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REVIEW OF DESERT HOT SPRINGS WELL TEST*

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INTRODUCTION

A well test was carried out in June 1977 using three wells at the Desert Hot Springs KGRA. Data were collected and analyzed by B. F. Russell (California State University at Fullerton).

These three wells partially penetrate an aquifer that is estimated to be about 1000 ft. thick. One of the wells was produced at 114 gpm for 4.5 hours. Water levels were measured in the producing well and the two observation wells. From the data in the reports published by the City of Desert Hot Springs¹ the exact locations of the wells, the position of the wells with respect to inferred faults, the geological configuration from well logs, and other valuable data were not available to us. Neither was the history of the wells used in the well tests. For example, how long had the production well been shut in prior to the test? What are the wellhead altitudes relative to sea level, etc.? In Tables 1, 2 and 3 the data available from the city of DHS are summarized.²

ANALYSES

In Fig. 1 we show the downhole pressure vs. time for the producing well, PW-1. This approach is a standard method of analysis. The early times data are not useful^{3,4} for several reasons.

- The early time variation in flowrate is not known.
- The wellbore storage effect cannot be determined from this data.
- The early time data are probably strongly perturbed by partial penetration effects.
- The early time data are probably affected by gravity drainage in this system.
- The system experiences delayed drainage due to partial saturation.

Taking into account these complications, analyses are possible, but not with the existing data. Other deficiencies, in addition to those listed above, are:

- The test was not carried out over a long enough time to reach the semi-steady-state condition in the well.
- Sufficiently accurate flow data are not available.

Table 1. Well data for the test over 4.5 hours at 110 gpm flow rate.

	<u>PW-1</u>	<u>OW-1</u>	<u>OW-2</u>
Static water level ^a	6.66	18.55	5.9 ft
Total depth	180	48	102 ft
Well diameter		6	6 in.
Open interval	110 to 180	unknown	unknown feet
Temperature ^b	148	unknown	unknown °F
Distance to PW-1	--	212	102 ft

^aFrom ground level.

^bDuring pumping.

Table 2. Drawdowns (water level changes)
in the production and observation wells.

TIME SINCE START OF PRODUCTION (Minutes)	DRAWDOWNS (feet)		
	PW-1	OW-1	OW-2
0	0		
1			
1.5	17.92		
2	21.11	0	0
3	22.40	.03	0.1
4		.05	0.3
5	21.93	.05	0.35
6	21.83	.10	.40
7		.15	.53
8	21.76	.15	.60
9		.12	.62
10		.15	.70
15	22.04	.18	.89
20	22.02	.20	.97
25	23.15		
30	23.26	.29	1.09
35		.34	
37			1.12
42	23.48		
50	23.61		1.22
55		.39	
57			
60	23.61		
65		0.39	
86			1.22
89		0.44	
90	23.63		
115			1.34
119		0.45	
120	23.76		
149		0.52	1.34
150	23.87		
210	23.92		
212			1.36
217		0.52	
265		0.57	
267			1.42
270	24.10		