

# POLLUTEv10

Version 10.00  
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## Case 17. Landfill with composite primary liners.

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
Geomembrane	60 mil	1	3E-5 m <sup>2</sup> /a	1	0 mL/g	950 kg/m <sup>3</sup>
Clay Liner	0.9 m	10	0.02 m <sup>2</sup> /a	0.35	0.5 mL/g	1.9 g/cm <sup>3</sup>
Collection System	0.3 m	1	100 m <sup>2</sup> /a	0.3	0 m <sup>3</sup> /kg	1.9 kg/m <sup>3</sup>
Clay Liner	0.9 m	10	0.02 m <sup>2</sup> /a	0.35	0.5 m <sup>3</sup> /kg	1.9 kg/m <sup>3</sup>
Aquitard	3 m	10	0.02 m <sup>2</sup> /a	0.3	0.5 m <sup>3</sup> /kg	1.9 kg/m <sup>3</sup>

### Boundary Conditions

Constant Concentration Top Boundary

Source Concentration	1500 µg/L
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Fixed Outflow Bottom Boundary

Landfill Length	200 m
Landfill Width	0 m
Base Thickness	3 m
Base Porosity	0.3
Base Outflow Velocity	10 m/a

### Velocity and Sink Profile

Time Period	Minimum Depth	Maximum Depth	Vertical Velocity	Horizontal Outflow	Phase Parameter
01	0 m	0.001524 m	3.9744E-5 m/a	0 m/a	1
	0.001524 m	0.9 m	3.9744E-5 m/a	0 m/a	1
	0.9 m	1.2 m	3.9744E-5 m/a	0 m/a	1
	1.2 m	2.1 m	3.9744E-5 m/a	0 m/a	1
	2.1 m	5.1 m	3.9744E-5 m/a	0 m/a	1

### Laplace Transform Parameters

TAU	7
N	20
SIG	0
RNU	2

**Calculated Concentrations at Selected Times and Depths**

Time yr	Depth m	Concentration µg/L
10	0.00000E+00	1.50000E+03
	1.52400E-03	6.82301E+02
	9.15240E-02	4.91734E+02
	1.81524E-01	3.36990E+02
	2.71524E-01	2.18955E+02
	3.61524E-01	1.34530E+02
	4.51524E-01	7.79841E+01
	5.41524E-01	4.25599E+01
	6.31524E-01	2.18129E+01
	7.21524E-01	1.04359E+01
	8.11524E-01	4.53240E+00
	9.01524E-01	1.48643E+00
	1.20152E+00	1.48503E+00
	1.29152E+00	5.76210E-01
	1.38152E+00	2.08994E-01
	1.47152E+00	7.08077E-02
	1.56152E+00	2.23949E-02
	1.65152E+00	6.60846E-03
	1.74152E+00	1.81852E-03
	1.83152E+00	4.66463E-04
1.92152E+00	1.11497E-04	
2.01152E+00	2.48687E-05	
2.10152E+00	5.39467E-06	
2.40152E+00	1.20333E-08	
2.70152E+00	6.03885E-11	
3.00152E+00	6.87701E-12	
3.30152E+00	7.51932E-13	
3.60152E+00	6.47886E-14	
3.90152E+00	4.34417E-15	
4.20152E+00	2.23624E-16	
4.50152E+00	8.70334E-18	
4.80152E+00	2.51664E-19	
5.10152E+00	8.43518E-22	
20	0.00000E+00	1.50000E+03
	1.52400E-03	8.25970E+02

	9.15240E-02	6.63622E+02
	1.81524E-01	5.19937E+02
	2.71524E-01	3.96788E+02
	3.61524E-01	2.94616E+02
	4.51524E-01	2.12571E+02
	5.41524E-01	1.48788E+02
	6.31524E-01	1.00729E+02
	7.21524E-01	6.55299E+01
	8.11524E-01	4.03088E+01
	9.01524E-01	2.23914E+01
	1.20152E+00	2.23811E+01
	1.29152E+00	1.33165E+01
	1.38152E+00	7.67019E+00
	1.47152E+00	4.27531E+00
	1.56152E+00	2.30527E+00
	1.65152E+00	1.20209E+00
	1.74152E+00	6.06039E-01
	1.83152E+00	2.95375E-01
	1.92152E+00	1.39266E-01
	2.01152E+00	6.38133E-02
	2.10152E+00	2.91305E-02
	2.40152E+00	1.20750E-03
	2.70152E+00	3.22076E-05
	3.00152E+00	5.50843E-07
	3.30152E+00	6.27797E-09
	3.60152E+00	1.24645E-10
	3.90152E+00	2.17231E-11
	4.20152E+00	4.98826E-12
	4.50152E+00	1.02823E-12
	4.80152E+00	1.84823E-13
	5.10152E+00	6.49567E-15
30	0.00000E+00	1.50000E+03
	1.52400E-03	9.08767E+02
	9.15240E-02	7.64404E+02
	1.81524E-01	6.32192E+02
	2.71524E-01	5.13696E+02
	3.61524E-01	4.09764E+02
	4.51524E-01	3.20540E+02
	5.41524E-01	2.45529E+02

	6.31524E-01	1.83719E+02
	7.21524E-01	1.33713E+02
	8.11524E-01	9.38852E+01
	9.01524E-01	6.25216E+01
	1.20152E+00	6.25021E+01
	1.29152E+00	4.31690E+01
	1.38152E+00	2.91924E+01
	1.47152E+00	1.93232E+01
	1.56152E+00	1.25171E+01
	1.65152E+00	7.93365E+00
	1.74152E+00	4.92000E+00
	1.83152E+00	2.98615E+00
	1.92152E+00	1.77624E+00
	2.01152E+00	1.04030E+00
	2.10152E+00	6.08765E-01
	2.40152E+00	6.82386E-02
	2.70152E+00	5.72790E-03
	3.00152E+00	3.58673E-04
	3.30152E+00	1.67066E-05
	3.60152E+00	5.78245E-07
	3.90152E+00	1.51637E-08
	4.20152E+00	4.24381E-10
	4.50152E+00	5.37901E-11
	4.80152E+00	1.51196E-11
	5.10152E+00	9.86130E-13
50	0.00000E+00	1.50000E+03
	1.52400E-03	1.00698E+03
	9.15240E-02	8.85043E+02
	1.81524E-01	7.69813E+02
	2.71524E-01	6.62331E+02
	3.61524E-01	5.63367E+02
	4.51524E-01	4.73405E+02
	5.41524E-01	3.92650E+02
	6.31524E-01	3.21043E+02
	7.21524E-01	2.58294E+02
	8.11524E-01	2.03925E+02
	9.01524E-01	1.57313E+02
	1.20152E+00	1.57282E+02
	1.29152E+00	1.23136E+02

	1.38152E+00	9.52239E+01
	1.47152E+00	7.27309E+01
	1.56152E+00	5.48631E+01
	1.65152E+00	4.08742E+01
	1.74152E+00	3.00837E+01
	1.83152E+00	2.18877E+01
	1.92152E+00	1.57645E+01
	2.01152E+00	1.12745E+01
	2.10152E+00	8.05635E+00
	2.40152E+00	2.02799E+00
	2.70152E+00	4.30860E-01
	3.00152E+00	7.70584E-02
	3.30152E+00	1.15773E-02
	3.60152E+00	1.45864E-03
	3.90152E+00	1.53901E-04
	4.20152E+00	1.35837E-05
	4.50152E+00	1.00268E-06
	4.80152E+00	6.20437E-08
	5.10152E+00	6.33453E-10
100	0.00000E+00	1.50000E+03
	1.52400E-03	1.12366E+03
	9.15240E-02	1.02956E+03
	1.81524E-01	9.38278E+02
	2.71524E-01	8.50331E+02
	3.61524E-01	7.66165E+02
	4.51524E-01	6.86160E+02
	5.41524E-01	6.10622E+02
	6.31524E-01	5.39781E+02
	7.21524E-01	4.73795E+02
	8.11524E-01	4.12748E+02
	9.01524E-01	3.56656E+02
	1.20152E+00	3.56615E+02
	1.29152E+00	3.09224E+02
	1.38152E+00	2.66596E+02
	1.47152E+00	2.28538E+02
	1.56152E+00	1.94817E+02
	1.65152E+00	1.65172E+02
	1.74152E+00	1.39318E+02
	1.83152E+00	1.16962E+02

	1.92152E+00	9.78016E+01
	2.01152E+00	8.15405E+01
	2.10152E+00	6.78884E+01
	2.40152E+00	3.19693E+01
	2.70152E+00	1.38707E+01
	3.00152E+00	5.53687E+00
	3.30152E+00	2.03101E+00
	3.60152E+00	6.83902E-01
	3.90152E+00	2.11220E-01
	4.20152E+00	5.97842E-02
	4.50152E+00	1.54780E-02
	4.80152E+00	3.55423E-03
	5.10152E+00	1.70270E-04

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