SITE 13

AQUIFER-TEST REPORT

I. SUMMARY

A. Location Palm Beach County, Florida

B. Date August 7, 1986

C. Well Development 1 hour with air; 2 hours of pumping

D. Length of Test 368 minutes of pumping

E. Discharge 329 gallons per minute

F. Hydraulic Coefficients Transmissivity is 83,000 square feet per day from observation well data.

G. Analytical Model Cooper-Jacob straight line

H. Preparer Leo J. Swayze

I. Reviewer Subdistrict Ground Water Specialist

J. Remarks The transmissivity represents the section of the aquifer between 30 and 130 feet below land surface.

II. NARRATIVE

A. Introduction

1. Test purpose To provide water managers with hydraulic parameters for ground-water modeling.

2. Personnel The test was conducted by personnel (Wayne Sonntag and Jeff Christian) of the U.S. Geological Survey, Water Resources Division, Miami subdistrict.

B. Physical Conditions

1. Aquifer description The main water-bearing zone of the surficial aquifer consists primarily of about 100 feet of sandy, shelly limestones interbedded with unconsolidated layers of sand and shell. This is overlain by about 30 feet of a moderately sorted, very fine sand and shelly marl of comparatively lower permeability. The overlying sands and shelly marls act as a confining layer for short periods of pumping. On a long-term pumping basis, the aquifer should be considered as "water table." The base of the surficial aquifer is 130 feet below land surface.

2. Site location The test site is located along West Lake Park Road, Palm Beach County, Florida (see location map).

Latitude is 26°48'43" Longitude is 80°12'50"

3. Well descriptions A geologic test well (PB-1555) was drilled to the base of the aquifer. The section to be tested was then determined by field observation of drill cuttings. The borehole was then backfilled to 123 feet. An observation well was established by screening the interval between 53 and 123 feet. A 9-inch borehole was drilled 30 feet from the observation well. A pumping well (PB-1557) was created by installing 6-inch PVC casing and screening the interval between 50 and 120 feet with 6-inch 10 slot PVC screen (see enclosed construction schedule).

4. Pump The well was pumped with a 40-horsepower 4-inch Rupp self-priming centrifugal pump.

5. Drawdown measurements Measurements were made with a chalked tape in both the pumping and observation wells.

6. Discharge Discharge was measured using the "free discharge pipe oriface" method as described in the Bureau of Reclamation's Ground Water Manual. A 10-foot length of 12-inch diameter PVC pipe fitted with a 6-inch PVC pipe riser was used to vent H_2S gas before discharge through the oriface was measured. Discharge was 329 gallons per minute.

7. Computations Computations are shown on the semilog graph of drawdown versus time. Method of analysis is based on the Cooper-Jacob straight line method as described by Lohman (1972) and Kruseman and DeRidder (1976).

C. Results

1. Transmissivity calculated from observation well drawdown data was 23,000 square feet per day. Drawdown data from the observation well approached a horizontal line after about 325 minutes of pumping. This probably does not represent an equilibrium situation but represents a transition from a confined system to a water-table system. This transition is due to the permeability contrast between the overlying surficial sands and the sandy and shelly limestones in the pumping zone. Grain-size analysis of the sands yielded a horizontal permeability value of 24 feet per day (Lappala, 1978). Vertical permeabilities could be 2 to 10 times lower (Weeks, 1976). This is about 95 times less than the horizontal permeability of the tested zone (230 feet per day). Based on this physical model of the system, aquifer characteristics were calculated using the Cooper-Jacob straight line method applied to the early drawdown data.

2. Transmissivity Aquifer transmissivity is about 23,000 square feet per day for geologic materials between 30 and 130 feet.

3. Storage coefficient Not applicable

4. Other activities in the area None

5. References

Kruseman, G.P., and DeRidder, N.A., 1976, Analysis and evaluation of pumping test data: International Institute for Land Reclamation and Improvement/ILRI, Wageningen, The Netherlands, 200 p.

Lappala, E.G., 1978, Quantitative hydrogeology of the Upper Republican Natural Resource District, southwest Nebraska: U.S. Geological Survey Water-Resources Investigations Report 78-38, 200 p.

Lohman, S.W., 1972, Ground-water hydraulics: U.S. Geological Survey Professional Paper 708, 70 p.

Weeks, E.P., 1978, Aquifer tests - the state of the art in hydrology: Invitational well-testing symposium proceedings, Lawrence-Berkley Report LBC-7027, Lawrence-Berkley Laboratory, University of California, 26 p.

D. Figures

1. Map of Palm Beach County with site location.

2. Calculations

   Semilog graph of time versus drawdown for pumping well and observation well.

3. Generalized geologic column.

4. Drawing of well construction.

Tables

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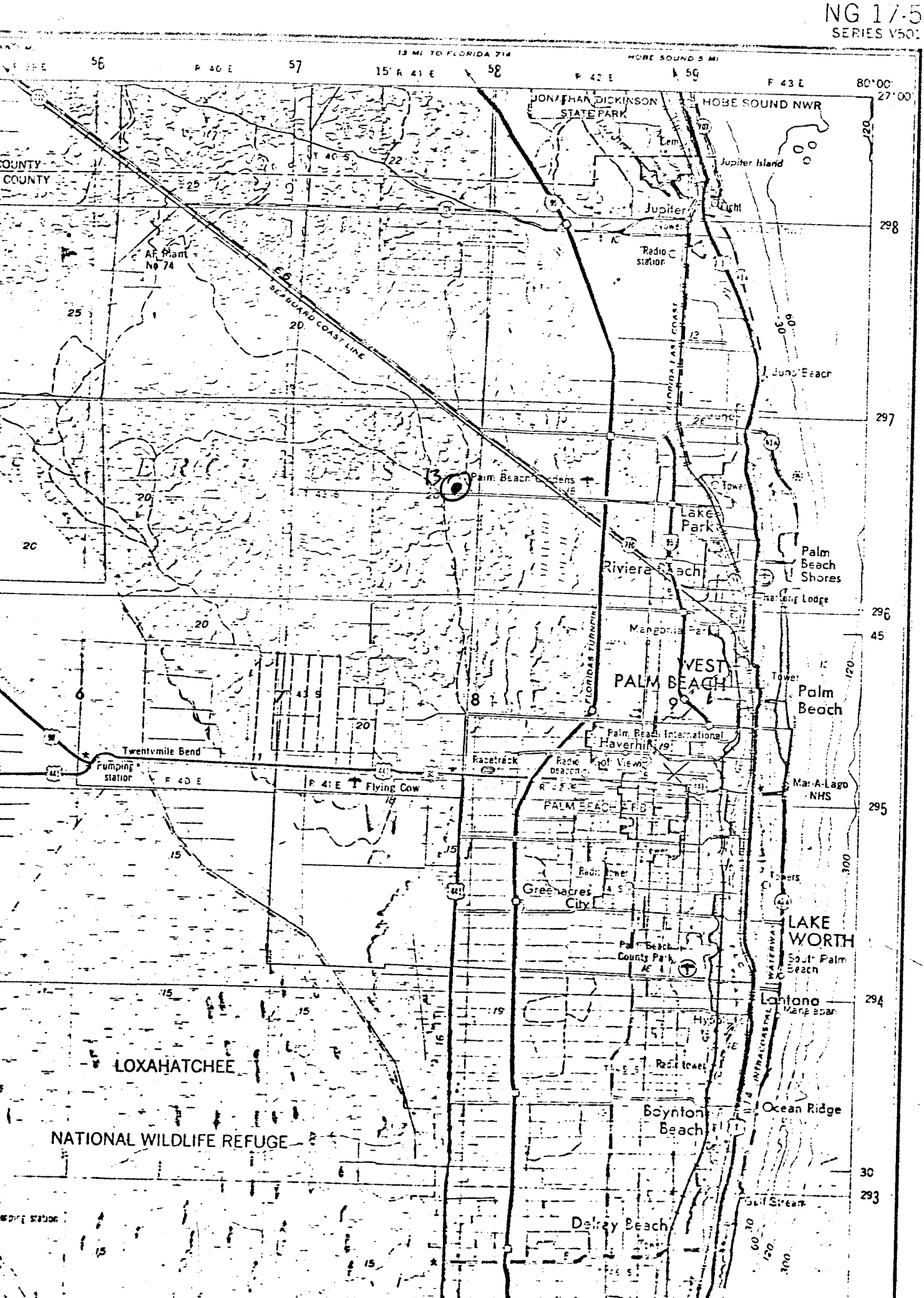

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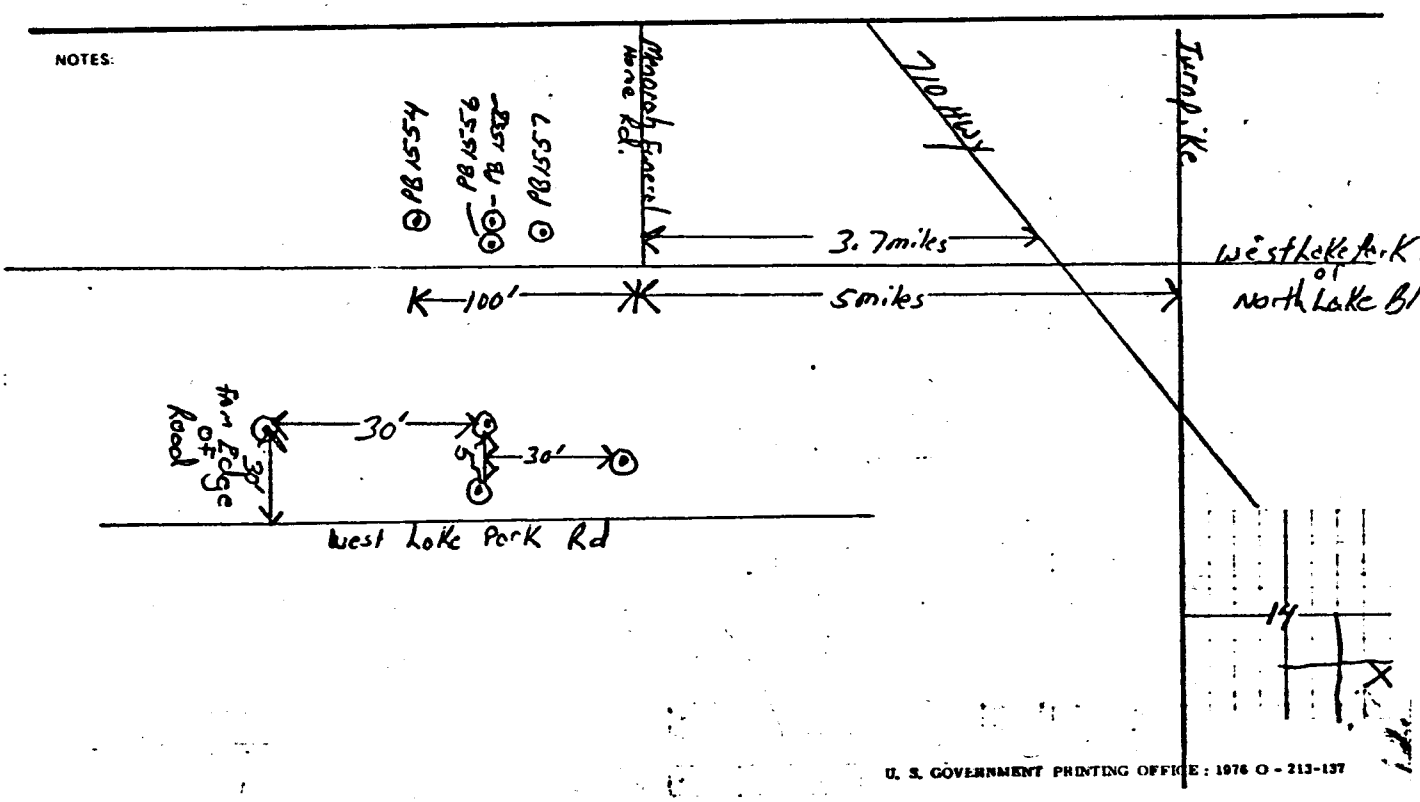

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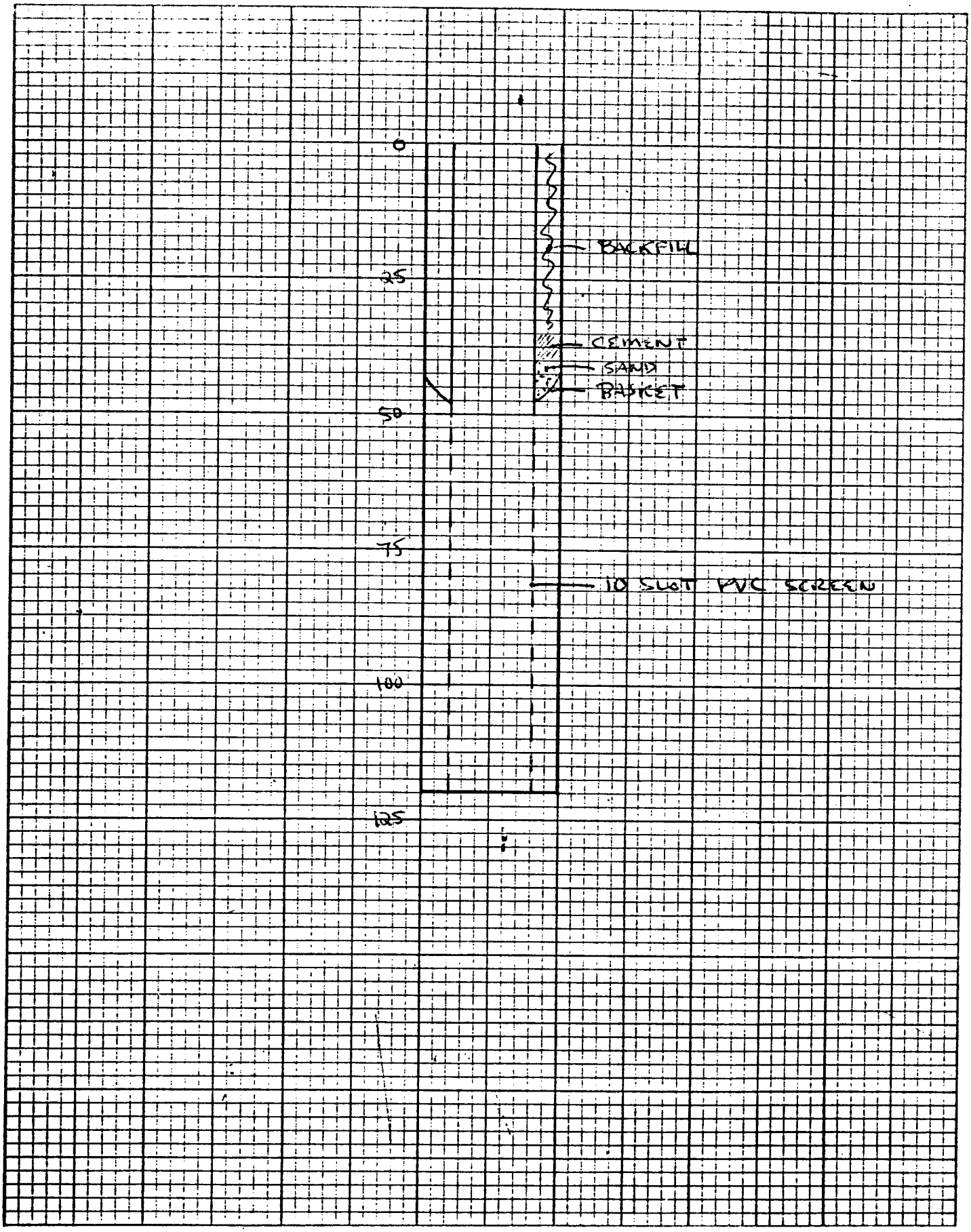


Well Construction: A 9-inch hole was drilled to 120 feet. A 6-inch PVC casing was then lowered to the bottom of the hole inside the 9-inch steel casing. The steel casing was then pulled back to 40 feet which allowed the basket to open. The open hole was then sand packed and cemented. The rest of the 9-inch steel casing was then removed. The open hole was then back-filled with sand and cuttings.

GSPT132

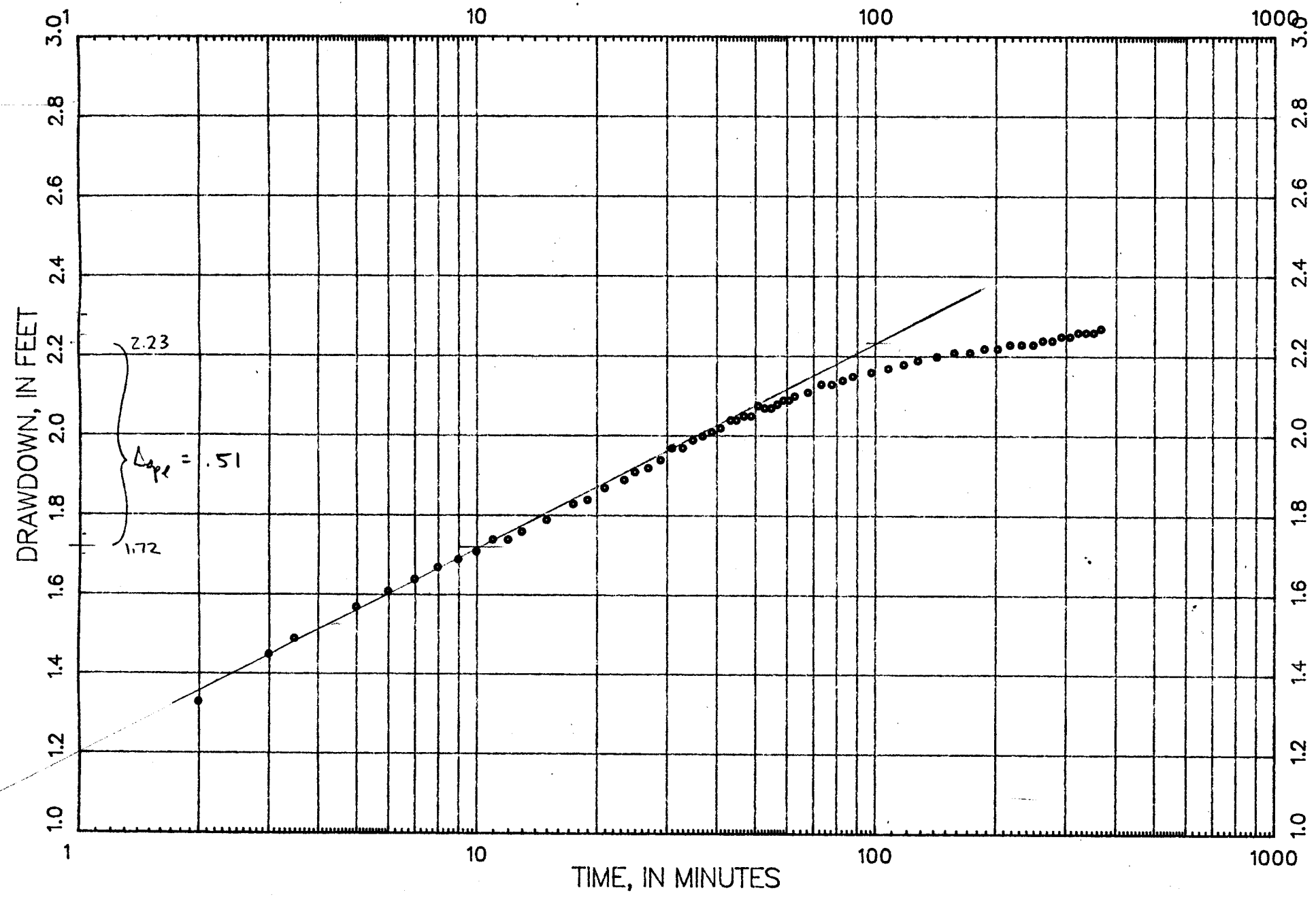
TIME	DTW	DISCHARGE	RADIUS
0.000	1.700	63328	30
2.000	3.030		
3.000	3.150	11	
3.500	3.190	329GPM	
5.000	3.270		
6.000	3.310		
7.000	3.340		
8.000	3.370		
9.000	3.390		
10.000	3.410		
11.000	3.440		
12.000	3.440		
13.000	3.460		
15.000	3.490		
17.500	3.530		
19.000	3.540		
21.000	3.570		
23.500	3.590		
25.000	3.610		
27.000	3.620		
29.000	3.640		
31.000	3.670		
33.000	3.670		
35.000	3.690		
37.000	3.700		
39.000	3.710		
41.000	3.720		
43.500	3.740		
45.000	3.740		
47.000	3.750		
49.000	3.750		
51.000	3.776		
53.000	3.770		
55.000	3.770		
57.000	3.780		
59.000	3.790		
61.000	3.790		
63.000	3.800		
68.000	3.810		
73.500	3.830		
78.000	3.830		
83.000	3.840		
88.000	3.850		
98.000	3.860		
108.000	3.870		
118.000	3.880		
128.000	3.890		
143.000	3.900		
158.000	3.910		
173.000	3.910		
188.000	3.920		
203.000	3.920		
218.000	3.930		
233.000	3.930		
249.000	3.930		
263.000	3.940		
278.000	3.940		
293.000	3.950		
308.000	3.950		
323.000	3.960		
338.000	3.960		
353.000	3.960		
368.000	3.970		

PB-1555

TIME	DTW	DISCHARGE	RADIUS
0.000	1.700	63328	30
2.000	3.030		
3.000	3.150		
3.500	3.190		
5.000	3.270		
6.000	3.310		
7.000	3.340		
8.000	3.370		
9.000	3.390		
10.000	3.410		
11.000	3.440		
12.000	3.440		
13.000	3.460		
15.000	3.490		
17.500	3.530		
19.000	3.540		
21.000	3.570		
23.500	3.590		
25.000	3.610		
27.000	3.620		
29.000	3.640		
31.000	3.670		
33.000	3.670		
35.000	3.690		
37.000	3.700		
39.000	3.710		
41.000	3.720		
43.500	3.740		
45.000	3.740		
47.000	3.750		
49.000	3.750		
51.000	3.776		
53.000	3.770		
55.000	3.770		
57.000	3.780		
59.000	3.790		
61.000	3.790		
63.000	3.800		
68.000	3.810		
73.500	3.830		
78.000	3.830		
83.000	3.840		
88.000	3.850		
93.000	3.850		
108.000	3.870		
118.000	3.880		
128.000	3.890		
143.000	3.900		
158.000	3.910		
173.000	3.910		
188.000	3.920		
203.000	3.920		
218.000	3.930		
233.000	3.930		
249.000	3.930		
263.000	3.940		
278.000	3.940		
293.000	3.950		
308.000	3.950		
323.000	3.960		
338.000	3.960		
353.000	3.960		
368.000	3.970		

DRAWDOWN VS. TIME

COOPER–JACOB METHOD



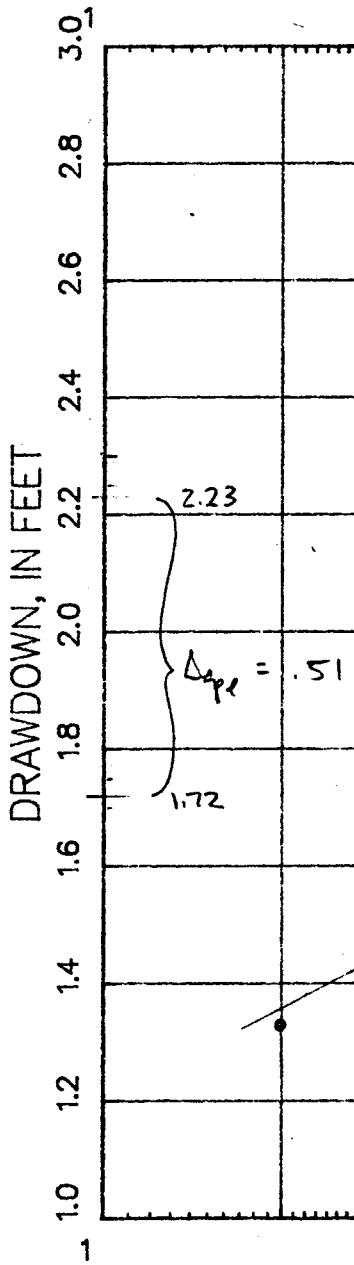
$kD = 2.3Q/4\pi\Delta_{sp}$

$= \frac{(2.3)(63332.5)}{(4)(3.14)(.51)}$

$= 22725\ ft^2/d$

$t_0 = .0045$

DR.13.0W PB-1555 OBS

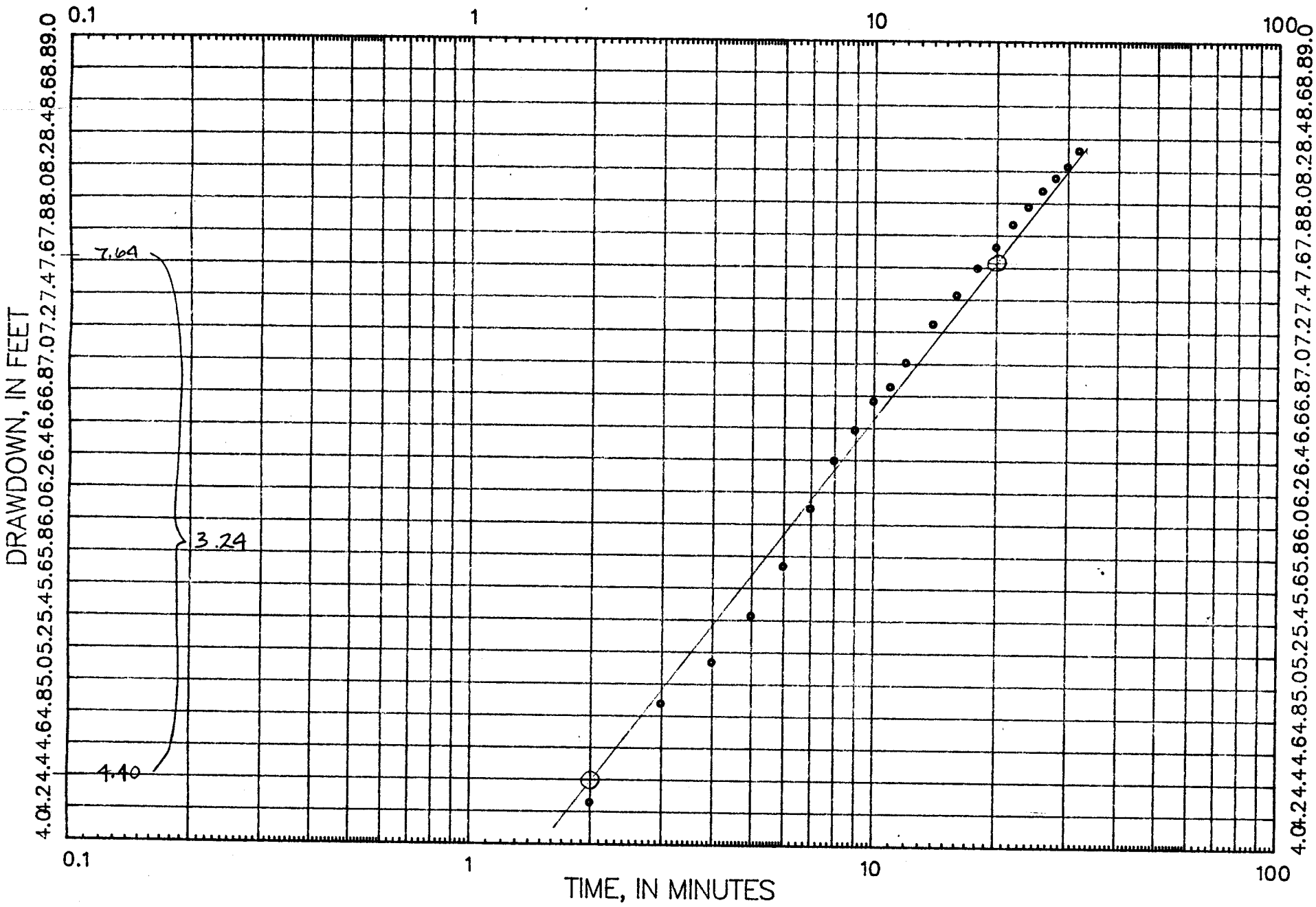


PB-1557

TIME	DTW	DISCHARGE	RADIUS
0.000	1.770	69500	0
2.000	6.030		
3.000	6.550		
4.000	6.910		
5.000	7.200		
6.000	7.510		
7.000	7.870		
8.000	8.170		
9.000	8.380		
10.000	8.540		
11.000	8.630		
12.000	8.780		
14.000	9.020		
16.000	9.200		
18.000	9.370		
20.000	9.500		
22.000	9.640		
24.000	9.750		
26.000	9.850		
28.000	9.950		
30.000	10.000		
32.000	10.100		

DRAWDOWN VS. TIME

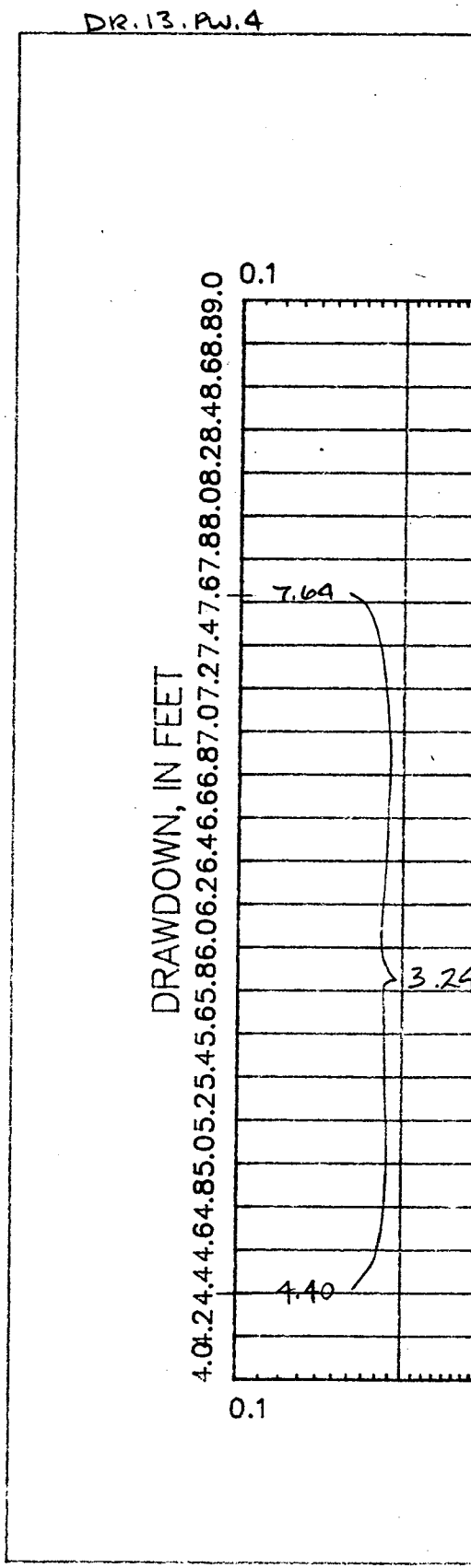
COOPER–JACOB METHOD



$KD = 2.3Q / 4\pi\Delta s_d$

$= \frac{(2.3)(69300)}{(4)(3.14)(3.24)}$

$=$



Lithologic Log of Well PB-1555

Lat 26°48'43", long 80°12'50"
Sec. 14, T. 42 S., R. 41 E.

Description	Thickness (feet)	Depth, feet below land surface
Sand, grayish-orange (10 YR 7/4) to yellowish-gray (5 Y 7/2); quartzose, medium to fine, well sorted, angular to subangular; 1 to 3 percent heavy minerals, medium to fine, well sorted, subrounded to rounded.	4	0 - 4
Marl, light-olive-gray (5 Y 5/2); micrite, clay and silt size particles; 30 to 35 percent quartzose, medium to very fine, moderately sorted, angular to subangular; 20 to 25 percent detrital carbonates and shell fragments.		4 - 7
Sand, yellowish-gray (5 Y 7/2); quartzose, medium to very fine, moderately sorted, angular to subrounded; about 20 to 25 percent marl; 1 to 3 percent heavy minerals, fine to very fine, subangular to rounded; 5 to 10 percent detrital carbonates and shell fragments.		7 - 10
Sand, yellowish-gray (5 Y 7/2); quartzose as above; 3 to 5 percent heavy minerals, fine to very fine, well sorted, subangular to rounded; 1 to 3 percent detrital carbonates; about 3 to 5 percent mud, clay and silt size particles.	4	10 - 14
Sand, yellowish-gray (5 Y 7/2) to light-olive-gray (5 Y 5/); quartzose as above; 3 to 5 percent heavy minerals, fine to very fine, well sorted, subrounded to rounded; about 10 percent mud, clay and silt size.	3	14 - 17
Sand, light-olive-gray (5 Y 5/2); quartzose, fine to very fine, well sorted, angular to subrounded; 3 to 5 percent heavy minerals as above; about 10 percent mud.	3	17 - 20
Sand, medium-gray (N 5) to medium-bluish-gray (5 B 5/1); quartzose, fine to very fin , well sorted, subangular to subrounded; 5 to 10 percent heavy minerals, medium to very fine, moderately sorted, subrounded to rounded; 20 to 25 percent detrital carbonates and shell fragments.	4	20 - 24
Sand as in 20 to 24 feet.	3	24 - 27

Lithologic Log of Well PB-1555--Continued

Description	Thickness (feet)	Depth, feet below land surface
Sand, medium-bluish-gray (5 B 5/1) to ive-gray (5 Y 4/1); quartzose as above; 10 to 15 cent heavy minerals and phosphates, medium to very fine, moderately sorted, subangular to rounded; 20 to 25 percent detrital carbonates and shell fragments; about 5 percent mud.	3	27 - 30
Limestone, medium-bluish-gray (5 B 5/1); sandy, sparse biosparite; 10 to 15 percent quartz, fine to very fine, subangular to subrounded; 3 to 5 percent heavy minerals, fine to very fine, subangular to rounded; very porous, vugs; poorly to moderately cemented; interbedded with about 40 percent sand, medium-bluish-gray (5 B 5/1) to light-olive-gray (5 Y 6/1); quartzose, medium to very fine, moderately sorted, angular to subangular; 3 to 5 percent heavy minerals, fine to very fine, well sorted; subrounded to rounded; 35 to 40 percent detrital carbonates and shell fragments, abundant bivalve fragments, Olivella, Chione.	4	30 - 34
Sand, light-gray (N 7) to light-bluish-gray (5 B 7/1); quartzose, medium to very fine, moderately sorted, angular to subangular; 5 to 10 percent heavy minerals, medium to very fine, moderately sorted, subrounded to rounded; 35 to 40 percent detrital carbonates and shell fragments, abundant bivalve fragments, abundant bivalve fragments; interbedded with about 30 percent limestone as above.	3	34 - 37
Limestone, medium-light-gray (N 6); sandy, sparse biosparite; 5 to 10 percent quartz, medium to very fine, angular to subrounded; 3 to 5 percent heavy minerals, medium to very fine, subrounded to rounded; very porous; moderately to well cemented; moldic, vugs; interbedded with about 20 percent sand, light-olive-gray (5 Y 6/1); quartzose, medium to very fine, moderately sorted, angular to su ngular; 5 to 10 percent heavy minerals and phosphat , medium to very fine, subrounded to rounded; 20 to 25 percent detrital carbonates and shell fragments, Cardita and other bivalves.	3	37 - 40

Lithologic Log of Well PB-1555--Continued

Description	Thickness (feet)	Depth, feet below land surface
Limestone, medium-gray (N 5); sandy, [illegible]rse biosparite, bivalvia; 10 to 15 percent quartz, [illegible]ium to very fine, moderately sorted, angular to subangular; moderately cemented; moldic, vugs; very porous; interbedded with about 30 percent sand, detrital carbonates and shell fragments; 25 to 30 percent quartzose, medium to very fine, moderately sorted, angular to subangular; 3 to 5 percent heavy minerals and phosphates, medium to very fine, subangular to rounded.	4	40 - 44
Limestone, medium-gray (N 5); sandy, sparse biosparite, bivalvia; 10 percent quartz, medium to very fine, angular to subrounded; 5 to 10 percent heavy minerals and phosphates, medium to very fine, subangular to rounded; moderately cemented; moldic, vugs, very porous; interbedded with about 30 percent sand as above.	3	44 - 47
Limestone; interbedded with sand as above.	3	47 - 50
Limestone, medium-gray (N 5) to light-olive-gray (5 Y 6/1); sandy, sparse biosparite; 10 to 20 percent quartz, medium to very fine, angular to subrounded; 3 to 5 percent heavy minerals, medium to very fine; subrounded to rounded; moderately to well cemented; vugs, very porous; interbedded with 20 percent sand; detrital carbonates, very coarse to very fine and shell fragments; 30 to 35 percent quartzose, medium to very fine, moderately sorted, angular to subangular; 3 to 5 percent heavy minerals, medium to very fine, moderately sorted, subangular to rounded.		50 - 54
Limestone, interbedded with sand as above	3	54 - 57
Sand, light-gray (N 7); quartzose, medium to very fine, moderately sorted, angular to subrounded; 3 to 5 percent heavy minerals, medium [illegible]o very fine, moderately sorted, subrounded to round[illegible]; 30 to 35 percent detrital carbonates and shell fragments; interbedded with about 30 percent limestone, medium-gray (N 5); sandy, sparse biosparite; 15 to 20 percent quartz, medium to very, angular to subrounded; 3 to 5 percent heavy minerals, medium to very fine, subrounded to rounded; moderately cemented; moldic, vugs, very porous.	3	57 - 60

Lithologic Log of Well PB-1555--Continued

Description	Thickness (feet)	Depth, feet below land surface
Sand, light-olive-gray (5 Y 6/1); quartzose, medium to very fine, moderately sorted, angular to subangular; 5 to 10 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subrounded to rounded; 35 to 40 percent detrital carbonates and shell fragments; interbedded with about 40 percent limestone, medium-dark-gray (N 4); sandy, sparse biosparite; 15 to 20 percent quartz, medium to very fine, angular to subrounded; 3 to 5 percent heavy minerals, medium to very fine, subrounded to rounded; moderately cemented; vugs, very porous.	4	60 - 64
Limestone, medium-light-gray (N 6) to yellowish-gray (5 Y 8/1); sandy, packed biosparite, Chione, Conopeum, Tellina; 5 to 10 percent quartz, medium to fine, angular to subangular; 1 to 3 percent heavy minerals, medium to very fine, subrounded to rounded; moderately to well cemented; moldic, vugs, very porous; interbedded with about 20 percent sand; detrital carbonates and shell fragments; 20 to 25 percent quartzose, coarse to very fine, poorly sorted, angular to subangular; 3 to 5 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subrounded to rounded.	3	64 - 67
Limestone as above; interbedded with 30 percent sand as above.	3	67 - 70
Sand, yellowish-gray (5 Y 7/2); detrital carbonates and shell fragments, Oliva, Tellina, barnacles, Chione, Cardita; 25 to 30 percent quartzose, medium to very fine, moderately sorted, angular to subangular; 3 to 5 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subrounded to rounded; interbedded with about 40 percent limestone as above.	4	70 - 74
Sand as above; interbedded with about 10 percent limestone as above; poorly cemented; Turritella.	3	74 - 77

Description	Thickness (feet)	Depth, feet below land surface
Shell and shell fragments, yellowish-gray (5 Y 7/2); Turritella, Tellina, Olivella, Cardita, bryzoans, Chione; 20 to 25 percent detrital carbonates, very coarse to very fine; 20 to 25 percent quartzose, medium to very fine, moderately sorted, angular to subangular; 3 to 5 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subrounded to rounded; interbedded with about 20 percent limestone, medium-light-gray (N 6); sandy, packed biosparite; 20 to 25 percent quartz, medium to very fine, angular to subangular; 3 to 5 percent heavy minerals and phosphates, medium to very fine, subrounded to rounded; poorly cemented; moldic, vugs, very porous.	3	77 - 80
Shell and shell fragments as above; interbedded with limestone as above.	4	80 - 84
Shell and shell fragments, yellowish-gray (5 Y 7/2); Terebra, Glycymeris, Turritella, Diplodonta, Tellina, bryzoans, Cardita, Olivella, Crepidula; 20 to 25 percent detrital carbonates, very coarse to very fine; 20 to 25 percent quartzose, medium to very fine, moderately sorted, angular to subrounded; 5 to 10 percent heavy minerals and phosphates, coarse to very fine, poorly sorted, subrounded to rounded; interbedded with about 10 percent limestone; sandy, packed biosparite.	3	84 - 87
Shell and shell fragments as above; Chlamys, Cancellaria, worm shells, Calliostoma, Chione, limpet, interbedded with about 5 percent limestone, rock fragments.	3	87 - 90
Shell and shell fragments, yellowish-gray (5 Y 8/1); Turritella, Turbonilla, Tellina, bryzoans, limpets, oysters, abundant bivalve fragments, barnacles; 15 to 20 percent detrital carbonates, very coarse to very fine; 20 to 25 percent quartzose, medium to very fine, moderately sorted, angular to subangular; 5 to 10 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subrounded to rounded; interbedded with about 5 percent coquina.	4	90 - 94

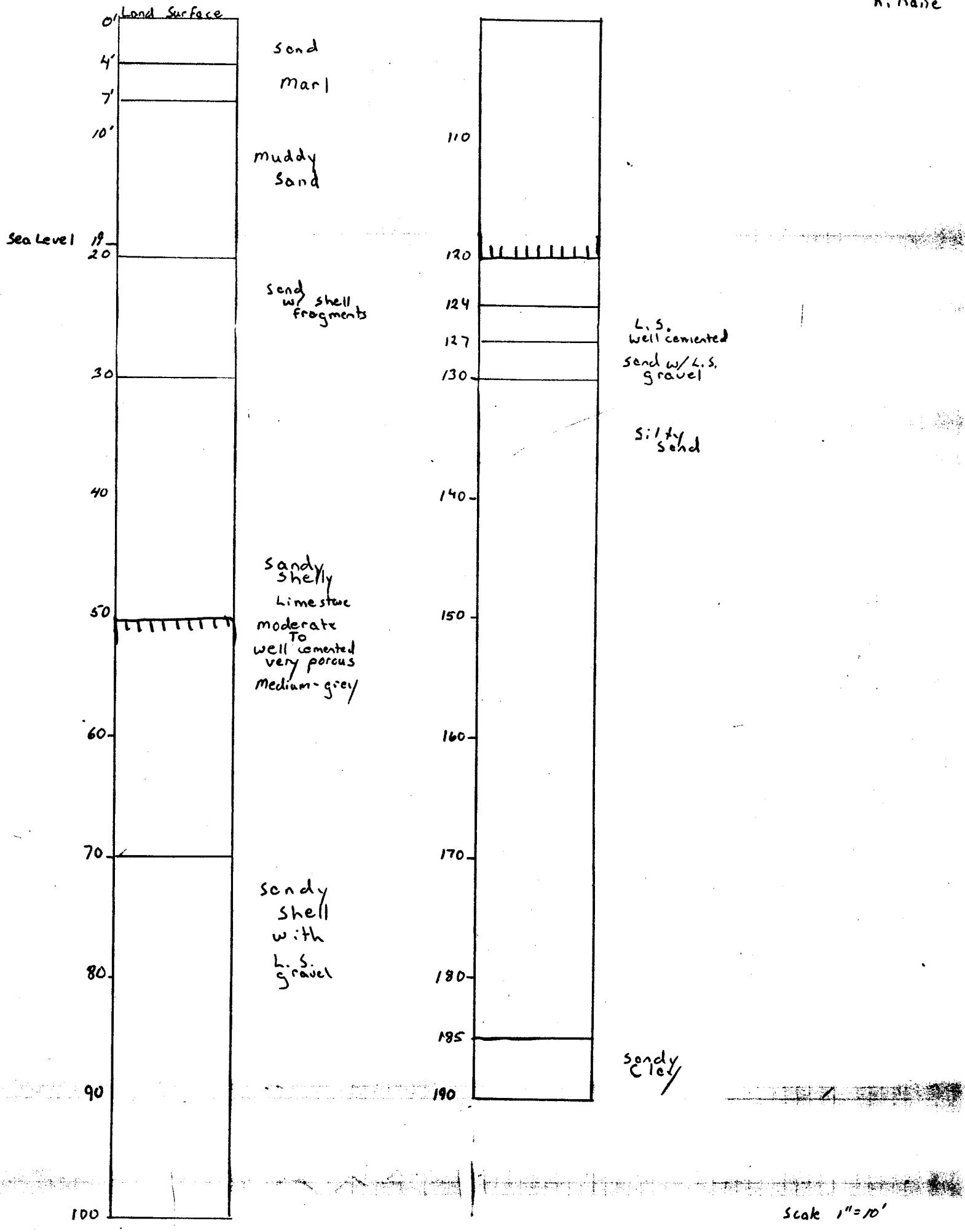
Description	Thickness (feet)	Depth, feet below land surface
Sand, medium-gray (N 5) to yellowish-gray (5 Y 7/2); detrital carbonates and shell fragments, Glycymeris, Chione, Turritella; 30 to 35 percent quartzose, medium to very fine, moderately sorted, angular to subrounded; 5 to 10 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subangular to rounded; about 3 percent rock fragments.	3	94 - 97
Sand as in 94 to 97 feet.	3	97 - 100
Sand, medium-light-gray (N 6) to yellowish-gray (5 Y 8/1); detrital carbonates and shell fragments, Plicatula, echinoid plates, Limopsis, Anadora, oyster shells, bryzoans, Turritella, limpets; 25 to 30 percent quartzose, medium to very fine, moderately sorted, angular to subangular; 5 to 10 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subrounded to rounded; interbedded with about 5 percent limestone; packed biosparite.		100 - 104
Sand as in 100 to 104 feet.	3	104 - 107
Shell and shell fragments, yellowish-gray (5 Y 8/1) to light-gray (N 7); abundant mollusks; 20 to 25 percent detrital carbonates, very coarse to very fine; 20 to 25 percent quartzose as above; 3 to 5 percent heavy minerals as above.	3	107 - 110
Sand, medium-gray (N 5) to yellowish-gray (5 Y 8/1); detrital carbonates and shell fragments, abundant mollusks; 35 to 40 percent quartzose, medium to very fine, moderately sorted, angular to subangular; 3 to 5 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subrounded to rounded.	4	110 - 114
Sand as in 110 to 114 feet.	3	114 - 117
Sand as in 114 to 117 feet; Turritella.	3	117 - 120
Sand, light-olive-gray (5 Y 6/1) to medium-light-gray (N 6); detrital carbonates, very coarse to very fine; 15 to 20 percent shell fragments, mollusks; 35 to 40 percent quartzose as above; 3 to 5 percent heavy minerals and phosphates as above; interbedded with about 5 percent limestone, light-olive-gray (5 Y 6/1); packed biosparite; poorly cemented; moldic, vugs, very porous.	4	120 - 124

Lithologic Log of Well PB-1555--Continued

Description	Thickness (feet)	Depth, feet below land surface
Limestone, yellowish-gray (5 Y 7/2); sandy, sparse biosparite; 15 to 20 percent quartzose medium to very fine, angular to subrounded; 3 to 5 percent heavy minerals, medium to very fine, subrounded to rounded; well cemented; moldic, vugs, moderately to very porous.	3	124 - 127
Sand, light-gray (N 7) to yellowish-gray (5 Y 8/1); quartzose, medium to very fine, moderately sorted, angular to subangular; 3 to 5 percent heavy minerals and phosphates, medium to very fine, subrounded to rounded; 35 to 40 percent detrital carbonates and shell fragments, bivalvia, barnacles, bryzoans; interbedded with about 10 percent limestone, yellowish-gray (5 Y 7/2); sandy, sparse biosparite; about 10 percent quartz, medium to very fine, angular to subrounded; 3 to 5 percent heavy minerals, medium to very fine, subrounded to rounded; moderately cemented; vugs, moldic, moderately porous.	3	127 - 130
Sand, very light gray (N 8) to yellowish-gray (5 Y 8/1); quartzose, medium to fine, moderately sorted, angular to subrounded; 3 to 5 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subrounded to rounded; 15 to 20 percent detrital carbonates and shell fragments; 5 to 10 percent streaks of clay and silt.		130 - 134
Sand as above with about 10 to 15 percent green clay nodules.	3	134 - 137
Sand as in 134 to 137 feet.	3	137 - 140
Sand, light-olive-gray (5 Y 6/1); quartzose, medium to very fine, moderately sorted, angular to subrounded; 1 to 3 percent heavy minerals and phosphates, medium to very fine, moderately sorted, subrounded to rounded; 5 to 10 percent detrital carbonates, very coarse to very fine; about 5 percent clay and silt.	4	140 - 144
Sand, yellowish-gray (5 Y 8/1) to pale-olive (10 Y 6/2); quartzose, fine to very fine, well sorted, angular to subrounded; 1 to 3 percent heavy minerals and phosphates, fine to very fine, well sorted, subrounded to rounded; 1 to 3 percent detrital carbonates; about 10 percent clay and silt.	3	144 - 147

Description	Thickness (feet)	Depth, feet below land surface
Sand, light-olive-gray (5 Y 5/2); quartzose, fine to very fine, well sorted, angular to subangular; 1 to 3 percent heavy minerals and phosphates, fine to very fine, well sorted, subrounded to rounded; 1 to 3 percent detrital carbonates; 5 to 10 percent clay and silt.	3	147 - 150
Sand as in 147 to 150 feet.	10	150 - 160
Sand, light-olive-gray (5 Y 5/2); quartzose, fine to very fine, well sorted, angular to subrounded; 1 to 3 percent heavy minerals and phosphates as above; 1 to 3 percent detrital carbonates; 15 to 20 percent clay and silt.	6	160 - 166
Clayey sand, light-olive-gray (5 Y 5/2); quartzose as above; 1 to 3 percent heavy minerals and phosphates as above; 3 to 5 percent detrital carbonates; 20 to 25 percent clay and silt.	4	166 - 170
Clayey sand as above.	5	170 - 175
Clayey sand, grayish-olive (10 Y 4/2); quartzose as above; 5 to 10 percent heavy minerals and phosphates as above; 3 to 5 percent detrital carbonates; 30 to 35 percent clay and silt.	5	175 - 180
Clayey sand as above.	5	180 - 185
Sandy clay, grayish-olive (10 Y 4/2); clay and silt; 30 to 35 percent quartzose as above; 3 to 5 percent heavy minerals and phosphates as above; 3 to 5 percent detrital carbonates.	5	185 - 190

R. Kane


0' Land Surface
4'
7'
10'
Sea Level 19'
20'
30
40
50
60
70
80
90
100
Sand
Marl
muddy Sand
Sand w/ shell fragments
Sandy Shelly Limestone moderate To well cemented very porous Medium-grey
Sandy Shell with L.S. gravel
110
120
124
127
130
140
150
160
170
180
185
190
L.S. well cemented Sand w/ L.S. gravel
Silty Sand
Sandy Clay
Scale 1" = 10'

Dat

APT ANALYSIS

SITE: USGS Site 13
Section 14, Township 42S, Range 41E
Elev 19' NGVD

REPORT: None; Used draft data from USGS

GEOLOGIC DATA: Lithologic Log from PB 1555 shows:

Perm	Depth	Lithology
Low	0'-4'	Sand
very low (semi-confining)	4'-7'	Sand w/ shell (20%) & clay (20%
Low	7'-14'	Sand w/ trace sandstone
very low (semi-confining)	14'-30'	Quartz and Carbonate sand and silt
medium	30'-47'	Alternating beds of Carbonate sand, quartz sand, shell and limestone
very high	47'-67'	Solutioned Limestone, Carbonate sand and shell)
medium	67'-117'	Carbonate sand and shell w/ small amount of quartz.
medium	117'-124'	Shell w/ Carbonate and quartz sand
med	124'-130'	Limestone and Shell, some quartz sand
Low	130'-140'	Quartz sand w/ small amount of carbonate.
Low to very low	140'-150	Quartz sand, Carbonate silt

very low 150'-190' Quartz sand, silt, clay

Based on this sample log:

1) Aquifer is 150' thick at this site
2) There is 20 feet of solutioned limestone (Turnpike) aquifer present
3) Main producing zone is from 30' to 130' below ground level
4) Aquifer is probably semi-confined

WELL DESCRIPTIONS:

WELL	Dia.	T.D.	cased Depth	screen/ OPEN	r
PB-1555	2"	123'	53'	screen	30'
PB 1557	6"	120'	50'	screen	PW

INFLUENCING FACTORS:

1) Both wells were open to 70% of the main producing zone
2)

USGS APT:

STARTED: 8/7/1986
Duration: 368 min
Discharge: 329 gpm, free discharge pipe orifice to unspecified location
Recovery: None

COMMENTS: 1) Maximum drawdowns were PB1555 2.27'
PB1557 8.33'

2) Drawdowns were measured w/ chalked tape

USGS ANALYSIS:

METHOD: Jacob

Results: PB1555 T = 22,725 Ft²/day

PB1557 T Not calculated

S not calculated

K = 230 Ft/day for b = 100'

COMMENTS: 1) Further analysis shows u conditions + limits are met.

2) Steady state conditions were ~~never~~ achieved during this test

3) Slope of line looked a little high.

SFWMD ANALYSIS:

METHOD : Jacob

Results T = 25,000 Ft²/day

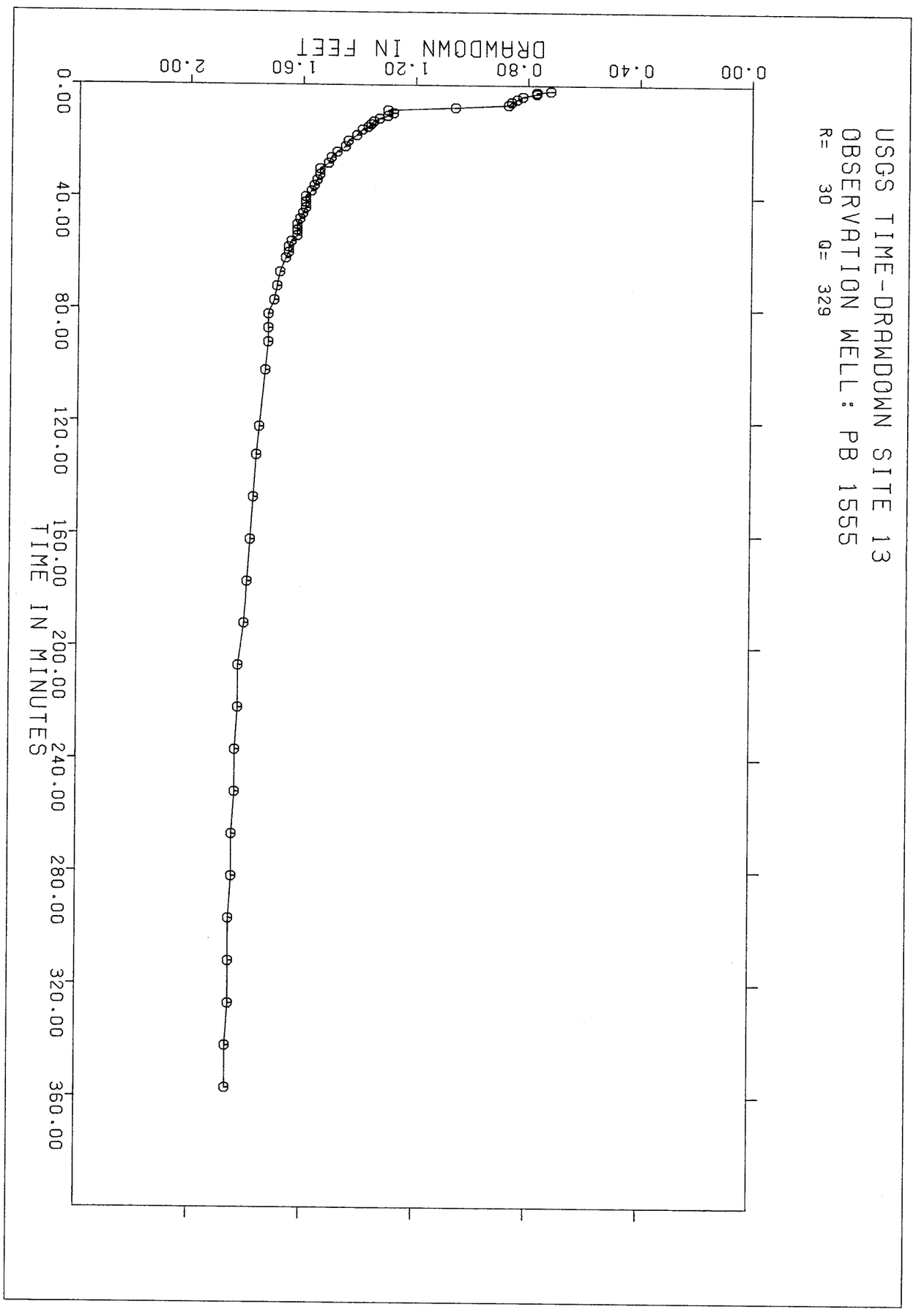
S = .00074

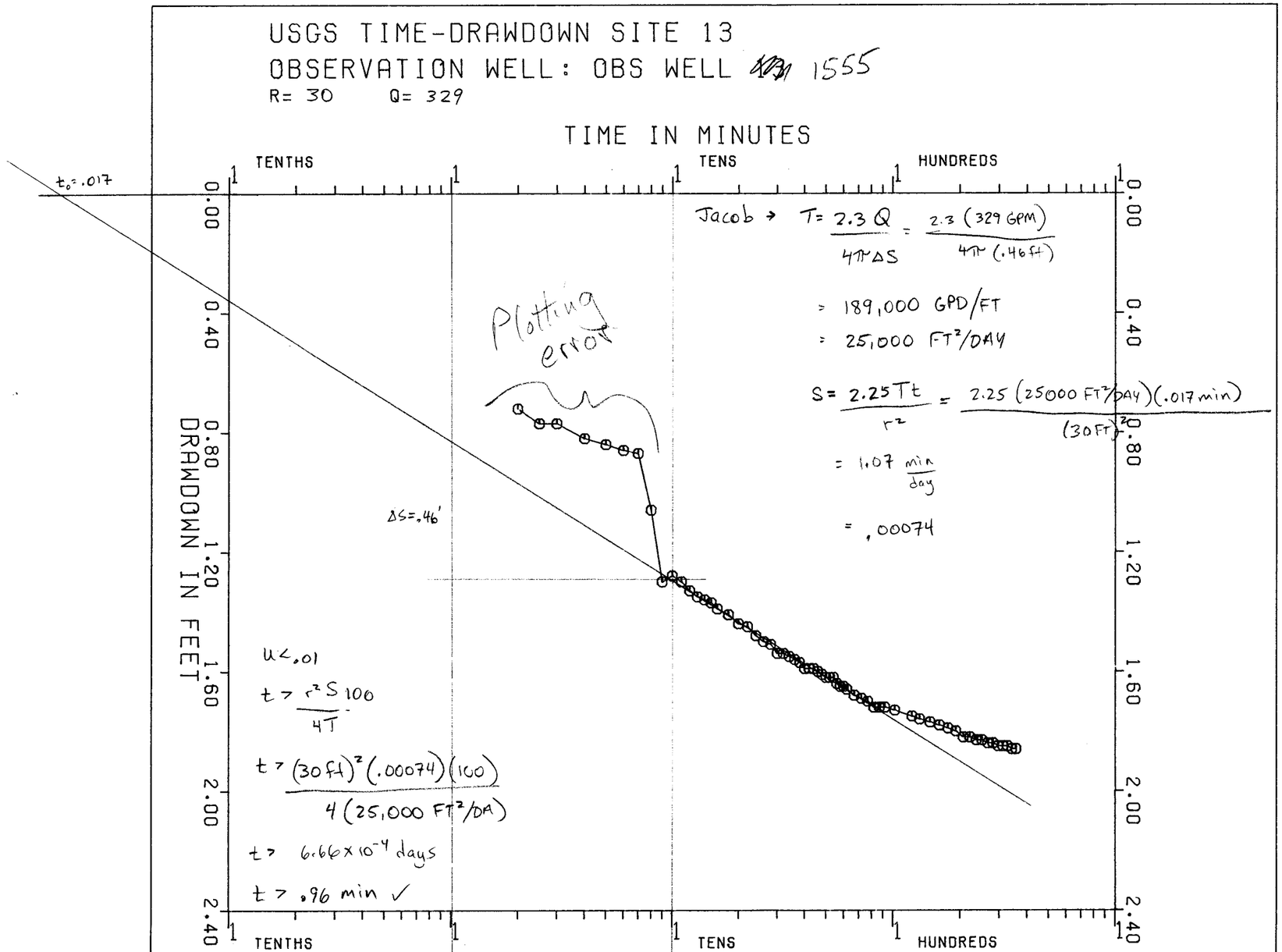
for $u < .01$ $t > .96$ min

COMMENTS: 1) Bad data plots for data earlier than 10 minutes. Although slope of line looks good, the data should probably be replotted

2) Cannot determine if Jacob analysis is done with proper section of semi log plot due to absence of early time data. ∴ $\overline{T}$ values may actually be lower.

WMD TAPENO 6350 PLOT NO 0005
USER NO SHINE DATE 87/08/12 TIME 13:46




USGS TIME-DRAWDOWN SITE 13
OBSERVATION WELL: OBS WELL ~~1031~~ 1555
R= 30 Q= 329
TIME IN MINUTES
TENTHS
TENS
HUNDREDS
DRAWDOWN IN FEET
0.00
0.40
0.80
1.20
1.60
2.00
2.40
t_o=.017
Jacob → $T = \frac{2.3Q}{4\pi\Delta S} = \frac{2.3\,(329\ GPM)}{4\pi\,(.46\ ft)}$
= 189,000 GPD/FT
= 25,000 FT²/DAY
$S = \frac{2.25Tt}{r^2} = \frac{2.25\,(25000\ FT^2/DAY)(.017\ min)}{(30\ FT)^2}$
= 1.07 min/day
= .00074
Plotting error
ΔS=.46'
u<.01
$t > \frac{r^2 S\,100}{4T}$
$t > \frac{(30\ ft)^2(.00074)(100)}{4\,(25{,}000\ FT^2/DA)}$
t > 6.66×10^{-4} days
t > .96 min ✓

WMD TAPENO 6642 PLOT NO 0015
USER NO SHINE DATE 87/05/28 TIME 15:10