the NTR arsenic criteria; or, (2) the 1998 cancer potency factor (1.5E+0 per (mg/kg)/day); injects a high degree of uncertainty into the criteria calculation for a regulatory level, especially given that EPA has not relied on either of these as the basis of more recent CWA or SDWA regulations.

Human health arsenic criteria in other Western states

Nationwide, nearly half of the states use the drinking water MCL value of 10 µg/L for their CWA human health criteria arsenic criterion (information from Oregon DEQ).

As indicated in the table on the right, six western states have adopted the drinking water MCL as their state CWA human health criteria concentration-based standard for arsenic.

Human Health Standards for Arsenic in Western States		
State	Arsenic criteria	Basis
Alaska	10 µg/L	Same as SDWA MCL
Idaho	10 µg/L	
Wyoming	10 µg/L	
Nevada	10 µg/L	
Utah	10 µg/L	
New Mexico	10 µg/L	
Oregon	2.1 µg/L (drinking surface + fish and shellfish: “fresh waters”)	1 x 10 ⁻⁴ risk level
	1.0 µg/L (fish and shellfish only: marine and estuarine)	1 x 10 ⁻⁵ risk level
California	5.0 µg/L	Based on MCLs of Section 64431, Title 22 of the California Code of Regulations.