**Section 742.APPENDIX C Tier 2 Illustrations and Tables**

**Section 742.TABLE C RBCA Equations**

|  |  |  |  |
| --- | --- | --- | --- |
| Equations for the combined exposures routes of soil ingestion inhalation of vapors and particulates, and dermal contact with soil | Remediation Objectives for Carcinogenic Contaminants (mg/kg) |  | R1 |
| Remediation Objectives for Non-carcinogenic Contaminants (mg/kg) |  | R2 |
| Volatilization Factor for Surficial Soils, VFss (kg/m3)Whichever is less between R3 and R4 |  | R3 |
|  | R4 |
| Volatilization Factor for Surfici al Soils Regarding Particulates, VFp (kg/m3) |  | R5 |
| Effective Diffusion Coefficient in Soil Based on Vapor-Phase Concentration Dseff (cm2/s) |  | R6 |

|  |  |  |  |
| --- | --- | --- | --- |
| Equations for the ambient vapor inhalation (outdoor) route from subsurface soils | Remediation Objectives for Carcinogenic Contaminants (mg/kg) |  | R7 |
| Remediation Objectives for Non-carcinogenic Contaminants (mg/kg) |  | R8 |
| Carcinogenic Risk-Based Screening Level for Air, RBSLair (μg/m3) |  | R9 |
| Noncarcino-genic Risk-Based Screening Level for Air, RBSLair (μg/m3) |  | R10 |
| Volatilization Factor - Subsurface Soil to Ambient Air, VFsamb (mg/m3)/(mg/kgsoil) |  | R11 |

|  |  |  |  |
| --- | --- | --- | --- |
| Equations for the Soil Component of the Ground-water Ingestion Exposure Route | Remediation Objective (mg/kg) |  | R12 |
| NOTE: This equation can only be used to model contaminant migration not in the water bearing unit. |
| Groundwater at the source, GWsource (mg/L)  |  | R13 |
| Leaching Factor, LFsw (mg/Lwater)/(mg/kgsoil)  |  | R14 |
| Steady-State Attenuation Along the Centerline of a Dissolved Plume,C(x)/Csource |  | R15 |
| NOTE: 1. This equation does not predict the contaminant flow within bedrock and may not accurately predict downgradient concentrations in the presence of a confining layer.2. If the value of the First Order Degradation Constant (λ) is not readily available, then set λ = 0. |
|  | Longitudinal Dispersivity, αx (cm) |  | R16 |
| Transverse Dispersivity, αy (cm) |  | R17 |
| Vertical Dispersivity, αz (cm) |  | R18 |
| Specific Discharge, U (cm/d) |  | R19 |
| Soil-Water Sorption Coefficient, ks |  | R20 |
| Volumetric Air Content in Vadose Zone Soils, θas (cm3air/cm3soil) |  | R21 |
| Volumetric Water Content in Vadose Zone Soils, θws (cm3water/cm3 soil) |  | R22 |
| Total Soil Porosity, θT (cm3/cm3soil) |  | R23 |
| Groundwater Darcy Velocity, Ugw (cm/yr) |  | R24 |
| Equations for the Groundwater Ingestion Exposure Route | Remediation Objective for Carcinogenic Contaminants (mg/L) |  | R25 |
| Dissolved Hydrocarbon Concentration along Centerline, C(x) (mg/L water) |  | R26 |
| NOTE: 1. This equation does not predict the containment flow within bedrock and may not accurately predict downgradient concentrations in the presence of a confining layer.2. If the value of the First Order Degradation Constant (λ) is not readily available, then set λ = 0. |

(Source: Amended at 31 Ill. Reg. 4063, effective February 23, 2007)