

Source Type

☒ Soil Source ☐ Groundwater Source

Level Number

☐ Level One

☐ Level Two

☒ Level Three

☐ Level Four

☐ Advanced

Parameter Values

☒ Deterministic ☐ Probabilistic

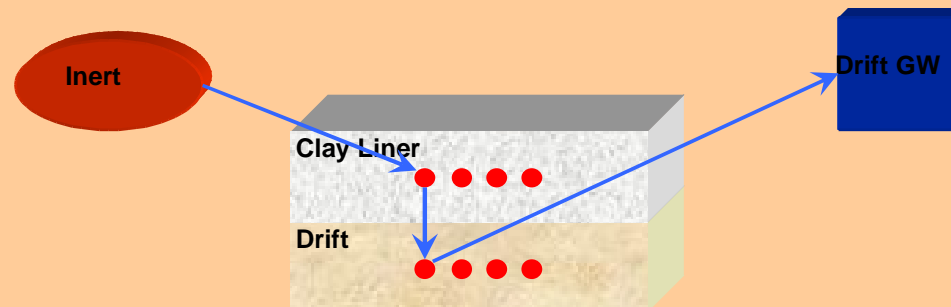
Created: 03/07/2020 17:34:33

by: Gavin Chaplin

Version: 3.00.00 Adv

Site: Cavenham Minor

Numerical value
Suggested formula
Probabilistic parameters
Data specified elsewhere
Suggested formula edited



SOURCE CONCENTRATIONS: Inert

Source Data Options

- ☐ Pore water concentrations
☐ Leaching test
☒ Soil contaminant concentrations

SOIL SOURCE

Source Type

- ☐ Constant source
☒ Declining source

Source Geometry

Inert_Source_length	800	m
Inert_Source_width	775	m
Inert_Source_area	620000	m2
Inert_Source_thickness	4.17	m
Inert_Source_volume	2585400	m3

General Source Properties

Inert_Source_porosity_total	[-]	0.4
Inert_Source_porosity_water_filled	[-]	0.1
Inert_Source_porosity_air_filled	[-]	0.3
Inert_Source_dry_bulk_density	kg/m3	1600
Inert_Source_fraction_organic_carbon	[-]	0.02

Source Contaminant Information

Source determinand names	Benzene	
Inert_Soil_contaminant_concentration	mg/kg	6
Inert_Source_solid_water_partitioning_coefficient_Kd	L/kg	2.682
Inert_Initial_inventory	kg	24819.84
Inert_Input_concentration	mg/L	2.159341

CONTAMINANT INFORMATION

		Species1
Source determinand names	▲ ▼	1 Benzene

Receptor Target Concentrations

	Name	Values in mg/L
Quality Standard 1	MRV	0.001
Quality Standard 2		
Quality Standard 3		
Quality Standard 4		

Generic Contaminant Properties

Contaminants_Solubility	mg/L	1770
Contaminants_Henrys_Law_Constant	[-]	0.182
Contaminants_Organic_Carbon_Water_Partition_Coefficient_Koc	L/kg	134.1
Contaminants_Free_Water_Diffusion_Coefficient	m2/s	6.64E-10

HYDROGEOLOGICAL UNITS

Hydrogeological Units		Clay Liner	Drift
Hydrogeology_Unit_Thickness	m	1	0.01
Hydrogeology_Log_Hydraulic_Conductivity	log(m/s)	-7	-4.2375
Hydrogeology_Hydraulic_Conductivity	m/s	1E-07	5.79E-05
Hydrogeology_Hydraulic_Gradient	[-]	10	0.00275
Hydrogeology_Porosity	[-]	0.4	0.42
Hydrogeology_Velocity	m/s	2.5E-06	3.79E-07
Hydrogeology_Tortuosity	[-]	10	10

ATTENUATION PARAMETERS

Hydrogeological Units	Clay Liner	Drift
-----------------------	------------	-------

General properties

Attenuation_Dry_bulk_density	kg/m3	2000	1900
Attenuation_Fraction_organic_carbon	[-]	0.05	0.002

Contaminant specific parameters

Benzene

Attenuation_Partition_Coefficient_Kd_Species_1	L/kg	6.705	0.2682
Attenuation_Retardation_Species_1	[-]	34.525	2.213286
Attenuation_Half_Life_Species_1	days	No Decay	350
Attenuation_Decay_Coefficient_Species_1	1/s	0	2.29E-08

WATER BALANCE

Infiltration through the soil zone source

Source Name: Inert

Effective_Rainfall	86	mm/year
Infiltration_Factor	0.6	[-]
Infiltration_Rate	51.6	mm/year
Infiltration_Area	620000	m2
Q_Infiltration	0.001014	m3/s

PATHWAY SUMMARY

Path 1
Path 1 Type
Path 1 Name
Path 1 Process
Path 1 Standards
Path 1 Parameter1
Path 1 Parameter2
Path 1 Parameter3
Path 1 Parameter4
Path 1 Parameter5
Path 1 Parameter6

Section 1		Section 2		Section 3		Section 4	
Source		Unit		Unit		Receptor	
Inert		Clay Liner: Node 1		Drift: Node 1		Drift GW	
Declining source		ADRD (1D)		ADRD (1D) + Dilution		Monitoring Borehole	
						Target Standard	MRV
Q_managed [m3/s]	0.000E+00	Velocity [m/s]	2.500E-06	Velocity [m/s]	3.790E-07		
Managed time [years]	0.000E+00	Dispersivity [m]	0.1	Dispersivity [m]	38.8		
Q_path [m3/s]	1.014E-03	Travel Distance [m]	1.0	Travel Distance [m]	387.5		
Q_decline [m3/s]	1.014E-03			Mixing Depth [m]	0.0		
				Mixing Width [m]	800.0		
		Q_Dilute [m3/s]	0	Q_Dilute [m3/s]	1.273E-06	Q_dilute [m3/s]	0.000E+00

SIMULATION PARAMETERS

Monte Carlo Analysis with Crystal Ball

Reported Percentile
Number of simulations

95
10000

- ☐ Stop on calculation error
☐ Use same sequence of random numbers

Minimise while running:

- ☒ Nothing
☐ All Spreadsheets (faster)
☐ Microsoft Excel (fastest)

Named Constants

s_per_year	31557600
s_per_day	86400

Laplace Transform Solution Parameters

sigma	0
nu	1
nsum	16
omega	11

Reporting Options

- ☐ Include Remedial Targets and Attenuation Factors on the results sheets in Advanced level.
☐ Use the array form of the RAM function
☐ Include a set of timeslices for each contaminant in each pathway

Number of timeslices for breakthrough curves

5

The timeslices specified on the results sheets are saved below.

Path1 timeslices in years

TS_Path1

10
25
50
100
250

BREAKTHROUGH RESULTS

Site Name: "Cavenham Minor"

Level 3

Pollutant Linkage: Inert, Clay Liner, Drift, Drift GW

Concentrations in mg/L in Drift GW

Compared with MRV target concentration in mg/L

1.000E-03

Time(years)	Species1
Benzene	
10	3.180E-10
25	2.308E-08
50	2.171E-08
100	1.889E-08
250	1.245E-08

Pollutant Linkage: Inert, Clay Liner, Drift, Drift GW

Remedial Target Concentrations in mg/kg in Inert

Time(years)	Species1
Benzene	
10	1.000E+40
25	1.000E+40
50	1.000E+40
100	1.000E+40
250	1.000E+40

Compared with source concentrations in mg/kg

6.000E+00

Pollutant Linkage: Inert, Clay Liner, Drift, Drift GW

Dilution Factor

1.001E+00 for all species and timeslices

Pollutant Linkage: Inert, Clay Liner, Drift, Drift GW

Attenuation Factor

Time(years)	Species1
Benzene	
10	6.781E+09
25	9.344E+07
50	9.932E+07
100	1.141E+08
250	1.733E+08

