2011 Health Risk Limits for Groundwater
Health Risk Assessment Unit, Environmental Health Division
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# Chemical Name: Dichlorodifluoromethane
## CAS: #75-71-8
## Synonyms: Freon 12 (CFC-12)

**Acute Non-Cancer Health Risk Limits ($nHRL_{acute}$) = Not Derived (Insufficient data)**

**Short-term Non-Cancer Health Risk Limit ($nHRL_{short-term}$) = Not Derived (Insufficient data)**

**Subchronic Non-Cancer Health Risk Limit ($nHRL_{subchronic}$) = Not Derived (Insufficient data)**

**Chronic Non-Cancer Health Risk Limit ($nHRL_{chronic}$) = 700 µg/L**

$$= \frac{\text{(Reference Dose, mg/kg/d) x (Relative Source Contribution) x (Conversion Factor)}}{\text{(Chronic intake rate, L/kg/d)}}$$

$$= \frac{\text{(0.15 mg/kg/d) x (0.2) x (1000 µg/mg)}}{\text{(0.043 L/kg-d)}}$$

= 698 µg/L rounded to **700µg/L**

| | |
|---|---|
| Reference Dose: | 0.15 mg/kg-d (laboratory animal) |
| Source of toxicity value: | MDH 2008 (same as EPA IRIS 1995) |
| Point of Departure: | 150 mg/kg-d (LOAEL based on a 2 year feeding study in rats, Sherman, H. 1974—Haskell Lab as cited by EPA-IRIS 1995 ) |
| Human Equivalent Dose Adjustment: | Insufficient information |
| Total uncertainty factor: | 1000 |
| UF allocation: | 10 interspecies extrapolation from animal to human; 10 intraspecies variation. The NOAEL was an order of magnitude lower than the minimal effect LOAEL. Rather than use the NOAEL the minimal LOAEL was used with a LOAEL-to-NOAEL UF of 3. A database UF of 3 was also used to address insufficiencies (lack of developmental study and lack of detailed study information). |
| Critical effect(s): | Decreased body weight |
| Co-critical effect(s): | None |
| Additivity endpoint(s): | None |
| Secondary effect(s): | None |

**Cancer Health Risk Limit (cHRL) = Not Applicable**

Cancer classification: Group D not classifiable as to human carcinogenicity (EPA 2006)

**Volatile: Yes (highly volatile)**

**Summary of changes since 1993/1994 HRL promulgation:**
The chronic 2011 HRL (700 µg/L) is 1.4 fold lower than the 1993/94 HRL (1000 µg/L) as the result of: 1) incorporating a time-weighted average intake rate which incorporates higher intake rates early in life; 2) utilization of a slightly lower RfD; and 3) rounding to one significant digit.

**Summary of toxicity testing for health effects identified in the Health Standards Statute:**

| | Endocrine | Immunotoxicity | Developmental | Reproductive | Neurotoxicity |
|---|---|---|---|---|---|
| Tested? | No | No | No | Yes | Yes |
| Effects? | -- | -- | -- | No[1] | Yes[2] |

Note: Even if testing for a specific health effect was not conducted for this chemical, information about that effect might be available from studies conducted for other purposes. Most chemicals have been subject to multiple studies in which researchers identify a dose where no effects were observed, and the lowest dose that caused one or more effects. A toxicity value based on the effect observed at the lowest dose across all available studies is considered protective of all other effects that occur at higher doses.

**Comments on extent of testing or effects:**
[1] EPA 1995 (IRIS) reported that no effects were observed in a three generation study, however, no study details (e.g., dose levels, parameters evaluated) were included in the EPA summary.
[2] Behavioral neurotoxicity has been studied in animals exposed via inhalation, and has been observed in humans in cases of abuse (huffing) and in occupational studies. Exposures in inhalation studies have not been compared to exposures in feeding studies.

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