

23

HYDRATECH UTILITIES
AQUIFER TESTING PROGRAM
January, 1980

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AQUIFER PERFORMANCE TESTING PROGRAM

HYDRATECH UTILITIES

Test Method:

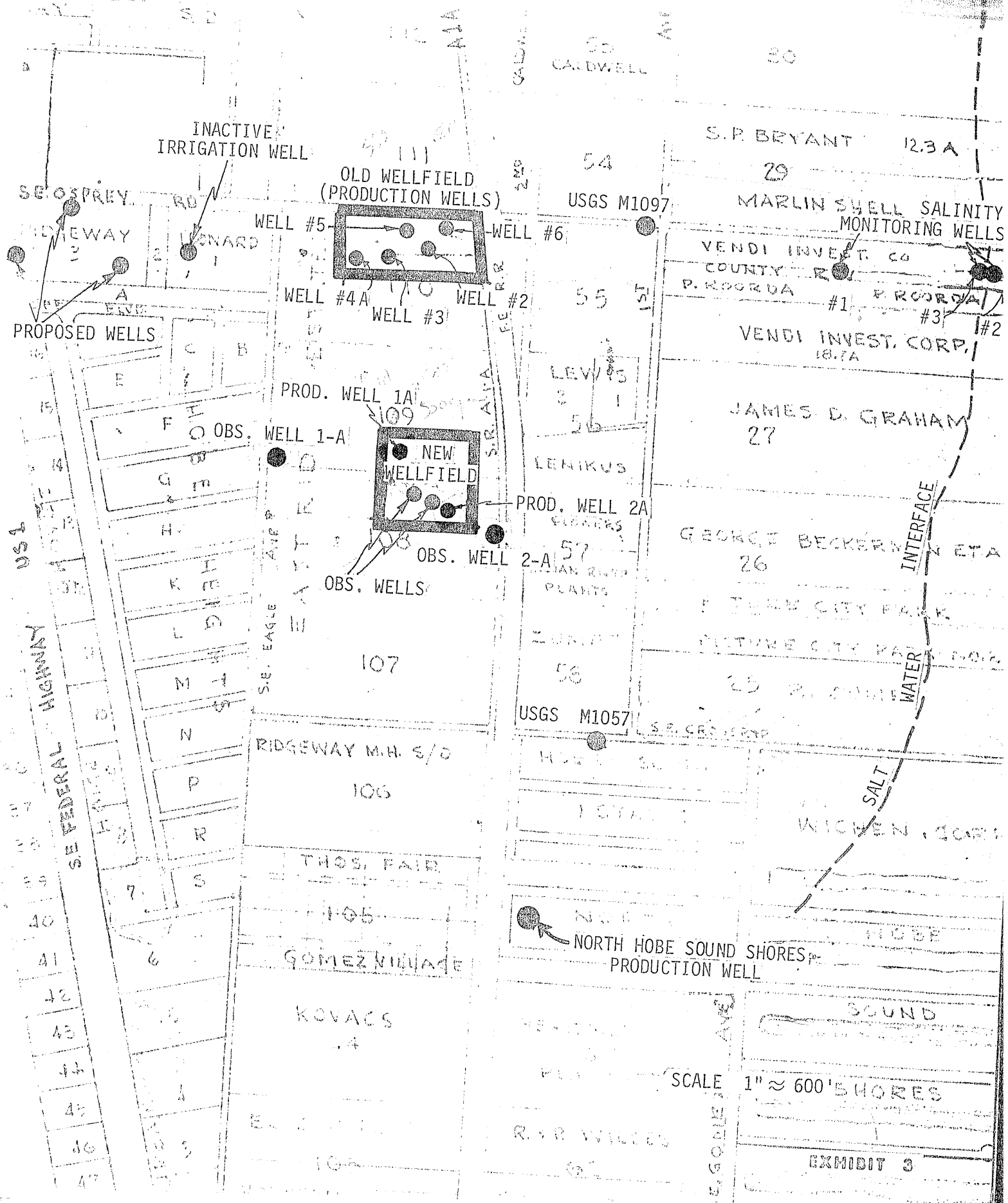
Water level readings were taken with probes attached to resistance measuring equipment. Depths to water were measured from markers on the wire leading to the probes. Readings were taken in feet and inches and converted to decimal feet. Time readings were taken for each of the drawdown measurements and recorded. A 24 hour non-pumping period preceded the test and no rainfall occurred during the test. The pumping test was conducted for a period of 72 hours at a rate of 300 G.P.M.. After the pump was shut off, recovery information was gathered for 1 hour. In an attempt to 'fill in' information for the first part of the test, a supplementary or second test was run and information was gathered for the Pumped Well and Observation Well No. 1. A pumping period of approximately 8 minutes and a recovery period of 4 minutes was used.

Wells:

Four wells were used in the testing program. Well No. 2A in the Eastridge Subdivision Park was pumped while changes were measured in it and 3 observation wells. Two observation wells were constructed at distances of 20 and 100 feet from the pumped well. These are designated as Observation Well No. 1 and Observation Well No. 2. Well No. 1A in the Eastridge Subdivision Park was also used to observe the drawdown effects.

Interpretation & Calculation:

Transmissibility Storage Coefficients were calculated using the time-drawdown information for Observation Wells 1 & 2 and by using the drawdown - distance information from all 4 wells. The results of these calculations is shown on the graphs for these wells. Information gathering during the early part of the pumping and recovery periods for the Pumped Well and Observation Well No. 1 was difficult due to surging. The supplementary test was performed to supply the missing data for the early portion of the test.



ISSUANCE RECOMMENDED:
Chief of Permits

EXHIBIT 3

HYDRATECH UTILITIES
AQUIFER TESTING PROGRAM

JANUARY, 1980

Pumped Well: Well No. 2A
East Well in Eastridge Park
130 feet of hole
102 feet of 8'' casing, no screen
Top elevation 22.93
Grd. elevation 22.43
Static Water elevation, 1st test 10.18
Static Water elevation, 2nd test 9.78

Observation Well No. 1: 20 feet from pumped well
120 feet of hole
105 feet of 2'' casing
10 feet of 2'' screen
Top elevation 22.12
Grd. elevation 21.91
Static Water elevation, 1st test 10.22
Static Water elevation, 2nd test 9.95

Observation Well No. 2: 100 feet from pumped well
120 feet of hole
105 feet of 2'' casing
9 feet of 2'' screen
Top elevation 21.55
Grd. elevation 21.34
Static Water elevation 10.47

Production Well:
(Used as observation well) Well No. 1A
West Well in Eastridge Park
130 feet of hole
102 feet of 8'' casing, no screen
Top elevation 24.00
Grd. elevation 23.50
Reading Base 24.73
Static Water elevation 11.65

DRILLER'S WELL LOG

HYDRATECH - RIDGEWAY

Hobe Sound, Florida

8" Production Well

0' - 5' - White sand
5' - 10' - Orange sand
10' - 15' - Orange sand, trace of sandstone
15' - 20' - Orange sand, trace of sandstone
20' - 25' - Orange sand, trace of sandstone
25' - 30' - Orange sand, trace of sandstone
30' - 35' - Sand and sandstone
35' - 40' - Sandstone - med.
40' - 45' - Sandstone - med.
45' - 50' - Sandstone - hd.
50' - 55' - Sand and shells - hd.
55' - 60' - Sandstone, trace of shells, med. hd.
60' - 65' - Sandstone, some shells, sand and limestone
65' - 70' - Sandstone, some shells, sand and limestone
70' - 75' - Sandstone, some shells, sand and limestone
75' - 80' - Sandstone, some shells, sand and limestone
80' - 85' - Sandstone, some shells, sand and limestone
85' - 90' - Sand, sandstone, trace of limestone and shells
90' - 95' - Sand, sandstone, trace of limestone and shells
95' - 100' - Limestone gravel and limestone, trace of shells
100' - 105' - Limestone gravel and limestone, trace of shells (set casing
102')
105' - 110' - Limestone and shells, trace of sand
110' - 115' - Limestone and shells, trace of sand
115' - 120' - Limestone and shells, trace of sand
120' - 125' - Limestone and shells, trace of sand
125' - 130' - Limestone and shells, trace of sand

AQUIFER TEST

PUMPED WELL

EAST WELL IN EASTRIDGE PARK

	Time	Elapsed Time min.	Depth ft.-in.	Drawdown	
PM	12:13:00	0.0	12 - 9	0	1-2-80
	12:14:00	1.0	20 - 0	7.25'	Pumping started
	12:15:00	2.0	20 - 4	7.58	
	12:16:00	3.0	20 - 6	7.75	
	12:16:30	3.5	20 - 9	8.00	
	12:17:30	4.5	20 - 10	8.08	
	12:18:30	5.5	20 - 10	8.08	
	12:19:30	6.5	20 - 11	8.17	
	12:20:30	7.5	21 - 0	8.25	
	12:23:00	10.0	21 - 2	8.42	
	12:25:00	12.0	21 - 2	8.42	
	12:28:30	15.5	21 - 2	8.42	
	12:31:30	18.5	21 - 2	8.42	
	12:34:30	21.5	21 - 2	8.42	
	12:36:30	23.5	21 - 2	8.42	
	12:38:30	25.5	21 - 2	8.42	
	12:40:30	27.5	21 - 2	8.42	
	12:44	31.0	21 - 2	8.42	
	12:50	37.0	21 - 2 1/2	8.46	
	12:53	40.0	21 - 2 1/2	8.46	
	12:56:30	43.5	21 - 2 1/2	8.46	
	1:00	47	21 - 2 1/2	8.46	
	1:04	51	21 - 2 1/2	8.46	
	1:15	62	21 - 2 1/2	8.46	
	1:26	73	21 - 2 1/2	8.46	
	1:56	103	21 - 2 3/4	8.48	
	2:30	137	21 - 2 3/4	8.48	
	3:05	172	21 - 3	8.50	
	4:00	227	21 - 3	8.50	
	4:58	285	21 - 3	8.50	
	6:00	347	21 - 3	8.50	
	7:00	407	21 - 3 1/4	8.52	
	9:26	553	21 - 3 1/4	8.52	
	11:04	651	21 - 3 1/4	8.52	
AM	2:55	882	21 - 3 1/4	8.52	1-3-80
	7:08	1135	21 - 3 1/4	8.52	
	11:00	1367	21 - 4 1/2	8.63	
PM	3:07	1614	21 - 5	8.67	
	11:00	2087	21 - 5	8.67	
AM	7:04	2571	21 - 5	8.67	1-4-80
PM	11:00	3527	21 - 6 1/2	8.79	
AM	7:00	4007	21 - 6 1/2	8.79	1-5-80
PM	12:13:00	4320.0	21 - 6 1/2	8.79	Pumping stopped

AQUIFER TEST

PUMPED WELL

EAST WELL IN EASTRIDGE PARK

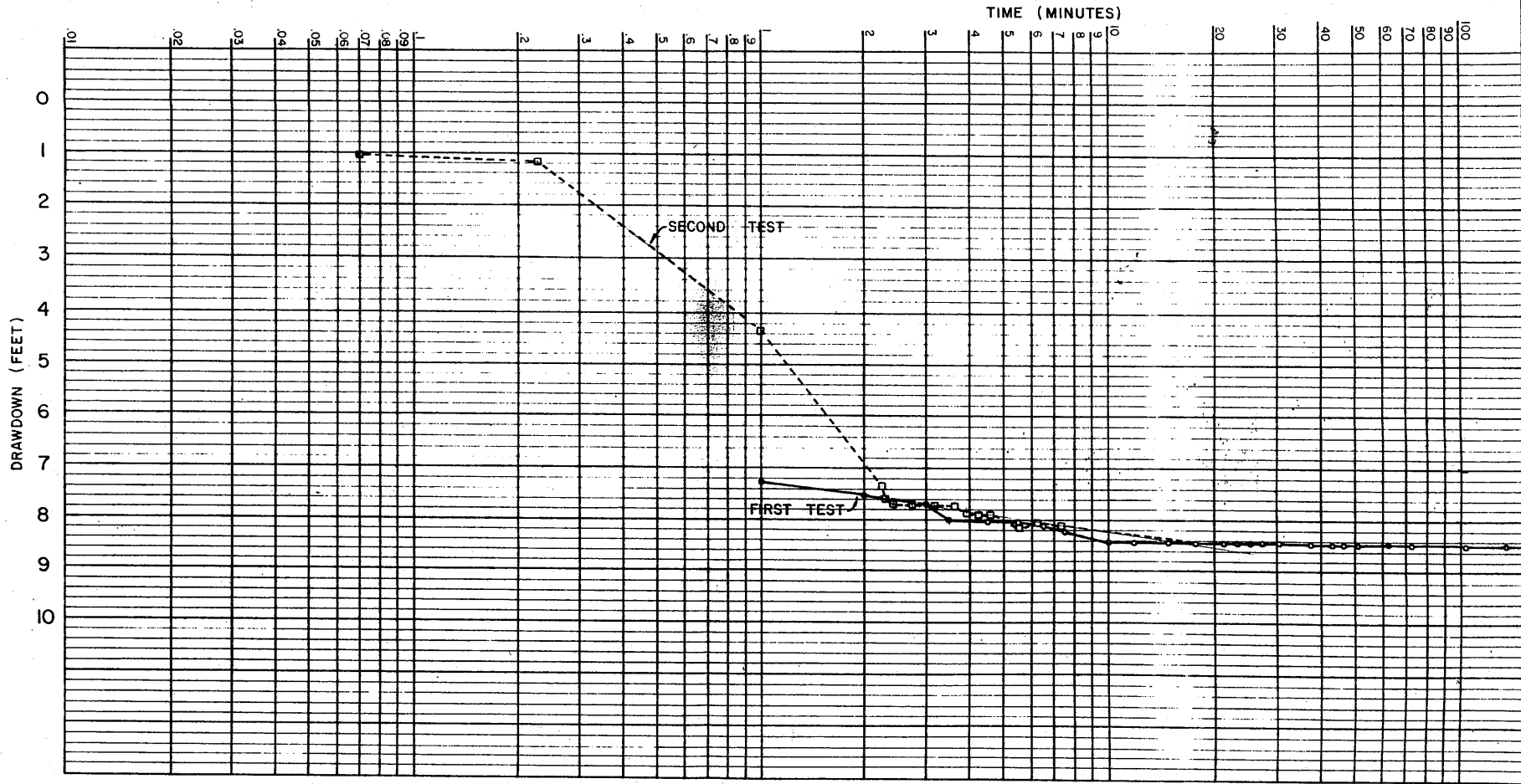
Supplementary test

Test	Elapsed Time min.	Depth ft.-in.	Drawdown
PM 1:14:16	0.0	13 - 1 3/4	0
1:14:20	.07	14 - 1	1.06
1:14:30	.23	14 - 4	1.19
1:15:15	.98	17 - 6	4.35
1:16:36	2.33	20 - 6	7.35
1:16:39	2.38	20 - 9	7.60
1:16:43	2.45	20 - 9 1/2	7.64
1:16:48	2.53	20 - 10	7.68
1:16:59	2.72	20 - 10 1/2	7.73
1:17:13	2.95	20 - 11	7.77
1:17:27	3.18	20 - 11	7.77
1:17:54	3.63	20 - 11	7.77
1:18:13	3.95	21	7.85
1:18:25	4.15	21 - 1/2	7.89
1:18:43	4.45	21 - 1	7.93
1:19:08	4.86	21 - 1	7.93
1:19:16	5.00	21 - 2	8.02
1:19:30	5.23	21 - 2	8.02
1:20:10	5.54	21 - 2 3/4	8.08
1:20:30	6.23	21 - 3	8.10
1:21:27	7.18	21 - 3	8.10
1:32:35	1832	21 - 5	8.27

1-11-80
pumping started

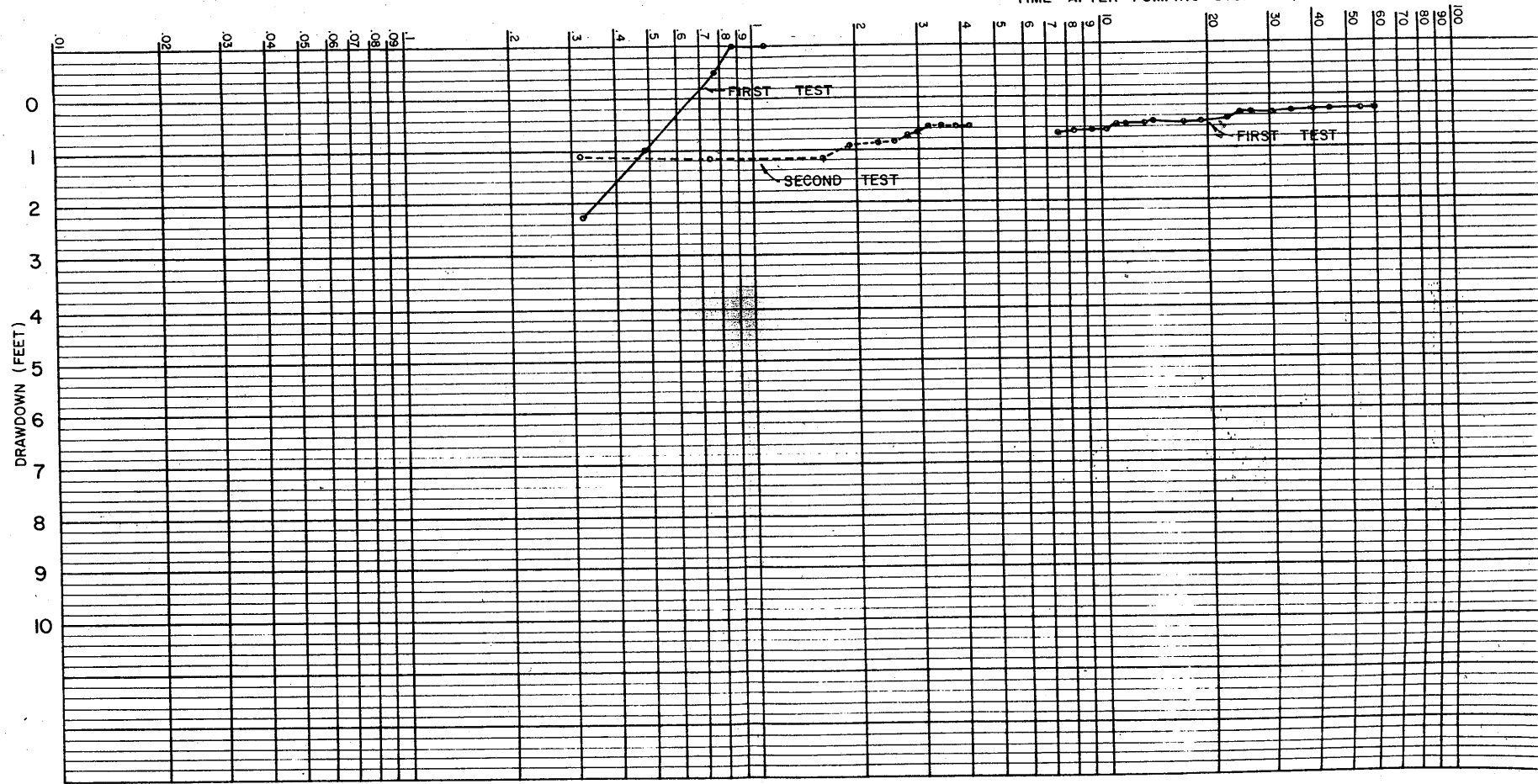
pumping stopped

PUMPED WELL



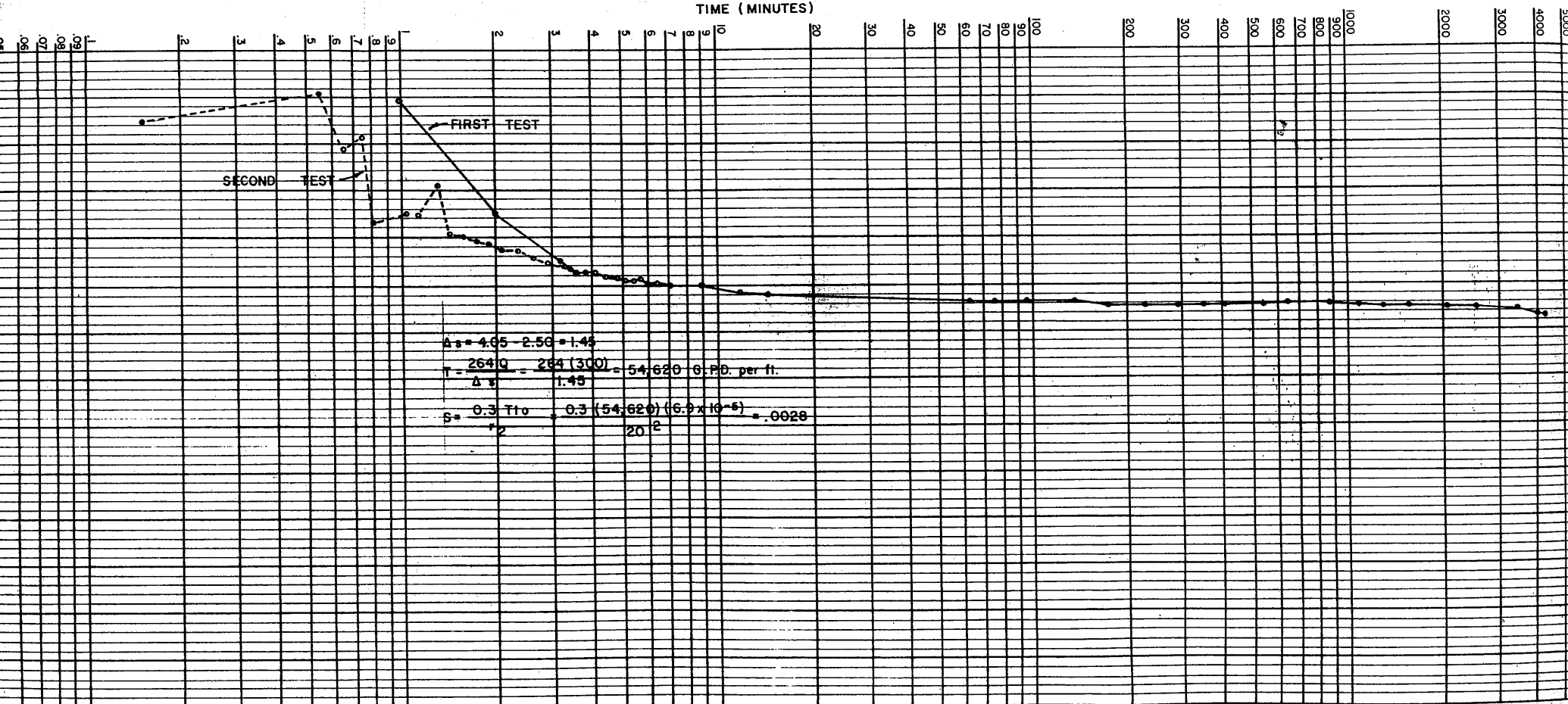
PUMPED WELL

TIME AFTER PUMPING STOPPED (MINUTES)



OBSERVATION WELL NO. 1

TIME (MINUTES)



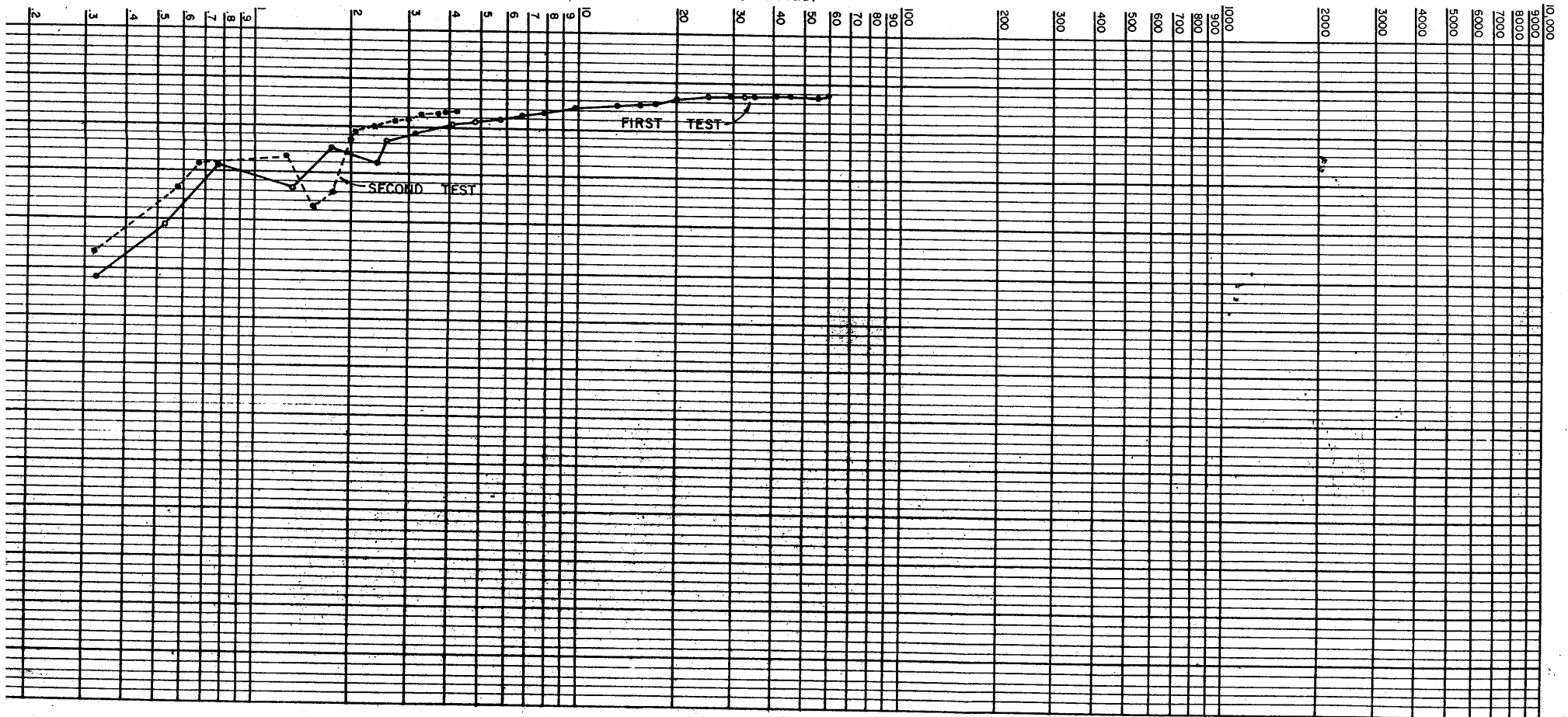
$$\Delta s = 4.05 - 2.50 = 1.45$$

$$T = \frac{264Q}{\Delta s} = \frac{264(300)}{1.45} = 54,620 \text{ G.P.D. per ft.}$$

$$S = \frac{0.3 T t_0}{r^2} = \frac{0.3 (54,620) (6.9 \times 10^{-5})}{20^2} = .0028$$

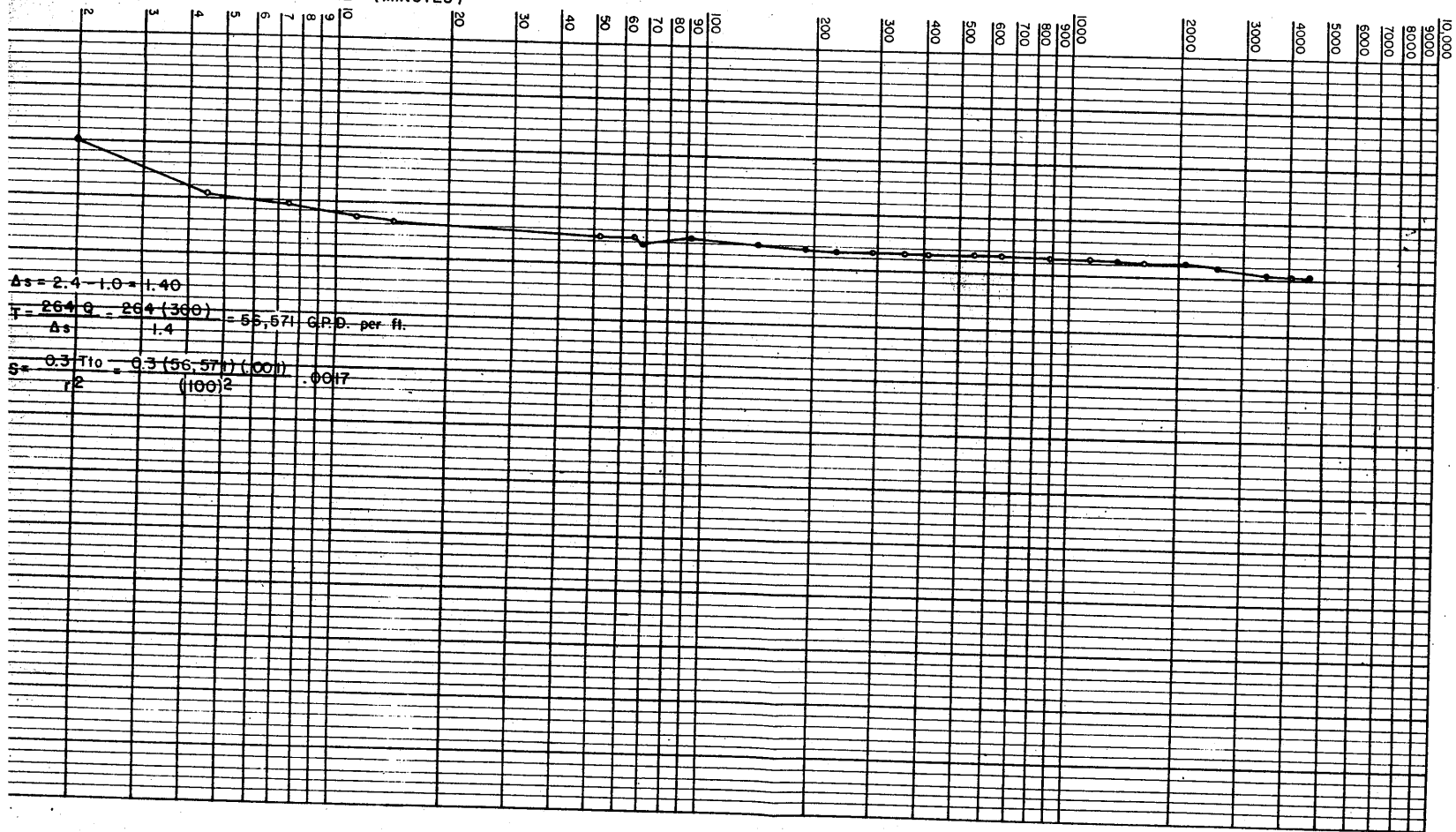
OBSERVATION WELL NO. 1

TIME AFTER PUMPING STOPPED (MINUTES)



OBSERVATION WELL NO. 2

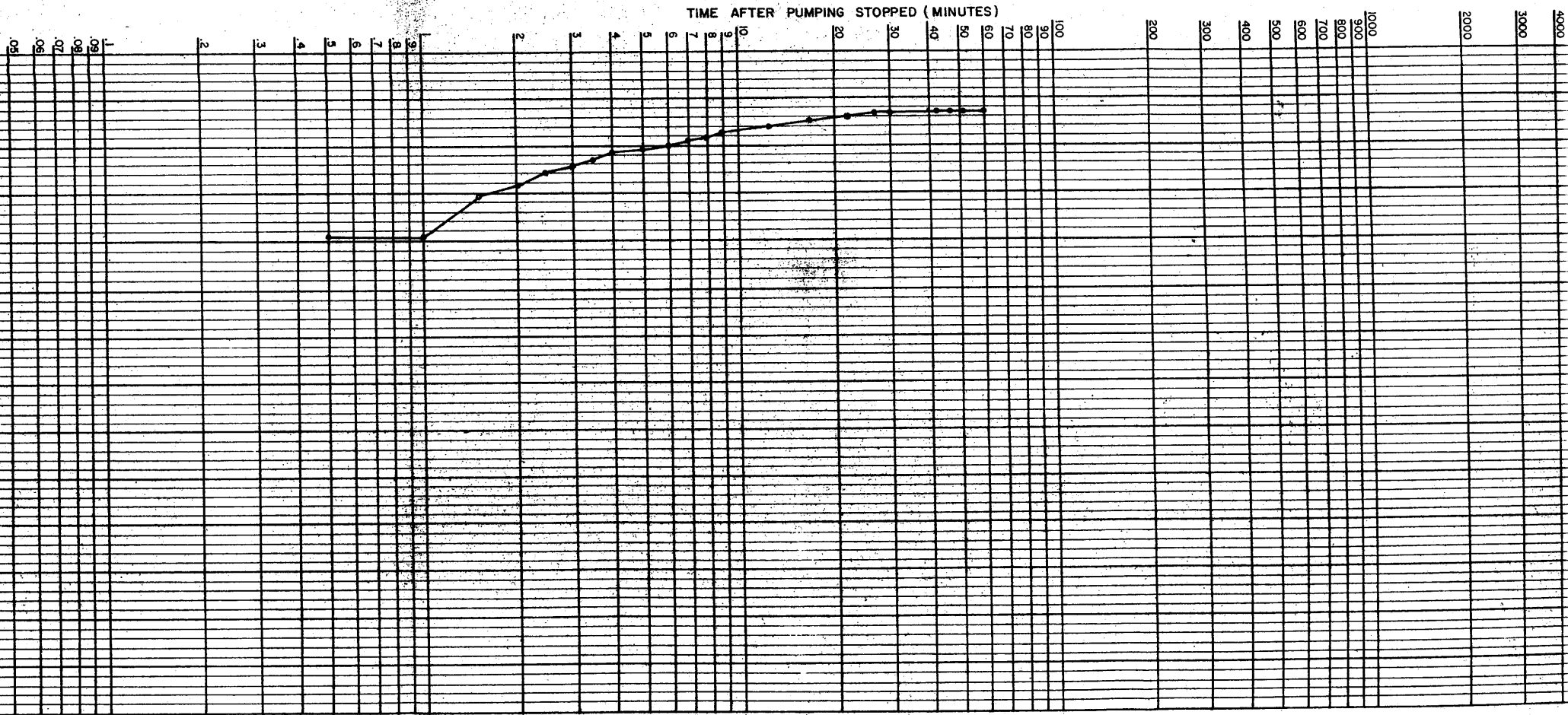
TIME (MINUTES)



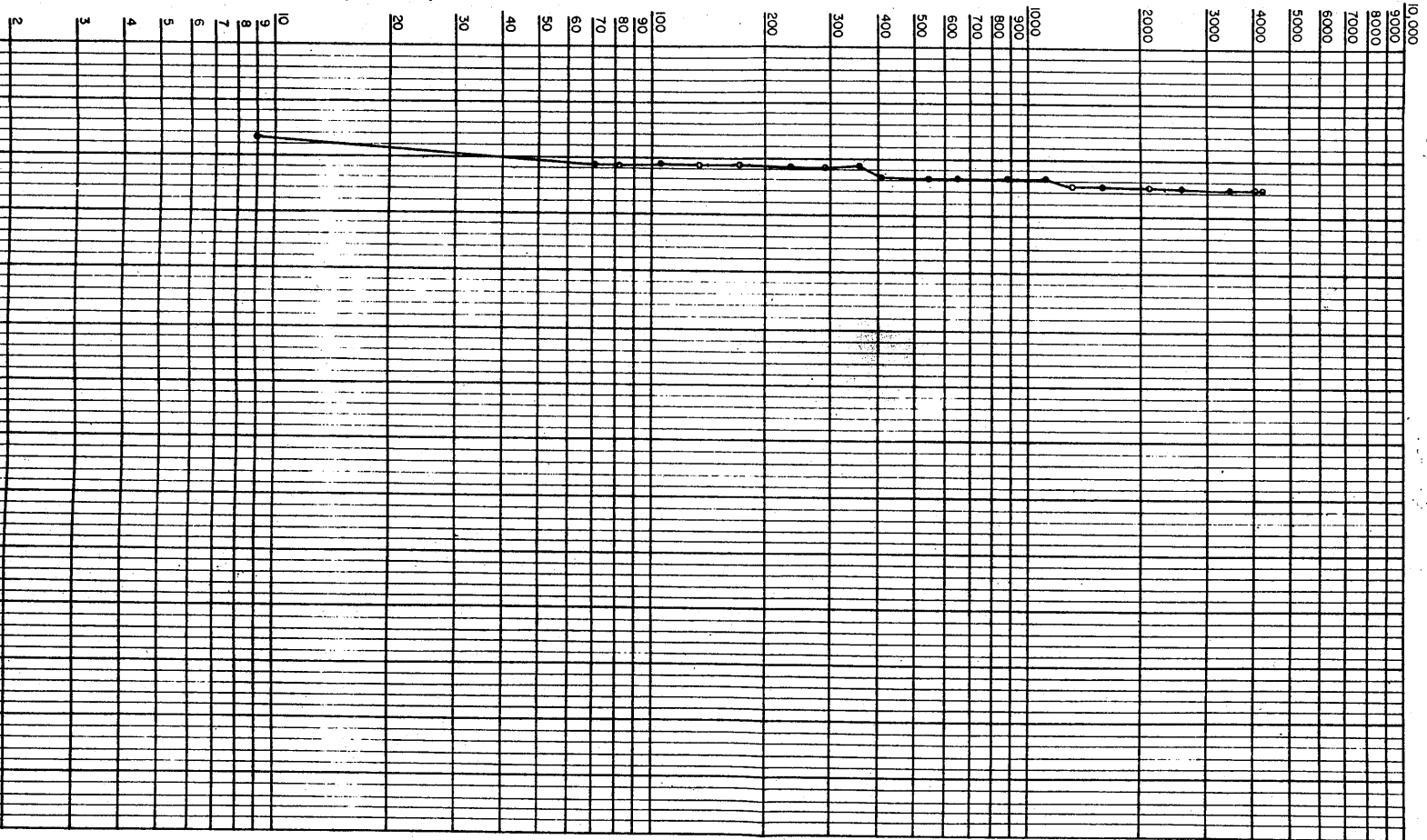
$\Delta s = 2.4 - 1.0 = 1.40$
 $T = \frac{264 \cdot Q}{\Delta s} = \frac{264 \cdot (300)}{1.4} = 56,571 \text{ G.P.D. per ft.}$
 $S = \frac{0.3 \cdot T \cdot t_0}{r^2} = \frac{0.3 \cdot (56,571) \cdot (100)}{(100)^2} = .0017$

OBSERVATION WELL NO. 2

TIME AFTER PUMPING STOPPED (MINUTES)

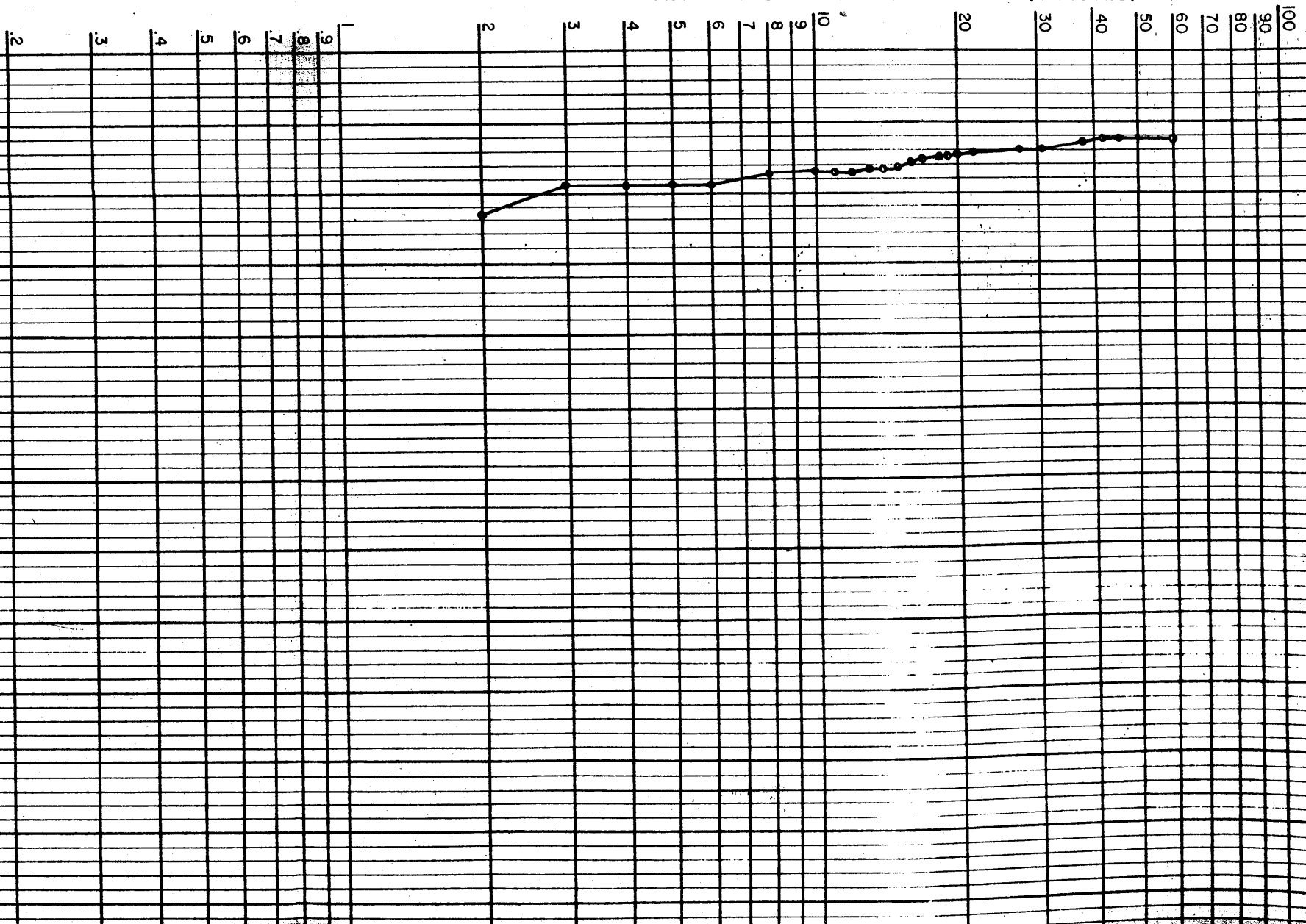


PRODUCTION WELL
TIME (MINUTES)



PRODUCTION WELL

TIME AFTER PUMPING STOPPED (MINUTES)



DISTANCE FROM PUMPED WELL (FEET)

PUMPING RATE = 300 G.P.M.

$$\Delta s = 4.10 - 1.42 = 2.68$$

$$T = \frac{528 Q}{\Delta s} = \frac{528 (300)}{2.68} = 59104 \text{ G.P.D. per ft.}$$

$$S = \frac{0.3 T t}{r_o^2} = \frac{0.3 (59104) (10)}{(720)^2} = 0.0024$$

10 MINUTES

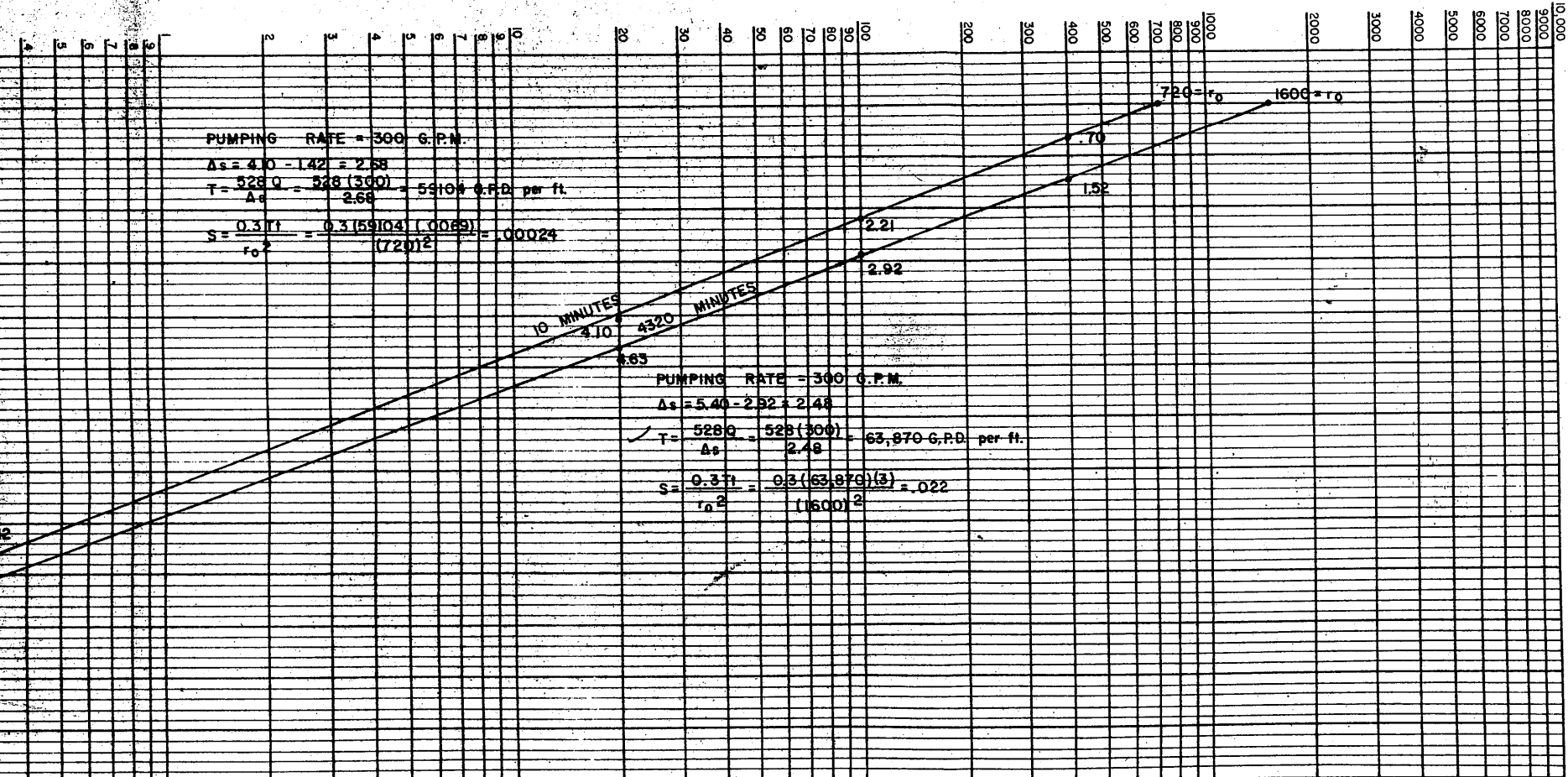
PUMPING RATE = 300 G.P.M.

$$\Delta s = 5.40 - 2.92 = 2.48$$

$$T = \frac{528 Q}{\Delta s} = \frac{528 (300)}{2.48} = 63,970 \text{ G.P.D. per ft.}$$

$$S = \frac{0.3 T t}{r_o^2} = \frac{0.3 (63,970) (3)}{(1600)^2} = .022$$

30 MINUTES



AQUIFER TEST

PUMPED WELL

EAST WELL IN EASTRIDGE PARK

Time	Elapsed Time min.	Depth ft.-in.	Drawdown	
PM 12:13:00	0.0	21 - 6 1/2	8.79	Pumping stopped
12:13:19	.32	15	2.25	
12:13:29	.49	13 - 9	1.00	
12:13:46	.77	12 - 3	- 0.5	Surge
12:13:52	.87	11 - 9	- 1.00	Surge
12:14:07	1.11	11 - 9	- 1.00	Surge
12:20:30	7.50	13 - 6	0.75	
12:21:24	8.40	13 - 5	0.67	
12:22:33	9.55	13 - 5	0.67	
12:23:26	10.43	13 - 5	0.67	
12:24:02	11.03	13 - 4	0.58	
12:24:45	11.75	13 - 3 1/2	0.54	
12:26:40	13.67	13 - 3 1/2	0.54	
12:27:08	14.13	13 - 3	0.50	
12:30:24	17.40	13 - 2 3/4	0.48	
12:31:48	18.80	13 - 2 1/2	0.45	
12:32:45	19.75	13 - 2 1/4	0.48	
12:35:00	23.00	13 - 2	0.42	
12:38	25.0	13 - 1 1/2	0.38	
12:40	27.0	13 - 1 1/2	0.38	
12:44	31.0	13 - 1 1/4	0.35	
12:48	35.0	13 - 1	0.33	
12:53	40.0	13 - 3/4	0.31	
12:58	45.0	13 - 1/2	0.29	
1:08	55.0	13 - 1/2	0.29	
1:10	57.0	13 - 1/4	0.27	
1:13	60.0	13 - 1/4	0.27	

AQUIFER TEST

PUMPED WELL

EAST WELL IN EASTRIDGE PARK

Supplementary test

Test	Elapsed Time min.	Depth ft.-in.	Drawdown	
PM 1:32:35	0.0	21 - 5	8.27	Pumping stopped
1:32:54	.32	14 - 3	1.10	
1:33:20	.75	14 - 4	1.19	
1:34:12	1.62	14 - 4	1.19	
1:34:28	1.88	14 - 1	.94	
1:34:52	2.28	14 -	.85	
1:35:08	2.55	13 - 11 1/2	.81	
1:35:22	2.78	13 - 11	.77	
1:35:33	2.97	13 - 10	.69	
1:35:48	3.22	13 - 9 1/2	.60	
1:36:06	3.52	13 - 9	.60	
1:36:26	3.85	13 - 8 1/2	.56	
1:36:45	4.17	13 - 8 1/2	.56	

HYD1A

AQUIFER TEST

OBSERVATION WELL #1

20 feet from pumped well

	Time	Elapsed Time min.	Depth ft.-in.	Drawdown	
					pumping started
					1-2-80
PM	12:13	0.0	11 - 10 3/4	0	
	12:14	1	12 - 10 3/4	0.06	
	12:15	2	14 - 3 3/4	2.48	
	12:16:30	53.5	15 - 6	3.67	
	12:18:30	5.5	15 - 9	3.92	
	12:22	9.0	15 - 10	4.00	
	12:24:30	11.5			
	12:25	12.0	16 - 1/4	4.19	
	12:27:30	14.5	16 - 1/2	4.21	
	1:17	64.0	16 - 2 1/2	4.38	
	1:30	77.0	16 - 2 1/2	4.38	
	1:56	103.0	16 - 2 1/2	4.38	
	2:30	137	16 - 2 1/2	4.38	
	3:06	173	16 - 3	4.42	
	4:04	231	16 - 3	4.42	
	5:05	292	16 - 3	4.42	
	6:05	352	16 - 3	4.42	
	7:06	413	16 - 3	4.42	
	9:26	553	16 - 3	4.42	
	11:04	651	16 - 3	4.42	
AM	3:00	887	16 - 3	4.42	1-3-80
	7:10	1137	16 - 3 1/2	4.46	
	11:00	1367	16 - 4	4.50	
PM	3:15	1622	16 - 4	4.50	
	11:04	2091	16 - 4	4.50	
AM	7:08	2575	16 - 4 1/4	4.52	1-4-80
PM	11:00	3527	16 - 5 1/4	4.60	
AM	7:00	4007	16 - 5 1/2	4.63	1-5-80
PM	12:13	4320	16 - 5 1/2	4.63	Pumping stopped

AQUIFER TEST
OBSERVATION WELL #1

HYD1AR

20 feet from pumped well

Time	Elapsed Time min.	Depth ft.-in.	Drawdown
PM 12:13:00	0.0	16 - 5 1/2	4.63
12:13:20	.33	16 - 1/4	4.19
12:13:32	.53	15	3.17
12:13:46	.77	14	2.17
12:14:19	1.32	14 - 2	2.33
12:14:46	1.77	13 - 4 1/2	1.54
12:15:28	2.47	13 - 7 1/2	1.79
12:15:39	2.65	13 - 2	1.33
12:16:14	3.23	13	1.17
12:17:05	4.08	12 - 10	1.00
12:17:52	4.87	12 - 9	0.91
12:18:45	5.75	12 - 8	0.83
12:19:50	6.83	12 - 7	0.75
12:20:59	7.98	12 - 6	0.67
12:22:56	9.93	12 - 5	0.58
12:26:20	13.33	12 - 4	0.50
12:28:58	15.97	12 - 3 1/2	0.46
12:30:40	17.67	12 - 3	0.42
12:33:05	20.08	12 - 2 1/2	0.38
12:38	25.63	12 - 2	0.33
12:42	29.70	12 - 1 3/4	0.31
12:45	32.75	12 - 1 1/2	0.29
12:48	35.80	12 - 1 1/2	0.29
12:53	40.88	12 - 1 1/4	0.27
12:58	45.97	12 - 1 1/4	0.27
1:08	55.92	12 - 1 1/4	0.27
1:13	60.00	12 - 1	0.25

1-5-80
Pumping stopped
recovery

AQUIFER TEST

HYD1B

OBSERVATION WELL #1

20 feet from pumped well

Supplementary test

Time	Elapsed Time min.	Depth ft.-in.	Drawdown	
1:14:16	0.0	12 - 2	0	pumping started
1:14:25	.15	12 - 9	.58	
1:14:49	.55	12 - 1	.08	
1:14:57	.68	13 - 4	1.17	
1:15:01	.75	13 - 1	.91	
1:15:05	.82	14 - 10	2.67	
1:15:18	1.03	14 - 6	2.33	
1:15:24	1.13	14 - 8	2.50	
1:15:36	1.33	14 - 1	1.92	
1:15:44	1.47	15 - 0	2.83	
1:15:53	1.62	15 - 2	3.00	
1:16:02	1.77	15 - 3	3.08	
1:16:11	1.92	15 - 4	3.17	
1:16:22	2.10	15 - 5	3.25	
1:16:40	2.40	15 - 6	3.33	
1:16:56	2.67	15 - 7	3.42	
1:17:13	2.95	15 - 7 3/4	3.48	
1:17:27	3.18	15 - 8 1/2	3.54	
1:17:54	3.63	15 - 11	3.75	
1:18:13	3.95	15 - 11	3.75	
1:18:25	4.15	15 - 11	3.75	
1:18:48	4.53	15 - 11 1/2	3.79	
1:19:07	4.85	15 - 11 1/2	3.79	
1:19:23	5.12	16 - 0	3.83	
1:20:03	5.78	16 - 1/2	3.88	
1:20:22	6.10	16 - 1	3.92	
1:20:46	6.50	16 - 1 1/2	3.95	
1:21:22	7.10	16 - 2	4.00	pumping stopped

AQUIFER TEST

HYD1BR

OBSERVATION WELL #1

20 feet from pumped well

Supplementary test

Time	Elapsed Time min.	Depth ft.-in.	Drawdown	
1:32:35	0.0	16 - 5 1/2	4.29	Pumping stopped
1:32:54	.32	15 - 11	3.75	
1:33:10	.58	14 - 6	2.33	Recovery
1:33:15	.67	14	1.83	
1:33:51	1.27	13 - 10	1.67	
1:34:07	1.53	14 - 10 1/2	2.71	
1:34:22	1.78	14 - 7	2.42	
1:34:35	2.00	13 - 6	1.33	
1:34:40	2.08	13 - 4	1.16	
1:35:00	2.42	13 - 2	1.00	
1:35:24	2.82	13 - 1	.92	
1:35:35	3.00	13	.83	
1:35:55	3.33	12 - 11	.75	
1:36:20	3.75	12 - 10 1/2	.71	
1:36:32	3.95	13 - 10	.67	
1:36:52	4.28	12 - 9 1/2	.63	

AQUIFER TEST

HYD2

OBSERVATION WELL #2

100 feet from pumped well

	Time	Elapsed Time min.	Depth ft.-in.	Drawdown	
PM	12:13:00	0.0	11 - 1	0	pumping started
	12:15	2.0	12 - 8	1.00	1-2-80
	12:17:30	4.5	13 - 1/2	1.95	
	12:20:30	7.5	13 - 2 1/4	2.10	
	12:24:30	11.5	13 - 5	2.33	
	12:27:30	14.5	13 - 5 1/2	2.38	
	1:06	53	13 - 8	2.58	
	1:19	66	13 - 8	2.58	
	1:32	69	13 - 8 1/2	2.62	
	1:56	93	13 - 8	2.58	
	2:32	139	13 - 8 1/4	2.60	
	3:10	177	13 - 8 1/2	2.63	
	4:04	231	13 - 9	2.67	
	5:05	292	13 - 9	2.67	
	6:08	355	13 - 9	2.67	
	7:06	413	13 - 9	2.67	
	9:26	553	13 - 9 1/2	2.71	
	11:09	656	13 - 9 1/2	2.71	
AM	3:04	891	13 - 9 1/2	2.71	1-3-80
	7:16	1143	13 - 9 1/2	2.71	1-3-80
	11:08	1375	13 - 10	2.75	
PM	3:25	1632	13 - 10 1/2	2.79	
	11:08	2095	13 - 10 1/2	2.79	
AM	7:14	2581	13 - 10 3/4	2.81	1-4-80
PM	11:00	3527	13 - 11 3/4	2.90	
AM	7:00	4007	14	2.92	1-5-80
	12:13	4320	14	2.92	pumping stopped

AQUIFER TEST

HYDQR

OBSERVATION WELL #2

100 feet from pumped well

Time	Elapsed Time min.	Depth ft.-in.	Drawdown
PM 12:13:00	0.0	14	2.92
12:13:30	0.5	14 - 3/4	2.98
12:14	1.0	13 - 11 3/4	2.90
12:14:30	1.5	13 - 1 1/2	2.04
12:15	2	12 - 10 3/4	1.81
12:15:30	2.5	12 - 8 1/4	1.60
12:16	3	12 - 6 1/2	1.46
12:16:30	3.5	12 - 5	1.33
12:17	4	12 - 4	1.25
12:18	5	12 - 2 3/4	1.15
12:19	6.0	12 - 1	1.0
12:20	7	12	0.92
12:21	8	11 - 11	0.83
12:22	9.0	11 - 10	0.75
12:25:30	12.5	11 - 8 1/4	0.60
12:30	17	11 - 6 3/4	0.48
12:35	22	11 - 5 3/4	0.40
12:40	27	11 - 5 1/4	0.35
12:43	30	11 - 5 1/4	0.35
12:50	37	11 - 4 3/4	0.31
12:55	42	11 - 4 1/2	0.29
1:00	47	11 - 4 1/2	0.29

Pumping stopped
1-5-80

recovery

AQUIFER TEST
 PRODUCTION WELL

HYD3

USED AS OBSERVATION WELL

400 feet from pumped well

	Time	Elapsed Time min.	Depth ft.-in.	Drawdown	
PM	12:13:00	0.0	13 - 1	0	pumping started 1-2-80
	12:22	9	13 - 9	0.67	
	1:24	71	12	1.08	
	1:35	82	11 - 10 3/4	1.10	
	2:00	107	11 - 10 3/4	1.10	
	2:35	142	11 - 10 1/2	1.12	
	3:05	172	11 - 10 1/2	1.12	
	4:11	238	14 - 3	1.17	
	5:11	293	14 - 3	1.17	
	6:12	359	14 - 3	1.17	
	7:06	413	14 - 2 1/2	1.29	
	9:26	553	14 - 3 1/2	1.38	
	11:11	658	14 - 3 1/2	1.38	
AM	3:09	896	14 - 3 1/4	1.38	1-3-80
	7:08	1135	14 - 3 1/2	1.38	
	11:14	1381	14 - 4	1.42	
PM	3:30	1637	14 - 4 1/4	1.44	
	11:12	2099	14 - 4 1/2	1.46	
AM	7:19	2586	14 - 4 3/4	1.48	1-4-80
PM	11:00	3527	14 - 4 3/4	1.48	
AM	7:00	4007	14 - 5 1/4	1.52	1-5-80
PM	12:13	4320	14 - 5 1/4	1.52	pumping stopped

AQUIFER TEST

PRODUCTION WELL

HYD3R

USED AS OBSERVATION WELL

400 feet from pumped well

Time	Elapsed Time min.	Depth ft.-in.	Drawdown
PM 12:13:00	0.0	14 - 5 1/4	1.35
12:15	2	14 - 5 1/2	1.38
12:16	3	14	0.92
12:17	4	14	0.92
12:18	5	13 - 11 3/4	0.90
12:19	6	13 - 10 1/2	0.88
12:21	8	13 - 10	0.75
12:23	10	13 - 9 3/4	0.73
12:24	11	13 - 9 3/4	0.73
12:25	12	13 - 9 1/2	0.71
12:26	13	13 - 8 3/4	0.65
12:27	14	13 - 8 3/4	0.65
12:28	15	13 - 8 1/2	0.63
12:29	16	13 - 8	0.58
12:30	17	13 - 7 1/2	0.54
12:31:30	18.5	13 - 7	0.50
12:32	19	13 - 6 1/4	0.44
12:33	20	13 - 6 1/2	0.46
12:33:30	20.5	13 - 6	0.42
12:35	22	13 - 6	0.42
12:40	27	13 - 6	0.42
12:41	28	13 - 5 3/4	0.40
12:44	31	13 - 5 3/4	0.40
12:50	37	13 - 5	0.33
12:54	41	13 - 4 3/4	0.31
12:59	46	13 - 4 3/4	0.31
1:13	60	13 - 4 3/4	0.31

1-5-80
Pumping stopped
recovery

HYD2

Neuman Analysis

$w(u_{sp}, b) = 10$
 $K_{uA} = 10$
 $s = 13$
 $t = 5.1$
 $r = 100'$
 $Q = 300 \text{ gpm}$

$$\begin{aligned}
 T &= \frac{114.6 Q w(u_{sp}, b)}{S} \\
 &= \frac{114.6 (300) (10)}{13} \\
 &= 26,446 \text{ gpd/ft}
 \end{aligned}$$

$$\begin{aligned}
 S &= \frac{T t}{2693 r^2 u_A} \\
 &= \frac{26,446 (5.1)}{2693 (100^2) (10)} \\
 &= 5.01 \times 10^{-4}
 \end{aligned}$$

