

Overview of Groundwater Standard for Total Chromium

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Groundwater Standards

- Environmental Management Commission (EMC) establishes the best usages of groundwaters as a source of drinking water. The EMC, directed by GS 143-214.1, establishes classifications and standards for the waters of the state.
- Rules are located in 15A NCAC 02L

NC DEQ Total Chromium Groundwater Standard

- Adopted by EMC – effective January 1, 2010
- Based upon EPA Integrated Risk Information System non-cancer oral Reference Dose (RfD) of 3×10^{-3} mg/kg/day for Hexavalent Chromium (1998 – One year, drinking water rat study)
 - This RfD is still listed on the IRIS site.
- This standard, as calculated, assumed all analytically reported **Total Chromium** may consist entirely of the more toxic **Hexavalent Chromium**.

Development of the Standard

- Previous standard was 50 ug/L
- Proposals to revise began in 2002
- After evaluation - 10 ug/L as total chromium was approved
- At point of development, info relating to carcinogenic effects had not been fully vetted.

GW Standards & IMACS

Per 02L .0202 (d) = the lower of:

1. Non-cancer concentration
2. 1/million cancer risk concentration
3. Taste threshold
4. Odor threshold
5. Maximum Contaminant Level (fed MCLs)
6. Secondary Drinking Water Standard

References Used

- In order of preference :
 - Integrated Risk Information System (US EPA)
 - Health Advisories (US EPA Office of Drinking Water)
 - Other health risk assessment data published by the US EPA
 - Other relevant, published health risk assessment data, and scientifically peer-reviewed published toxicological data.

Chromium – Surface Water Standards (freshwater)

Parameter	Derivation	Surface Water Quality Standard
Chromium III, acute	As dissolved fraction, hardness-dependent $WQS = [0.316 \times e^{\{0.8190[\ln \text{Hardness}] + 3.7256\}}]$	180 @ 25mg/L hardness
Chromium III, chronic	As dissolved fraction, hardness-dependent $WQS = [0.860 \times e^{\{0.8190[\ln \text{Hardness}] + 6848\}}]$	24 @ 25mg/L hardness
Chromium VI, acute	As dissolved fraction	16
Chromium VI, chronic	As dissolved fraction	11

All values and equations per EPA's 1995 Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water (EPA-820-B-96-001)

Questions?

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