Adopted as Rule: September 30, 2013

Toxicological Summary for trans-1,2-Dichloroethene: CAS#: 156-60-5

Synonyms: trans-1,2-Dichloroethylene

Acute Non-Cancer Health Risk Limit ($nHRL_{acute}$) = Not Derived (Insufficient Data)

Short-term Non-Cancer Health Risk Limit ($nHRL_{short\text{-}term}$) = Not Derived (Insufficient Data)

Subchronic Non-Cancer Health Risk Limit ($nHRL_{subchronic}$) = 200 µg/L

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

$$= \frac{\text{(0.091 mg/kg/d) x (0.2) x (1000 µg/mg)}}{\text{(0.077 L/kg-d)}}$$

= 236 rounded to **200 µg/L**

Reference Dose / Concentration:	0.091 mg/kg-d (mice)
Source of toxicity value:	MDH 2012
Point of Departure:	65 mg/kg-d (BMDL based on EPA modeling of immunotoxicity data from Shopp et al. (1985))
Human Equivalent Dose Adjustment:	9.1 mg/kg-d [65 mg/kg-d x 0.14] (MDH, 2011)
Total uncertainty factor:	100
UF allocation:	3 for interspecies extrapolation (to address potential differences in toxicodynamics), 10 for intraspecies variability, 3 for database insufficiency (e.g., for lack of multigenerational study, data from inhalation studies did supplement dataset)
Critical effect(s):	Decreased ability to produce antibodies against sheep RBCs in male spleen cells
Co-critical effect(s):	Decreased thymus weight, clinical chemistry effects
Additivity endpoint(s):	Immune system

Chronic Non-Cancer Health Risk Limit ($nHRL_{chronic}$) = 40 µg/L

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

$$= \frac{\text{(0.0091mg/kg/d) x (0.2) x (1000 µg/mg)}}{\text{(0.043 L/kg-d)}}$$

= 42 rounded to **40 µg/L**

Reference Dose / Concentration:	0.0091 mg/kg-d (mice)
Source of toxicity value:	MDH 2012
Point of Departure:	65 mg/kg-d (BMDL based on EPA modeling of immunotoxicity data from Shopp et al. (1985))
Human Equivalent Dose Adjustment:	9.1 mg/kg-d [65 mg/kg-d x 0.14] (MDH, 2011)
Total uncertainty factor:	1000
UF allocation:	3 for interspecies extrapolation (to address potential differences in toxicodynamics), 10 for intraspecies variability, 10 for subchronic to chronic extrapolation, 3 for database insufficiency (for lack of multigenerational study, data from inhalation studies did supplement dataset)
Critical effect(s):	Decreased ability to produce antibodies against sheep RBCs in male spleen cells
Co-critical effect(s):	Decreased thymus weight, clinical chemistry effects
Additivity endpoint(s):	Immune system

Cancer Health Risk Limit (cHRL) = Not applicable

Cancer classification:	"*Inadequate information to assess the carcinogenic potential*" of trans-1,2-DCE.
Slope factor:	None
Source of slope factor:	EPA IRIS 2010
Tumor site(s):	None

Volatile: Yes (high)

Summary of changes since 1993/1994 HRL promulgation:
A Chronic HRL of 100 µg/L was promulgated in 1993. In 2011, Subchronic and Chronic Health-Based Values (HBVs) of 600 and 100 µg/L were derived. The Subchronic HBV value represented a new guidance value and the Chronic value did not change. MDH reevaluated the HBVs in 2012 to incorporate HED methodology. The resulting Subchronic and Chronic HBVs (200 and 40 µg/L) were lower (3-fold and 2.5-fold) than the values derived in 2011. The HBVs were adopted as HRLs in 2013 and the 1993 HRL was repealed.

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

	Endocrine	Immunotoxicity	Development	Reproductive	Neurotoxicity
Tested?	No	Yes	Yes	No	No
Effects?	No	Yes[1]	Yes[2]	No[3]	Secondary observations[4]

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] Shopp et al. (1985) measured depression in humoral immune status following 90 days of exposure via drinking water. These effects form the basis of the subchronic and chronic HRLs.
[2]A single inhalation developmental study exists. Decreased fetal body weight was observed at doses estimated to be over 400-fold higher than the minimal short-term critical Human Equivalent Dose. A database uncertainty factor has been applied, in part, due to the lack of oral developmental/reproductive studies.
[3]Examination of the reproductive organs of animals in the 90-day study did not report any histological changes. A database uncertainty factor has been applied, in part, due to the absence of a multigenerational study.
[4]Neurological effects have not been adequately studied. Acute exposures (e.g., single, high dose) have reported effects.

References:

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