

Chromium VI Human Health Non Cancer Calculations for Grand Portage Reservation Water Quality Standards – Tier 1

Chromium VI

CAS RN: 18540-29-9

Carcinogenicity

Weight-of-evidence

Classification: Class D; Not classifiable

NOAEL: 2.5mg/kg/day US EPA IRIS as of March 2006

Uncertainty Factor (UF): 300 US EPA IRIS as of March 2006

Relative Source Contribution (RSC): 0.8 US EPA

Human Body Weight (BW): 70 kg 40 CFR 132

Water Consumption (WC): 2.01 l/day 40 CFR 132 (the sum of drinking water 2.0 l/day and incidental ingestion 0.01 l/day)

Food Chain Multiplier (FCM): 1 40 CFR 132

Bioconcentration Factor (BCF): 16 National Toxics Rule

Chromium VI Criteria Calculations:

ADE: 0.008333 =NOAEL / UF; 2.5/300

BAF for inorganics is equal to the BCF. BCF = 16; FCM = 1, Human Health BAF = 16.

Grand Portage

Human Health Criteria:

$$\begin{aligned}
 &= (ADE * RSC * BW) / ((WC + ((FCt13 * HH \text{ BAF } t13) + (FCt14 * HH \text{ BAF } t14)))) \\
 &= (0.008333 * 0.8 * 70) / (2.01 + ((0.0356 * 16) + (0.1068 * 16))) \\
 &= 0.109 \text{ mg/L} \\
 &= 109 \text{ } \mu\text{g/L}
 \end{aligned}$$

Grand Portage human health noncancer Chromium VI criterion for drinking water sources is 109 μ /L.

Where:

ADE - Acceptable daily exposure

RSC - Relative Source Contribution

NOAEL - No observable adverse effect level

UF - Uncertainty factor

BW - Body weight

WC - Water consumption, drinking and incidental exposure

TL3 - Trophic level 3

TL4 - Trophic level 4

FCtl3 - Fish consumption trophic level 3

FCtl4 - Fish consumption trophic level 4

HH BAF - Human health bioaccumulation factor