

# POLLUTEv10

Version 10.00  
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GAEA Technologies Ltd., R.K. Rowe and J.R. Booker

## Case 18: Phase Change

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
Primary Liner	0.6 m	4	0.02 m <sup>2</sup> /a	0.4	1.5 cm <sup>3</sup> /g	1.9 g/cm <sup>3</sup>
Unsaturated Collection System	0.2 m	4	300 m <sup>2</sup> /a	0.45	0 cm <sup>3</sup> /g	1.9 g/cm <sup>3</sup>
Saturated Collection System	0.1 m	4	100 m <sup>2</sup> /a	0.45	0 cm <sup>3</sup> /g	1.9 g/cm <sup>3</sup>
Secondary Liner	0.75 m	4	0.02 m <sup>2</sup> /a	0.4	1.5 cm <sup>3</sup> /g	1.9 g/cm <sup>3</sup>

### Boundary Conditions

#### Constant Concentration Top Boundary

Source Concentration	0.04 mol/m <sup>3</sup>
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#### Fixed Outflow Bottom Boundary

Landfill Length	500 m
Landfill Width	500 m
Base Thickness	1 m
Base Porosity	0.3
Base Outflow Velocity	3 m/a

### Radioactive or Biological Decay

Radioactive or Biological Decay Source Half Life = 10 year

Radioactive or Biological Decay Base Half Life = 40 year

#### First Order Radioactive or Biological Decay Depth Ranges

Minimum Depth	Maximum Depth	Half Life
0 m	0.6 m	40 year
0.6 m	0.9 m	0 year
0.9 m	1.65 m	40 year

### Velocity and Sink Profile

Time Period	Minimum Depth	Maximum Depth	Vertical Velocity	Horizontal Outflow	Phase Parameter
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01	0 m	0.6 m	0.003 m/a	0 m/a	1
	0.6 m	0.8 m	0.003 m/a	0 m/a	0.1
	0.8 m	0.9 m	0.003 m/a	15 m/a	1
	0.9 m	1.65 m	0 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 year	Depth m	Concentration mol/m <sup>3</sup>
80	0.00000E+00	1.6E-04
	1.50000E-01	4.9E-04
	3.00000E-01	7.2E-04
	4.50000E-01	8.2E-04
	6.00000E-01	8.0E-04
	6.50000E-01	8.0E-04
	7.00000E-01	8.0E-04
	7.50000E-01	8.0E-04
	8.00000E-01	8.0E-04
	8.25000E-01	8.0E-04
	8.50000E-01	8.0E-04
	8.75000E-01	8.0E-04
	9.00000E-01	8.0E-04
	1.08750E+00	6.5E-04
	1.27500E+00	4.6E-04
1.46250E+00	3.0E-04	
1.65000E+00	2.1E-04	
85	0.00000E+00	1.1E-04
	1.50000E-01	3.9E-04
	3.00000E-01	5.9E-04
	4.50000E-01	6.9E-04
	6.00000E-01	7.0E-04
	6.50000E-01	7.0E-04
	7.00000E-01	7.0E-04
	7.50000E-01	7.0E-04
	8.00000E-01	7.0E-04

	8.25000E-01	7.0E-04
	8.50000E-01	7.0E-04
	8.75000E-01	7.0E-04
	9.00000E-01	7.0E-04
	1.08750E+00	5.8E-04
	1.27500E+00	4.3E-04
	1.46250E+00	3.0E-04
	1.65000E+00	2.1E-04
90	0.00000E+00	7.8E-05
	1.50000E-01	3.2E-04
	3.00000E-01	4.9E-04
	4.50000E-01	5.9E-04
	6.00000E-01	6.0E-04
	6.50000E-01	6.0E-04
	7.00000E-01	6.0E-04
	7.50000E-01	6.0E-04
	8.00000E-01	6.0E-04
	8.25000E-01	6.0E-04
	8.50000E-01	6.0E-04
	8.75000E-01	6.0E-04
	9.00000E-01	6.0E-04
	1.08750E+00	5.2E-04
	1.27500E+00	4.0E-04
	1.46250E+00	2.9E-04
	1.65000E+00	2.1E-04
95	0.00000E+00	5.5E-05
	1.50000E-01	2.5E-04
	3.00000E-01	4.1E-04
	4.50000E-01	5.0E-04
	6.00000E-01	5.2E-04
	6.50000E-01	5.2E-04
	7.00000E-01	5.2E-04
	7.50000E-01	5.2E-04
	8.00000E-01	5.2E-04
	8.25000E-01	5.2E-04
	8.50000E-01	5.2E-04
	8.75000E-01	5.2E-04
	9.00000E-01	5.2E-04
	1.08750E+00	4.7E-04

	1.27500E+00	3.7E-04
	1.46250E+00	2.8E-04
	1.65000E+00	2.1E-04
100	0.00000E+00	3.9E-05
	1.50000E-01	2.1E-04
	3.00000E-01	3.4E-04
	4.50000E-01	4.2E-04
	6.00000E-01	4.5E-04
	6.50000E-01	4.5E-04
	7.00000E-01	4.5E-04
	7.50000E-01	4.5E-04
	8.00000E-01	4.5E-04
	8.25000E-01	4.5E-04
	8.50000E-01	4.5E-04
	8.75000E-01	4.5E-04
	9.00000E-01	4.5E-04
	1.08750E+00	4.1E-04
	1.27500E+00	3.4E-04
	1.46250E+00	2.6E-04
	1.65000E+00	2.0E-04

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