APPENDIX L

Primeros of Results of Computer Modeling on Permeability Test Using Hyper Ventilate

Air Permeability Test - Data Analysis (cont.)

VT 1

10 cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
5.0	1.2	5.0	0.2	5.0	0.1
10.0	1.8	10.0	0.3	10.0	0.3
15.0	2.0	15.0	0.3	15.0	0.4
20.0	2.2	20.0	0.3	20.0	0.45
25.0	2.2	25.0	0.3	25.0	0.5
30.0	2.2	30.0	0.3	30.0	0.5
35.0	2.2	35.0	0.3	35.0	0.5
				–	
clear		clear		clear	

③ Enter (optional):

a) flowrate 10 (SCFM)

b) screened interval thickness 6 (ft)

-->Calculate<--

k=	29.166555	darcy (A)	k= 347.644684	darcy (A)	k= 71.08566 darcy (A)
k=	27.05919	darcy (B)	k= 1744.39325	darcy (B)	k= 60.653393 darcy (B)

Return | Explanation & Statistics | AP8

5m shallow | 10m shallow | 20m shallow

Air Permeability Test - Data Analysis (cont.)

VT1

10 CFM

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	-0.2
5.0	3.0	5.0	0.3	5.0	-0.2
10.0	4.8	10.0	0.3	10.0	-0.1
15.0	5.7	15.0	0.4	15.0	-0.1
20.0	6.2	20.0	0.5	20.0	0
25.0	6.5	25.0	0.4	25.0	0
30.0	6.5	30.0	0.4	30.0	0
35.0	6.5	35.0	0.4	35.0	0
clear		clear		clear	

③ Enter (optional):

a) flowrate 10 (SCFM)

b) screened interval thickness 6 (ft)

-->Calculate<--

k=	8.142864	darcy (A)	k= 221.550764	darcy (A)	k= 137.474802 darcy (A)
k=	12.270153	darcy (B)	k= 693.84244	darcy (B)	k= 5.62426 darcy (B)

Return | Explanation & Statistics | AP8

5m Deep | 10m Deep | 20m Deep

Air Permeability Test - Data Analysis (cont.)

VT 1

20 cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 20 (SCFM)

b) screened interval thickness 6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0	0.5	0	0.5	0
1.0	0.2	1.0	0	1.0	0
1.5	0.7	1.5	0	1.5	0
2.0	1.0	2.0	0.1	2.0	0
2.5	1.5	2.5	0.2	2.5	0.05
3.0	1.8	3.0	0.2	3.0	0.1
3.5	2.0	3.5	0.2	3.5	0.15
4.0	2.2	4.0	0.3	4.0	0.05
4.5	2.5	4.5	0.3	4.5	0.1

clear clear clear

-->Calculate<--

k= 25.351787 darcy (A) k= 113.665328 darcy (A) k= 225.095719 darcy (A)

k= 16.089725 darcy (B) k= 36.855132 darcy (B) k= 119.30088 darcy (B)

Return Explanation & Statistics AP8

5m shallow 10m shallow 20m shallow

Air Permeability Test - Data Analysis (cont.)

VT 1

20 cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 20 (SCFM)

b) screened interval thickness 6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0	0.5	0	0.5	0
1.0	1.0	1.0	0	1.0	0
1.5	2.0	1.5	0.2	1.5	0
2.0	2.8	2.0	0.3	2.0	0
2.5	3.5	2.5	0.4	2.5	0
3.0	4.2	3.0	0.6	3.0	0
3.5	5.0	3.5	0.6	3.5	0
4.0	5.5	4.0	0.7	4.0	0
4.5	6.2	4.5	0.7	4.5	0

clear clear clear

-->Calculate<--

k= 11.712057 darcy (A) k= 115.53399 darcy (A) k= 485.92595 darcy (A)

k= 19.81791 darcy (B) k= 92.67732 darcy (B) k= 87.26999 darcy (B)

Return Explanation & Statistics AP8

5m Deep 10m Deep 20m Deep

Air Permeability Test - Data Analysis (cont.)

VT 1 25cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 25 (SCFM)

b) screened interval thickness 6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0	0.5	0	0.5	0
1.0	0.7	1.0	0.1	1.0	0.05
1.5	1.2	1.5	0.1	1.5	0.05
2.0	1.8	2.0	0.2	2.0	0.05
2.5	2.2	2.5	0.3	2.5	0.1
3.0	2.5	3.0	0.4	3.0	0.15
3.5	2.8	3.5	0.4	3.5	0.15
4.0	3.2	4.0	0.5	4.0	0.1
4.5	3.2	4.5	0.5	4.5	0.15

clear clear clear

--> Calculate <--

k= 37.20004 darcy (A) k= 128.838637 darcy (A) k= 233.921423 darcy (A)

k= 35.956093 darcy (B) k= 58.083183 darcy (B) k= 142.945832 darcy (B)

Return | Explanation & Statistics | AP8

5m 10m 20m

Shallow Shallow Shallow

Air Permeability Test - Data Analysis (cont.)

VT 1

25cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 25 (SCFM)

b) screened interval thickness 6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0.5	0.5	0	0.5	0
1.0	2.0	1.0	0.1	1.0	0.05
1.5	3.0	1.5	0.4	1.5	0.05
2.0	4.0	2.0	0.6	2.0	0.05
2.5	5.0	2.5	0.7	2.5	0.05
3.0	6.0	3.0	0.8	3.0	0.05
3.5	6.8	3.5	0.8	3.5	0.05
4.0	7.8	4.0	0.9	4.0	0.1
4.5	8.2	4.5	1.0	4.5	0.1

clear clear clear

--> Calculate <--

k= 18.74915 darcy (A) k= 220.421959 darcy (A) k= 615.497532 darcy (A)

k= 58.862728 darcy (B) k= 706.683647 darcy (B) k= 227.90159 darcy (B)

Return | Explanation & Statistics | AP8

5m 10m 20m

Deep Deep Deep

VT 2

39 cfm

Air Permeability Test - Data Analysis (cont.)

① Enter radial distances of monitoring points → r= [ ] (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 39 (SCFM)

b) screened interval thickness 6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
		0	0	0	0
		0.5	0	0.5	0
		1.0	0	1.0	0.05
		1.5	0	1.5	0.05
		2.0	0	2.0	0.1
		2.5	0	2.5	0.1
		3.0	0	3.0	0.1
		3.5	0	3.5	0.1
		4.0	0.3	4.0	0.1
		4.5	0.3	4.5	0.1

clear clear clear

--> Calculate <--

k= [ ] darcy (A) k= 401.623412 darcy (A) k= 1143.60698 darcy (A)

k= [ ] darcy (B) k= 34.903878 darcy (B) k= 373.37588 darcy (B)

Return | Explanation & Statistics | AP8

10m 20m

Shallow Shallow

VT 2

39 cfm

Air Permeability Test - Data Analysis (cont.)

① Enter radial distances of monitoring points → r= [ ] (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 39 (SCFM)

b) screened interval thickness 6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
		0	0	0	0
		0.5	0	0.5	0
		1.0	0.6	1.0	0.05
		1.5	0.6	1.5	0.05
		2.0	0.6	2.0	0.05
		2.5	0.6	2.5	0.05
		3.0	0.6	3.0	0.1
		3.5	0.6	3.5	0.1
		4.0	0.6	4.0	0.1
		4.5	0.6	4.5	0.1

clear clear clear

--> Calculate <--

k= [ ] darcy (A) k= 516.727694 darcy (A) k= 1764.56422 darcy (A)

k= [ ] darcy (B) k= 1617.54639 darcy (B) k= 517.722444 darcy (B)

Return | Explanation & Statistics | AP8

10m 20m

Deep Deep

Air Permeability Test - Data Analysis (cont.)

VT 2

100 cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 100 (SCFM)

b) screened interval thickness 6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0	0.5	0.2	0.5	0.05
1.0	0.2	1.0	0.3	1.0	0.15
1.5	0.5	1.5	0.5	1.5	0.25
2.0	0.5	2.0	0.55	2.0	0.3
2.5	0.5	2.5	0.55	2.5	0.3
3.0	0.5	3.0	0.55	3.0	0.35
3.5	0.5	3.5	0.6	3.5	0.35
4.0	0.5	4.0	0.6	4.0	0.35
4.5	0.7	4.5	0.6	4.5	0.4

clear clear clear

→Calculate←

k= 667.642515 darcy (A) k= 1203.25958 darcy (A) k= 1286.64369 darcy (A)

k= 32.050538 darcy (B) k= 853.372712 darcy (B) k= 762.939222 darcy (B)

Return Explanation & Statistics AP8

5m Shallow 10m Shallow 20m Shallow

Air Permeability Test - Data Analysis (cont.)

VT 2

100 cfm

① Enter radial distances of monitoring points → r= (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 100 (SCFM)

b) screened interval thickness 6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
		0	0	2.0	0.3
		0.5	0.2	2.5	0.35
		1.0	0.3	3.0	0.35
		1.5	0.5	3.5	0.4
		2.0	0.55	4.0	0.4
		2.5	0.55	4.5	0.4
		3.0	0.6	5.0	0.45
		3.5	0.6	6.0	0.45
		4.0	0.6	7.0	0.45
		4.5	0.6	8.0	0.45

clear clear clear

→Calculate←

k= darcy (A) k= 1209.63154 darcy (A) k= 1086.34376 darcy (A)

k= darcy (B) k= 896.699278 darcy (B) k= 613.338555 darcy (B)

Return Explanation & Statistics AP8

10m Deep 20m Deep

VT3

8 cfm

Air Permeability Test - Data Analysis (cont.)

① Enter radial distances of monitoring points → r= 3.3 (ft) | r= 3.3 (ft) | r= (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 8 (SCFM)

b) screened interval thickness 6.6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0.0	0.00	0.0	0.00		
0.5	0.00	0.5	0.45		
1.0	0.00	1.0	0.45		
1.5	0.00	1.5	0.50		
2.0	0.25	2.0	0.75		
2.5	0.25	2.5	1.00		
3.0	0.25	3.0	1.10		
3.5	0.30	3.5	1.25		
4.0	0.30	4.0	1.45		
4.5	0.30	4.5	1.50		

clear | clear | clear

-->Calculate<-- k= 64.468139 darcy (A) k= 0.541019 darcy (B) | k= 13.748915 darcy (A) k= 0.6995 darcy (B) | k= darcy (A) k= darcy (B)

Return | Explanation & Statistics | AP8

1m(3A) Shallow | 1m(3A) Deep.

VT3

Flow Rate = 8 cfm

Air Permeability Test - Data Analysis (cont.)

① Enter radial distances of monitoring points → r= 16.4 (ft) | r= 32.8 (ft) | r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 8 (SCFM)

b) screened interval thickness 6.6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0.0	0.00	0.0	0.00	0.0	0.00
0.5	0.50	0.5	0.15	0.5	0.00
1.0	0.60	1.0	0.25	1.0	0.00
1.5	0.60	1.5	0.30	1.5	0.00
2.0	0.60	2.0	0.30	2.0	0.00
2.5	0.50	2.5	0.30	2.5	0.00
3.0	0.50	3.0	0.30	3.0	0.00
3.5	0.50	3.5	0.30	3.5	0.00
4.0	0.50	4.0	0.30	4.0	0.05
4.5	0.50	4.5	0.30	4.5	0.05

clear | clear | clear

-->Calculate<-- k= -245.01171 darcy (A) k= 0.000033 darcy (B) | k= -40732.828 darcy (A) k= 0 darcy (B) | k= 543.347705 darcy (A) k= 164.611337 darcy (B)

Return | Explanation & Statistics | AP8

5m(3B) Shallow | 10m(3C) Shallow | 20m(3D) Shallow

VT3
Flow Rate = 8 cfm

Air Permeability Test - Data Analysis (cont.)

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 16.4 (ft) r= (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 8 (SCFM)

b) screened interval thickness 6.6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0.0	0.00	0.0	0.0		
0.5	0.00	0.5	0.0		
1.0	0.30	1.0	0.0		
1.5	0.30	1.5	0.0		
2.0	0.30	2.0	0.0		
2.5	0.30	2.5	0.0		
3.0	0.30	3.0	0.0		
3.5	0.30	3.5	0.0		
4.0	0.30	4.0	0.0		
4.5	0.30	4.5	0.0		

clear clear clear

→Calculate←

k= 278.145246 darcy (A) k= 197.047962 darcy (A) k= darcy (A)
k= 2942.39233 darcy (B) k= 6.083139 darcy (B) k= darcy (B)

Return Explanation & Statistics AP8

5m(3E) 5m(3E)

Shallow Deep.

VT3
Flow Rate = 8 cfm

Air Permeability Test - Data Analysis (cont.)

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 8 (SCFM)

b) screened interval thickness 6.6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0.0	0.00	0.0	0.0	0.0	0.0
0.5	0.30	0.5	0.0	0.5	0.0
1.0	0.40	1.0	0.0	1.0	0.0
1.5	0.40	1.5	0.0	1.5	0.0
2.0	0.40	2.0	0.0	2.0	0.0
2.5	0.30	2.5	0.0	2.5	0.0
3.0	0.50	3.0	0.0	3.0	0.0
3.5	0.50	3.5	0.0	3.5	0.0
4.0	0.50	4.0	0.0	4.0	0.05
4.5	0.50	4.5	0.0	4.5	0.05

clear clear clear

→Calculate←

k= 260.694936 darcy (A) k= 362.300077 darcy (A) k= 1039.02573 darcy (A)
k= 103367.804 darcy (B) k= 26.627864 darcy (B) k= 253.290206 darcy (B)

Return Explanation & Statistics AP8

5m(3B) 10m(3C) 20m(3D)

Deep Deep Deep.

Air Permeability Test - Data Analysis (cont.)

VT3
Flow Rate = 8 cfm

1. Enter radial distances of monitoring points → r= 16.4 (ft) | r= 16.4 (ft) | r= (ft)

2. Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0.0	0.0	0.0	0.00		
0.5	0.1	0.5	0.10		
1.0	0.25	1.0	0.10		
1.5	0.3	1.5	0.20		
2.0	0.3	2.0	0.20		
2.5	0.25	2.5	0.20		
3.0	0.25	3.0	0.20		
3.5	0.25	3.5	0.10		
4.0	0.3	4.0	0.10		
4.5	0.4	4.5	0.20		
clear		clear		clear	

3. Enter (optional):
a) flowrate 8 (SCFM)
b) screened interval thickness 6.6 (ft)

--> Calculate <--

k= 200.19175	darcy (A)	k= -603.90699	darcy (A)	k=	darcy (A)
k= 762.323056	darcy (B)	k= 0.002013	darcy (B)	k=	darcy (B)

Return | Explanation & Statistics | AP8

5m(3F) Shallow

5m(3F) Deep.

Air Permeability Test - Data Analysis (cont.)

VT3

1. Enter radial distances of monitoring points → r= 3.28 (ft) | r= 16.4 (ft) | r= 32.8 (ft)

2. Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	1.1	0.5	0.3	0.5	0.1
1.0	1.1	1.0	0.4	1.0	0.2
1.5	1.2	1.5	0.4	1.5	0.25
2.0	1.2	2.0	0.4	2.0	0.25
2.5	1.2	2.5	0.4	2.5	0.25
3.0	1.2	3.0	0.4	3.0	0.25
3.5	1.2	3.5	0.4	3.5	0.25
4.0	1.1	4.0	0.4	4.0	0.25
4.5	1.1	4.5	0.4	4.5	0.25
clear		clear		clear	

Flow Rate = 6.9 cfm. (9/22)

3. Enter (optional):
a) flowrate 6.9 (SCFM)
b) screened interval thickness 6.6 (ft)

--> Calculate <--

k= -39.903423	darcy (A)	k= -167.94618	darcy (A)	k= -345.98816	darcy (A)
k= 0.001517	darcy (B)	k= 0.006038	darcy (B)	k= 0.00639	darcy (B)

Return | Explanation & Statistics | AP8

1m Shallow

5m Shallow

10m Shallow.

Air Permeability Test - Data Analysis (cont.)

VT3

① Enter radial distances of monitoring points → r= 3.28 (ft) | r= 16.4 (ft) | r= 32.8 (ft)

② Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	1.0	0.5	0.3	0.5	0.1
1.0	1.1	1.0	0.4	1.0	0.25
1.5	1.2	1.5	0.4	1.5	0.3
2.0	1.2	2.0	0.4	2.0	0.3
2.5	1.2	2.5	0.4	2.5	0.3
3.0	1.2	3.0	0.4	3.0	0.35
3.5	1.0	3.5	0.4	3.5	0.3
4.0	1.0	4.0	0.4	4.0	0.3
4.5	1.0	4.5	0.4	4.5	0.3
clear		clear		clear	

③ Enter (optional):

a) flowrate 6.9 (SCFM)

b) screened interval thickness 6.6 (ft)

Flow Rate = 6.9 cfm (Mean)

	1m Deep	5m Deep	10m Deep
k=	-296.93490 darcy (A)	-167.94618 darcy (A)	-648.7605 darcy (A)
k=	0 darcy (B)	0.006038 darcy (B)	0 darcy (B)

→Calculate←

Return | Explanation & Statistics | AP8

Air Permeability Test - Data Analysis (cont.)

VT3

① Enter radial distances of monitoring points → r= (ft) | r= 16.4 (ft) | r= 16.4 (ft)

② Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
		0	0	0	0
		0.5	0	0.5	0.25
		1.0	0.25	1.0	0.25
		1.5	0.25	1.5	0.25
		2.0	0.25	2.0	0.25
		2.5	0.25	2.5	0.25
		3.0	0.25	3.0	0.25
		3.5	0.25	3.5	0.25
		4.0	0.25	4.0	0.25
		4.5	0.25	4.5	0.25
clear		clear		clear	

③ Enter (optional):

a) flowrate 6.9 (SCFM)

b) screened interval thickness 6.6 (ft)

Flow Rate = 6.9 cfm (mean).

		5m (3E.) Shallow	5m (3E) Shallow
k=	darcy (A)	263.67328 darcy (A)	129598195 darcy (A)
k=	darcy (B)	1706.05263 darcy (B)	darcy (B)

→Calculate←

Return | Explanation & Statistics | AP8

Air Permeability Test - Data Analysis (cont.)

VT3

① Enter radial distances of monitoring points → r= 16.4 (ft) | r= 16.4 (ft) | r= 16.4 (ft)

② Enter measured times and gauge vacuums

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0.1	0.5	0	0.5	0.25
1.0	0.1	1.0	0	1.0	0.3
1.5	0.05	1.5	0	1.5	0.3
2.0	0.05	2.0	0.1	2.0	0.3
2.5	0	2.5	0.1	2.5	0.3
3.0	0	3.0	0.1	3.0	0.3
3.5	0	3.5	0.1	3.5	0.3
4.0	0	4.0	0.1	4.0	0.3
4.5	0	4.5	0.1	4.5	0.3

clear | clear | clear

③ Enter (optional):

a) flowrate 6.9 (SCFM)

b) screened interval thickness 6.6 (ft)

FlowRate = 6.9 cfm. (Mean)

→Calculate←

k=	-406.50564	darcy (A)	k= -3512.0378	darcy (A)	k= 1797.08894 darcy (A)
k=	0.965321	darcy (B)	k= 0	darcy (B)	k= 0000000 darcy (B)

Return | Explanation & Statistics | AP8

Sm(3B) Deep | Sm(3E) Deep | Sm(3F) Deep.

Air Permeability Test - Data Analysis (cont.)

VT3

① Enter radial distances of monitoring points → r= 3.3 (ft) | r= 3.3 (ft) | r= (ft)

② Enter measured times and gauge vacuums

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0.0	0.0	0.0	0.0		
0.5	1.75	0.5	2.75		
1.0	1.25	1.0	2.00		
1.5	1.00	1.5	2.00		
2.0	0.75	2.0	1.9		
2.5	0.75	2.5	1.8		
3.0	0.50	3.0	1.8		
3.5	0.50	3.5	1.8		
4.0	0.50	4.0	1.8		
4.5	0.50	4.5	1.8		

clear | clear | clear

③ Enter (optional):

a) flowrate 10.7 (SCFM)

b) screened interval thickness 6.6 (ft)

FlowRate = 7.5 cfm

→Calculate←

k=	-32.634142	darcy (A)	k= -55.057544	darcy (A)	k= darcy (A)
k=	0.027097	darcy (B)	k= 0.000104	darcy (B)	k= darcy (B)

Return | Explanation & Statistics | AP8

Im(3A) Shallow | Im(3A) Deep.

Air Permeability Test - Data Analysis (cont.)

① Enter radial distances of monitoring points → r= 15.4 (ft) r= (ft) r= (ft)

② Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0.0	0.0				
0.5	0.4				
1.0	0.4				
1.5	0.4				
2.0	0.3				
2.5	0.3				
3.0	0.3				
3.5	0.3				
4.0	0.3				
4.5	0.3				
clear		clear		clear	

③ Enter (optional):

a) flowrate 10.7 (SCFM)

b) screened interval thickness 6.6 (ft)

--> Calculate <--

k= -323.89674 darcy (A) k= darcy (A) k= darcy (A)

k= 0.00266 darcy (B) k= darcy (B) k= darcy (B)

Return | Explanation & Statistics | AP8

VT3

Flow Rate = 7.5 cfm

5m (3B)

Shallow

Air Permeability Test - Data Analysis (cont.)

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0.0	0.0	0.0	0.00	0.0	0.00
0.5	0.2	0.5	0.10	0.5	0.05
1.0	0.2	1.0	0.15	1.0	0.05
1.5	0.2	1.5	0.15	1.5	0.05
2.0	0.1	2.0	0.15	2.0	0.05
2.5	0.1	2.5	0.15	2.5	0.05
3.0	0.1	3.0	0.15	3.0	0.05
3.5	0.2	3.5	0.15	3.5	0.05
4.0	0.2	4.0	0.15	4.0	0.05
4.5	0.2	4.5	0.15	4.5	0.05
clear		clear		clear	

③ Enter (optional):

a) flowrate 10.7 (SCFM)

b) screened interval thickness 6.6 (ft)

--> Calculate <--

k= 2188.35568 darcy (A) k= 1287.36573 darcy (A) k= 3182.97579 darcy (A)

k= 105078080 darcy (B) k= 5226876.47 darcy (B) k= 6651491.36 darcy (B)

Return | Explanation & Statistics | AP8

VT3

Flow Rate = 7.5 cfm

5m (3B) 10m (3C) 20m (3D)

Deep Deep Deep

Air Permeability Test - Data Analysis (cont.)

VT3

Flow Rate = 7.5 cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 16.4 (ft) r= (ft)

② Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0.0	0.00	0.0	0.00		
0.5	0.10	0.5	0.10		
1.0	0.20	1.0	0.10		
1.5	0.20	1.5	0.10		
2.0	0.20	2.0	0.10		
2.5	0.25	2.5	0.20		
3.0	0.25	3.0	0.20		
3.5	0.20	3.5	0.10		
4.0	0.20	4.0	0.10		
4.5	.20	4.5	0.10		
clear		clear		clear	

③ Enter (optional):

a) flowrate 10.7 (SCFM)

b) screened interval thickness 6.6 (ft)

-->Calculate<--

k=	669.688468 darcy (A)	k=	-8287.9650 darcy (A)	k=	darcy (A)
k=	32171.1809 darcy (B)	k=	0 darcy (B)	k=	darcy (B)

Return | Explanation & Statistics | AP8

5m (3F) 5m (3F)

Shallow Deep

Air Permeability Test - Data Analysis (cont.)

VT4

81 cfm.

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0.2	0.5	0.2	0.5	0.15
1.0	0.4	1.0	0.3	1.0	0.25
1.5	0.5	1.5	0.4	1.5	0.35
2.0	0.5	2.0	0.5	2.0	0.40
2.5	0.5	2.5	0.5	2.5	0.45
3.0	0.5	3.0	0.5	3.0	0.45
3.5	0.7	3.5	0.5	3.5	0.50
4.0	0.7	4.0	0.6	4.0	0.50
4.5	0.7	4.5	0.6	4.5	0.55
clear		clear		clear	

③ Enter (optional):

a) flowrate 81 (SCFM)

b) screened interval thickness 6.6 (ft)

-->Calculate<--

k=	838.461513 darcy (A)	k=	889.986351 darcy (A)	k=	861.003797 darcy (A)
k=	233.86508 darcy (B)	k=	778.530454 darcy (B)	k=	1717.56880 darcy (B)

Return | Explanation & Statistics | AP8

5m 10m 20m

Shallow Shallow Shallow

Air Permeability Test - Data Analysis (cont.)

VT4

81 cfm.

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 81 (SCFM)

b) screened interval thickness 6.6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0.2	0.5	0.3	0.5	0
1.0	0.4	1.0	0.5	1.0	0
1.5	0.5	1.5	0.6	1.5	0
2.0	0.5	2.0	0.6	2.0	0
2.5	0.5	2.5	0.6	2.5	0
3.0	0.5	3.0	0.6	3.0	0.05
3.5	0.5	3.5	0.6	3.5	0.10
4.0	0.5	4.0	0.6	4.0	0.10
4.5	0.5	4.5	0.6	4.5	0.15
clear		clear		clear	

k=	773.365393	k=	1003.61827	k=	691.277208
darcy (A)		darcy (A)		darcy (A)	
k=	110.481992	k=	3152.51405	k=	118.889959
darcy (B)		darcy (B)		darcy (B)	

--> Calculate <--

Return | Explanation & Statistics | AP8

5m	10m	20m
Deep	Deep	Deep.

Air Permeability Test - Data Analysis (cont.)

VT4

90 cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 90 (SCFM)

b) screened interval thickness 6.6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0.4	0.5	0.4	0.5	0.25
1.0	0.5	1.0	0.5	1.0	0.35
1.5	0.6	1.5	0.5	1.5	0.40
2.0	0.6	2.0	0.5	2.0	0.40
2.5	0.7	2.5	0.6	2.5	0.50
3.0	0.7	3.0	0.6	3.0	0.50
3.5	0.7	3.5	0.6	3.5	0.50
4.0	0.8	4.0	0.7	4.0	0.55
4.5	0.8	4.5	0.7	4.5	0.55
clear		clear		clear	

k=	695.77352	k=	936.838762	k=	969.223069
darcy (A)		darcy (A)		darcy (A)	
k=	183.477181	k=	1450.80190	k=	2799.7353
darcy (B)		darcy (B)		darcy (B)	

--> Calculate <--

Return | Explanation & Statistics | AP8

5m	10m	20m
Shallow	Shallow	Shallow

Air Permeability Test - Data Analysis (cont.)

VT4

90 cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 90 (SCFM)

b) screened interval thickness 6.6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0.4	0.5	0.5	0.5	0.05
1.0	0.4	1.0	0.6	1.0	0.05
1.5	0.4	1.5	0.7	1.5	0.05
2.0	0.4	2.0	0.7	2.0	0.10
2.5	0.5	2.5	0.7	2.5	0.10
3.0	0.5	3.0	0.8	3.0	0.10
3.5	0.5	3.5	0.8	3.5	0.10
4.0	0.5	4.0	0.8	4.0	0.15
4.5	0.5	4.5	0.8	4.5	0.20

clear clear clear

—>Calculate<—

k=	951.380543 darcy (A)	k=	983.572067 darcy (A)	k=	975.980177 darcy (A)
k=	194.479512 darcy (B)	k=	5915.58309 darcy (B)	k=	205.994188 darcy (B)

Return | Explanation & Statistics | AP8

5m	5m	5m
Deep	Deep	Deep

Air Permeability Test - Data Analysis (cont.)

VT4

105 cfm

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

③ Enter (optional):

a) flowrate 105 (SCFM)

b) screened interval thickness 6.6 (ft)

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0.80	0.5	0.5	0.5	0.40
1.0	0.80	1.0	0.6	1.0	0.50
1.5	0.90	1.5	0.7	1.5	0.55
2.0	1.00	2.0	0.7	2.0	0.60
2.5	1.00	2.5	0.8	2.5	0.60
3.0	1.05	3.0	0.8	3.0	0.65
3.5	1.10	3.5	0.9	3.5	0.70
4.0	1.10	4.0	0.9	4.0	0.75
4.5	1.10	4.5	0.9	4.5	0.75

clear clear clear

—>Calculate<—

k=	1619.69686 darcy (A)	k=	901.534731 darcy (A)	k=	941.31554 darcy (A)
k=	293882.689 darcy (B)	k=	2285.07419 darcy (B)	k=	4494.10596 darcy (B)

Return | Explanation & Statistics | AP8

5m	10m	20m
Shallow	Shallow	Shallow

Air Permeability Test - Data Analysis (cont.)

① Enter radial distances of monitoring points → r= 16.4 (ft) r= 32.8 (ft) r= 65.6 (ft)

② Enter measured times and gauge vacuums →

(min)	(in H2O)	(min)	(in H2O)	(min)	(in H2O)
0	0	0	0	0	0
0.5	0.40	0.5	0.6	0.5	0.20
1.0	0.40	1.0	0.7	1.0	0.40
1.5	0.40	1.5	0.8	1.5	0.55
2.0	0.50	2.0	0.8	2.0	0.70
2.5	0.60	2.5	0.9	2.5	0.80
3.0	0.60	3.0	0.9	3.0	0.80
3.5	0.60	3.5	0.9	3.5	0.80
4.0	0.60	4.0	0.9	4.0	1.00
4.5	0.70	4.5	1.0	4.5	1.00
clear		clear		clear	

③ Enter (optional):

a) flowrate 105 (SCFM)

b) screened interval thickness 6.6 (ft)

--> Calculate <--

k= 1038.79554 darcy (A)	k= 1138.56262 darcy (A)	k= 488.588295 darcy (A)
k= 225.278511 darcy (B)	k= 14574.4044 darcy (B)	k= 867.495005 darcy (B)

Return | Explanation & Statistics | AP8

VT4

105 cfm

5m Deep

10m Deep

20m Deep

Air Permeability Test - Data Analysis (cont.)

The permeability, k, can then be calculated by one of two methods:

① The first is applicable when both Q (flowrate) and m (well screen interval) are known accurately. The calculated slope A is used:

$$k = \frac{Q \mu}{4 A \pi m}$$

② The second approach is used whenever Q or m are not known with confidence. In this case, both the slope, A, and intercept, B, are used:

$$k = \frac{r^2 \varepsilon \mu}{4 P_{Atm}} \exp[\, 0.5772 + \frac{B}{A})]$$

Return AP7