

Physical Hydrogeology

Project 2

Due: 3/5/09

Part A – compute answers to questions 1-3 by hand or using MS-Excel

1. A well that is screened in a confined aquifer is pumped at a rate of 100,000 ft³/day for 25 days. If the aquifer transmissivity is 10,000 ft²/day, and the storativity is 0.005, what is the drawdown at distances of 40, 200, 800, and 4,000 ft?
 - a. If the aquifer is fully confined?
 - b. If the aquifer is overlain by a 12-ft-thick leaky confining layer with a vertical hydraulic conductivity of 0.025 ft²/day and a storativity of 0.0002?
2. The following data are from a pumping test where a well was pumped at 250 gallons per minute. Drawdown as shown below was measured in an observation well 200 ft away from the pumped well. Use the Theis type curve to find the aquifer transmissivity and storativity.

time (min)	drawdown (ft)
0	0
1	0.66
1.5	0.87
2	0.99
2.5	1.11
3	1.21
4	1.36
5	1.49
6	1.59
8	1.75
10	1.86
12	1.97
14	2.08
18	2.2
24	2.36
30	2.49
40	2.65
50	2.78
60	2.88
80	3.04
100	3.16
120	3.28
150	3.42

3. A slug test was made with a piezometer that had a casing radius of 2.54 cm and a screen radius of 2.54 cm. A slug of 4000 cm^3 of water was injected; this raised the water level by 197.3 cm. The well completely penetrated a confined stratum that was 2.3 m thick. The decline in head with time is given below. Find the aquifer transmissivity and storativity using the Cooper-Bredehoeft-Papadopulos method.

time (s)	Head (cm)
0	197.3
1	185.4
2	178.6
3	173.6
5	167.7
7	158.8
10	147
13	140
17	129.2
22	118.4
32	99.6
53	74
84	51.3
119	35.5
170	23.3
245	15.2
400	8.7
800	4.3

Part B - Compute answers to questions 1-3 using the AQTESOLV software