Toxicity Information Updates

NEWMOA Meeting
EPA New England Presentation
March 28, 2013

Topics

- Tetrachloroethene (PCE)
- Trichloroethene (TCE)
- Dioxin
- Naphthalene

PCE

- Final Health Assessment released Feb. 2012 with new IRIS toxicity values (oral and inhalation).
- Comparing to old toxicity values:
  - New cancer values decrease → cancer risks decrease → cancer screening levels less stringent
  - New non-cancer values decrease → NC hazards increase → NC screening levels more stringent
- No change to MCL of 5 µg/L.

PCE - Residential Screening Levels

Medium	1E-06 Cancer Risk Screening Level (Old Screening Level)	HI=0.1 Non-cancer Screening Level (Old Screening Level)
Residential Soil	21.9 mg/kg (0.6)	8.6 mg/kg (37.2)
Residential Tap Water	9.8 µg/L (0.072)	3.5 µg/L (8.4)
Residential Indoor Air	9.4 µg/m^3 (0.4)	4.2 µg/m^3 (28.2)
Groundwater for Vapor Intrusion	12.5 µg/L (0.5)	5.6 µg/L (37.3)

PCE - Worker Screening Levels

Medium	1E-06 Cancer Risk Screening Level	HI=0.1 Non-cancer Screening Level
Soil	110.0 mg/kg	41.3 mg/kg
Indoor Air	47.2 µg/m^3	17.5 µg/m^3
Groundwater for Vapor Intrusion	63.0 µg/L	23.3 µg/L

TCE

- Final Health Assessment released Sep. 2011 with new IRIS toxicity values (oral and inhalation).
- Comparing to old toxicity values:
  - New cancer values increase → cancer risks increase → cancer screening levels more stringent
  - New non-cancer values decrease → NC hazards increase → NC screening levels more stringent
- No change to MCL of 5 µg/L.

TCE

- Cancer values: oral slope factor (CSF) and inhalation unit risk (IUR)
- Cancer values have 2 components:
  - Kidney Cancer
    - Mutagenic Mode of Action
    - More toxic for Early Life Exposure
    - Age-Dependent Adjustment Factors apply
  - Non-Hodgkin Lymphoma and Liver Cancer
    - No adjustments needed

TCE

- Non-cancer values:
  - Oral reference dose (RfD) value based on critical effects of heart malformations (rats), adult immunological effects (mice), and developmental immunotoxicity (mice).
  - Inhalation reference concentration (RfC) value based on route-to-route extrapolated results from oral studies for critical effects of heart malformations (rats) and immunotoxicity (mice).

TCE - Residential Screening Levels

Medium	1E-06 Cancer Risk Screening Level (Old Screening Level)	HI=0.1 Non-cancer Screen (Old Screening Level)
Residential Soil	0.91 m/kg	0.44 mg/kg
Residential Tap Water	0.44 µg/L (2.0)	0.26 µg/L (2.1)
Residential Indoor Air	0.43 µg/m^3 (1.2)	0.21 µg/m^3 (1.0)
Groundwater for Vapor Intrusion	1 µg/L (2.89)	0.5 µg/L (2.38)

TCE - Worker Screening Levels

Medium	1E-06 Cancer Risk Screening Level	HI=0.1 Non-cancer Screening Level
Indoor Air	3.0 µg/m^3	0.88 µg/m^3
Groundwater for Vapor Intrusion	7.1 µg/L	2.1 µg/L

TCE – short-term exposure issue

- Chronic toxicity values (RfD and RfC) are estimates of continuous exposure without an appreciable risk of non-cancer effects over a lifetime .
- TCE RfD and RfC based on increased developmental effects (fetal cardiac malformations) observed in short-term exposure to rats.

TCE – short-term exposure issue

- Issue: Chronic toxicity value versus short-term exposure with developmental health effects.
- Significant implications regarding immediate actions and decisions to reduce exposure.

TCE – short-term exposure issue

- Question: What is the appropriate duration exposure measure for comparison with chronic RfD and RfC based on short-term developmental effects?
- ORD and OSWER currently reviewing available science and implications to develop recommendations for appropriate exposure time frame.

TCE – Issues at VI Sites

- Implementation issues
  - Use the RfC value as average or not-to-exceed?
  - Sampling – how many rounds, samples, days?
  - Analytical turn-around time
  - Short time to respond upon receiving data
  - What are the appropriate actions? At what level and when to consider them?
  - Communications – how and when to inform potentially exposed people – before or after sampling?
  - Cost
  - Legal/enforcement

Dioxin Reanalysis Vol.1

- Final Non-Cancer Dioxin Reanalysis (Vol.1) released Feb. 2012 with new IRIS oral RfD of 1E-09 mg/kg-day for 2,3,7,8-TCDD.
- To use RfD to develop site-specific risk-based cleanup levels at CERCLA and RCRA sites.
- To use RfD for soil, dust, sediment, fish tissue via ingestion and dermal pathways.

Dioxin Reanalysis Vol.2

- Cancer Dioxin Reanalysis (Vol.2) is under development, schedule TBD.
- Available oral CSF for use from different sources (EPA 1985, CalEPA), not on IRIS.

Risk-based Dioxin Soil Levels

	Cancer Risk-Based	HI = 0.1	HI = 1.0
Resident	4.5 ppt	5 ppt	50 ppt
Outdoor Worker	18 ppt	66 ppt	660 ppt

Dioxin – Sampling and Cleanup Levels

- Recommend an incremental composite sampling approach for soil and sediment.
- Dioxin Tool Box for sampling and analysis
  - http://www.epa.gov/superfund/health/contaminants/dioxin/dioxinsoil.html
- Consult with HQ on sampling and setting dioxin cleanup levels.

Naphthalene

- Currently, non-cancer toxicity values (oral and inhalation) available on IRIS.
- Additional assessment under development, schedule TBD.