Direct Ingestion of Toluene in Soil

Scenario Assumptions:

1.) Residential Soil Ingestion Scenario
2.) Ingestion occurs for 30 years
3.) Time averaged Ingestion rate and Body Weight are used assuming a person is born at the area
4.) Exposure Frequency is 350 days/year
5.) Toluene is a non-carcinogen with its oral $RfD = 0.2 \frac{mg}{kg \cdot day}$ (IRIS)

$$Intake = \frac{(C_s)(IR)(CF)(FI)(EF)(ED)}{(BW)(AT)}$$

$$= \frac{(C_s)(120 \frac{mg}{day})(10^{-6} \frac{kg}{mg})(1.0)(350 \frac{days}{year})(30 \text{ years})}{(59 \text{ kg})(30 \text{ years})(365 \frac{days}{year})}$$

$$= (C_s)(1.95 \times 10^{-6} \text{ day}^{-1})$$

A) Non-Carcinogenic Concentration of Concern

$$\text{Hazard Quotient} = \frac{Intake}{RfD} = 1 \rightarrow Intake = RfD$$

$$(C_s)(1.95 \times 10^{-6} \text{ day}^{-1}) = 0.2 \frac{mg}{kg \cdot day}$$

$$C_s = \frac{0.2 \frac{mg}{kg \cdot day}}{1.95 \times 10^{-6} \text{ day}^{-1}} = 10256 \frac{mg}{kg}$$

B) Hazard Quotient at Maximum Toluene Concentration

Maximum Toluene Concentration = 1200 mg/kg

$$\frac{Intake}{RfD} = \frac{(1200 \text{ mg/kg})(1.95 \times 10^{-6} \text{ day}^{-1})}{(0.2 \frac{mg}{kg \cdot day})} = 1.2E-02$$

ADMIN RECORD