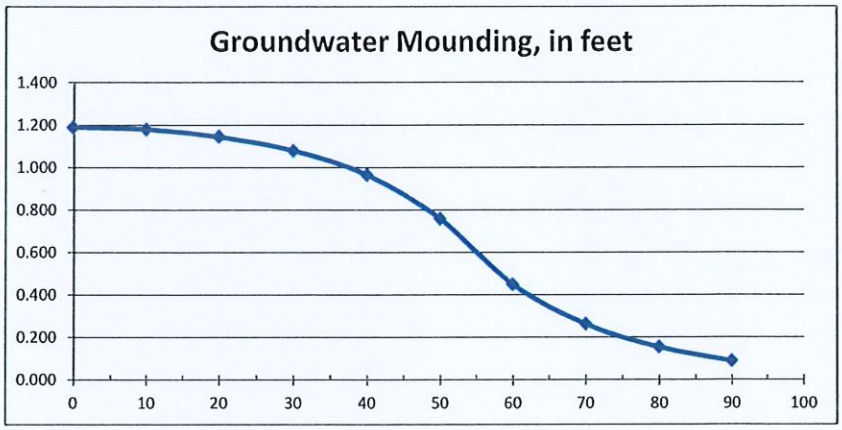
INFILTRATION BASIN MOUNDING ANALYSIS - X DIRECTION

Input Values

0.50	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
8.90	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
53.900	x	1/2 length of basin (x direction, in feet)
8.100	y	1/2 width of basin (y direction, in feet)
16.31	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)
11.189	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
1.189	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
1.189	0
1.179	10
1.144	20
1.079	30
0.964	40
0.758	50
0.449	60
0.262	70
0.153	80
0.088	90

Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

INFILTRATION BASIN MOUNDING ANALYSIS - Y DIRECTION

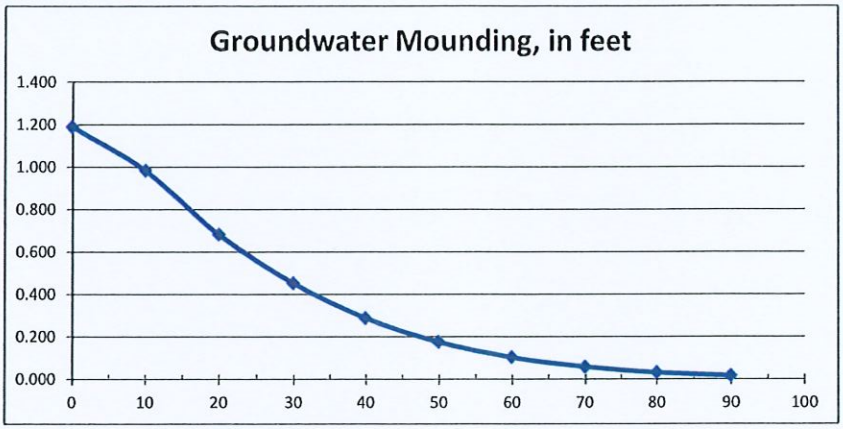
Input Values

0.50	R	Recharge rate (permeability rate) (in/hr)
0.150	Sy	Specific yield, Sy (dimensionless) default value is 0.15; max value is 0.2 provided that a lab test data is submitted
8.90	Kh	Horizontal hydraulic conductivity (in/hr) Kh = 5xRecharge Rate (R) in the costal plan; Kh=R outside the coastal plan
8.100	x	1/2 length of basin (x direction, in feet)
53.900	y	1/2 width of basin (y direction, in feet)
16.31	t	Duration of infiltration period (hours)
10.00	hi(0)	Initial thickness of saturated zone (feet)

11.189	h(max)	Maximum thickness of saturated zone (beneath center of basin at end of infiltration period)
1.189	Δh(max)	Maximum groundwater mounding (beneath center of basin at end of infiltration period)

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
1.189	0
0.983	10
0.681	20
0.452	30
0.287	40
0.174	50
0.101	60
0.057	70
0.030	80
0.016	90

Re-Calculate Now



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GALLERIA II
Project # 2021.080.02
05/22/25

Mounding Analysis-Time Calculation

Duration of infiltration period:

$$t\ (hr) = \frac{\text{Volume of runoff to be infilltrated (cf) x 12 in/ft}}{\text{Infiltration area (sf) x Recharge (in/hr)}}$$

$$t\ (hr) = \frac{1{,}188\ \text{(cf) x 12 in/ft}}{1748\ \text{(sf) x 0.5 (in/hr)}}$$

t (hr) = 16.31 hrs