

POLLUTEv10

Version 10.00
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Case 10: Time-varying advective-dispersive transport

THE VARIABLE VELOCITY AND/OR CONCENTRATION OPTION HAS BEEN USED. NOTE THAT THE ACCURACY OF THE CALCULATIONS WITH THIS OPTION WILL DEPEND ON THE NUMBER OF SUBLAYERS USED.

Layer Properties

Layer	Thickness	Number of Sublayers	Coefficient of Hydrodynamic Dispersion	Matrix Porosity	Distribution Coefficient	Dry Density
Aquitard	4 m	12	0.02 cm ² /a	0.4	0 m ³ /kg	1.5 g/cm ³

Boundary Conditions

Finite Mass Top Boundary

Fixed Outflow Bottom Boundary

Landfill Length	200 m
Landfill Width	1 m
Base Thickness	1 m
Base Porosity	0.3

Variation in Properties with Time

Time Periods with the same Source and Velocity

Period	Start Time	No. of Steps	Time Step	Source Conc	Rate of Change	Height of Leachate	Volume Collected
1	0 year	1	20 year	1000 mg/L	0	7.5 m	0.3 m/a
2	20 year	10	1 year	-1 mg/L	0	7.5 m	0.3 m/a
3	30 year	10	10 year	-1 mg/L	0	7.5 m	0.279 m/a

Period	Start Time	End Time	Proportion Mass	Dispersivity	Base Velocity
1	0 year	20 year	-0.001 m/a	0 m	2 m/a
2	20 year	30 year	0 m/a	0.4 m	2 m/a
3	30 year	130 year	0.021 m/a	0.4 m	6.2 m/a

Laplace Transform Parameters

TAU	7
N	20
SIG	0
RNU	2

Calculated Concentrations at Selected Times and Depths

Time year	Depth m	Concentration mg/L
20	0.00000E+00	4.49325E+02
	1.00000E+00	0.00000E+00
	2.00000E+00	0.00000E+00
	3.00000E+00	0.00000E+00
	4.00000E+00	0.00000E+00
21	0.00000E+00	4.31705E+02
	1.00000E+00	1.00000E-06
	2.00000E+00	1.00000E-06
	3.00000E+00	1.00000E-06
	4.00000E+00	9.67262E-07
22	0.00000E+00	4.14003E+02
	1.00000E+00	1.00000E-06
	2.00000E+00	1.00000E-06
	3.00000E+00	1.00000E-06
	4.00000E+00	9.37269E-07
23	0.00000E+00	3.96794E+02
	1.00000E+00	1.00077E-06
	2.00000E+00	1.00000E-06
	3.00000E+00	1.00000E-06
	4.00000E+00	9.09545E-07
24	0.00000E+00	3.80289E+02
	1.00000E+00	2.07504E-06
	2.00000E+00	1.00000E-06
	3.00000E+00	9.99975E-07
	4.00000E+00	8.84196E-07
25	0.00000E+00	3.64527E+02
	1.00000E+00	3.65734E-04
	2.00000E+00	1.00000E-06
	3.00000E+00	9.99845E-07
	4.00000E+00	8.61276E-07
26	0.00000E+00	3.49497E+02
	1.00000E+00	2.29492E-02
	2.00000E+00	1.00087E-06
	3.00000E+00	9.99496E-07
	4.00000E+00	8.40775E-07
27	0.00000E+00	3.35167E+02
	1.00000E+00	3.11221E-01
	2.00000E+00	1.08757E-06

	3.00000E+00	9.98821E-07
	4.00000E+00	8.22635E-07
28	0.00000E+00	3.21499E+02
	1.00000E+00	1.72580E+00
	2.00000E+00	7.77444E-06
	3.00000E+00	9.97774E-07
	4.00000E+00	8.06771E-07
29	0.00000E+00	3.08457E+02
	1.00000E+00	5.60019E+00
	2.00000E+00	2.97135E-04
	3.00000E+00	9.97698E-07
	4.00000E+00	7.93081E-07
30	0.00000E+00	2.96004E+02
	1.00000E+00	1.29488E+01
	2.00000E+00	5.20872E-03
	3.00000E+00	1.06410E-06
	4.00000E+00	7.81453E-07
40	0.00000E+00	1.98142E+02
	1.00000E+00	1.33970E+02
	2.00000E+00	2.09028E+01
	3.00000E+00	7.03111E-01
	4.00000E+00	1.51793E-03
50	0.00000E+00	1.33459E+02
	1.00000E+00	1.57489E+02
	2.00000E+00	7.94960E+01
	3.00000E+00	1.63395E+01
	4.00000E+00	5.85595E-01
60	0.00000E+00	9.01035E+01
	1.00000E+00	1.37918E+02
	2.00000E+00	1.15366E+02
	3.00000E+00	5.12839E+01
	4.00000E+00	6.32261E+00
70	0.00000E+00	6.09187E+01
	1.00000E+00	1.09276E+02
	2.00000E+00	1.21824E+02
	3.00000E+00	8.30150E+01
	4.00000E+00	2.05081E+01
80	0.00000E+00	4.12281E+01
	1.00000E+00	8.25960E+01
	2.00000E+00	1.11199E+02
	3.00000E+00	9.94726E+01

	4.00000E+00	3.83552E+01
90	0.00000E+00	2.79233E+01
	1.00000E+00	6.08070E+01
	2.00000E+00	9.37155E+01
	3.00000E+00	1.01299E+02
	4.00000E+00	5.31367E+01
100	0.00000E+00	1.89240E+01
	1.00000E+00	4.40385E+01
	2.00000E+00	7.52120E+01
	3.00000E+00	9.35019E+01
	4.00000E+00	6.13405E+01
110	0.00000E+00	1.28317E+01
	1.00000E+00	3.15460E+01
	2.00000E+00	5.84391E+01
	3.00000E+00	8.09347E+01
	4.00000E+00	6.28349E+01
120	0.00000E+00	8.70473E+00
	1.00000E+00	2.24225E+01
	2.00000E+00	4.43887E+01
	3.00000E+00	6.70057E+01
	4.00000E+00	5.92564E+01
130	0.00000E+00	5.90747E+00
	1.00000E+00	1.58465E+01
	2.00000E+00	3.31616E+01
	3.00000E+00	5.37101E+01
	4.00000E+00	5.26434E+01

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