**Section 302.590 Procedures for Determining the Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV)**

An LMHHNC or LMHHNV must be derived for those toxic substances for which any exposure, regardless of extent, carries some risk of damage from cancer or a nonthreshold toxic mechanism. For single or combinations of substances, a risk level of 1 in 100,000 (or 10-5) must be used to determine an LMHHNC or LMHHNV.

a) Minimum Data Requirements. Minimal experimental or epidemiological data requirements are incorporated in the cancer classification determined by USEPA in Appendix C II A to 40 CFR 132, incorporated by reference at 35 Ill. Adm. Code 301.106.

b) Principles for Development of Criteria or Values

1) Animal data are fitted to a linearized multistage computer model (Global 1986 in "Mutagenicity and Carcinogenicity Assessment for 1, 3-Butadiene" September 1985 EPA/600/8-85/004A, incorporated by reference at 35 Ill. Adm. Code 301.106 or scientifically justified equivalents). The upper-bound 95 percent confidence limit on risk at the 1 in 100,000 risk level must be used to calculate a risk associated dose (RAD); and

2) A species scaling factor must be used to account for differences between test species and humans. Milligrams per surface area per day is an equivalent dose between species. All doses presented in mg/kg body weight will be converted to an equivalent surface area dose by raising the mg/kg dose to the 3/4 power.

c) Determining the Risk-Associated Dose (RAD). The RAD must be calculated using the following equation:

RAD = 0.00001 / q1\*

Where:

|  |  |  |
| --- | --- | --- |
| RAD | = | risk-associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day) |
| 0.00001 (1 X 10-5) | = | incremental risk of developing cancer equal to 1 in 100,000 |
| q1\* | = | slope factor (mg/kg/day)-1 |
| RAD | = | risk-associated dose in milligrams of toxicant or combinations of toxicants per kilogram body weight per day (mg/kg/day) |
| 0.00001 (1 X 10(-5)) | = | incremental risk of developing cancer equal to 1 in 100,000 |
| q1\* | = | slope factor (mg/kg/day)-1 |

d) Determining the Lake Michigan Basin Human Health Nonthreshold Criterion (LMHHNC) or the Lake Michigan Basin Human Health Nonthreshold Value (LMHHNV)

LMHHNC or LMHHNV =

{ RAD x BW } / { WC + [(FCTL3 x BAFHHTL3) + (FCTL4 x BAFHHTL4)] }

Where:

|  |  |  |
| --- | --- | --- |
| LMHHNC or LMHHNV is in milligrams per liter (mg/L) | | |
| RAD | = | risk-associated dose of a substance or combination of substances in milligrams per day (mg/d) which is associated with a lifetime cancer risk level equal to a ratio of 1 to 100,000 |
| BW | = | weight of an average human (BW = 70 kg) |
| WC | = | per capita water consumption for surface waters classified as public water supplies = two liters/day, or per capita incidental daily water ingestion for surface waters not used as human drinking water sources = 0.01 liters/day |
| FCTL3 | = | mean consumption of trophic level 3 of regionally caught freshwater fish = 0.0036 kg/day |
| FCTL4 | = | mean consumption of trophic level 4 of regionally caught freshwater fish = 0.0114 kg/day |
| BAFHHTL3, BAFHHTL4 | = | bioaccumulation factor for trophic levels 3 and 4 as derived in Section 302.570 |

(Source: Amended at 47 Ill. Reg. 4437, effective March 23, 2023)