

POLLUTEv10

Version 10.00
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Case 15: Leachate Collection with Failure.

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.

THE PASSIVE SINK OPTION HAS BEEN USED. NOTE THE USER IS RESPONSIBLE FOR ENSURING THAT VELOCITY CHANGES ARE CONSISTENT WITH THE PASSIVE SINK.

Layer Properties

Layer	Thickness	Number of Sublayers	Coefficient of Hydrodynamic Dispersion	Matrix Porosity	Distribution Coefficient	Dry Density
Clay	1 m	4	0.02 m ² /a	0.4	0 mL/g	1.5 g/cm ³
Collection System	0.3 m	4	10 m ² /a	0.3	0 mL/g	1.5 g/cm ³
Aquitard	2 m	4	0.02 m ² /a	0.4	0 mL/g	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	0.29 m/a
2	20 year	5	2 year	-1 mg/L	0	7.5 m	0.2 m/a
3	30 year	2	10 year	-1 mg/L	0	7.5 m	0.2 m/a
4	50 year	5	10 year	-1 mg/L	0	7.5 m	0.2 m/a
5	100 year	5	20 year	-1 mg/L	0	7.5 m	0.2 m/a

Period	Start Time	End Time	Proportion Mass	Dispersivity	Base Velocity
1	0 year	20 year	1 m/a	0.4 m	4 m/a
2	20 year	30 year	1 m/a	0.4 m	4 m/a
3	30 year	50 year	1 m/a	0.4 m	4 m/a
4	50 year	100 year	1 m/a	0.4 m	4 m/a
5	100 year	200 year	1 m/a	0.4 m	4 m/a

Velocity and Sink Profile

Time Period	Minimum Depth	Maximum Depth	Vertical Velocity	Horizontal Outflow
1/1	0 m	1 m	0.01 m/a	0 m/a
	1 m	1.3 m	0.01 m/a	6.67 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
2/1	0 m	1 m	0.028 m/a	0 m/a
	1 m	1.3 m	0.028 m/a	18.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
2/2	0 m	1 m	0.046 m/a	0 m/a
	1 m	1.3 m	0.046 m/a	30.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
2/3	0 m	1 m	0.064 m/a	0 m/a
	1 m	1.3 m	0.064 m/a	42.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
2/4	0 m	1 m	0.082 m/a	0 m/a
	1 m	1.3 m	0.082 m/a	54.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
2/5	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
3/1	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
3/2	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
4/1	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
4/2	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
4/3	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
4/4	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
4/5	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
5/1	0 m	1 m	0.1 m/a	0 m/a

	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
5/2	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
5/3	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
5/4	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a
5/5	0 m	1 m	0.1 m/a	0 m/a
	1 m	1.3 m	0.1 m/a	66.7 m/a
	1.3 m	3.3 m	0 m/a	0 m/a

Laplace Transform Parameters

TAU	7
N	20
SIG	0
RNU	2

Calculated Concentrations at Selected Times and Depths

Time yr	Depth m	Concentration mg/L
20	0.00000E+00	4.39458E+02
	2.50000E-01	4.45414E+02
	5.00000E-01	4.21072E+02
	7.50000E-01	3.71230E+02
	1.00000E+00	3.03346E+02
	1.07500E+00	3.03267E+02
	1.15000E+00	3.03210E+02
	1.22500E+00	3.03172E+02
	1.30000E+00	3.03156E+02
	1.80000E+00	1.30668E+02
22	2.30000E+00	4.10805E+01
	2.80000E+00	9.39089E+00
	3.30000E+00	7.09459E-01
	0.00000E+00	4.13716E+02
	2.50000E-01	4.15764E+02
	5.00000E-01	4.01711E+02
	7.50000E-01	3.70118E+02

	1.0000E+00	3.2240E+02
	1.0750E+00	3.22329E+02
	1.1500E+00	3.22314E+02
	1.2250E+00	3.22357E+02
	1.3000E+00	3.22461E+02
	1.8000E+00	1.41146E+02
	2.3000E+00	4.89910E+01
	2.8000E+00	1.23589E+01
	3.3000E+00	1.06210E+00
24	0.0000E+00	3.89485E+02
	2.5000E-01	3.92748E+02
	5.0000E-01	3.86116E+02
	7.5000E-01	3.67924E+02
	1.0000E+00	3.37179E+02
	1.0750E+00	3.37130E+02
	1.1500E+00	3.37180E+02
	1.2250E+00	3.37328E+02
	1.3000E+00	3.37574E+02
	1.8000E+00	1.53001E+02
	2.3000E+00	5.64732E+01
	2.8000E+00	1.55062E+01
	3.3000E+00	1.51797E+00
26	0.0000E+00	3.66737E+02
	2.5000E-01	3.71705E+02
	5.0000E-01	3.70484E+02
	7.5000E-01	3.61391E+02
	1.0000E+00	3.42591E+02
	1.0750E+00	3.42577E+02
	1.1500E+00	3.42700E+02
	1.2250E+00	3.42959E+02
	1.3000E+00	3.43354E+02
	1.8000E+00	1.64523E+02
	2.3000E+00	6.38979E+01
	2.8000E+00	1.87496E+01
	3.3000E+00	2.07745E+00
28	0.0000E+00	3.45391E+02
	2.5000E-01	3.51193E+02
	5.0000E-01	3.53121E+02
	7.5000E-01	3.49653E+02

	1.0000E+00	3.3880E+02
	1.0750E+00	3.3883E+02
	1.1500E+00	3.3902E+02
	1.2250E+00	3.3938E+02
	1.3000E+00	3.3992E+02
	1.8000E+00	1.7410E+02
	2.3000E+00	7.1184E+01
	2.8000E+00	2.2080E+01
	3.3000E+00	2.7365E+00
30	0.0000E+00	3.2534E+02
	2.5000E-01	3.3115E+02
	5.0000E-01	3.3449E+02
	7.5000E-01	3.3410E+02
	1.0000E+00	3.2817E+02
	1.0750E+00	3.2823E+02
	1.1500E+00	3.2848E+02
	1.2250E+00	3.2893E+02
	1.3000E+00	3.2959E+02
	1.8000E+00	1.8084E+02
	2.3000E+00	7.8033E+01
	2.8000E+00	2.5469E+01
	3.3000E+00	3.4897E+00
40	0.0000E+00	2.1988E+02
	2.5000E-01	2.2755E+02
	5.0000E-01	2.3449E+02
	7.5000E-01	2.4013E+02
	1.0000E+00	2.4365E+02
	1.0750E+00	2.4373E+02
	1.1500E+00	2.4396E+02
	1.2250E+00	2.4434E+02
	1.3000E+00	2.4486E+02
	1.8000E+00	1.8808E+02
	2.3000E+00	1.0760E+02
	2.8000E+00	4.7120E+01
	3.3000E+00	1.0354E+01
50	0.0000E+00	1.4880E+02
	2.5000E-01	1.5458E+02
	5.0000E-01	1.6024E+02
	7.5000E-01	1.6559E+02

	1.0000E+00	1.7040E+02
	1.0750E+00	1.7047E+02
	1.1500E+00	1.7064E+02
	1.2250E+00	1.7092E+02
	1.3000E+00	1.7130E+02
	1.8000E+00	1.6025E+02
	2.3000E+00	1.1203E+02
	2.8000E+00	5.9849E+01
	3.3000E+00	1.7885E+01
60	0.0000E+00	1.0077E+02
	2.5000E-01	1.0498E+02
	5.0000E-01	1.0931E+02
	7.5000E-01	1.1375E+02
	1.0000E+00	1.1833E+02
	1.0750E+00	1.1838E+02
	1.1500E+00	1.1851E+02
	1.2250E+00	1.1871E+02
	1.3000E+00	1.1898E+02
	1.8000E+00	1.2821E+02
	2.3000E+00	1.0232E+02
	2.8000E+00	6.2544E+01
	3.3000E+00	2.3073E+01
70	0.0000E+00	6.8282E+01
	2.5000E-01	7.1323E+01
	5.0000E-01	7.4563E+01
	7.5000E-01	7.8082E+01
	1.0000E+00	8.2015E+01
	1.0750E+00	8.2059E+01
	1.1500E+00	8.2153E+01
	1.2250E+00	8.2296E+01
	1.3000E+00	8.2488E+01
	1.8000E+00	9.9701E+01
	2.3000E+00	8.7280E+01
	2.8000E+00	5.6980E+01
	3.3000E+00	1.8166E+01
80	0.0000E+00	4.6290E+01
	2.5000E-01	4.8471E+01
	5.0000E-01	5.0868E+01
	7.5000E-01	5.3584E+01

	1.0000E+00	5.67908E+01
	1.07500E+00	5.68246E+01
	1.15000E+00	5.68924E+01
	1.22500E+00	5.69943E+01
	1.30000E+00	5.71306E+01
	1.80000E+00	7.58421E+01
	2.30000E+00	7.02613E+01
	2.80000E+00	4.64189E+01
	3.30000E+00	1.15399E+01
90	0.00000E+00	3.13962E+01
	2.50000E-01	3.29495E+01
	5.00000E-01	3.46989E+01
	7.50000E-01	3.67433E+01
	1.00000E+00	3.92481E+01
	1.07500E+00	3.92732E+01
	1.15000E+00	3.93218E+01
	1.22500E+00	3.93940E+01
	1.30000E+00	3.94900E+01
	1.80000E+00	5.63663E+01
	2.30000E+00	5.39338E+01
	2.80000E+00	3.53685E+01
	3.30000E+00	6.86305E+00
100	0.00000E+00	2.13031E+01
	2.50000E-01	2.23996E+01
	5.00000E-01	2.36575E+01
	7.50000E-01	2.51607E+01
	1.00000E+00	2.70484E+01
	1.07500E+00	2.70667E+01
	1.15000E+00	2.71012E+01
	1.22500E+00	2.71519E+01
	1.30000E+00	2.72190E+01
	1.80000E+00	4.10071E+01
	2.30000E+00	3.99961E+01
	2.80000E+00	2.59711E+01
	3.30000E+00	4.08187E+00
120	0.00000E+00	9.81941E+00
	2.50000E-01	1.03660E+01
	5.00000E-01	1.10143E+01
	7.50000E-01	1.18199E+01

	1.0000E+00	1.28740E+01
	1.07500E+00	1.28836E+01
	1.15000E+00	1.29010E+01
	1.22500E+00	1.29261E+01
	1.30000E+00	1.29590E+01
	1.80000E+00	2.17629E+01
	2.30000E+00	2.28425E+01
	2.80000E+00	1.72279E+01
	3.30000E+00	8.03809E+00
140	0.00000E+00	4.53399E+00
	2.50000E-01	4.81130E+00
	5.00000E-01	5.15272E+00
	7.50000E-01	5.59511E+00
	1.00000E+00	6.19918E+00
	1.07500E+00	6.20442E+00
	1.15000E+00	6.21338E+00
	1.22500E+00	6.22608E+00
	1.30000E+00	6.24254E+00
	1.80000E+00	1.20070E+01
	2.30000E+00	1.37437E+01
	2.80000E+00	1.14863E+01
	3.30000E+00	6.34964E+00
160	0.00000E+00	2.09868E+00
	2.50000E-01	2.24287E+00
	5.00000E-01	2.42754E+00
	7.50000E-01	2.67669E+00
	1.00000E+00	3.02985E+00
	1.07500E+00	3.03276E+00
	1.15000E+00	3.03750E+00
	1.22500E+00	3.04407E+00
	1.30000E+00	3.05248E+00
	1.80000E+00	6.75429E+00
	2.30000E+00	8.22963E+00
	2.80000E+00	7.25496E+00
	3.30000E+00	4.27872E+00
180	0.00000E+00	9.74478E-01
	2.50000E-01	1.05045E+00
	5.00000E-01	1.15134E+00
	7.50000E-01	1.29222E+00

	1.0000E+00	1.49788E+00
	1.07500E+00	1.49952E+00
	1.15000E+00	1.50205E+00
	1.22500E+00	1.50549E+00
	1.30000E+00	1.50985E+00
	1.80000E+00	3.80921E+00
	2.30000E+00	4.85844E+00
	2.80000E+00	4.42580E+00
	3.30000E+00	2.70091E+00
200	0.00000E+00	4.54172E-01
	2.50000E-01	4.94531E-01
	5.00000E-01	5.49866E-01
	7.50000E-01	6.29355E-01
	1.00000E+00	7.48070E-01
	1.07500E+00	7.48984E-01
	1.15000E+00	7.50349E-01
	1.22500E+00	7.52168E-01
	1.30000E+00	7.54441E-01
	1.80000E+00	2.14382E+00
	2.30000E+00	2.83035E+00
	2.80000E+00	2.63685E+00
	3.30000E+00	1.64423E+00

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