

APPENDIX B

INFILTRATION BASIN SOILS RECONTAMINATION ANALYSIS AND STORMWATER SEDIMENT

Appendix B. Calculation of Potential DDx Compound Build-Up at Bottom of Infiltration Basin.

Migration to Groundwater

Screening Level in Soil (mg/Kg) =	$C_w \times [K_d + (\Theta_w + \Theta_a \times H') / \rho_b]$		<u>DDD</u>	<u>DDE</u>	<u>DDT</u>
C_w = target leachate concentration (mg/L)		1,000 x JSCS SLV for discharge at the Willamette River	3.1E-04	2.2E-04	2.2E-04
K_d = soil-water partition coefficient (L/Kg) = $K_{oc} \times f_{oc}$		calculated	2,000	8,940	5,260
K_{oc} = organic carbon/water partition coefficient (L/Kg)		chemical-specific	1.0E+06	4.5E+06	2.6E+06
f_{oc} = fraction organic carbon (g/g)		default value	0.002	0.002	0.002
Θ_w = water-filled soil porosity		default value	0.3	0.3	0.3
Θ_a = air-filled soil porosity = $n - \Theta_w$		calculated	0.13	0.13	0.13
n = soil porosity = $1 - (\rho_b / \rho_s)$		calculated	0.43	0.43	0.43
H' = dimensionless Henry's Law Constant		chemical specific	1.6E-04	8.6E-04	3.3E-04
ρ_b = dry soil bulk density (Kg/L)		default value	1.5	1.5	1.5
ρ_s = soil particulate density (Kg/L)		default value	2.65	2.65	2.65
		SSL (mg/Kg):	0.62	1.97	1.16

Assume top 3 inches of basin concentrate stormwater flow:

Area of basin (250' diameter) =	49,087 ft ²			
Volume concentrating DDx Compounds =	12,272 ft ³			
=	347 m ³			
=	347,293 L			
Mass of soil with concentrated DDx =	520,939	Kg		
		<u>DDD</u>	<u>DDE</u>	<u>DDT</u>
Mass of DDx that can be concentrated before the SSL is exceeded (mg):		323,015	1,024,607	602,854
Approximate current average concentration in stormwater --> i.e. no treatment (mg/L):		4.4E-05	1.7E-04	1.9E-04
L of stormwater that can be infiltrated before SSL is exceeded:		7.34E+09	6.03E+09	3.17E+09
In gallons:		1.94E+09	1.59E+09	8.38E+08
Gallons/year infiltrated (assumes 100% of annual stormwater discharge is infiltrated):		1.87E+07	1.87E+07	1.87E+07
Years before SSL is exceeded at the bottom of the basin:		104	85	45