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# AN INTERIM WATER SUPPLY FOR THE OAKES AQUIFER TEST AREA OF THE GARRISON DIVERSION UNIT: PRODUCTION-WELL TEST DATA, WATER QUALITY ANALYSES, AND AS-BUILT CONSTRUCTION DATA

By Robert B. Shaver

Water Resources Investigation No.19
North Dakota State Water Commission

1990

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WATER-RESOURCE INVESTIGATION NO. 19

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## INTRODUCTION

From June 19 through August 30, 1990, representatives of the North Dakota State Water Commission, in cooperation with the United States Bureau of Reclamation, supervised the construction and testing of 32 production wells completed in the Oakes aquifer. The wells will provide an interim ground-water supply to irrigate about 680 acres of land located in the Oakes 5,000-acre test area. The 5,000-acre test area is part of the West Oakes irrigation development tract of the Garrison Diversion Unit.

Five wells were completed in the W1/2 of Section 4, Township 130 North, Range 59 West (figure 1). The total pumping rate of the five wells measured in August 30, 1990 was 1074 gallons per minute.

Fourteen wells were completed in the SW1/4 of Section 3, Township 130 North, Range 59 West (figure 2). The total pumping rate of the 14 wells measured on August 30, 1990 was 2056 gallons per minute.

Ten wells were completed in the NE1/4 of Section 16, Township 130 North, Range 59 West (figure 3). The total pumping rate of the 10 wells measured on August 30, 1990 was 1021 gallons per minute.

## LOCATION-NUMBERING SYSTEM

The location-numbering system used in this report is based on the public land classification system used by the U.S. Bureau of Land Management. The system is illustrated in

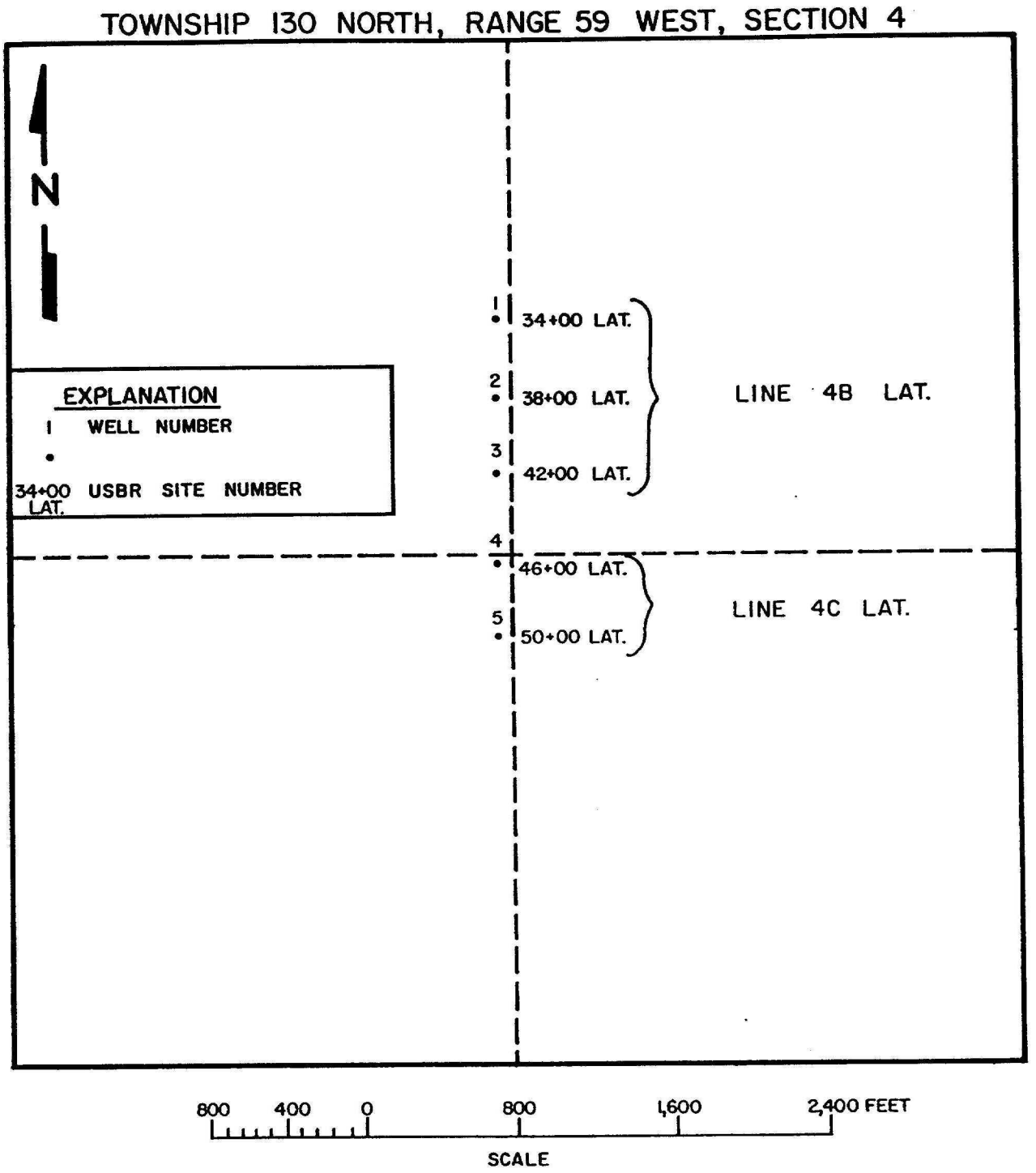



Figure 1. -- Location of production wells 1 through 5

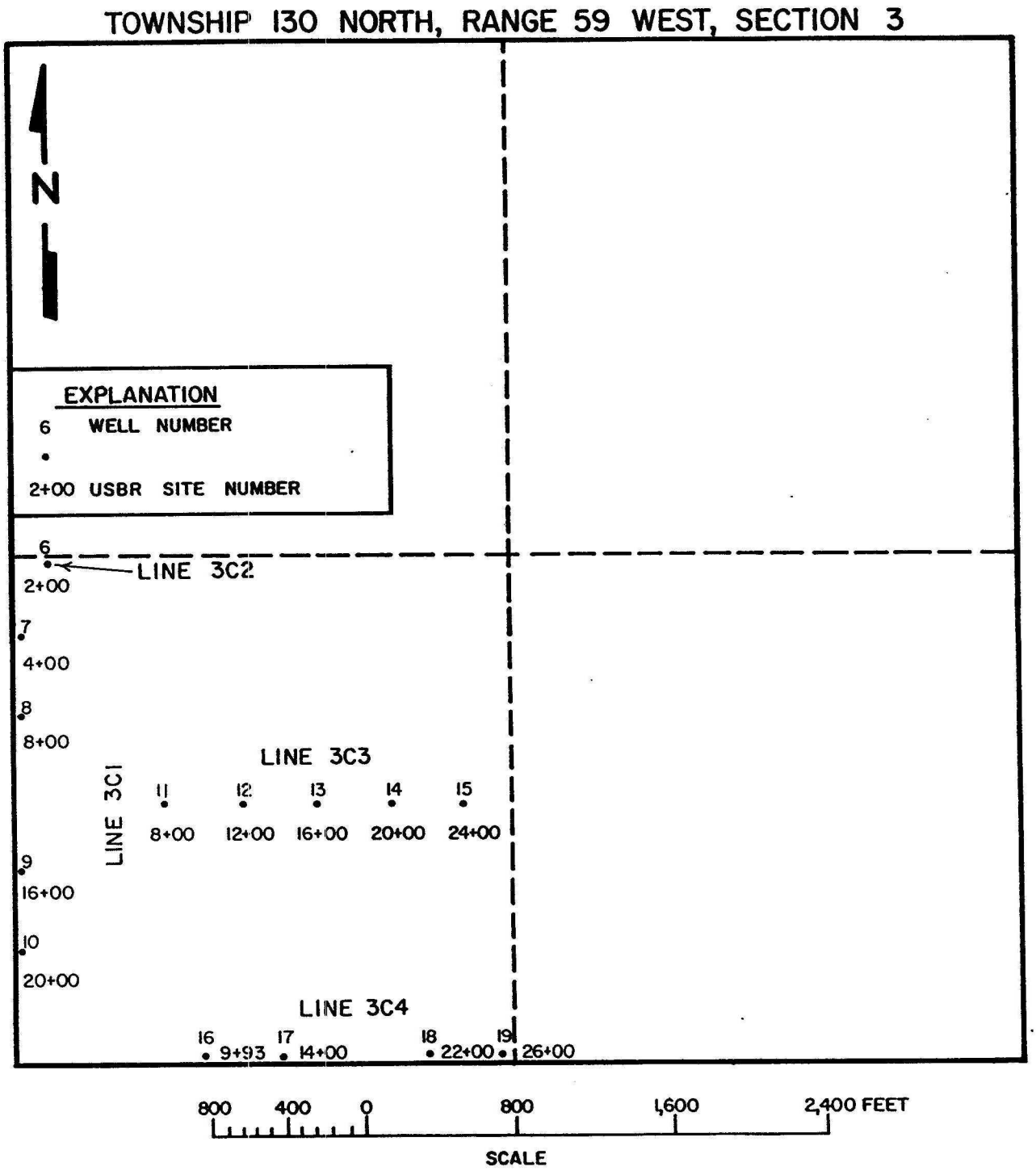



Figure 2. -- Location of production wells 6 through 19

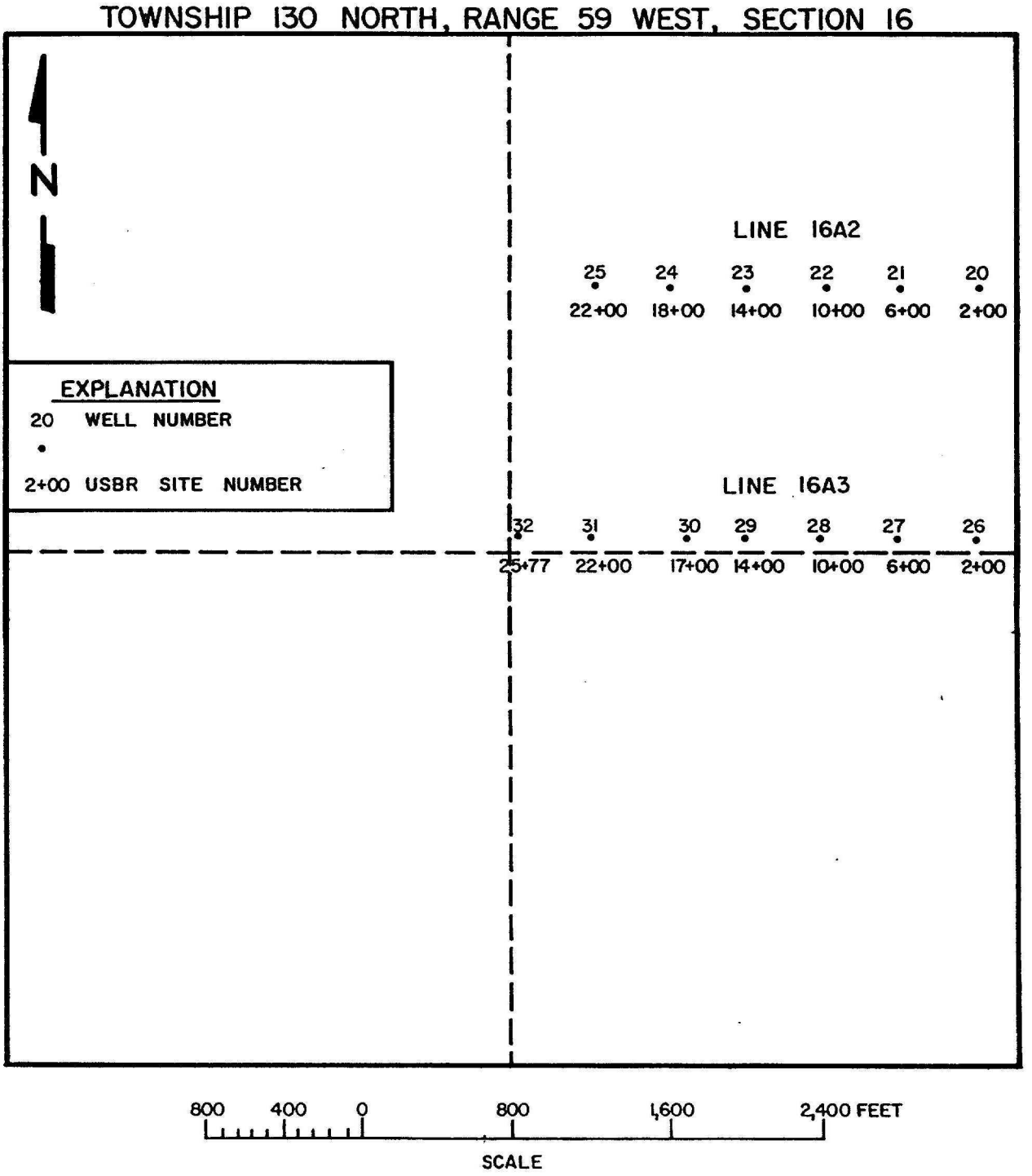



Figure 3. -- Location of production wells 20 through 32

figure 4. The first number denotes the township north of a base line, the second number denotes the range west of the fifth principal meridian, and the third number denotes the section in which the well or test hole is located. The letters A, B, C, and D designate, respectively, the northeast, northwest, southwest, and southeast quarter section, quarter-quarter section, and quarter-quarter-quarter section (10-acre tract). For example, well 130-059-15DAA is located in the NE1/4 NE1/4 SE1/4 Section 15, Township 130 North, Range 59 West. Consecutive terminal numerals are added if more than one well or test hole is located within a 10-acre tract (figure 4).

## PURPOSE AND SCOPE

The purpose of this report is to provide the U.S. Bureau of Reclamation with all basic data related to testing and construction (as-built) of the 32 production wells. The basic data includes the following:

1) Specific capacity test data
2) Pump-test data
3) Data used to calculate the maximum sustainable pumping rate for each well
4) Water-quality data
5) Final discharge rate measurements
6) Pump curves
7) Well-construction (as-built) data

## SPECIFIC CAPACITY TESTS

Specific capacity of a well is the pumping rate divided by the drawdown measured after a specified pumping period. For this report, specific capacity is reported in units of

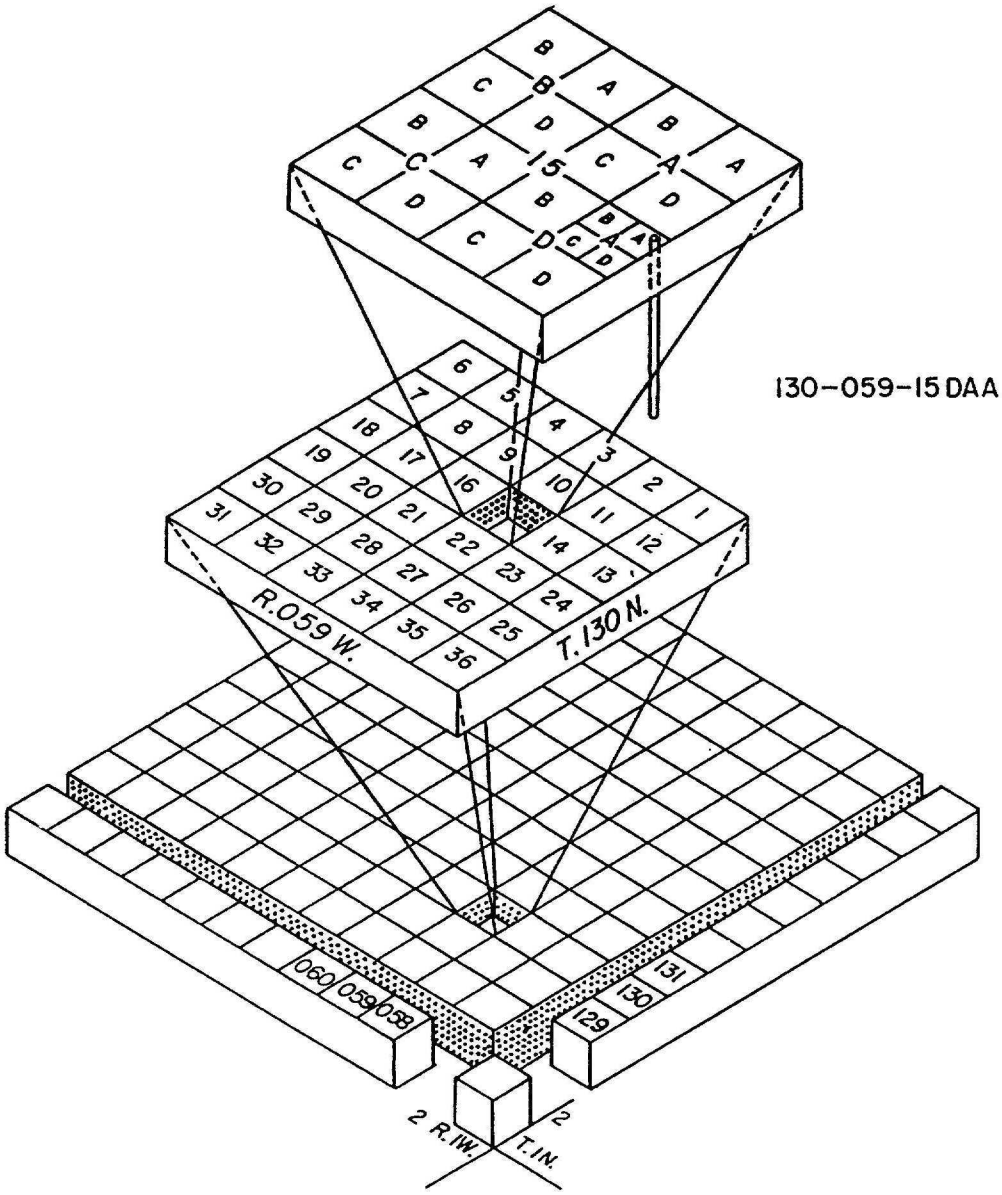



Figure 4. -- Location-numbering system

gallons per minute per foot.

For the most part, four specific capacity tests were completed on each of the 32 production wells. The first specific capacity test was conducted prior to well development after the aquifer materials collapsed around the screen. In some cases, no specific capacity data was reported prior to well development because the specific capacity was very small and measurement was not practical.

Each specific capacity test was run for a period of five minutes using a 2-inch diameter centrifugal pump. Pump discharge was controlled with a 2-inch diameter gate valve. Discharge rate was measured volumetrically using a 55-gallon drum and wrist watches capable of measuring time to the nearest second.

For most wells, a specific capacity test was conducted after 3, 6, and 9 hours of well development. Well development consisted of simultaneous jetting and pumping to remove fine-grained sediment adjacent to and near the well screen.

The purpose of the specific capacity tests was to assess change in well yield in relation to well development time. Graphs showing change in specific capacity versus cumulative well-development time for each of the 32 wells are shown in appendix 1. The greatest increase in specific capacity generally occurred after the first three hours of well development. For many wells, the rate of increase in specific capacity declined significantly after six hours of

well development. Final specific capacity ranged from 4.5 gallons per minute per foot of drawdown at well #23 to 72.9 gallons per minute per foot of drawdown at well #3. The large range in specific capacity reflects the large degree of spatial variability in aquifer hydraulic conductivity.

## PUMPING TESTS

Two-hour pumping tests were conducted on 29 of the 32 production wells. Pumping tests on wells 23, 24, and 29 were not initiated because the specific capacity of these wells indicated insufficient well yield. At these three well sites, the small well yields reflect the low hydraulic conductivity of the aquifer. Well-screen transmitting capacity was not a factor contributing to the small well yields measured during the specific capacity tests.

Water levels in the production wells were measured at selected times using a Solinst Model 101 electric water-level meter. Discharge was measured every second using a Panametrics Model 6069 ultra-sonic flowmeter (± 2 percent accuracy) with transducers mounted on a 5-foot long, 4-inch diameter, steel measuring section. The discharge rate was kept constant using a gate valve.

The purpose of the pumping tests was to provide data to estimate a sustainable pumping rate for each well. Graphs showing logarithmic time versus arithmetic drawdown are found in appendix 2. The slope of the lines (delta s) shown at the top of the graphs was measured from hand-drawn graphs and may

differ slightly from the slopes of the lines shown in the figures that were drawn using a computer soft-ware graphics package. The lines were included on the graphs to show which areas of the data plot were selected for analysis.

## CALCULATION OF WELL PUMPING RATE

The Oakes aquifer is unconfined at all production-well sites. As a result, aquifer-test data is characterized by delayed-yield response which may not dissipate for at least 12 to 24 hours after pumping is initiated. Ideally, each pumping test should be run until delayed yield ceases to affect drawdown response. This allows for calculation of aquifer parameters (transmissivity and apparent specific yield) which, in turn, are used to estimate a sustainable pumping rate. Because of project time constraints, a method to estimate sustainable pumping rates from 2-hour pump tests was developed using the following formula:

$$Q_{final} = \frac{Q_{test}\ (s_{avail.} - (s_{interf.} + s_{nat.}))}{(\Delta s)(6.75) + s_{100min.} + \frac{(\Delta s(6.75))^2}{m - s_{100min.}}}$$

where:

$Q_{final}$ = estimated sustainable pumping rate, in gallons per minute.

$Q_{test}$ = pumping rate measured during 2-hour pumping test, in gallons per minute.

$s_{avail.}$ = available drawdown to top of screen, in feet.

$s_{interf.}$ = calculated interference from other wells, in feet.

$s_{nat.}$ = estimated natural water-table decline over a typical irrigation season, in feet.

$\Delta s$ = slope of semilogarithmic time versus drawdown plot for first 100 minutes of 2-hour pump test, in feet.

$s_{100\ min.}$ = drawdown after 100 minutes of pumping during 2-hour pump test, in feet.

M = initial saturated thickness of aquifer, in feet.

6.75 = constant based on the product of length of design pumping period and estimated $\Delta s$ after delayed yield dissipates.

The length of the pumping period is 40 days minus 0.069 days (100 minutes) which corresponds to extending 2.7 log cycles on the semilogarithmic time versus drawdown graph. The $\Delta s$ value after delayed yield dissipates was estimated by multiplying the $\Delta s$ value measured from the 2-hour pumping test by 2.5.

Data used to calculate sustainable pumping rates for each of the 29 production wells are shown in appendix 3.

## WATER QUALITY

Water samples for chemical analysis were collected from the 29 production wells after about 100 minutes of pumping during the 2-hour pump tests. The wells were pumped with a submersible pump. All water samples were collected from a faucet mounted at the end of the 4-inch diameter, steel discharge measuring section.

Three samples were collected in plastic bottles for analysis in the laboratory:

1) Raw (500 ml),
2) Filtered (500 ml), and
3) Filtered and acidified (500 ml).

Specific conductance, pH, and concentrations of bicarbonate and carbonate were measured in the lab using the raw sample. Concentrations of sulfate, chloride, fluoride, boran, nitrate, silica, and total-dissolved solids were measured in the lab using the filtered (0.45 micron) sample. Concentrations of calcium, magnesium, sodium, potassium, iron, and manganese were determined using the filtered and acidified sample. A 2-ml ampule of concentrated nitric acid was added to this sample to lower pH and prevent precipitation of carbonates and metal oxides.

Concentrations of the major cations were determined in the lab using a Perkin-Elmer Model 4000 atomic absorption spectrophotometer. Concentrations of bicarbonate, carbonate, and chloride were determined using a Fisher Model 741 titralyzer. Concentration of sulfate was determined by a gravimetric method. The North Dakota State Water Commission laboratory participates in quality-assurance programs with the United States Geological Survey.

The water quality analyses are summarized in table 1. The water ranges from a calcium-magnesium-bicarbonate to a calcium-sodium-bicarbonate type. Dissolved-solids concentrations are less than 800 milligrams per liter. The

# Table 1. -- Water chemistry analyses from production wells 1-21, 24-28, and 30-32

| Location | Well Number | Date Sampled | $SiO_2$ | Fe | Mn | Ca | Mg | Na | K | $HCO_3$ | $CO_3$ | $SO_4$ | Cl | F | $NO_3$ | B | TDS | Hardness as $CaCO_3$ | Hardness as NCH | % Na | SAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (milligrams per liter) | | | | | | | | | | | | | | | | | | |
| 130-059-03CAC1 | 13 | 07-12-90 | 33 | 2.5 | 0.27 | 85 | 35 | 91 | 5 | 484 | 0 | 150 | 14 | 0.3 | 1 | 0.13 | 655 | 360 | 0 | 35 | 2.1 |
| 130-059-03CAD1 | 14 | 07-12-90 | 32 | 2.7 | 0.22 | 91 | 45 | 120 | 6 | 530 | 0 | 200 | 22 | 0.2 | 1 | 0.13 | 781 | 410 | 0 | 38 | 2.6 |
| 130-059-03CAD2 | 15 | 07-16-90 | 27 | 3.7 | 0.28 | 120 | 61 | 110 | 7 | 571 | 0 | 300 | 29 | 0.2 | 1 | 0.1 | 940 | 550 | 83 | 30 | 2.0 |
| 130-059-03CBB2 | 7 | 07-16-90 | 28 | 3.4 | 0.53 | 110 | 35 | 100 | 6 | 510 | 0 | 220 | 17 | 0.2 | 1 | 0.07 | 772 | 420 | 1 | 34 | 2.1 |
| 130-059-03CBB3 | 6 | 07-10-90 | 30 | 2.8 | 0.47 | 100 | 36 | 92 | 5 | 425 | 0 | 250 | 16 | 0.2 | 1 | 0.14 | 743 | 400 | 49 | 33 | 2.0 |
| 130-059-03CBC1 | 8 | 07-10-90 | 29 | 2.6 | 0.47 | 100 | 31 | 100 | 6 | 506 | 0 | 170 | 15 | 0.2 | 1 | 0.1 | 704 | 380 | 0 | 36 | 2.2 |
| 130-059-03CBD1 | 11 | 07-13-90 | 32 | 1.9 | 0.31 | 74 | 24 | 82 | 4 | 393 | 0 | 130 | 9 | 0.2 | 1 | 0.11 | 552 | 280 | 0 | 38 | 2.1 |
| 130-059-03CBD2 | 12 | 07-12-90 | 33 | 1.9 | 0.22 | 70 | 25 | 87 | 4 | 425 | 0 | 110 | 10 | 0.2 | 1 | 0.11 | 552 | 280 | 0 | 40 | 2.3 |
| 130-059-03CCB1 | 9 | 07-10-90 | 30 | 2.5 | 0.9 | 100 | 33 | 38 | 4 | 393 | 0 | 130 | 18 | 0.2 | 1 | 0.06 | 552 | 390 | 63 | 17 | 0.8 |
| 130-059-03CCC1 | 10 | 07-10-90 | 31 | 2.4 | 0.64 | 110 | 38 | 45 | 4 | 464 | 0 | 140 | 18 | 0.2 | 0 | 0.09 | 619 | 430 | 51 | 18 | 0.9 |
| 130-059-03CCD1 | 16 | 07-12-90 | 29 | 2.3 | 0.73 | 120 | 37 | 54 | 5 | 499 | 0 | 140 | 19 | 0.2 | 1 | 0.06 | 654 | 450 | 43 | 20 | 1.1 |
| 130-059-03CDC1 | 17 | 07-17-90 | 33 | 2.4 | 0.76 | 110 | 37 | 38 | 4 | 416 | 0 | 140 | 20 | 0.2 | 1 | 0.05 | 591 | 430 | 86 | 16 | 0.8 |
| 130-059-03CDD1 | 18 | 07-17-90 | 30 | 2.7 | 0.8 | 100 | 31 | 42 | 5 | 440 | 0 | 98 | 16 | 0.2 | 1 | 0.05 | 543 | 380 | 17 | 19 | 0.9 |
| 130-059-03CDD2 | 19 | 07-18-90 | 29 | 3.3 | 0.67 | 120 | 37 | 52 | 5 | 491 | 0 | 140 | 20 | 0.2 | 1 | 0.05 | 650 | 450 | 49 | 20 | 1.1 |
| 130-059-04BDA4 | 1 | 06-28-90 | 29 | 2.3 | 0.41 | 95 | 31 | 45 | 4 | 417 | 0 | 110 | 12 | 0.2 | 1 | 0.09 | 535 | 360 | 23 | 21 | 1.0 |
| 130-059-04BDA5 | 2 | 06-28-90 | 29 | 1.9 | 0.42 | 83 | 26 | 43 | 4 | 379 | 0 | 79 | 11 | 0.2 | 1 | 0.08 | 465 | 310 | 4 | 23 | 1.1 |
| 130-059-04BDD5 | 3 | 06-29-90 | 28 | 1.4 | 0.63 | 87 | 28 | 40 | 4 | 402 | 0 | 72 | 12 | 0.2 | 1 | 0.08 | 472 | 330 | 3 | 21 | 1.0 |
| 130-059-04CAA6 | 4 | 06-27-90 | 29 | 1.5 | 0.7 | 92 | 30 | 40 | 4 | 391 | 0 | 110 | 14 | 0.2 | 1 | 0.08 | 516 | 350 | 33 | 20 | 0.9 |
| 130-059-04CAA8 | 5 | 06-26-90 | 28 | 1.9 | 0.8 | 95 | 34 | 38 | 4 | 335 | 0 | 150 | 32 | 0.2 | 1 | 0.08 | 550 | 380 | 100 | 18 | 0.8 |
| 130-059-16AAD1 | 20 | 07-26-90 | 30 | 2.7 | 0.87 | 110 | 32 | 16 | 3 | 331 | 0 | 130 | 24 | 0.2 | 2 | 0.03 | 514 | 410 | 130 | 8 | 0.3 |
| 130-059-16AAD2 | 21 | 07-26-90 | 30 | 2.1 | 0.78 | 100 | 31 | 14 | 2 | 280 | 0 | 140 | 22 | 0.2 | 1 | 0.04 | 481 | 380 | 150 | 7 | 0.3 |
| 130-059-16ABC1 | 25 | 07-24-90 | 30 | 1.4 | 1.1 | 96 | 32 | 11 | 2 | 283 | 0 | 150 | 23 | 0.2 | 1 | 0.05 | 487 | 370 | 140 | 6 | 0.2 |
| 130-059-16ABD2 | 24 | 07-24-90 | 32 | 0.9 | 1.1 | 99 | 31 | 18 | 3 | 306 | 0 | 150 | 22 | 0.2 | 1 | 0.08 | 509 | 370 | 120 | 9 | 0.4 |
| 130-059-16ACC1 | 32 | 07-25-90 | 33 | 0.62 | 1.1 | 110 | 35 | 15 | 3 | 321 | 0 | 180 | 13 | 0.2 | 1 | 0.07 | 549 | 420 | 160 | 7 | 0.3 |
| 130-059-16ACC2 | 31 | 07-26-90 | 31 | 1.5 | 1.2 | 100 | 32 | 16 | 3 | 306 | 0 | 170 | 13 | 0.2 | | 0.05 | 519 | 380 | 130 | 8 | 0.4 |
| 130-059-16ACD1 | 30 | 07-25-90 | 33 | 1.3 | 1.2 | 130 | 37 | 10 | 2 | 313 | 0 | 230 | 14 | 0.2 | 1 | 0.07 | 614 | 480 | 220 | 4 | 0.2 |
| 130-059-16ADC | 28 | 07-26-90 | 29 | 0.34 | 0.96 | 100 | 28 | 8 | 2 | 267 | 0 | 160 | 14 | 0.1 | | 0.03 | 475 | 360 | 150 | 5 | 0.2 |
| 130-059-16ADD1 | 27 | 07-24-90 | 32 | 1.1 | 0.73 | 77 | 23 | 8 | 1 | 248 | 0 | 110 | 10 | 0.2 | 1 | 0.04 | 386 | 290 | 84 | 5 | 0.2 |
| 130-059-16ADD2 | 26 | 07-23-90 | 32 | 0.77 | 0.71 | 82 | 22 | 12 | 2 | 268 | 0 | 84 | 14 | 0.2 | | 0.04 | 382 | 300 | 76 | 8 | 0.3 |

water does not pose any limitations with respect to irrigation applications in the 5,000-acre test area.

## DISCHARGE MEASURING TESTS

The Panametrics Model 6069 ultra-sonic flowmeter was used to measure discharge rate at each of the 29 production wells after all wells were completed with pumps and motors, and connected to the pipe-line distribution systems. A zero calibration was performed for each installation of the Panametrics transducers, and zero flow was confirmed by visual inspection at the butter-fly valves installed on each of the wells. Pipe-full conditions, a requirement for proper operation of the flowmeter were insured for each installation. A pressure gauge was installed at the top of the drop pipe just before the 90-degree elbow connecting the drop pipe to the distribution pipe line. The pressure gauge was used to measure operational head (less friction head loss from drop pipe).

Results of the discharge tests are summarized in tables 2 through 4. A combined flow measurement was made near the discharge point in lateral 0-2.0 for each of the three well fields. The combined flow measurements are close to the sums of individual flow measurements for each of the three well fields. The in-line McCrometer flowmeter is in agreement with the total flow for wells 1 through 5; about 25 percent low for wells 6 through 19, and about 15 percent low for wells 20 through 32. All measured well pumping rates are in

**Table 2.-- Well discharge-test Data (Wells 1-5)**

| Well Number | Pumping Rate (G.P.M.) | Pumping Level Below Mid-Point of 90° Elbow (Ft.) | Meter Readings Pressure (P.S.I.) | Meter Readings Head (Ft.) | Drop Pipe Friction-Head Loss (Ft.) | Total Head Loss (Ft.) |
|---|---|---|---|---|---|---|
| 1 | 258 | 20.99 | 8 | 18.48 | 1 | 40.47 |
| 2 | 259 | 22.46 | 6.5 | 15.02 | 2 | 39.48 |
| 3 | 280 | 16.91 | 6 | 13.86 | 2 | 32.77 |
| 4 | 115 | 18.06 | 2.5 | 5.78 | 5 | 28.84 |
| 5 | 162 | 18.08 | 2 | 4.62 | 2 | 24.70 |

Sum of Individual Flow Measurements = 1074 G.P.M.
Combined Flow Measurement = 1078 G.P.M.
McCrometer Flow Measurement = 1030 G.P.M.

**Table 3. -- Well discharge-test Data (Wells 6-19)**

| Well Number | Pumping Rate (G.P.M.) | Pumping Level Below Mid-Point of 90° Elbow (Ft.) | Meter Readings | | Drop Pipe Friction-Head Loss (Ft.) | Total Head Loss (Ft.) |
|---|---|---|---|---|---|---|
| | | | Pressure (P.S.I.) | Head (Ft.) | | |
| 6 | 369 | 25.39 | 20 | 46.20 | 3 | 74.59 |
| 7 | 143 | 18.09 | 15 | 34.65 | 1 | 53.74 |
| 8 | 114 | 19.41 | 16 | 36.96 | 1 | 57.37 |
| 9 | 275 | 19.31 | 14 | 32.34 | 2 | 53.65 |
| 10 | 209 | 16.32 | 16 | 36.96 | 1 | 54.28 |
| 11 | 130 | 18.33 | 15 | 34.65 | 0.5 | 53.48 |
| 12 | 96 | 17.03 | 15.5 | 35.81 | 1 | 53.84 |
| 13 | 117 | 18.25 | 16.5 | 38.12 | 1 | 57.37 |
| 14 | 69 | 18.31 | 16.5 | 38.12 | 0.5 | 56.93 |
| 15 | 90 | 18.76 | 17 | 39.27 | 1 | 59.03 |
| 16 | 131 | 19.33 | 14 | 32.34 | 0.5 | 52.17 |
| 17 | 89 | 13.23 | 17 | 39.27 | 1 | 53.50 |
| 18 | 97 | 18.52 | 15 | 34.65 | 1 | 54.17 |
| 19 | 127 | 21.62 | 15 | 34.65 | 1 | 57.27 |

Sum of Individual Flow Measurements = 2056 G.P.M.
Combined Flow Measurement = 1797 G.P.M.*
McCrometer Flow Measurement = 1600 G.P.M.

*The combined flow measurement represents wells 7 through 19, less well 6 (off at time of measurement, could not restart), adding rate measured at well 6 (369 G.P.M.) to combined flow of 1797 G.P.M. gives a combined flow of 2166 G.P.M.

**Table 4. -- Well discharge-test Data (Wells 20-32)**

| Well Number | Pumping Rate (G.P.M.) | Pumping Level Below Mid-Point of 90° Elbow (Ft.) | Meter Readings Pressure (P.S.I.) | Meter Readings Head (Ft.) | Drop Pipe Friction-Head Loss (Ft.) | Total Head Loss (Ft.) |
|---|---|---|---|---|---|---|
| 20 | 74 | 16.91 | 7.5 | 17.33 | 0.5 | 34.74 |
| 21 | 127 | 17.72 | 5.5 | 17.71 | 1 | 36.43 |
| 22 | * | | | | | |
| 23 | * | | | | | |
| 24 | 109 | 24.50 | 5 | 11.55 | 1 | 37.05 |
| 25 | 117 | 19.99 | 5 | 11.55 | 1 | 32.54 |
| 26 | 66 | 21.07 | 8 | 18.48 | 0.5 | 40.05 |
| 27 | 112 | 20.77 | 8 | 18.48 | 1 | 40.25 |
| 28 | 108 | 19.13 | 8 | 18.48 | 1 | 38.61 |
| 29 | * | | | | | |
| 30 | 109 | 24.62 | 5 | 11.55 | 1 | 37.17 |
| 31 | 81 | 25.87 | 4 | 9.24 | 0.5 | 35.61 |
| 32 | 118 | 23.01 | 5 | 11.55 | 1.5 | 36.06 |

*Well abandoned due to low specific capacity, no test conducted.

Sum of Individual Flow Measurements = 1021 G.P.M.
Combined Flow Measurement = 1024 G.P.M.
McCrometer Flow Measurement = 875 G.P.M.

reasonable agreement with theoretical pumping rates determined from the pump curves. Pump curves for each well were supplied by the drilling contractor and are found in appendix 4. The pump motor horsepower and impeller diameter (trim) are shown on each pump curve.

## AS-BUILT WELL DIAGRAMS

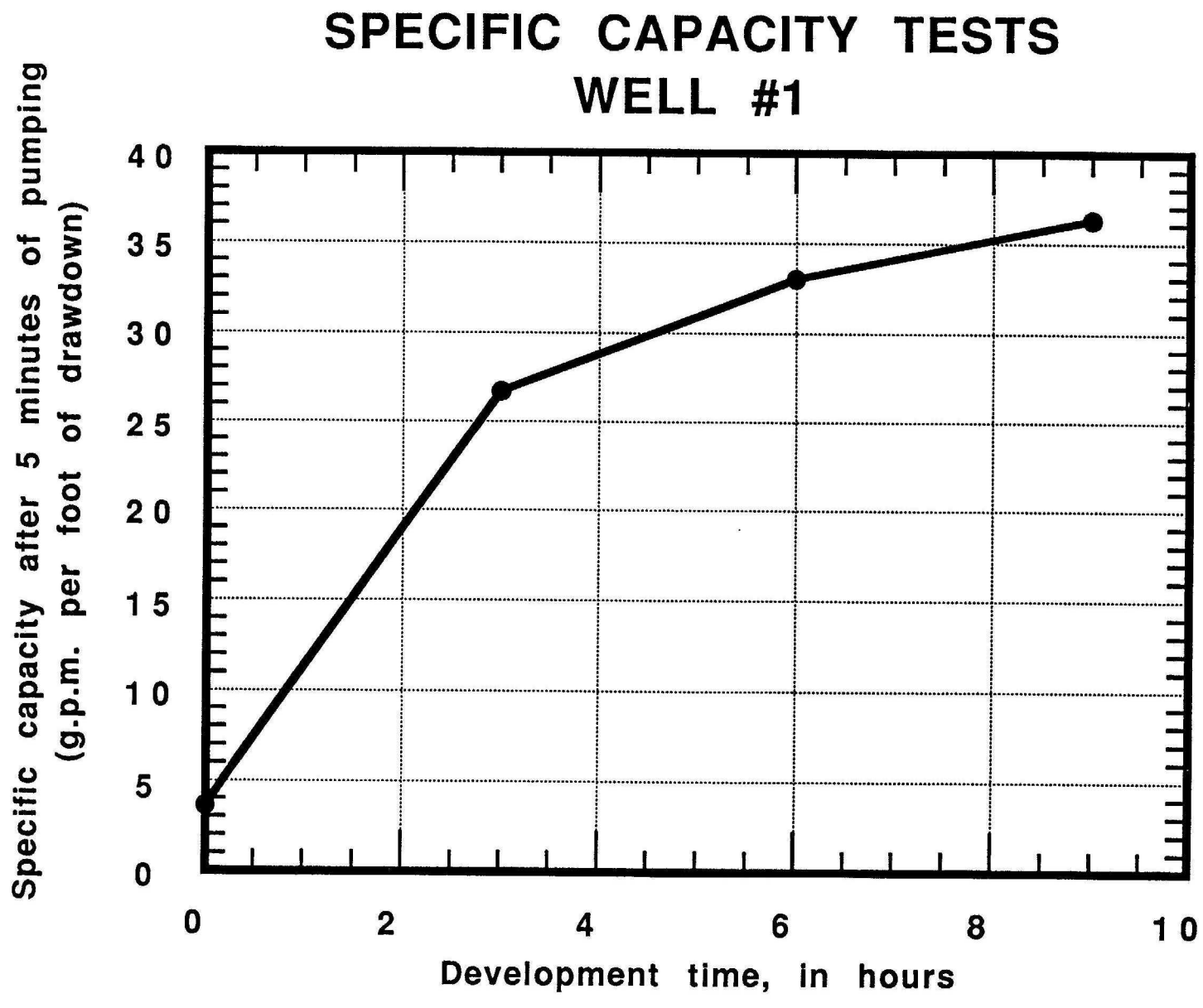
As-built well diagrams for the 32 production wells are found in appendix 5. During construction it was discovered that the Simmons 8-inch diameter well seals would not fit inside the 8-inch diameter SDR21 (ASTM 480) PVC casing. To remedy this problem, the top 4.5 inches of SDR21 casing was sawed off. An 8-inch diameter PVC coupling was installed on the SDR21 casing using a solvent welded joint. A 4.5-inch length of SDR26 (ASTM 480) PVC casing was installed inside the top of the coupling as a liner. The liner was cut flush to the top of the coupling and was secured to the coupling by using a solvent welded joint. The inner diameter of the SDR26 liner (casing) is larger than the inner diameter of the SDR21 casing. This modification allowed for the installation of the 8-inch diameter Simmons well seal and is not shown on the as-built well diagrams in appendix 5.

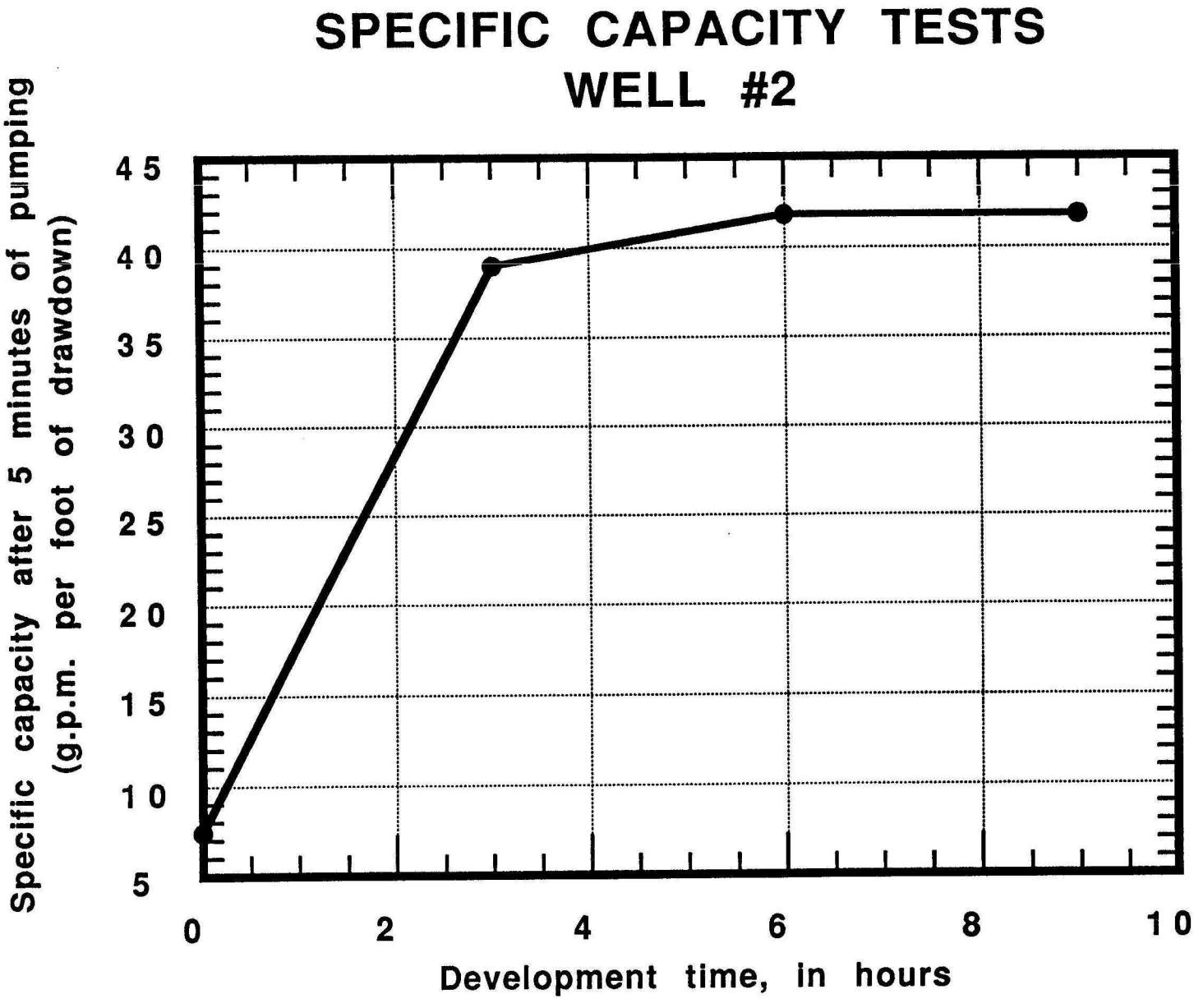
Static water levels shown on each well diagram are in feet below land surface. For all wells (except nos. 22, 23, and 29) the reported static water levels are the static water levels measured prior to each of the 2-hour pumping tests. For wells 22, 23, and 29, the reported static water levels

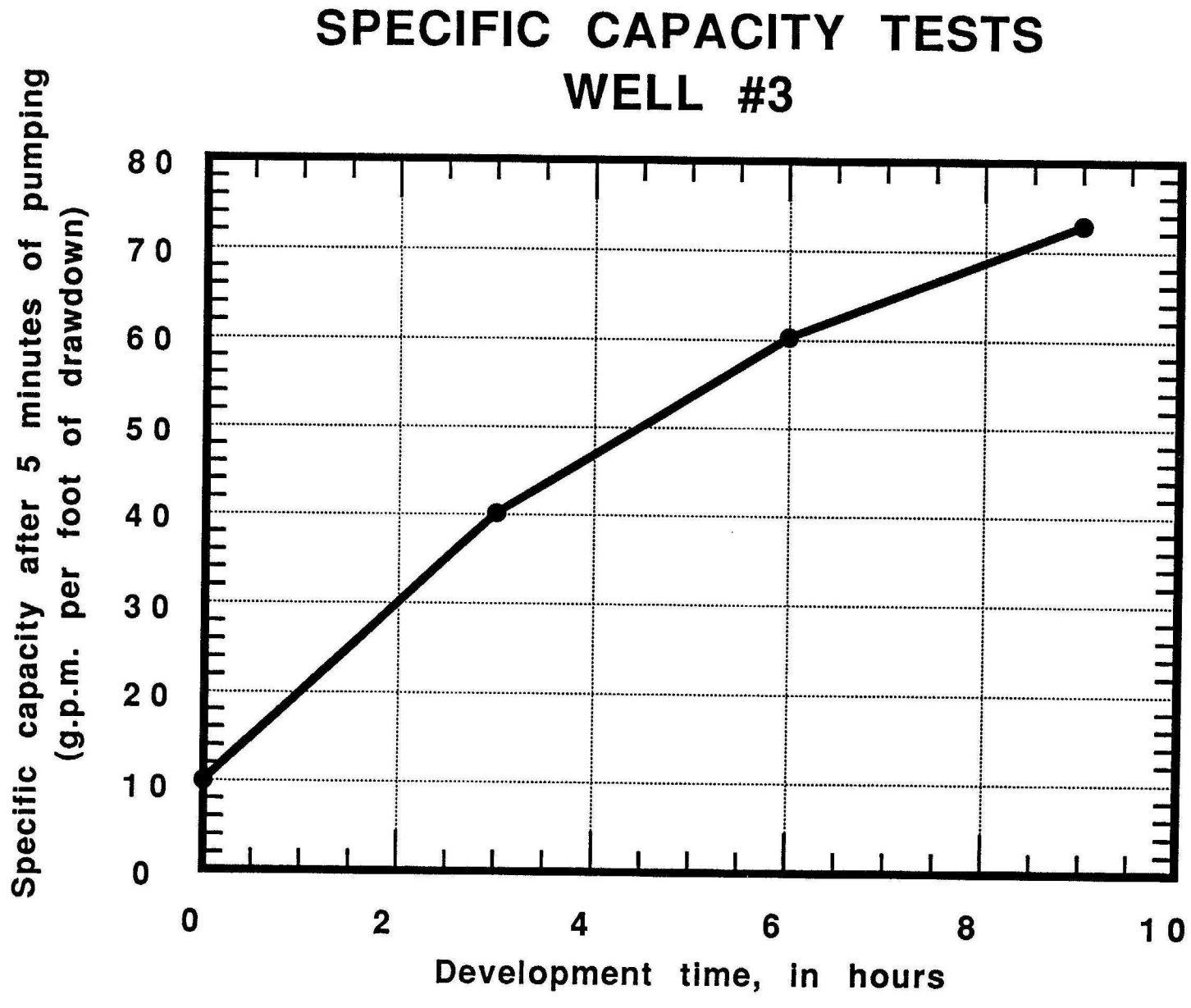
are the static water levels measured prior to the first specific capacity test. The date of water-level measurement is shown to the right of each static water level on the as-built diagrams.

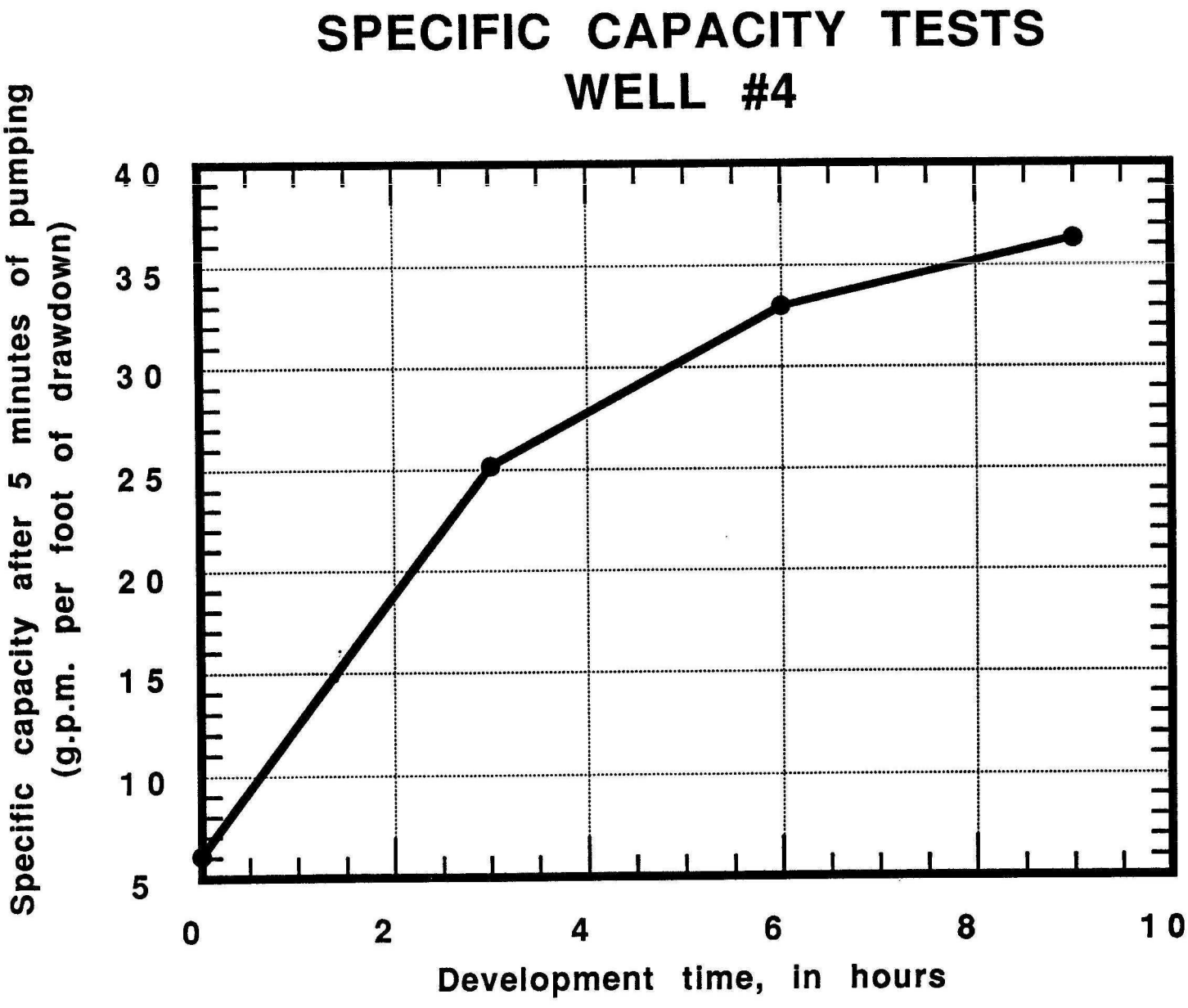
A 0.19 foot blank section of stainless steel occurs between the bottom of the SDR21 casing and the first screen slot opening. This additional interval was added to the total length of casing to determine the screened interval, to the nearest tenth of a foot, below land surface.

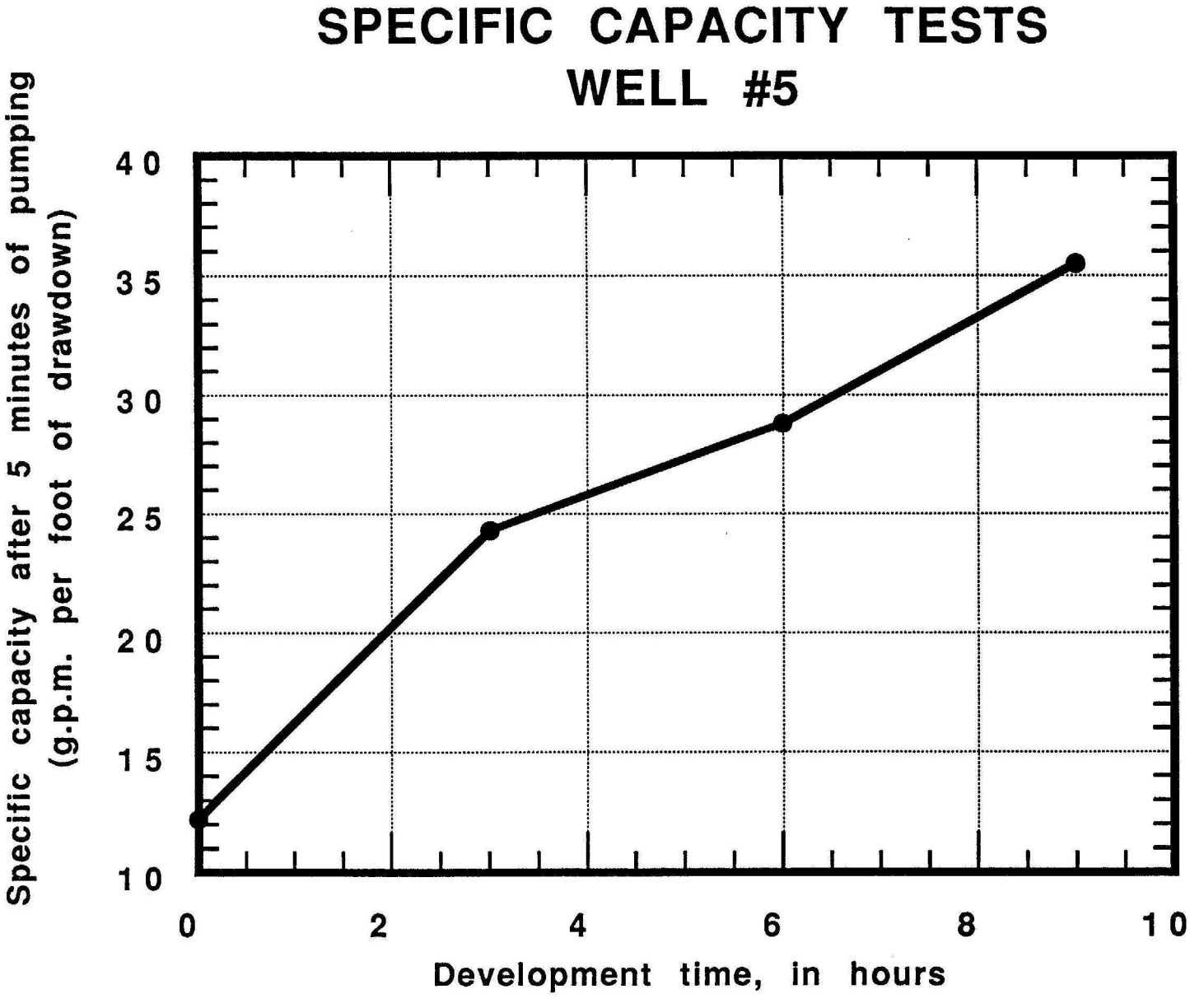
**APPENDIX I. -- Graphs showing specific capacity data for production wells 1 through 32**

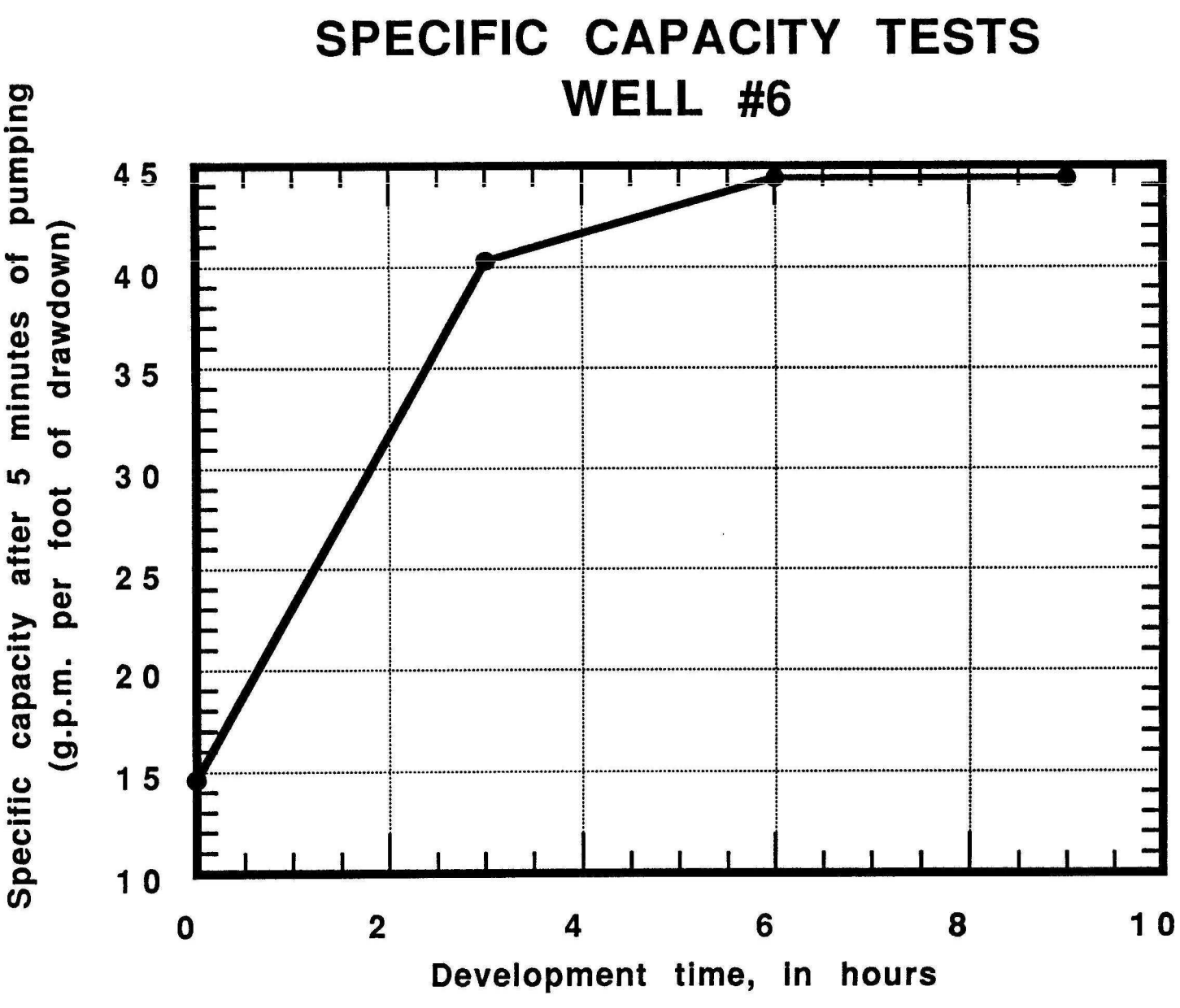

SPECIFIC CAPACITY TESTS
WELL #1
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
Development time, in hours

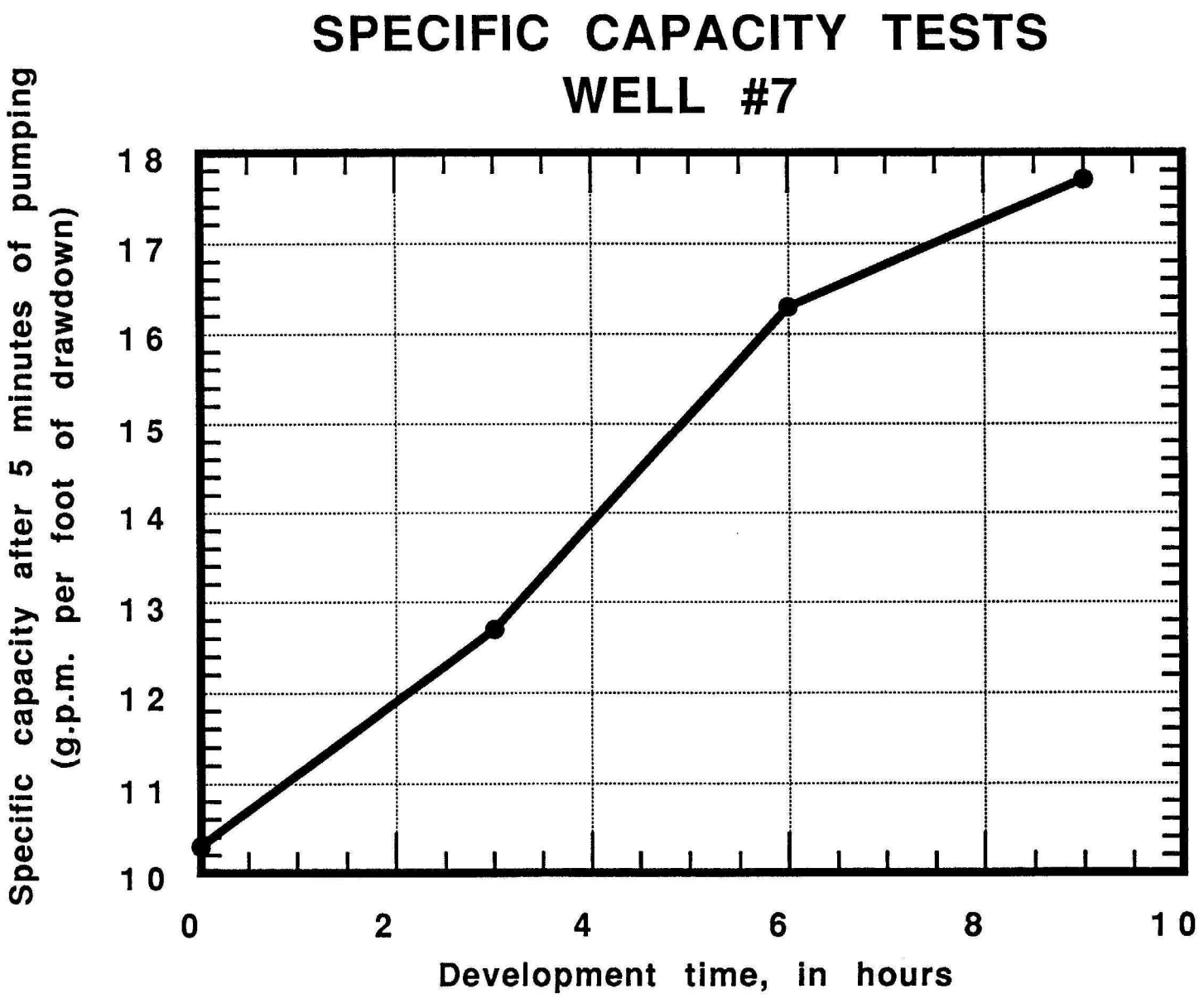

SPECIFIC CAPACITY TESTS
WELL #2
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
45
40
35
30
25
20
15
10
5
0
2
4
6
8
10
Development time, in hours

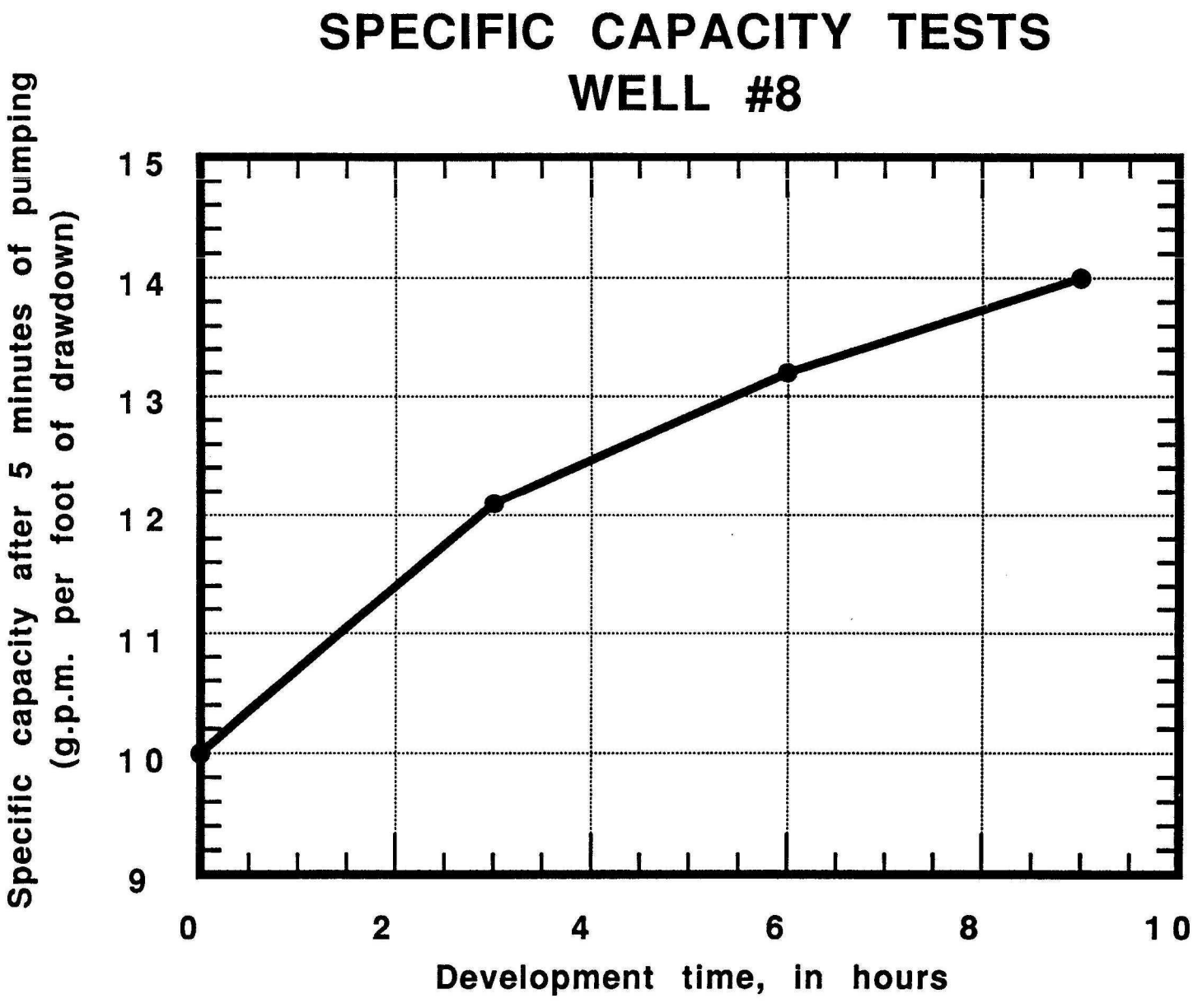

SPECIFIC CAPACITY TESTS
WELL #3
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
80
70
60
50
40
30
20
10
0
0
2
4
6
8
10
Development time, in hours

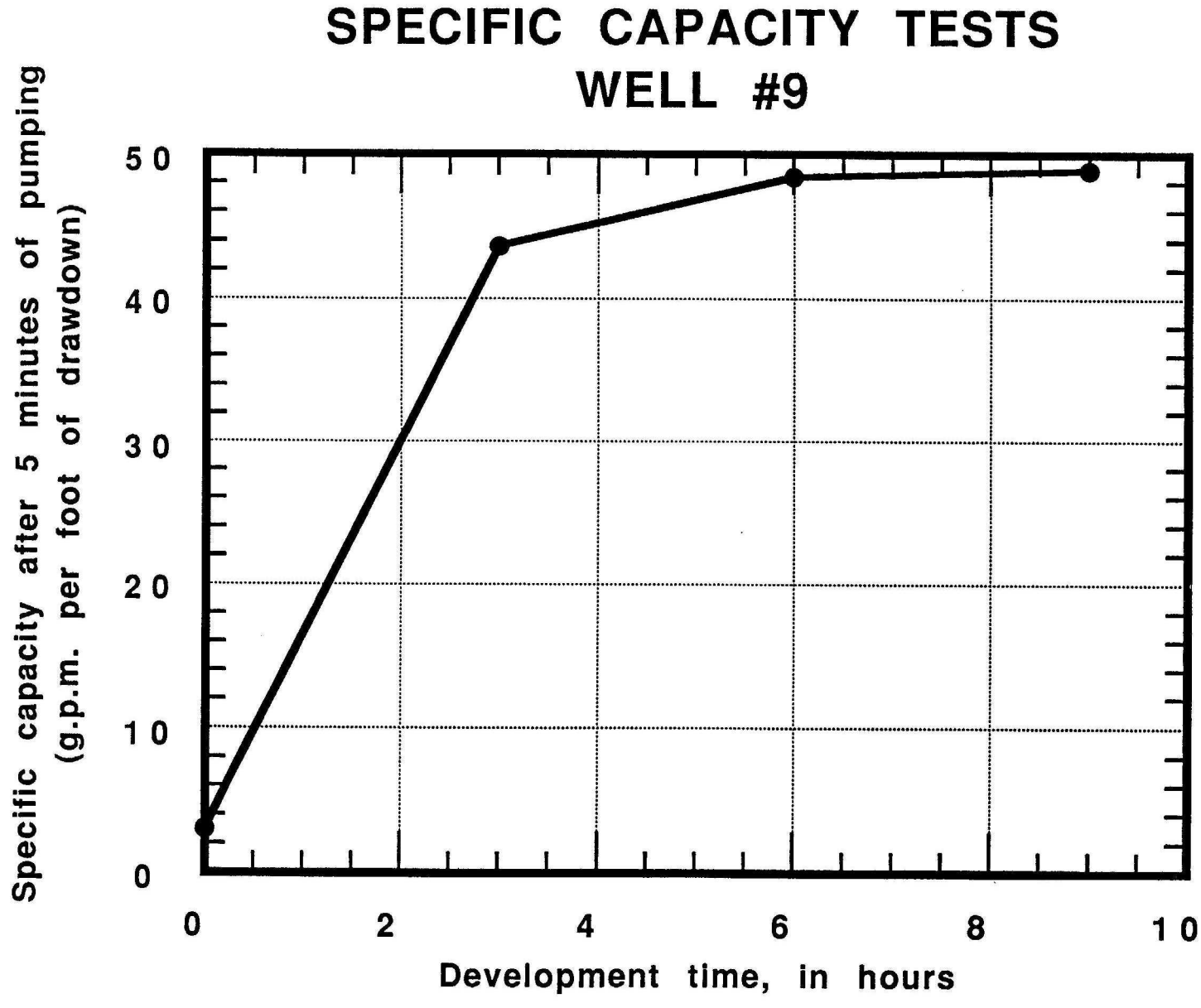

SPECIFIC CAPACITY TESTS
WELL #4
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
40
35
30
25
20
15
10
5
0
2
4
6
8
10
Development time, in hours

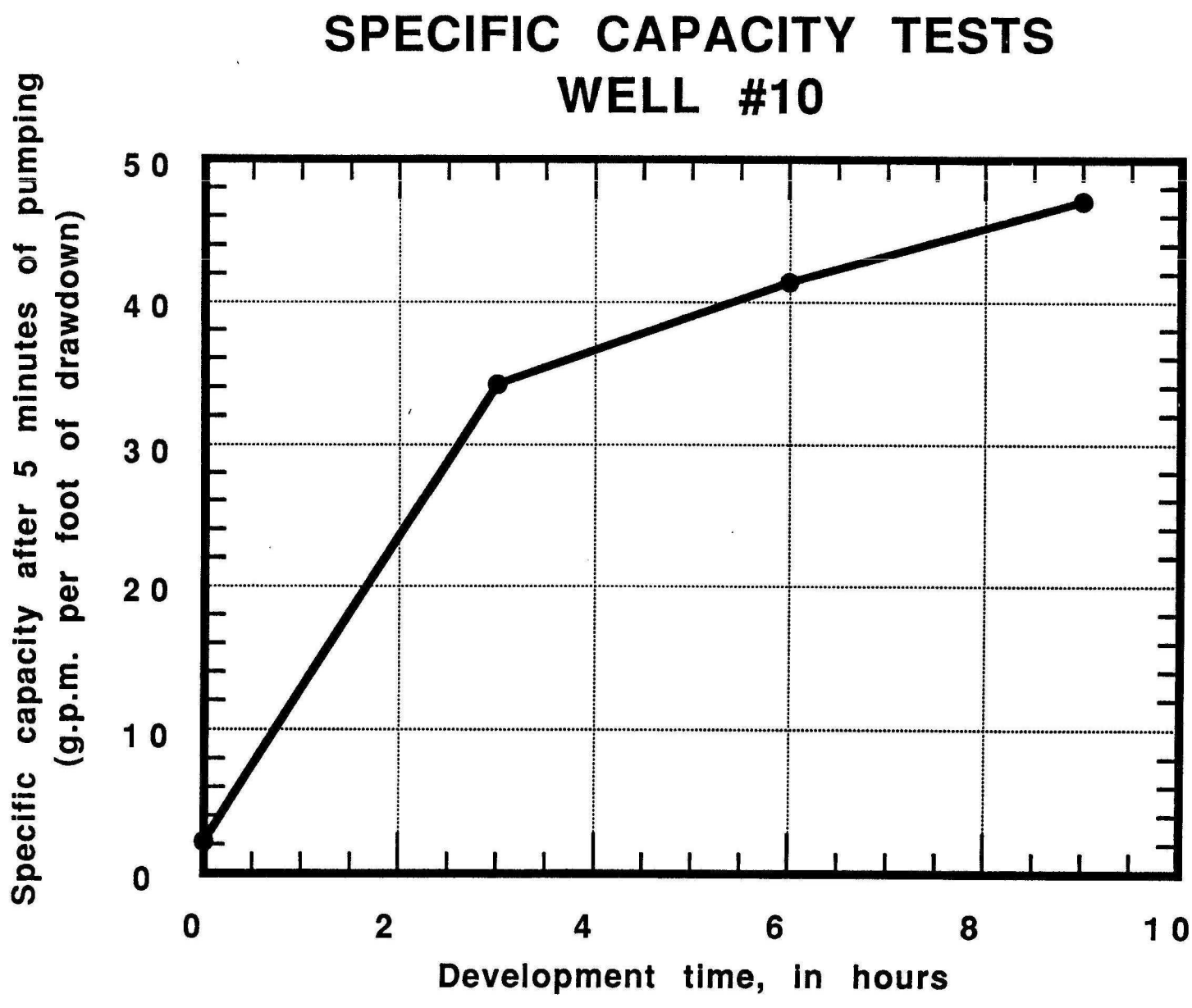

SPECIFIC CAPACITY TESTS
WELL #5
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
40
35
30
25
20
15
10
0
2
4
6
8
10
Development time, in hours

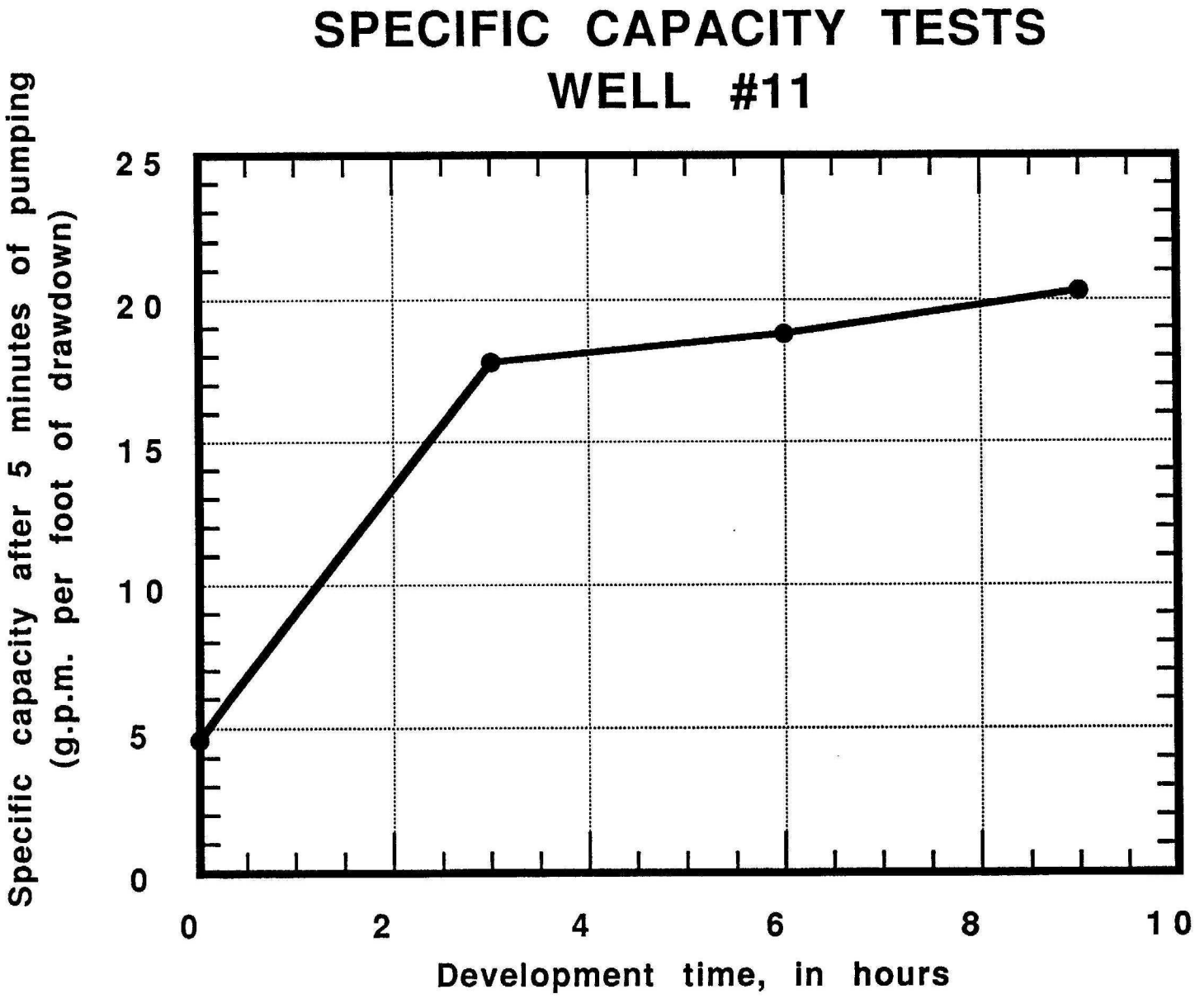

SPECIFIC CAPACITY TESTS
WELL #6
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
45
40
35
30
25
20
15
10
0
2
4
6
8
10
Development time, in hours

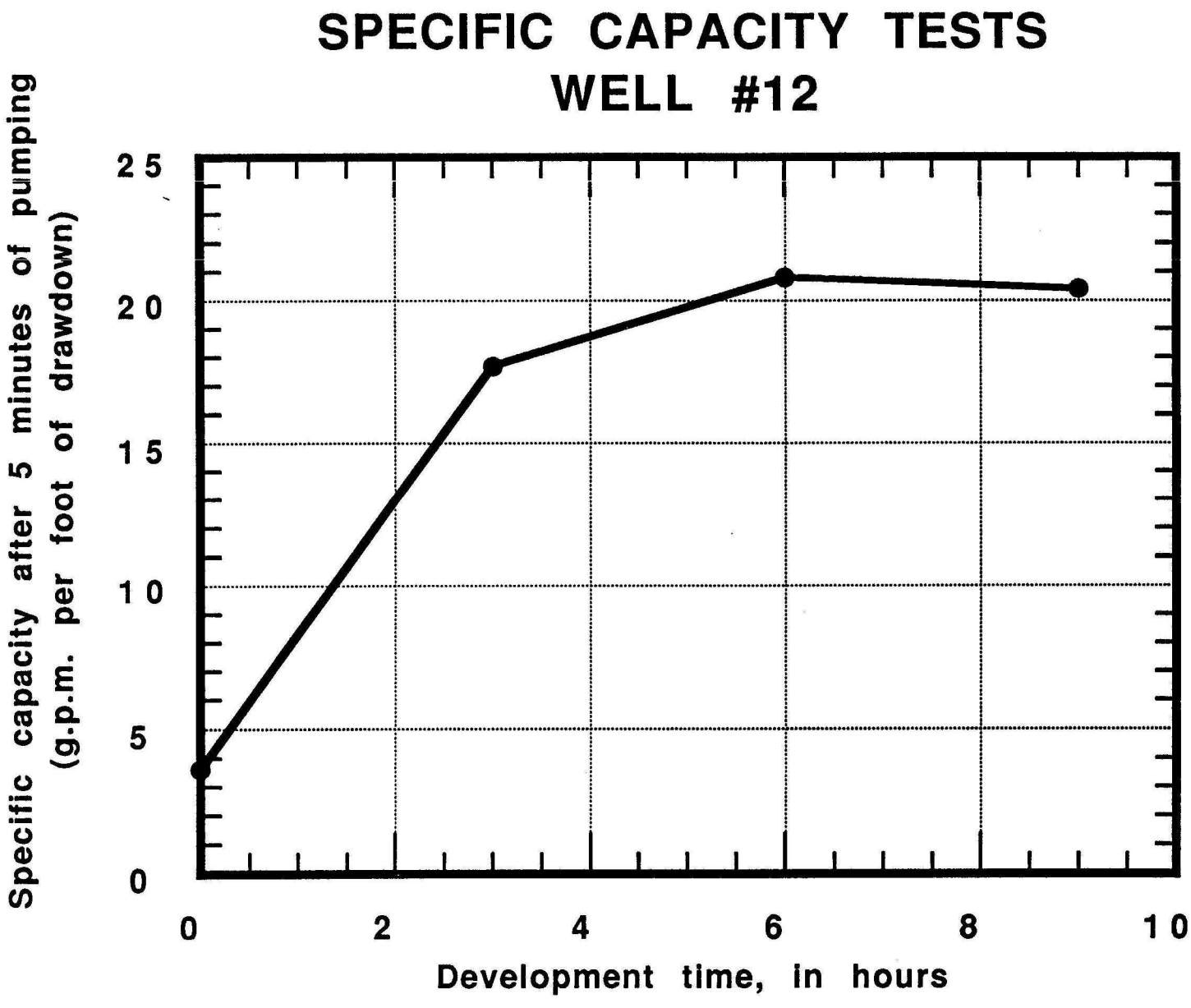

SPECIFIC CAPACITY TESTS
WELL #7
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
18
17
16
15
14
13
12
11
10
0
2
4
6
8
10
Development time, in hours

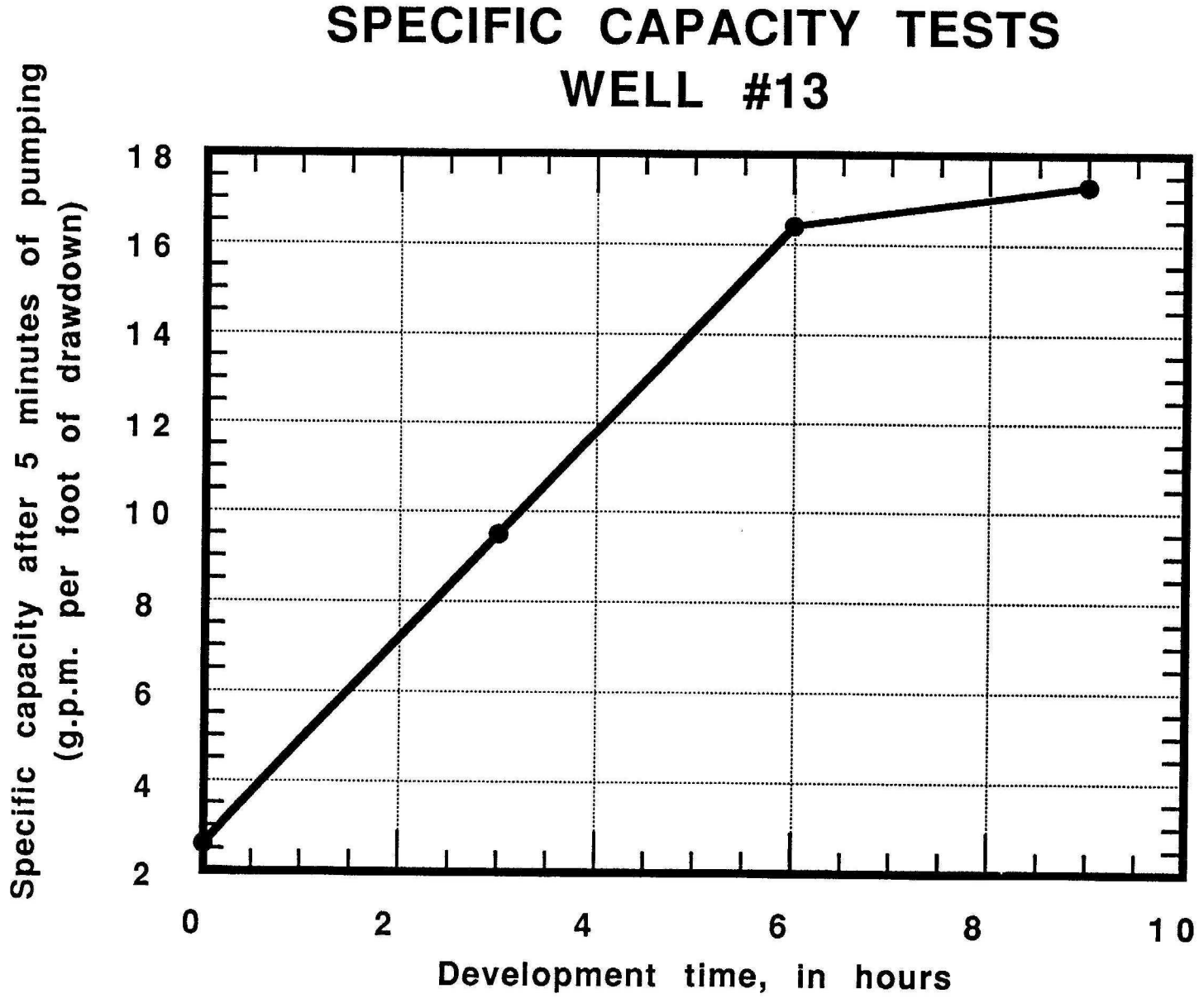

SPECIFIC CAPACITY TESTS
WELL #8
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
15
14
13
12
11
10
9
0
2
4
6
8
10
Development time, in hours

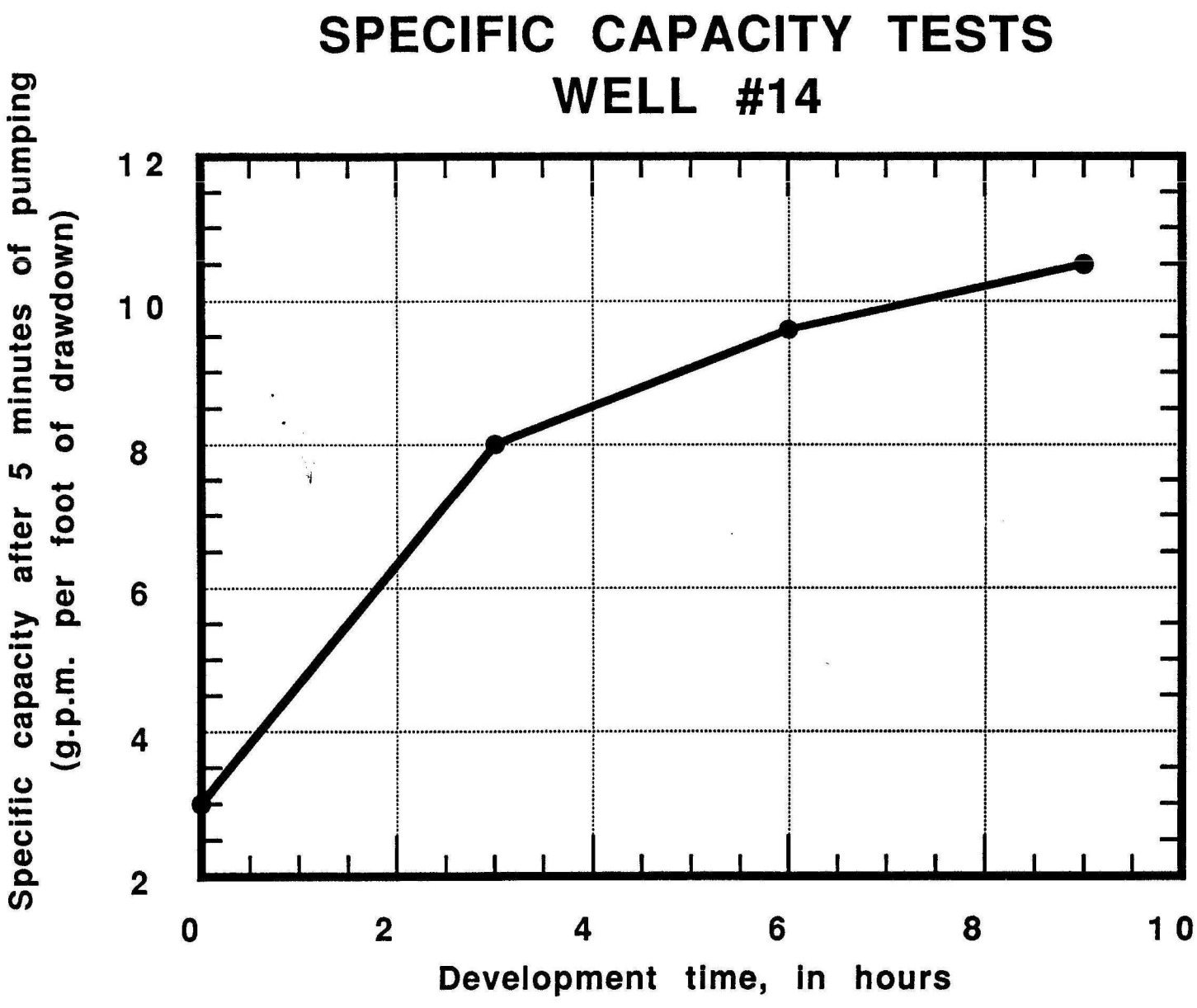

SPECIFIC CAPACITY TESTS
WELL #9
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
50
40
30
20
10
0
0
2
4
6
8
10
Development time, in hours

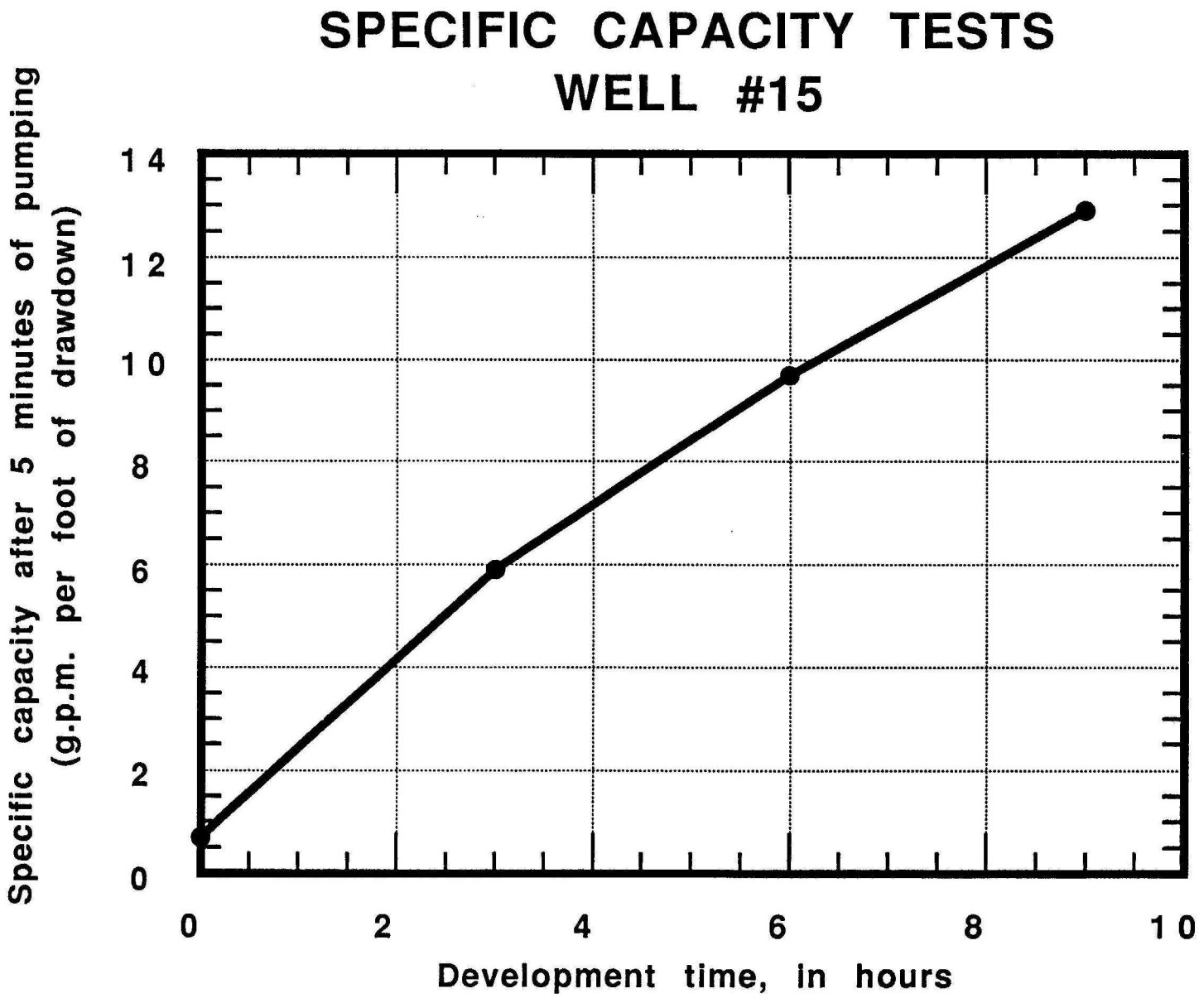

SPECIFIC CAPACITY TESTS
WELL #10
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
50
40
30
20
10
0
0
2
4
6
8
10
Development time, in hours

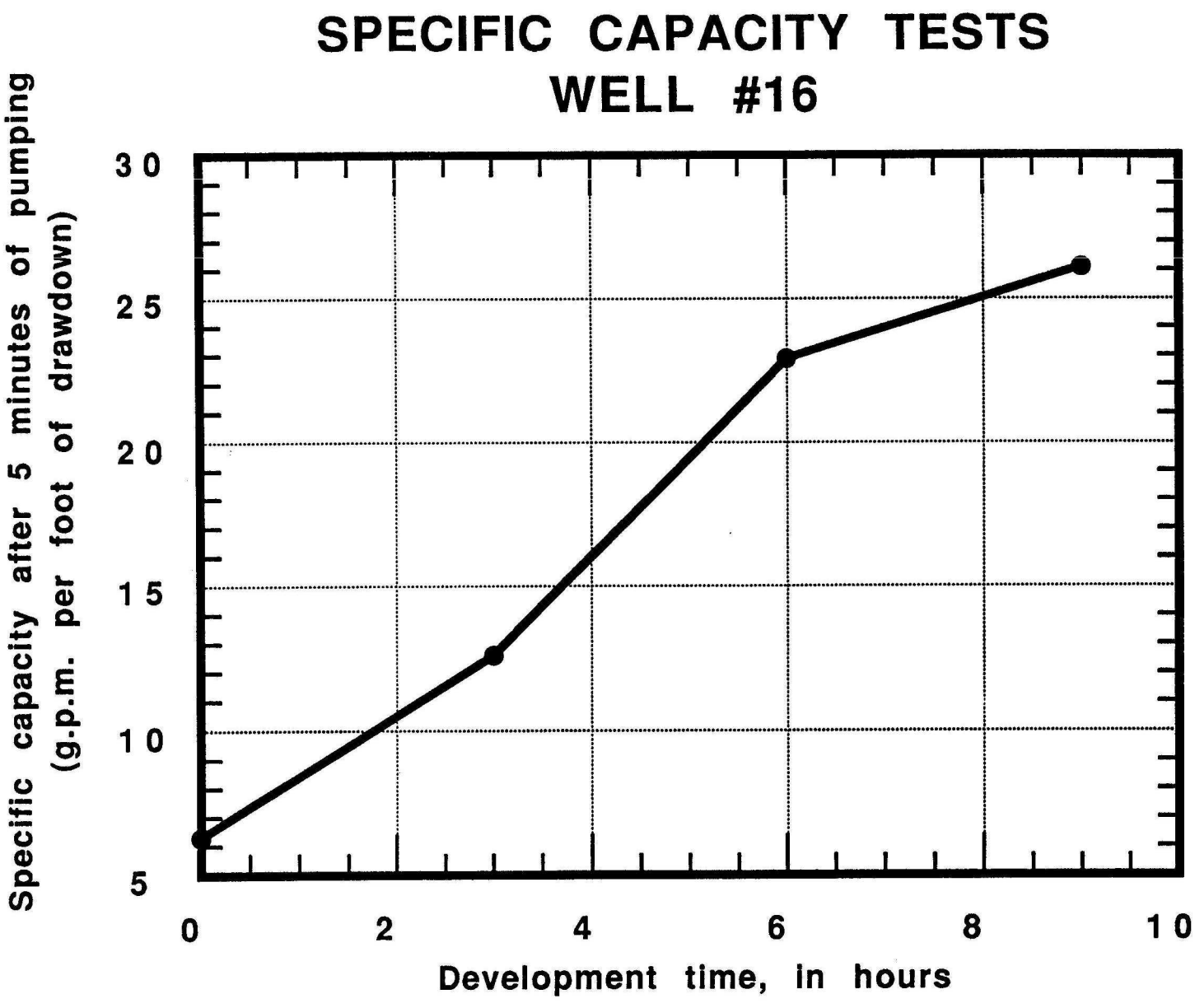

SPECIFIC CAPACITY TESTS
WELL #11
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
25
20
15
10
5
0
0
2
4
6
8
10
Development time, in hours

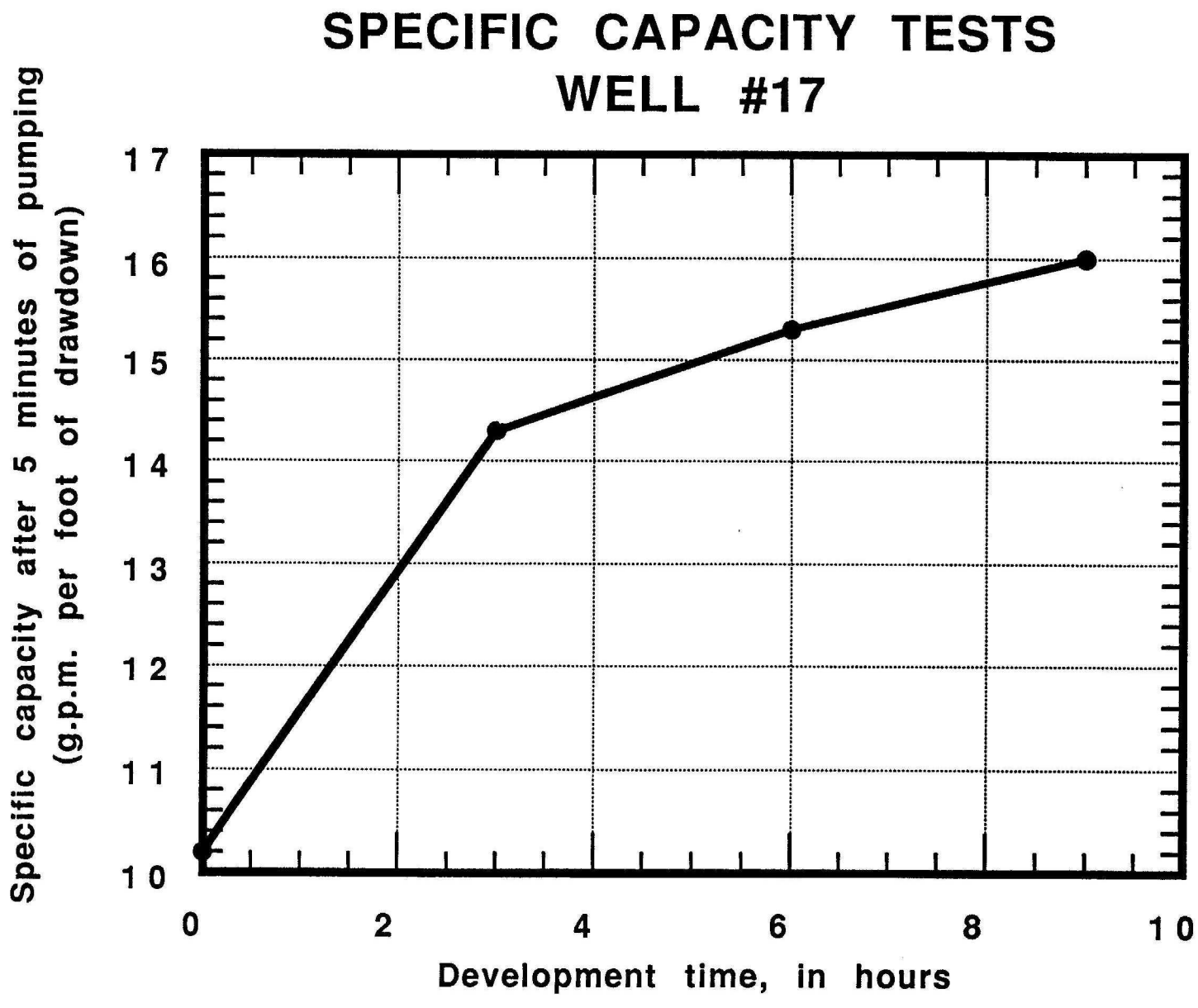

SPECIFIC CAPACITY TESTS
WELL #12
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
25
20
15
10
5
0
0
2
4
6
8
10
Development time, in hours

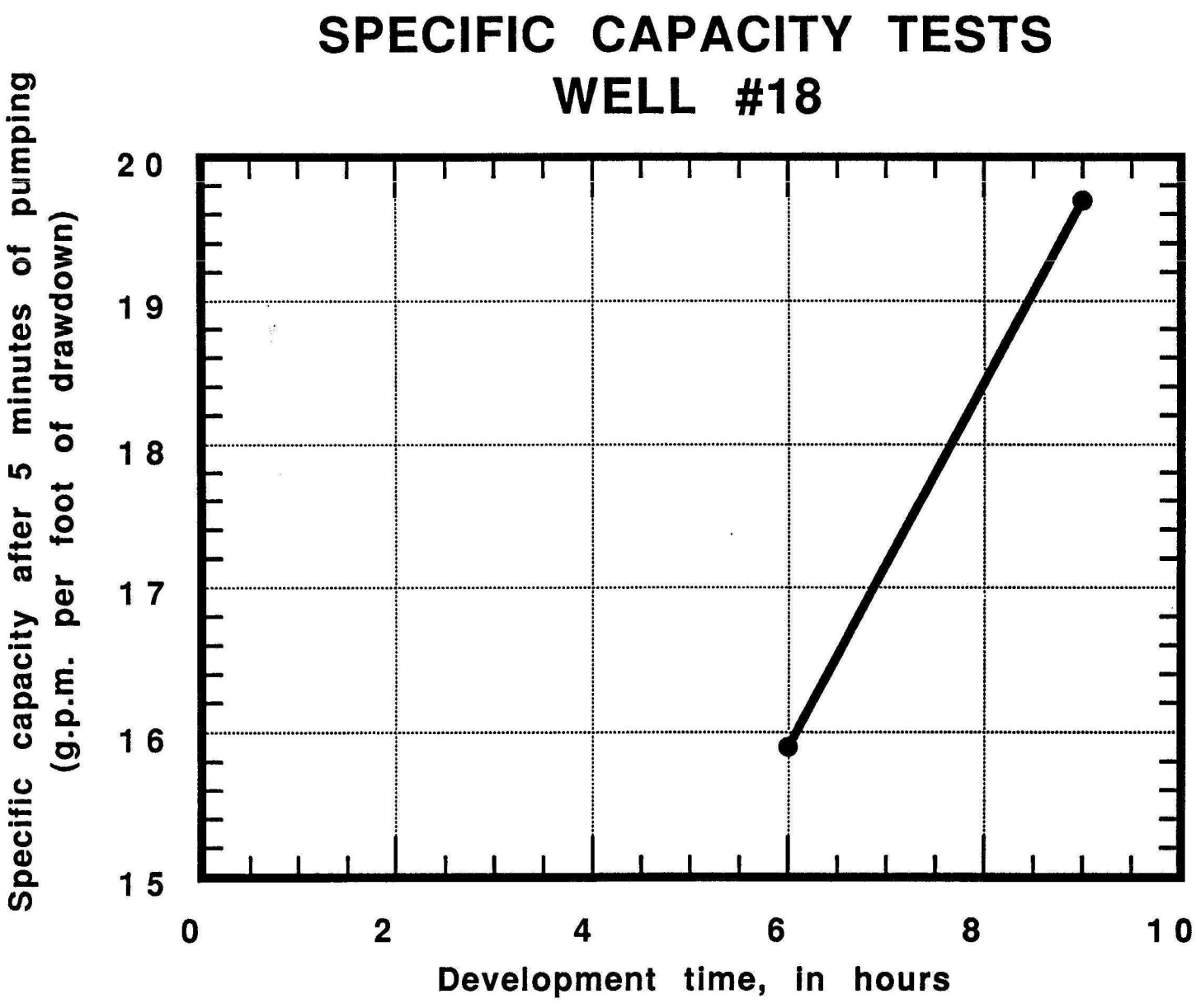

SPECIFIC CAPACITY TESTS
WELL #13
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
18
16
14
12
10
8
6
4
2
0
2
4
6
8
10
Development time, in hours

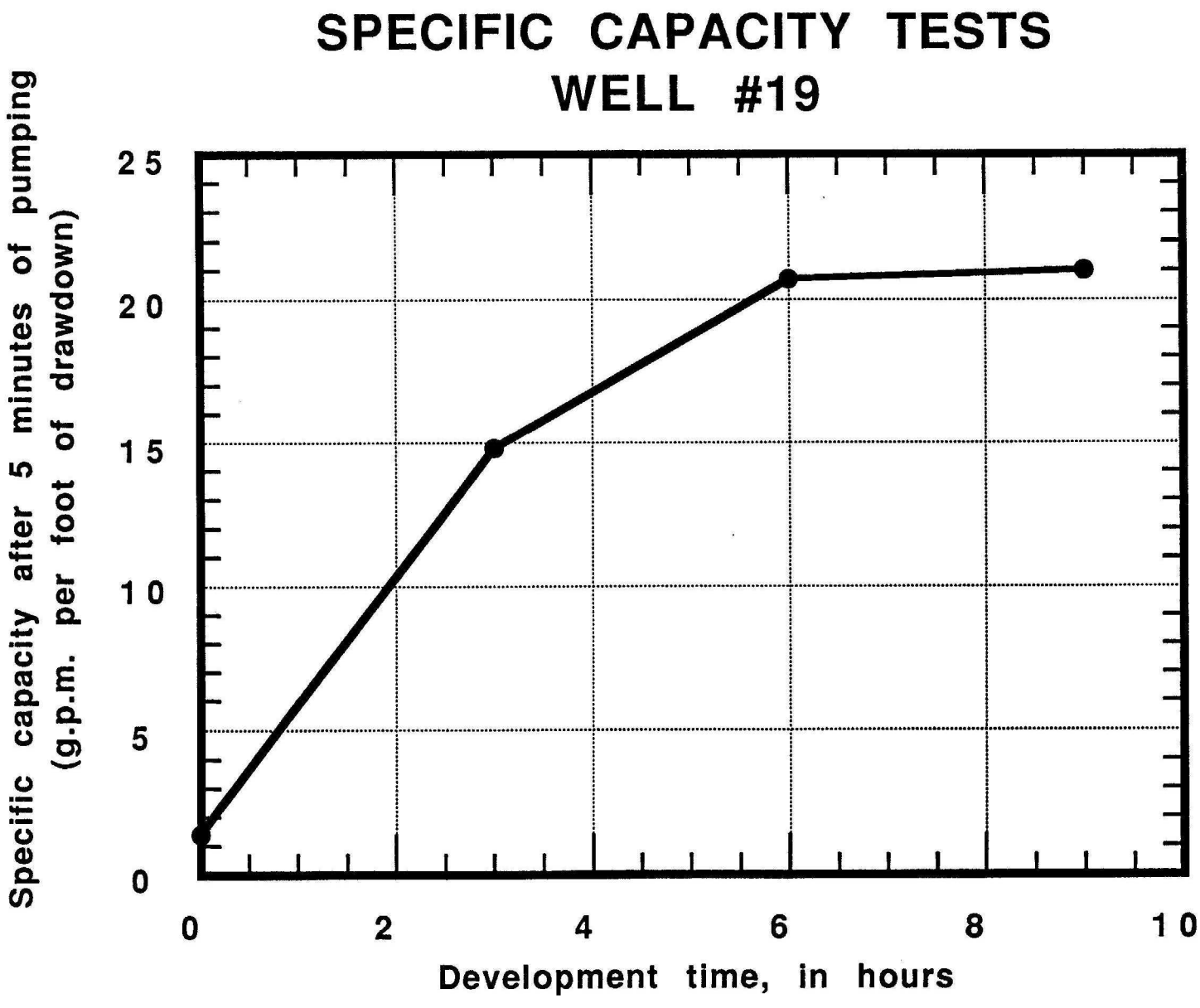

SPECIFIC CAPACITY TESTS
WELL #14
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
12
10
8
6
4
2
0
2
4
6
8
10
Development time, in hours

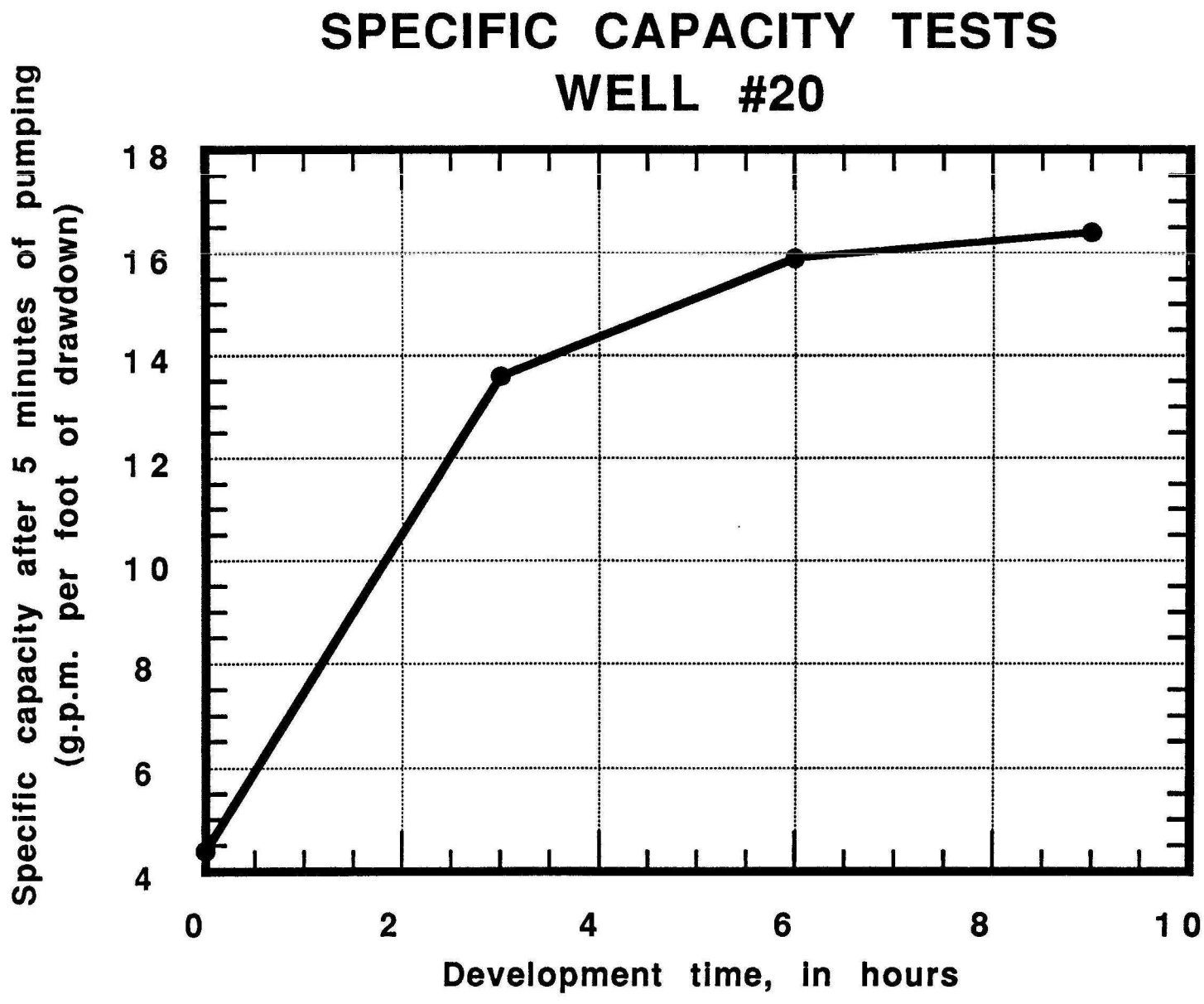

SPECIFIC CAPACITY TESTS
WELL #15
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
14
12
10
8
6
4
2
0
0
2
4
6
8
10
Development time, in hours

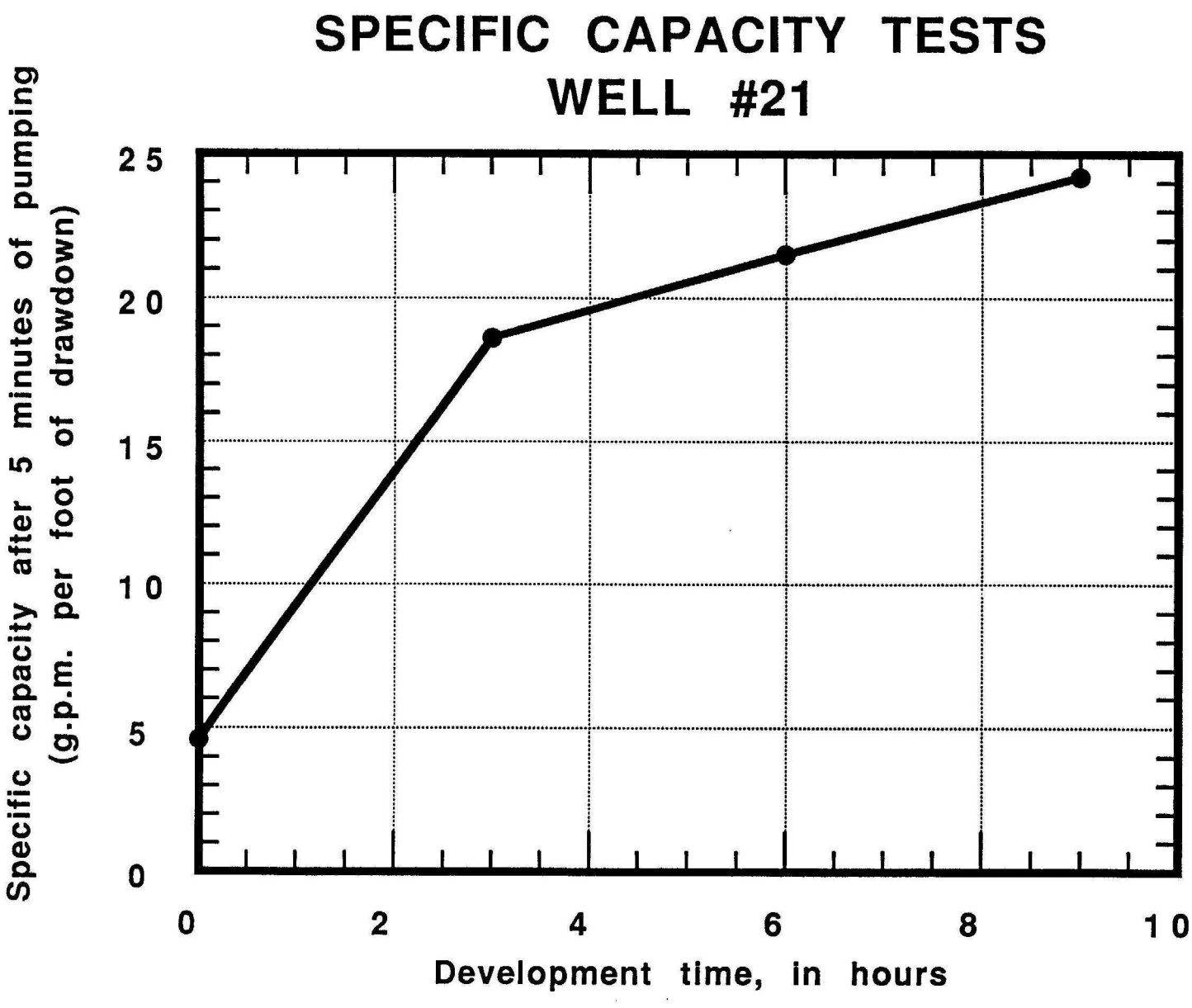

SPECIFIC CAPACITY TESTS
WELL #16
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
30
25
20
15
10
5
0
2
4
6
8
10
Development time, in hours

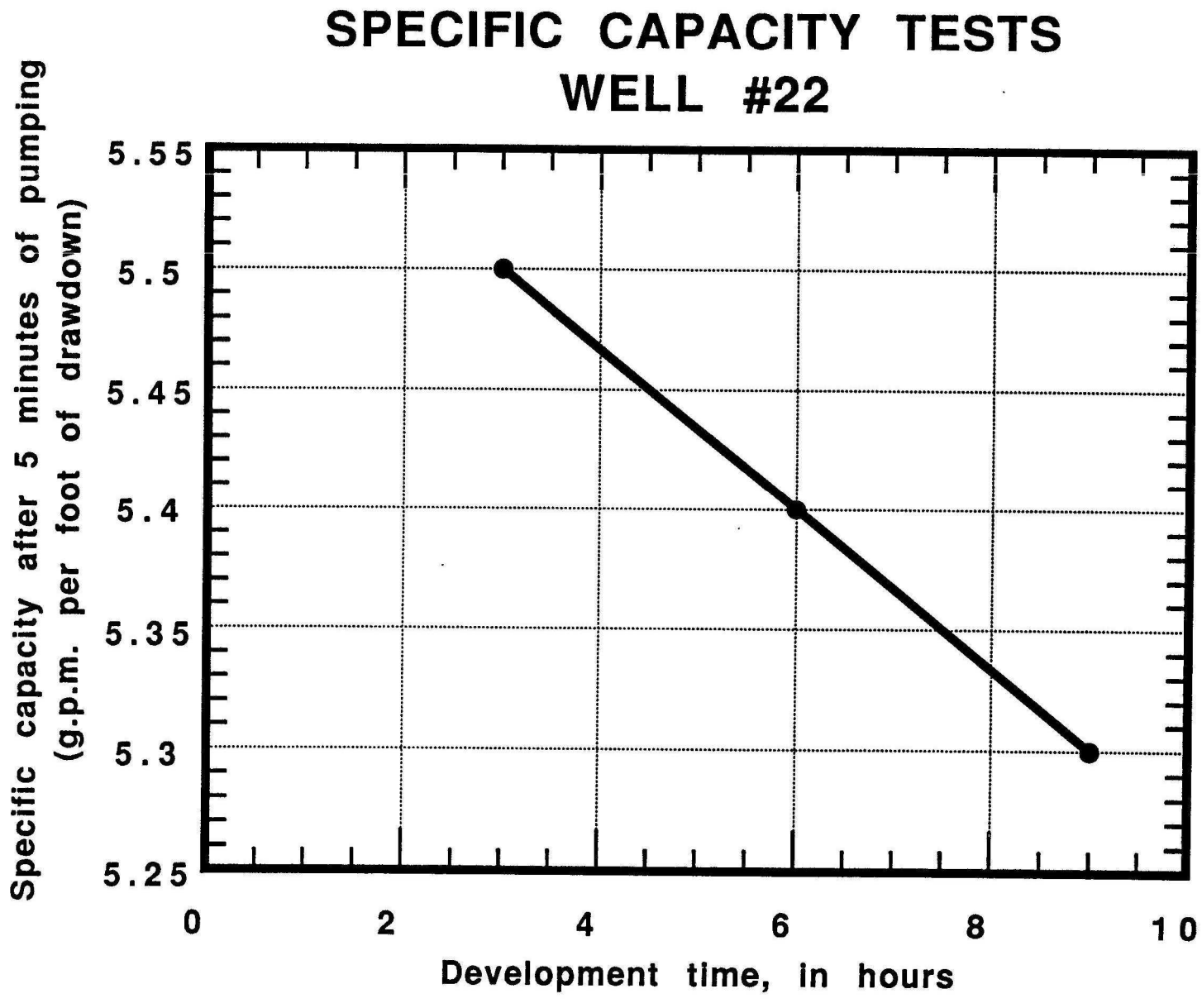

SPECIFIC CAPACITY TESTS
WELL #17
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
17
16
15
14
13
12
11
10
0
2
4
6
8
10
Development time, in hours

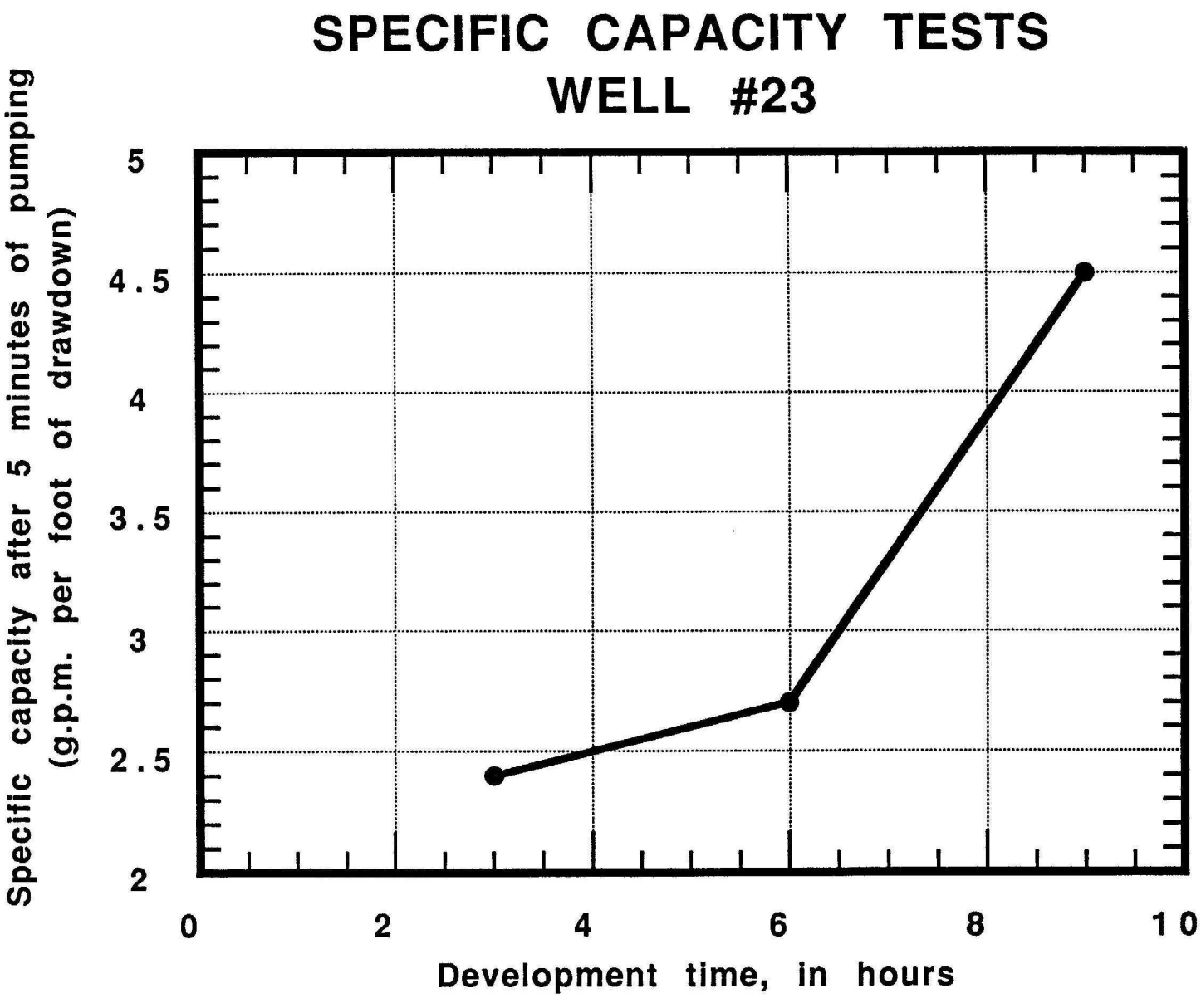

SPECIFIC CAPACITY TESTS
WELL #18
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
20
19
18
17
16
15
0
2
4
6
8
10
Development time, in hours

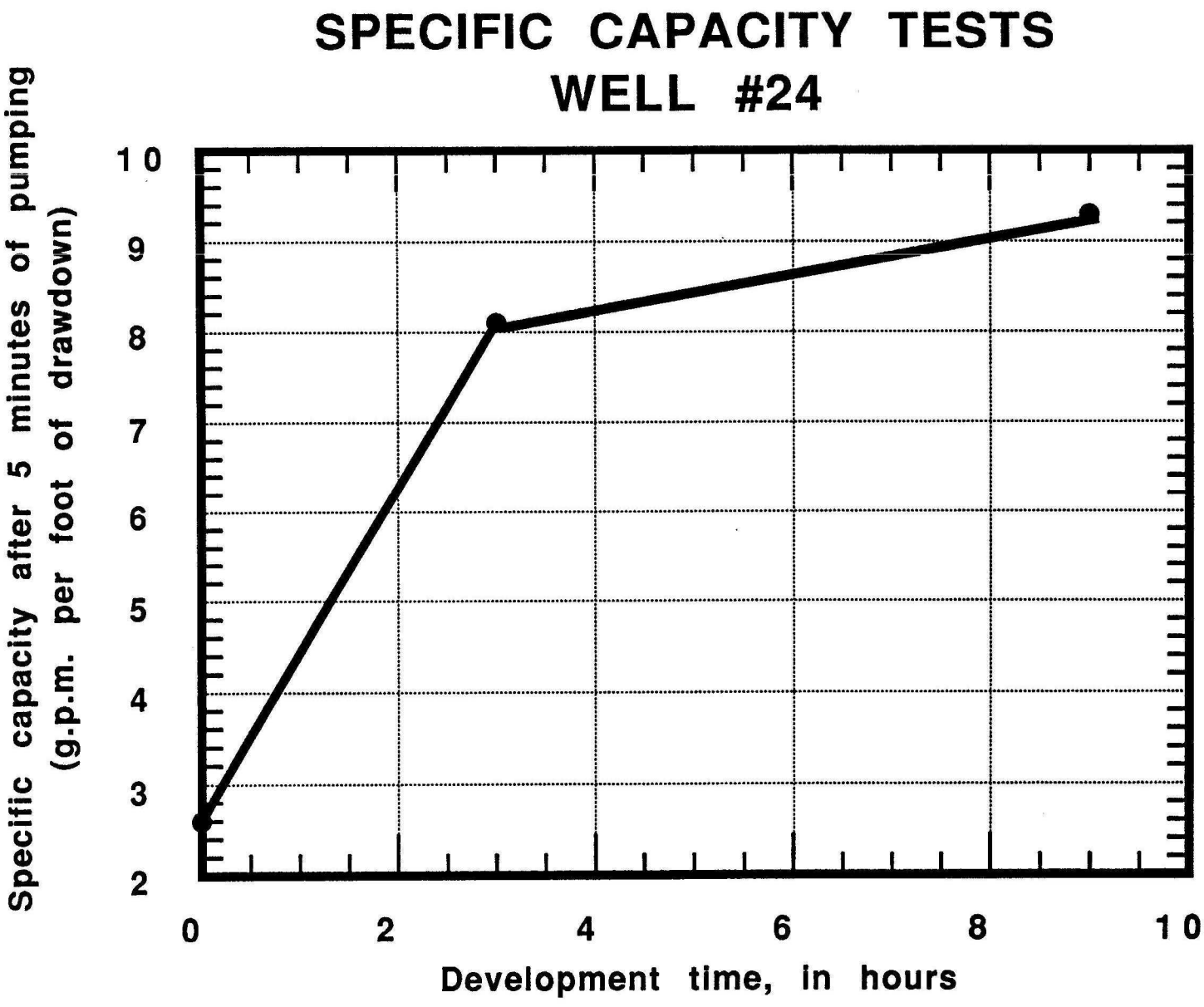

SPECIFIC CAPACITY TESTS
WELL #19
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
25
20
15
10
5
0
0
2
4
6
8
10
Development time, in hours

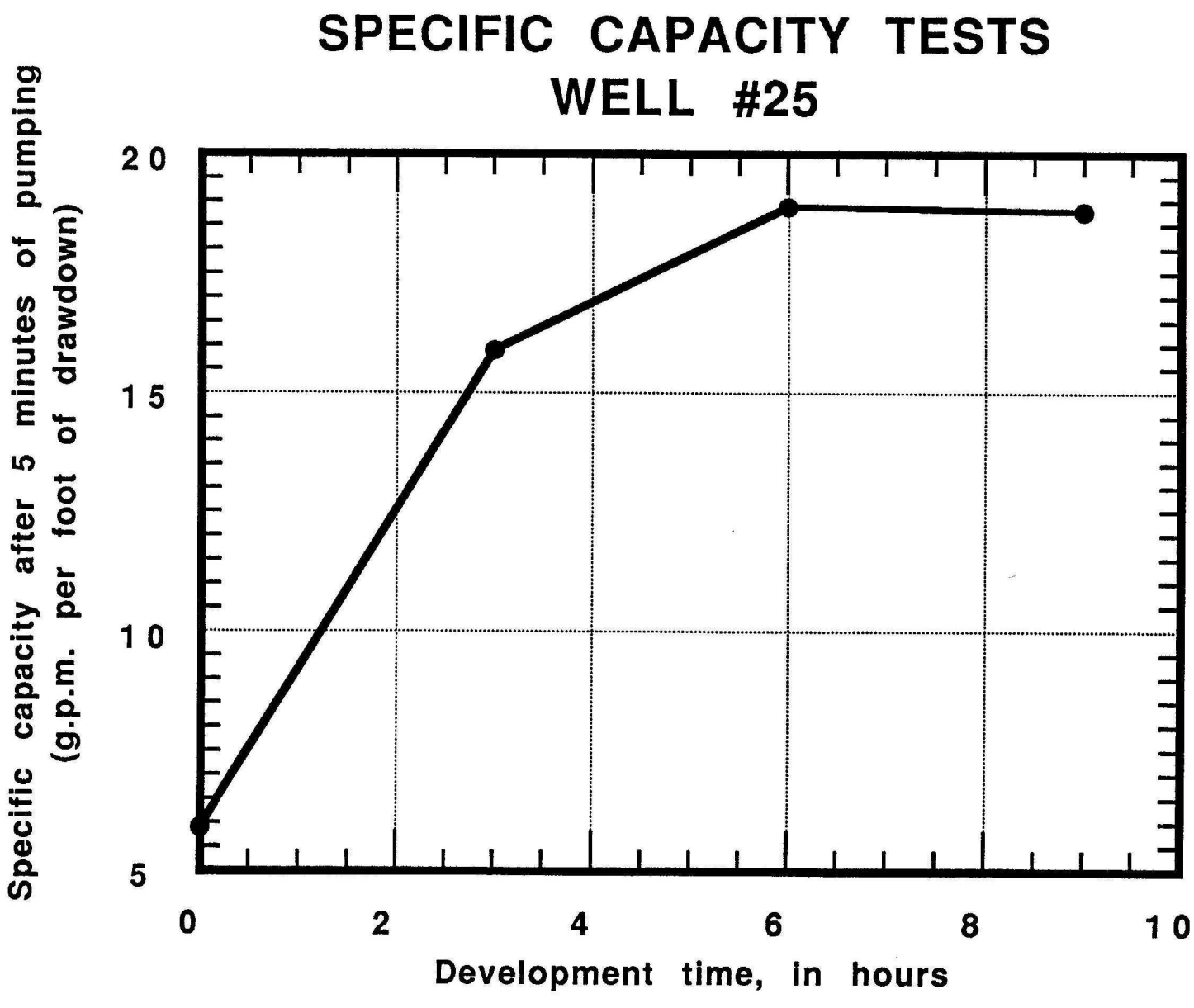

SPECIFIC CAPACITY TESTS
WELL #20
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
18
16
14
12
10
8
6
4
0
2
4
6
8
10
Development time, in hours

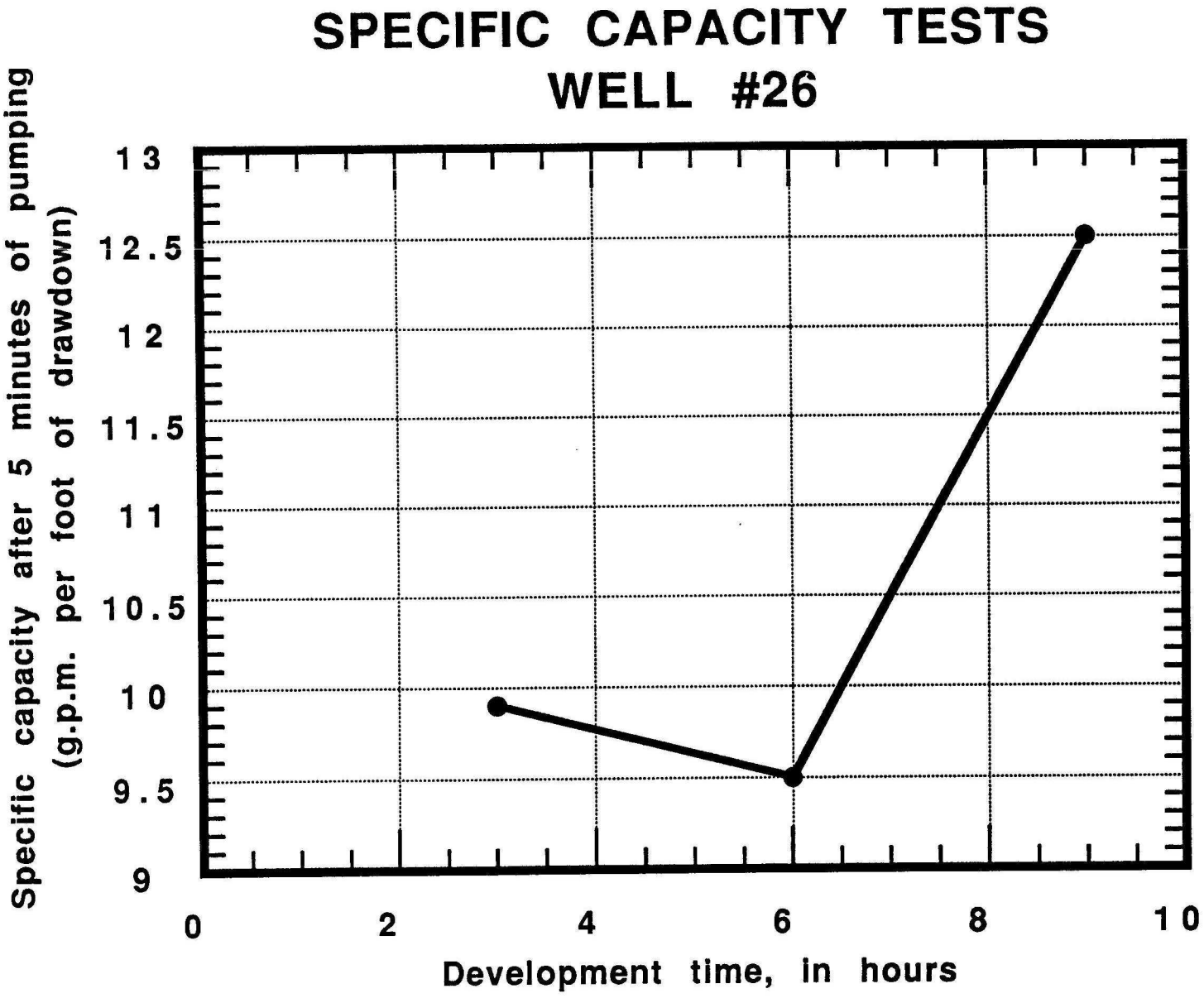

SPECIFIC CAPACITY TESTS
WELL #21
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
25
20
15
10
5
0
0
2
4
6
8
10
Development time, in hours

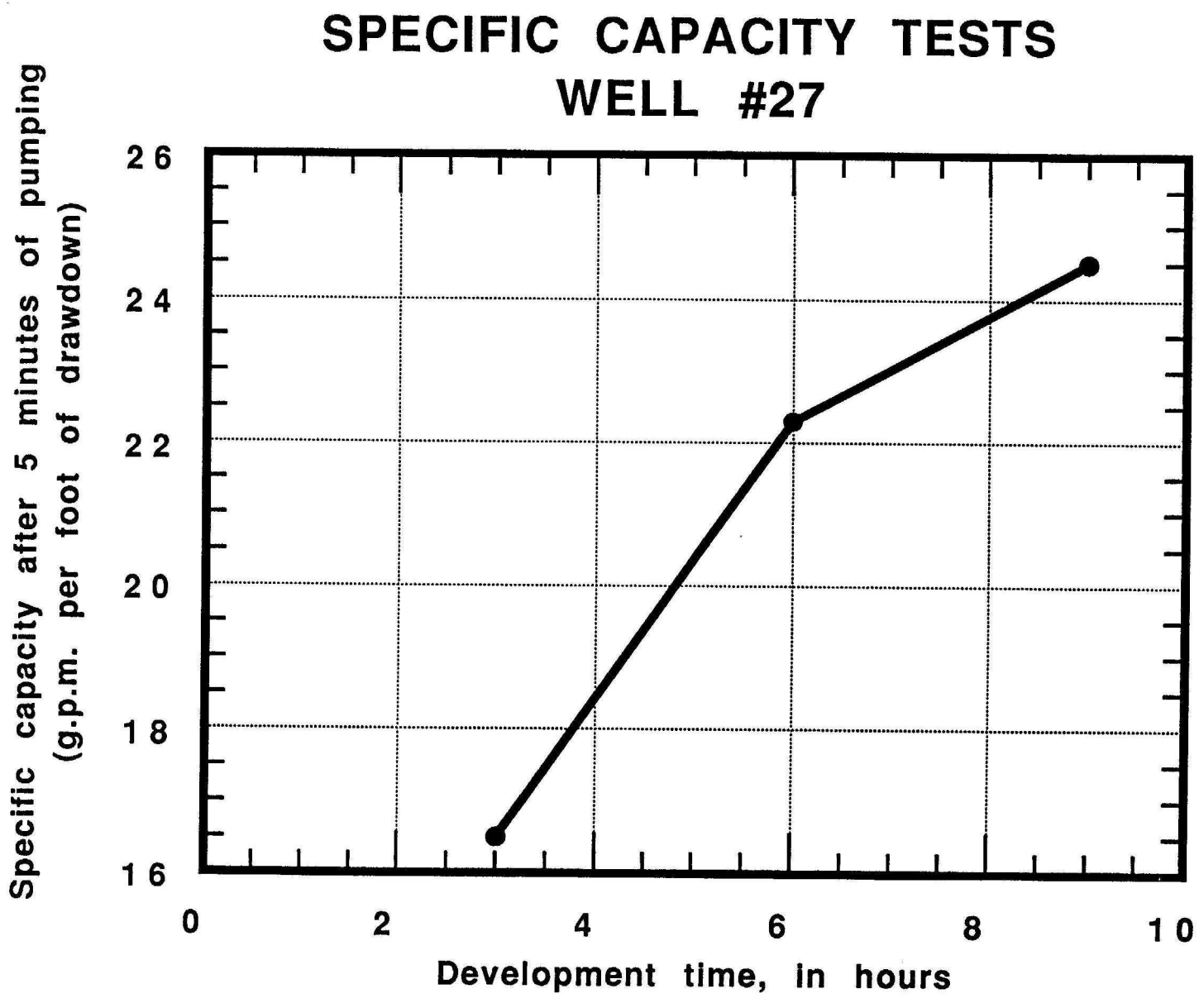

SPECIFIC CAPACITY TESTS
WELL #22
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
5.55
5.5
5.45
5.4
5.35
5.3
5.25
0
2
4
6
8
10
Development time, in hours

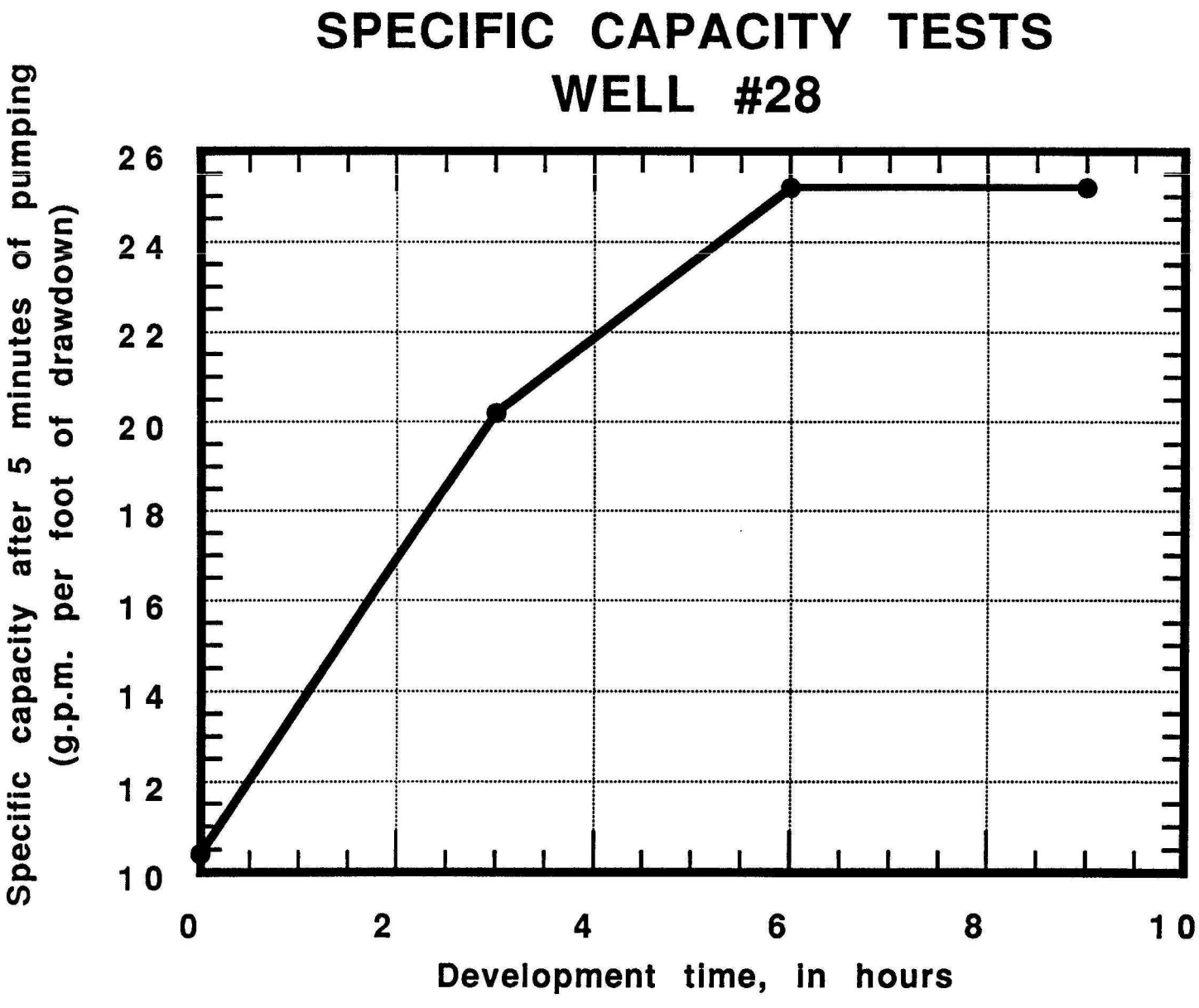

SPECIFIC CAPACITY TESTS
WELL #23
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
5
4.5
4
3.5
3
2.5
2
0
2
4
6
8
10
Development time, in hours

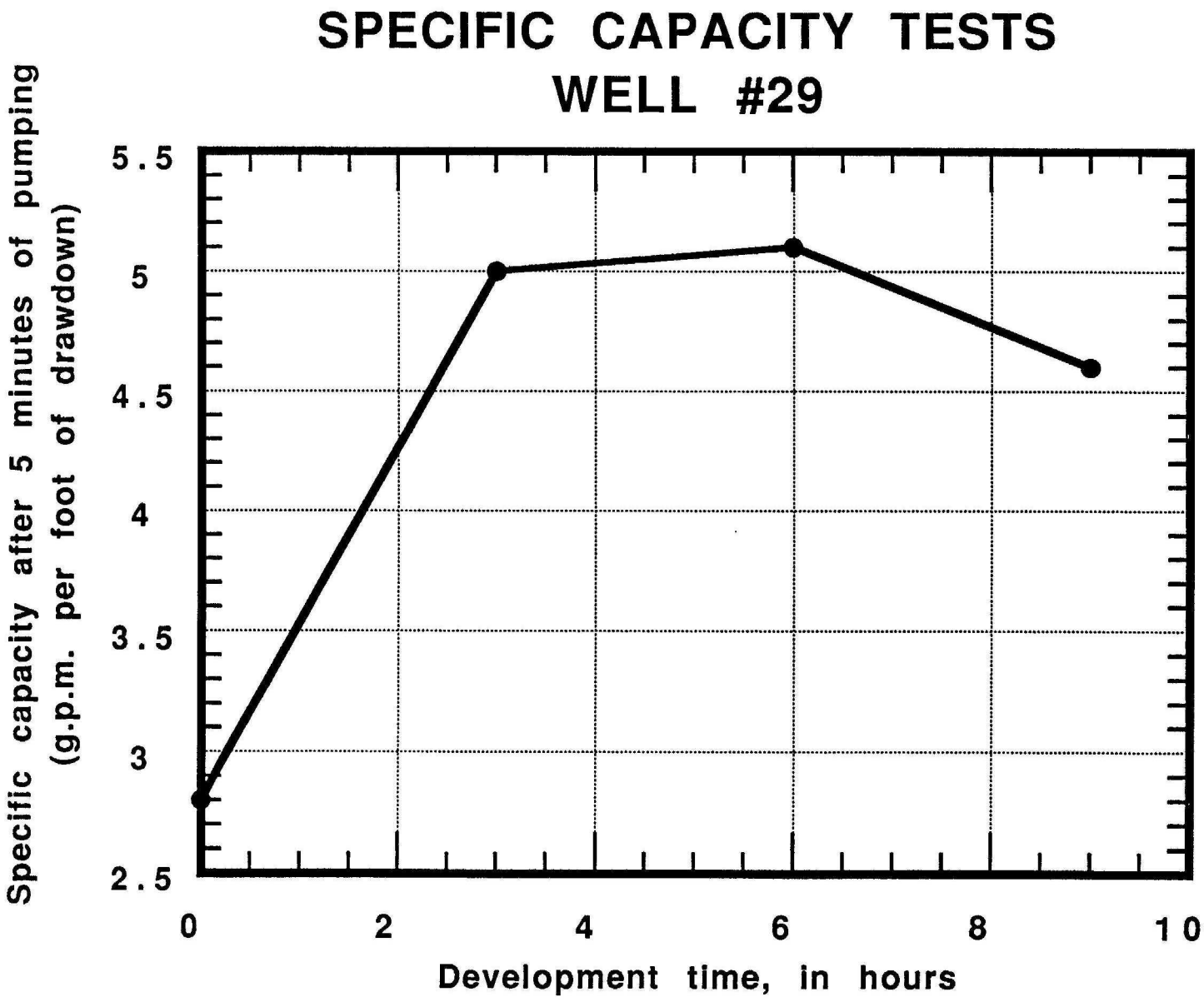

SPECIFIC CAPACITY TESTS
WELL #24
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
10
9
8
7
6
5
4
3
2
0
2
4
6
8
10
Development time, in hours

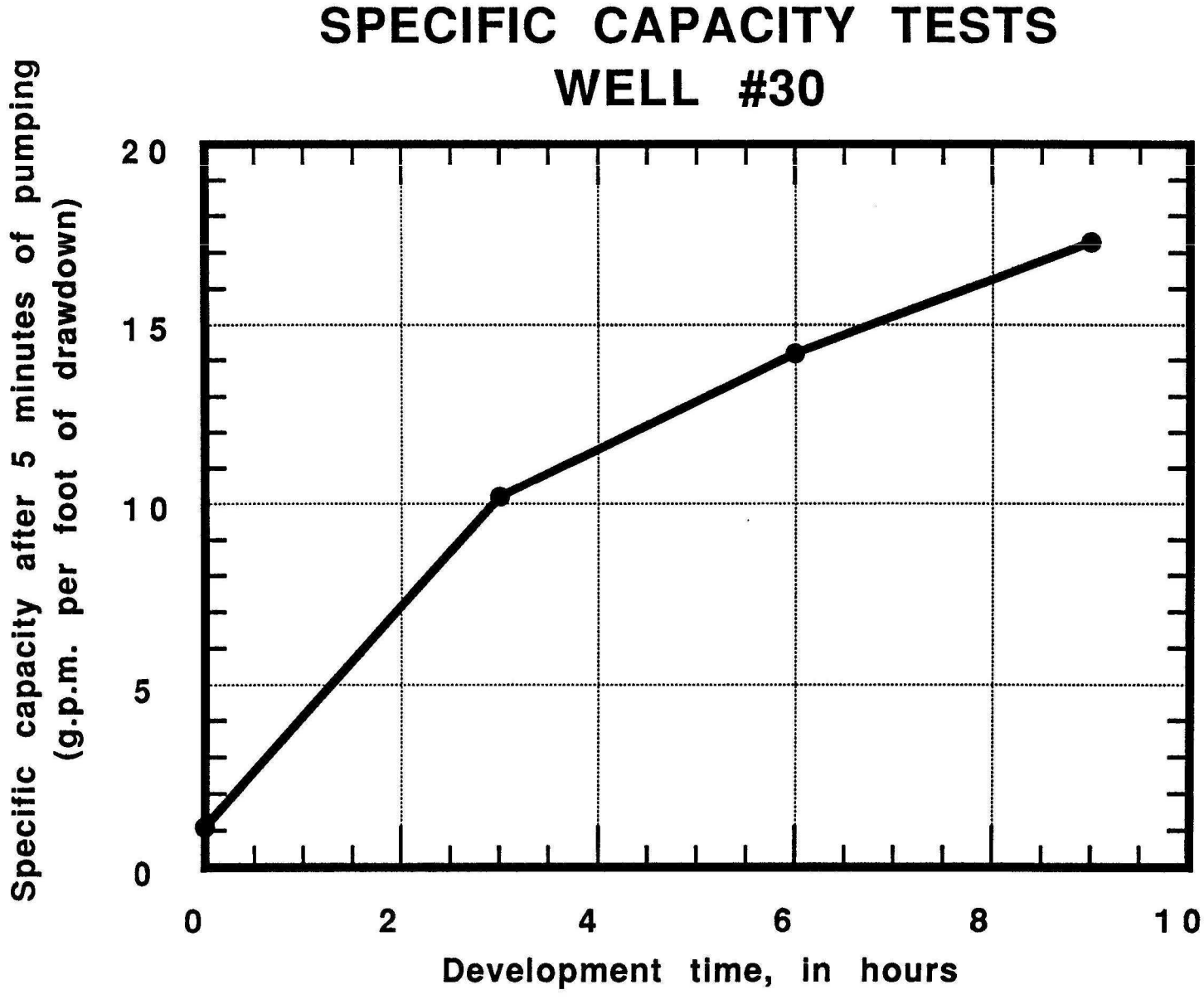

SPECIFIC CAPACITY TESTS
WELL #25
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
20
15
10
5
0
2
4
6
8
10
Development time, in hours

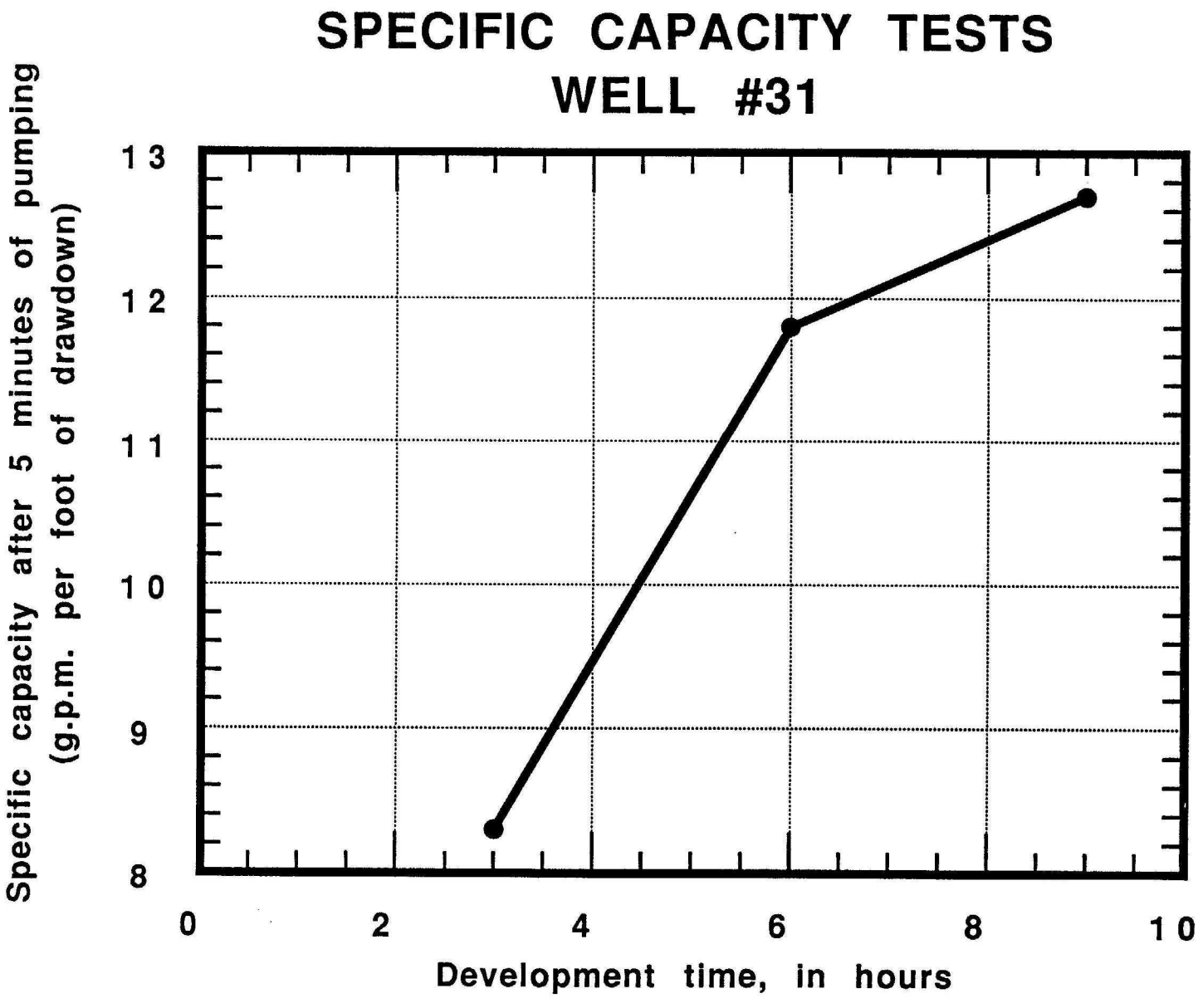

SPECIFIC CAPACITY TESTS
WELL #26
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
13
12.5
12
11.5
11
10.5
10
9.5
9
0
2
4
6
8
10
Development time, in hours

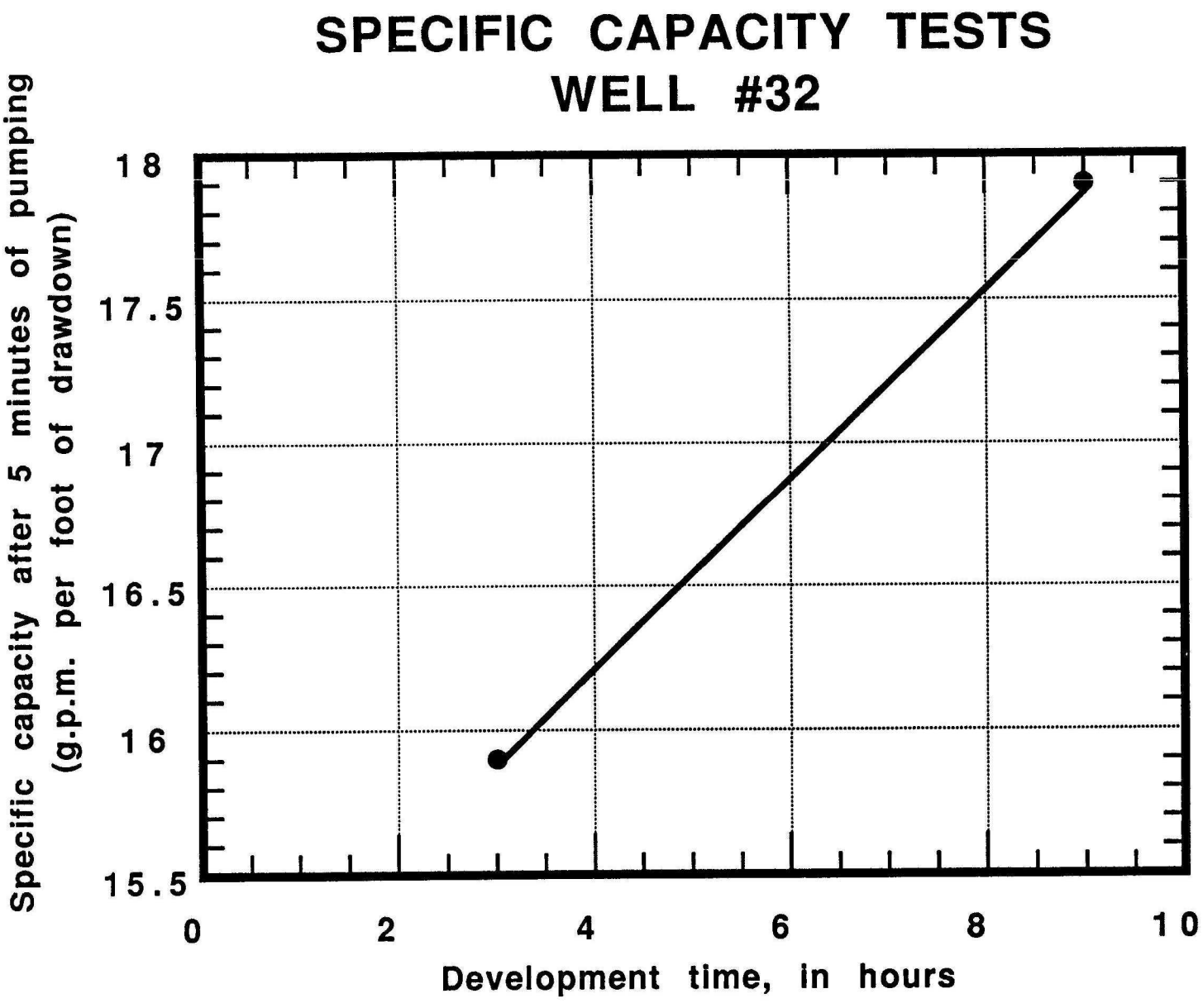

SPECIFIC CAPACITY TESTS
WELL #27
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
26
24
22
20
18
16
0
2
4
6
8
10
Development time, in hours


SPECIFIC CAPACITY TESTS
WELL #28
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
26
24
22
20
18
16
14
12
10
0
2
4
6
8
10
Development time, in hours


SPECIFIC CAPACITY TESTS
WELL #29
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
5.5
5
4.5
4
3.5
3
2.5
0
2
4
6
8
10
Development time, in hours

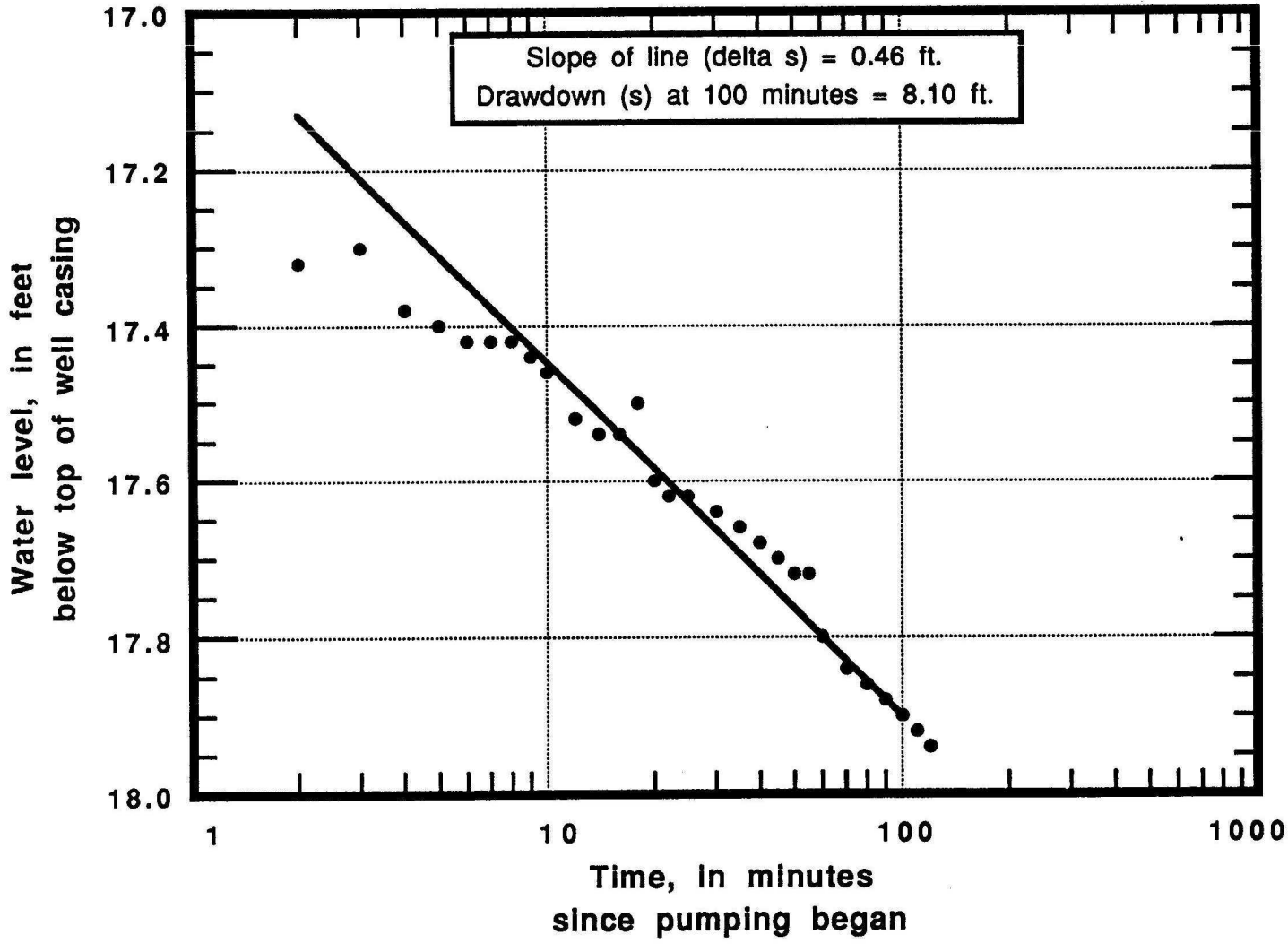

SPECIFIC CAPACITY TESTS
WELL #30
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
20
15
10
5
0
0
2
4
6
8
10
Development time, in hours

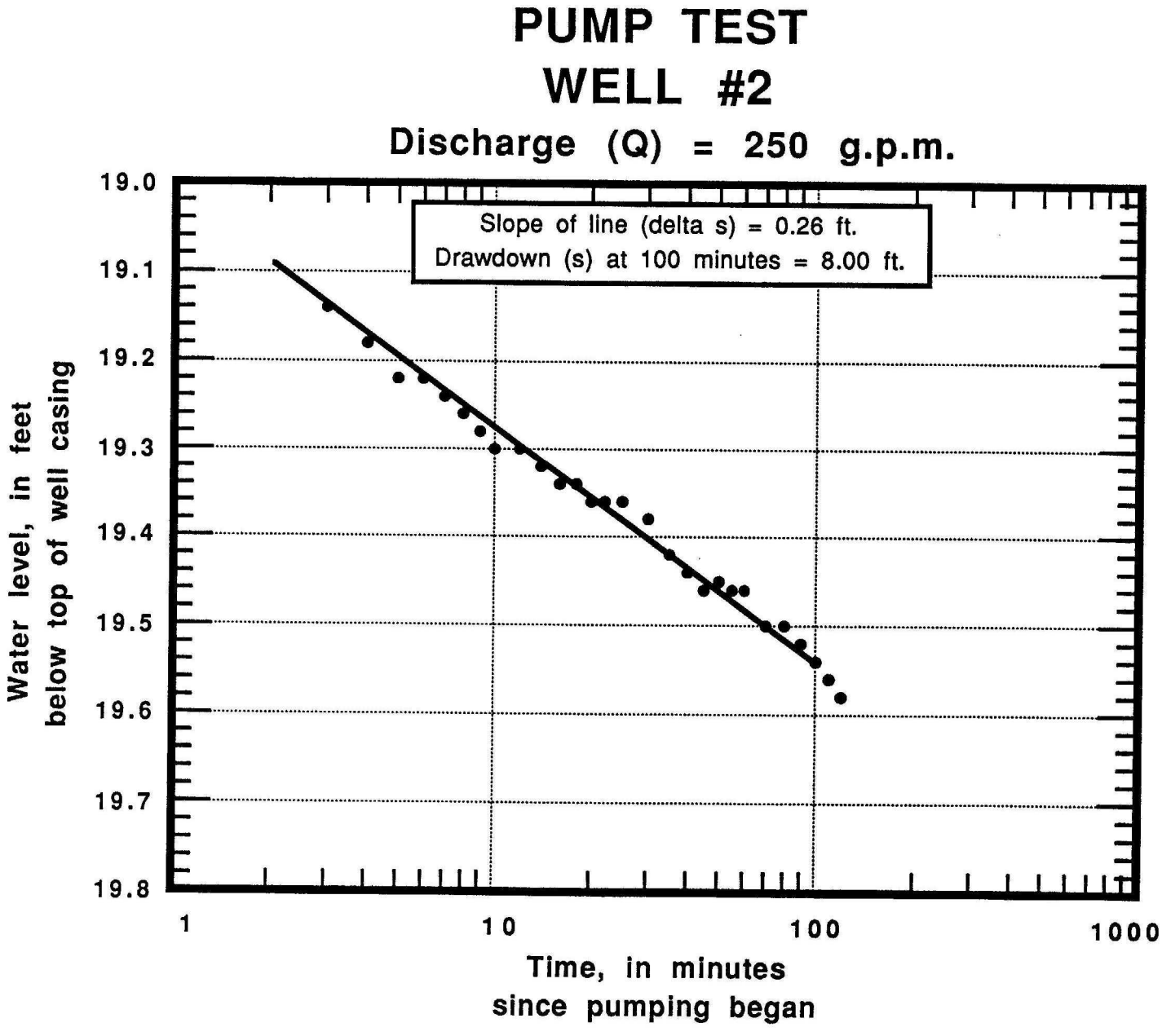

SPECIFIC CAPACITY TESTS
WELL #31
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
13
12
11
10
9
8
0
2
4
6
8
10
Development time, in hours


SPECIFIC CAPACITY TESTS
WELL #32
Specific capacity after 5 minutes of pumping
(g.p.m. per foot of drawdown)
18
17.5
17
16.5
16
15.5
0
2
4
6
8
10
Development time, in hours

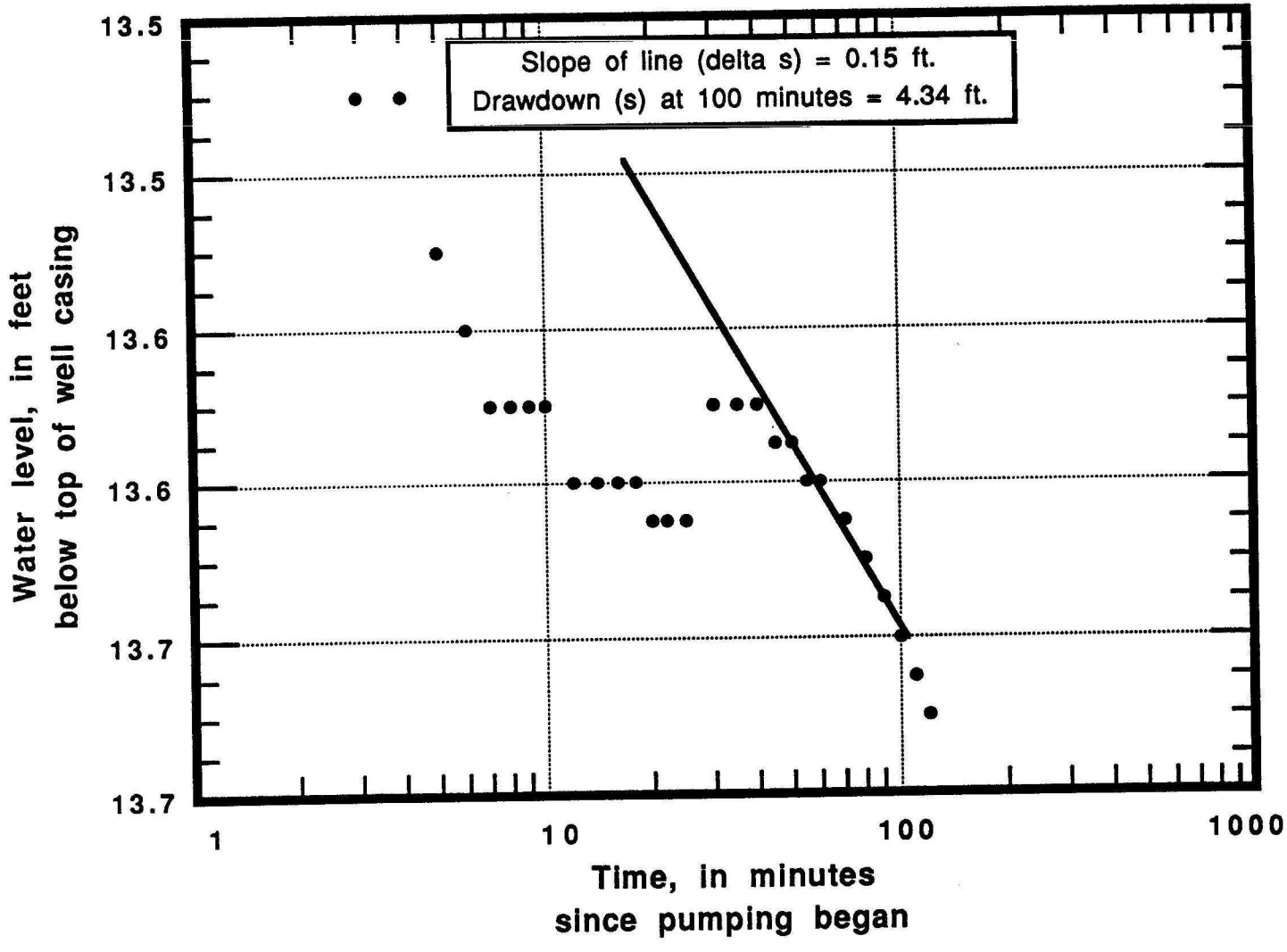
**APPENDIX 2. -- Graphs showing logarithmic time versus arithmetic drawdown plots from 2-hour pump tests (production wells 1-21, 24-28, and 30-32)**

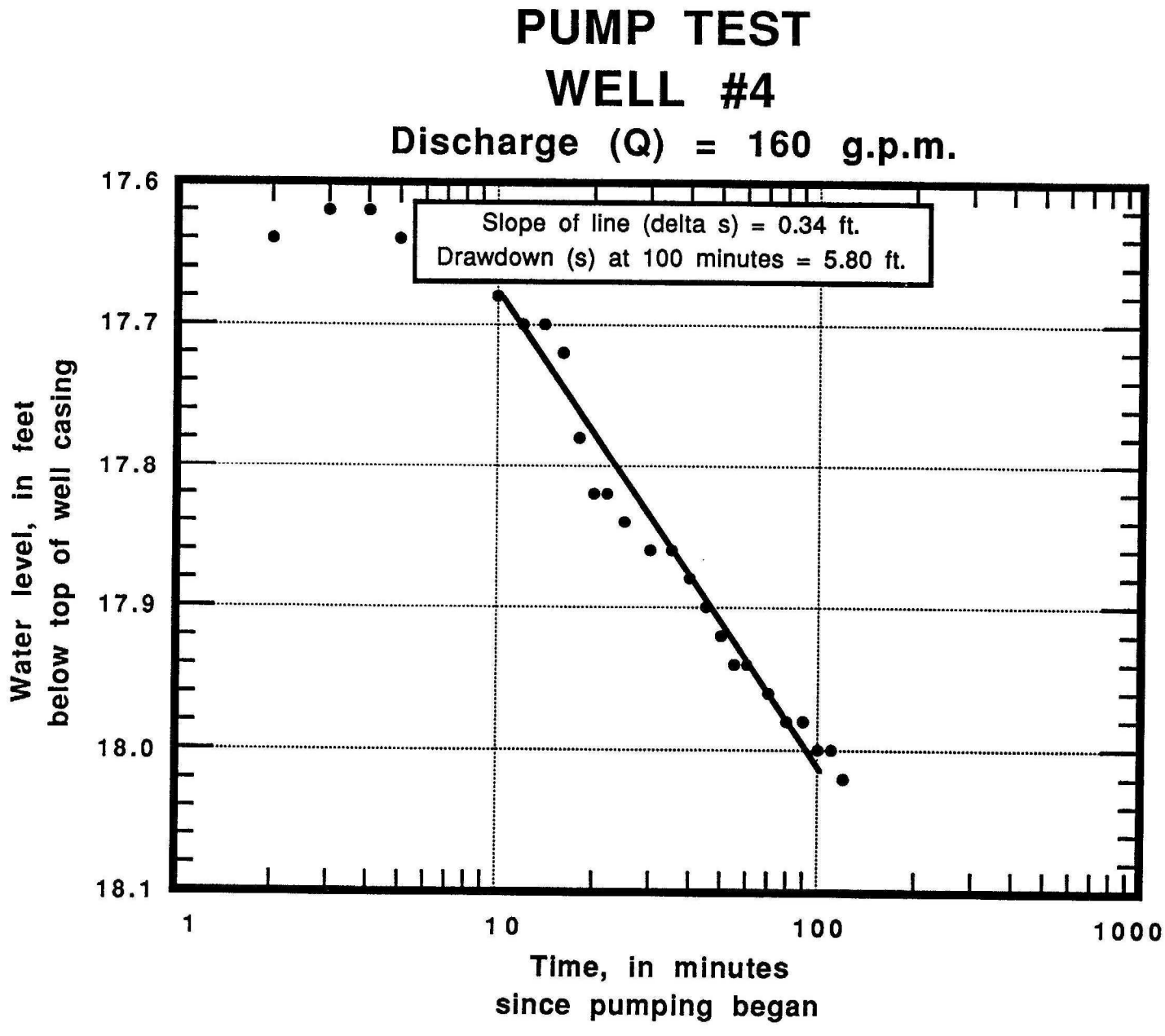
# PUMP TEST
# WELL #1
## Discharge (Q) = 250 g.p.m.

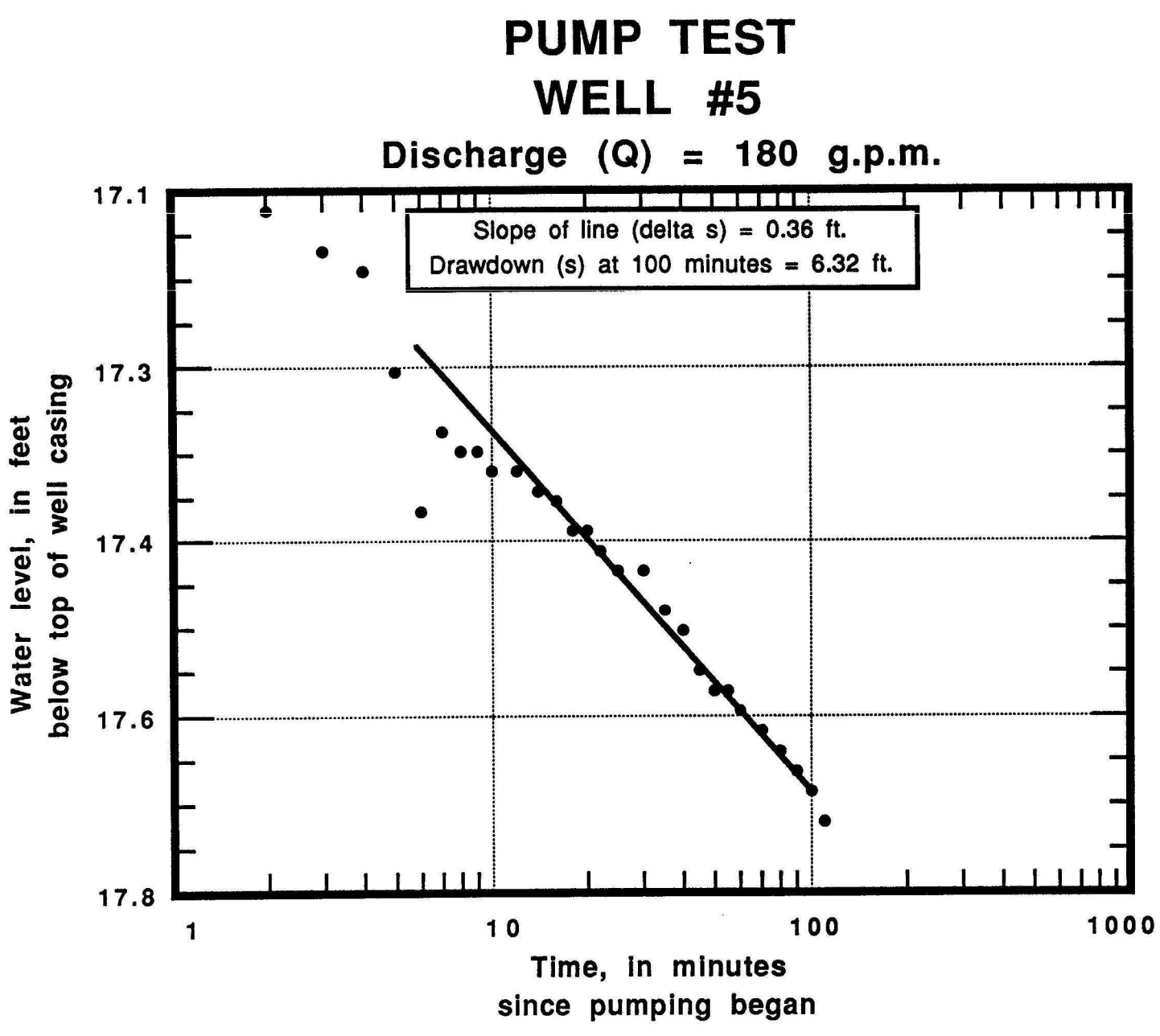


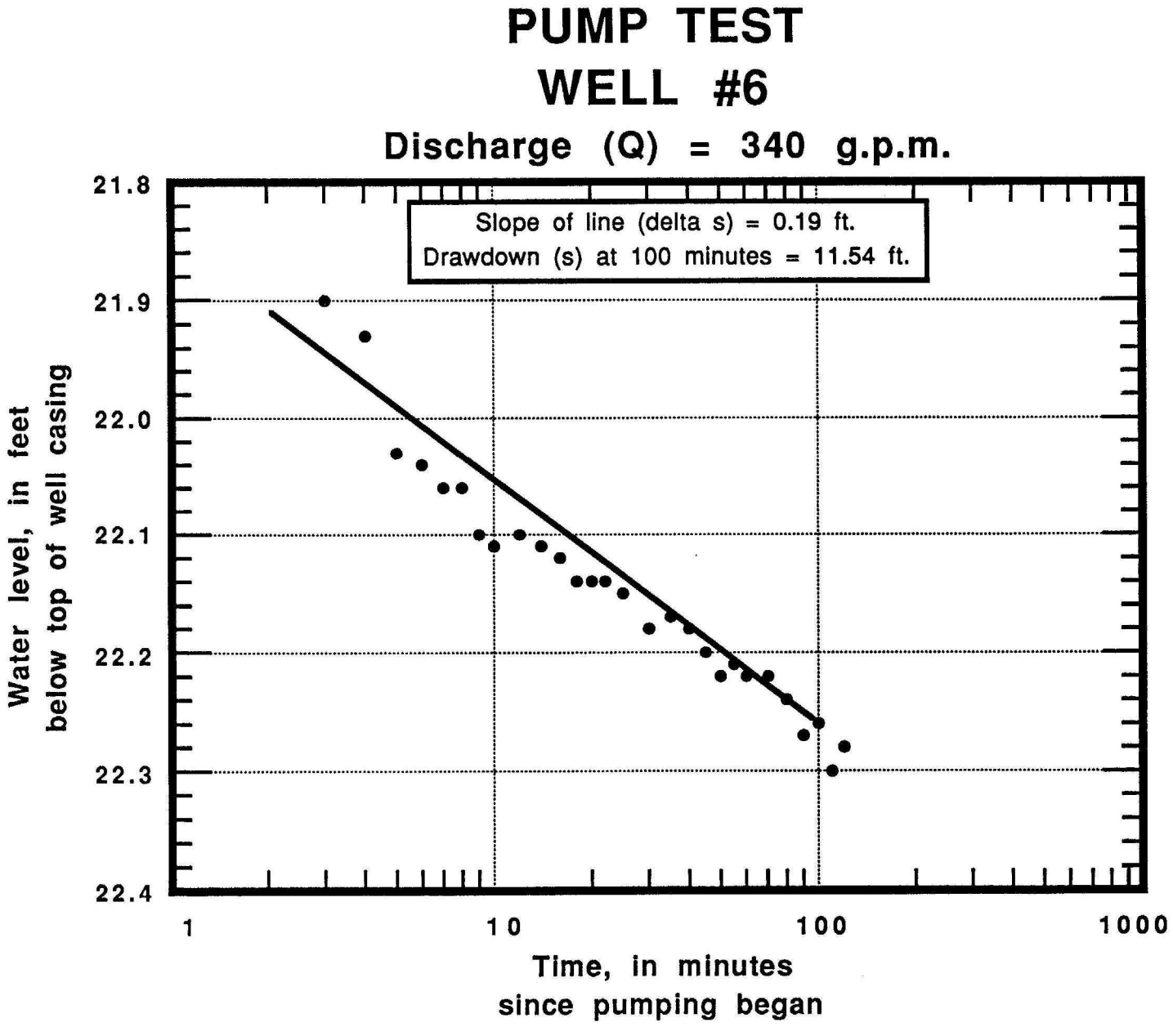

PUMP TEST
WELL #2
Discharge (Q) = 250 g.p.m.
Slope of line (delta s) = 0.26 ft.
Drawdown (s) at 100 minutes = 8.00 ft.
Water level, in feet
below top of well casing
19.0
19.1
19.2
19.3
19.4
19.5
19.6
19.7
19.8
1
10
100
1000
Time, in minutes
since pumping began

# PUMP TEST
# WELL #3
## Discharge (Q) = 277 g.p.m.

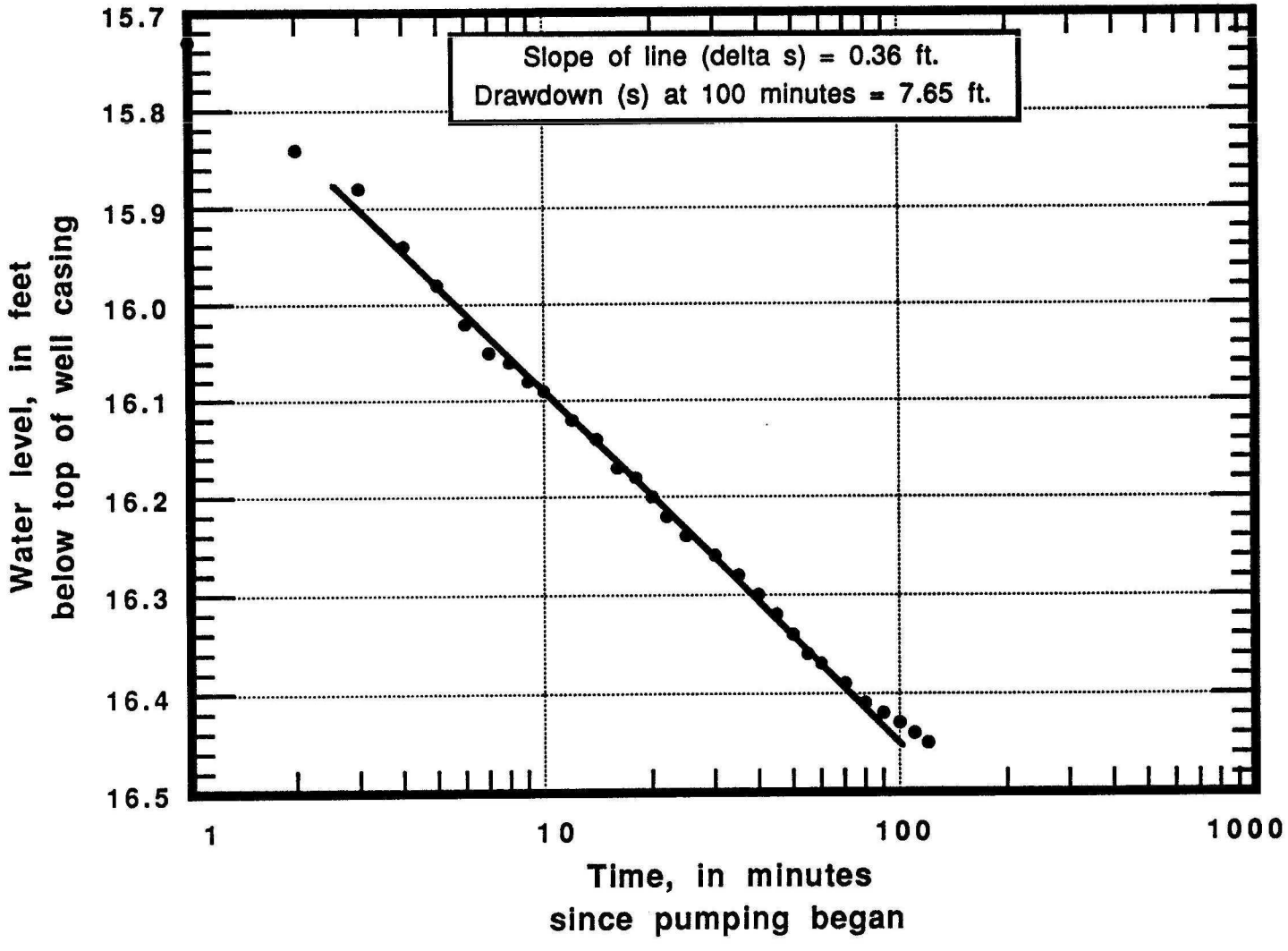



PUMP TEST
WELL #4
Discharge (Q) = 160 g.p.m.
Slope of line (delta s) = 0.34 ft.
Drawdown (s) at 100 minutes = 5.80 ft.
Water level, in feet below top of well casing
17.6
17.7
17.8
17.9
18.0
18.1
1
10
100
1000
Time, in minutes since pumping began

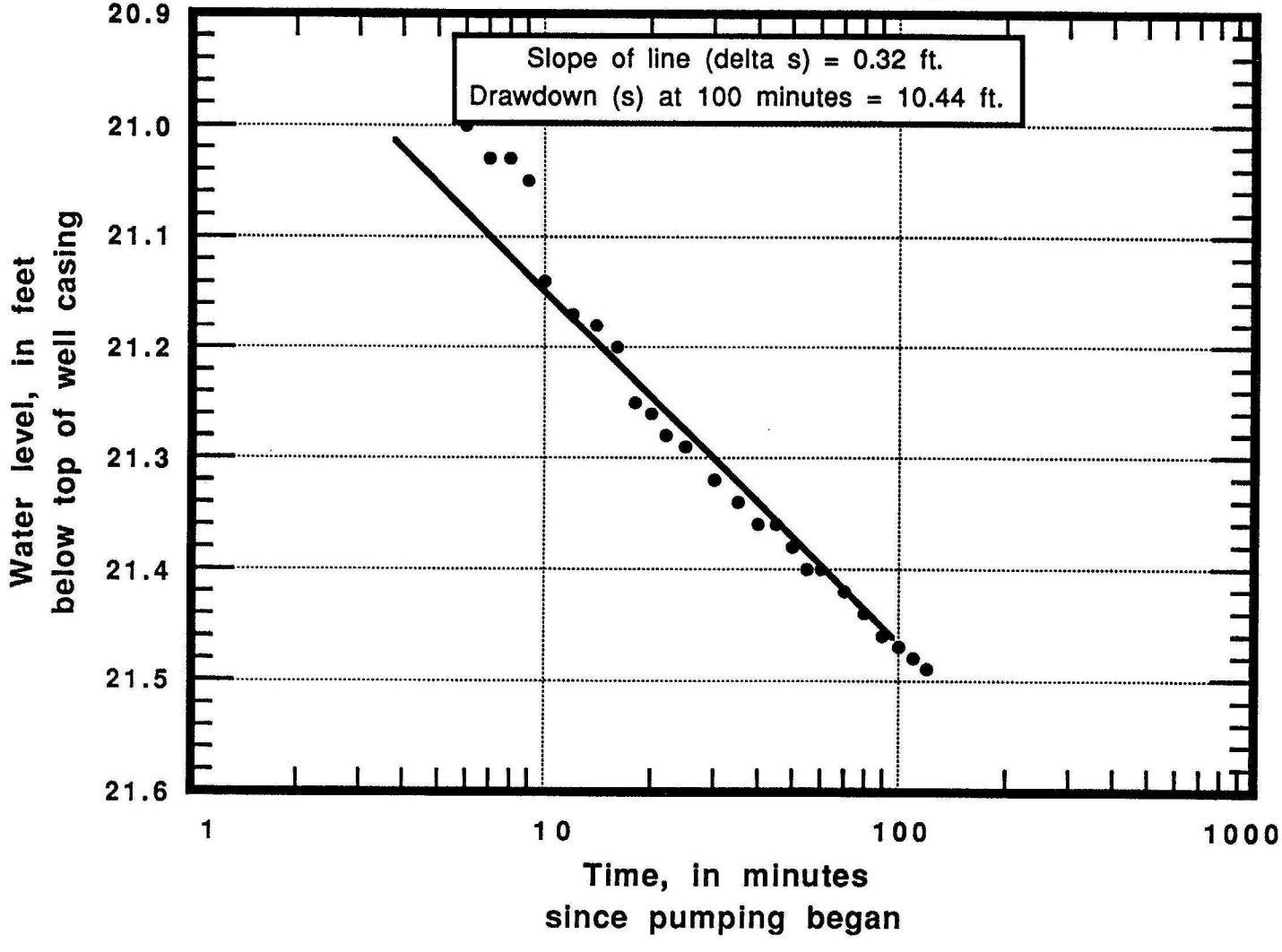

PUMP TEST
WELL #5
Discharge (Q) = 180 g.p.m.
Slope of line (delta s) = 0.36 ft.
Drawdown (s) at 100 minutes = 6.32 ft.
17.1
17.3
17.4
17.6
17.8
Water level, in feet
below top of well casing
1
10
100
1000
Time, in minutes
since pumping began


PUMP TEST
WELL #6
Discharge (Q) = 340 g.p.m.
Slope of line (delta s) = 0.19 ft.
Drawdown (s) at 100 minutes = 11.54 ft.
Water level, in feet
below top of well casing
21.8
21.9
22.0
22.1
22.2
22.3
22.4
1
10
100
1000
Time, in minutes
since pumping began

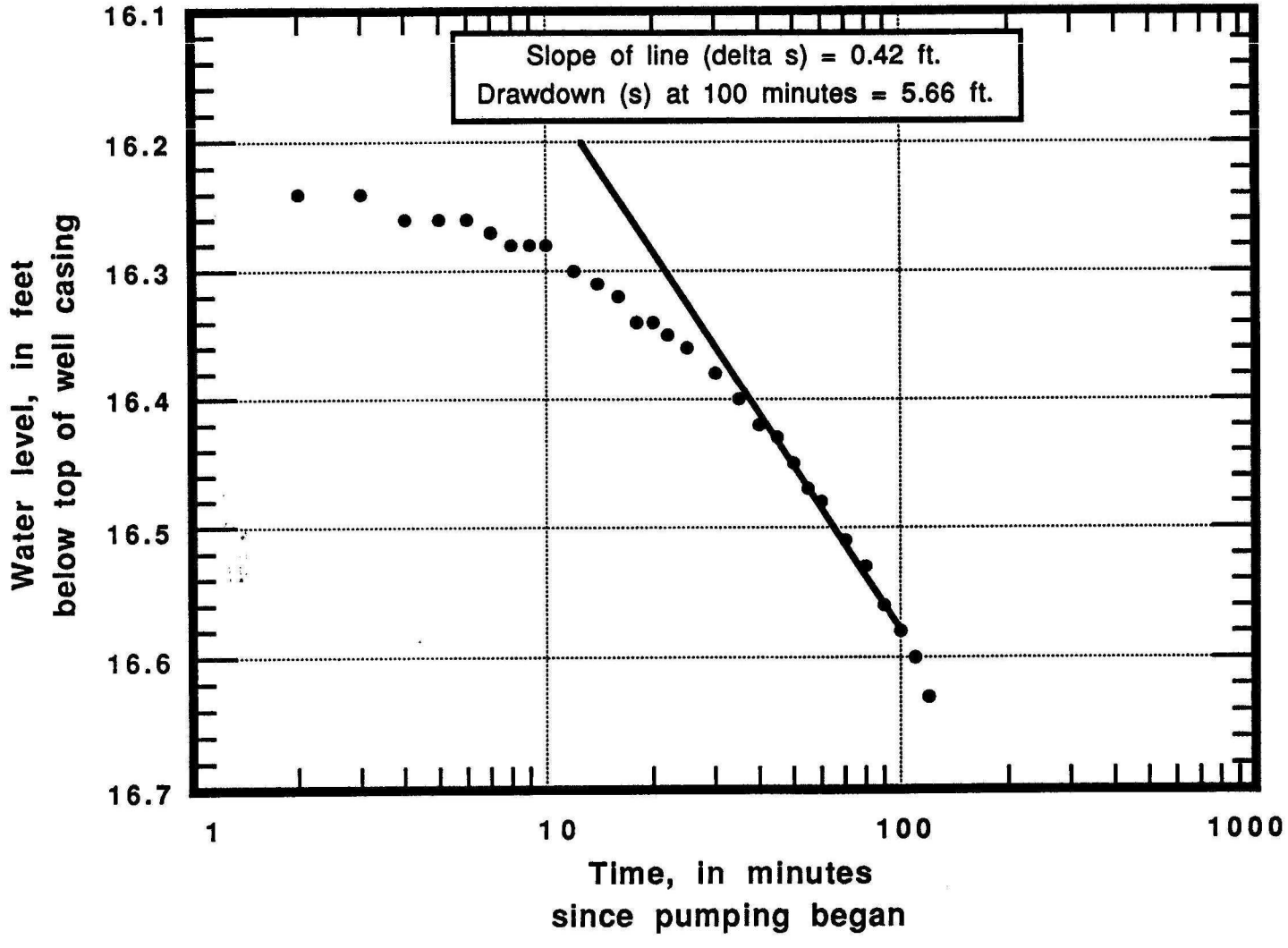
# PUMP TEST
# WELL #7
## Discharge (Q) = 150 g.p.m.

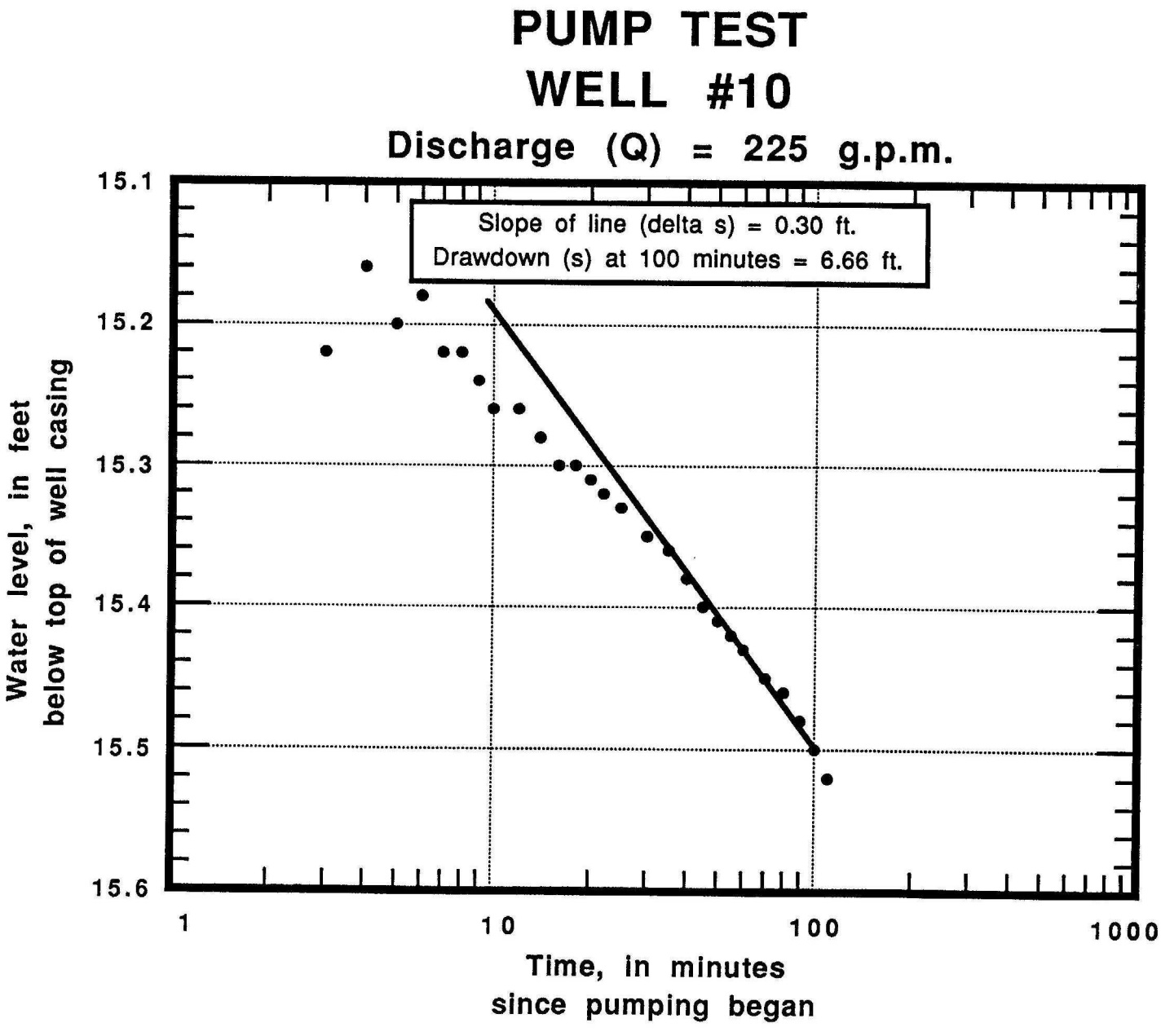


# PUMP TEST
# WELL #8
## Discharge (Q) = 150 g.p.m.

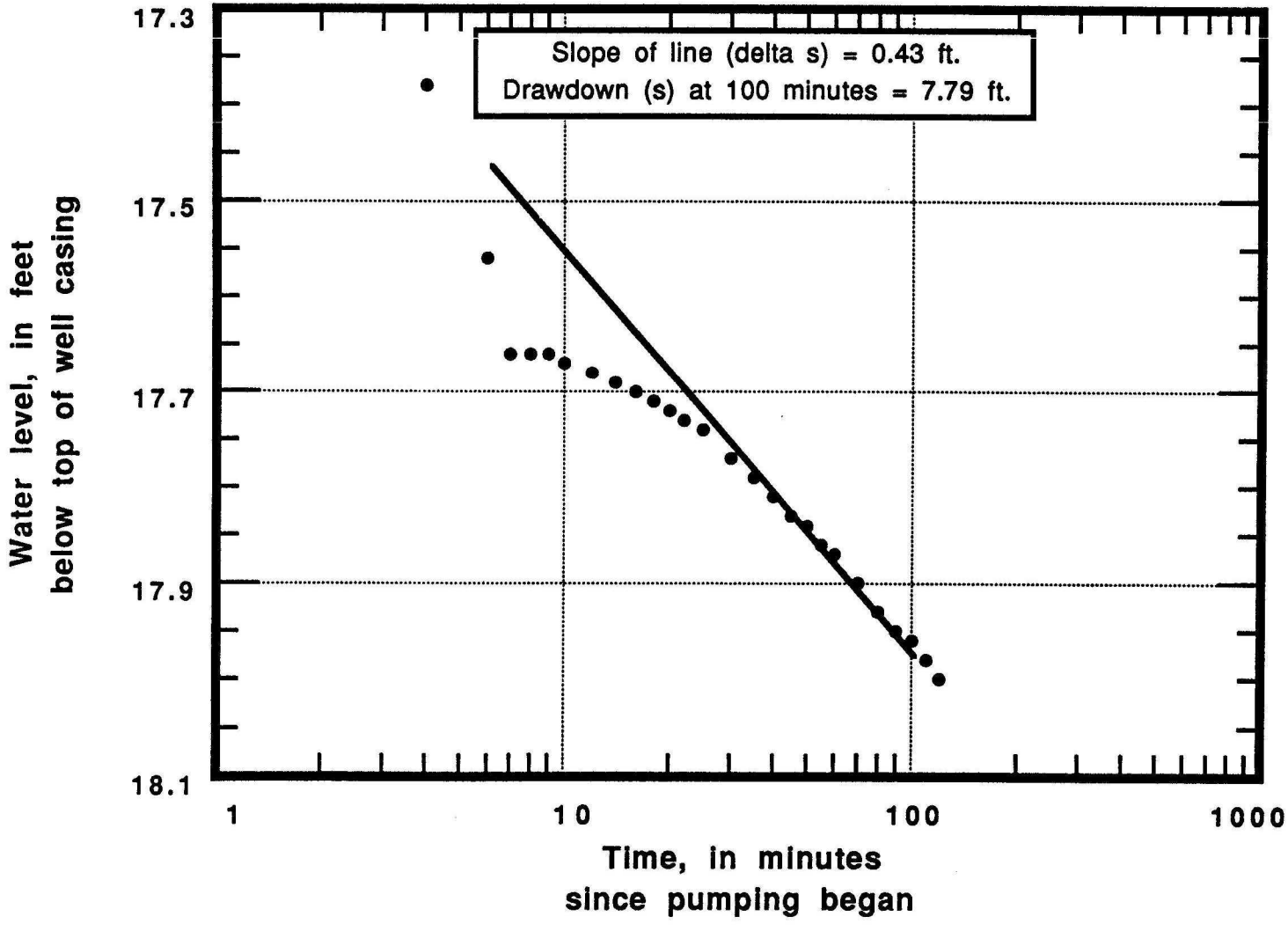


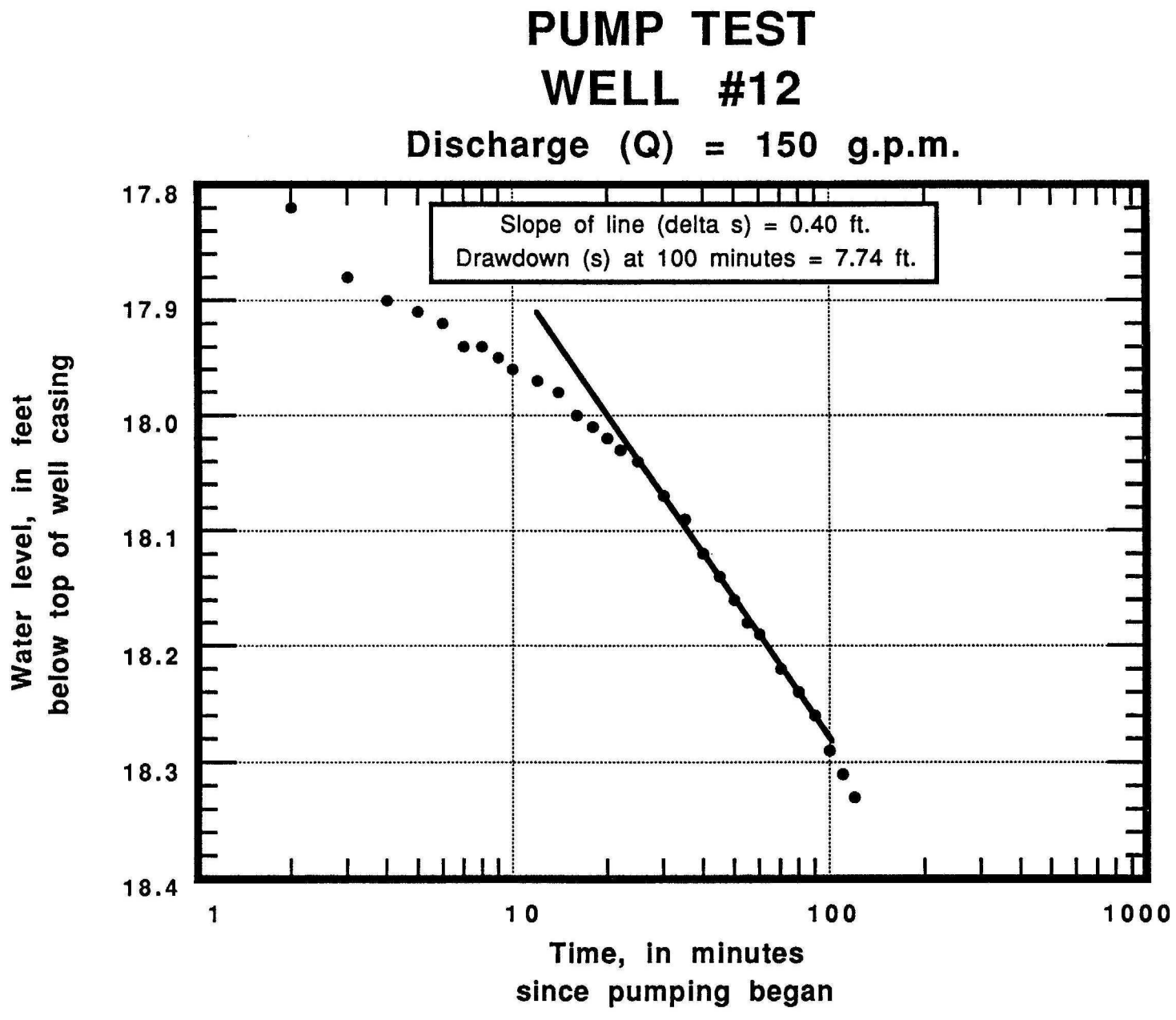
# PUMP TEST
# WELL #9
## Discharge (Q) = 250 g.p.m.



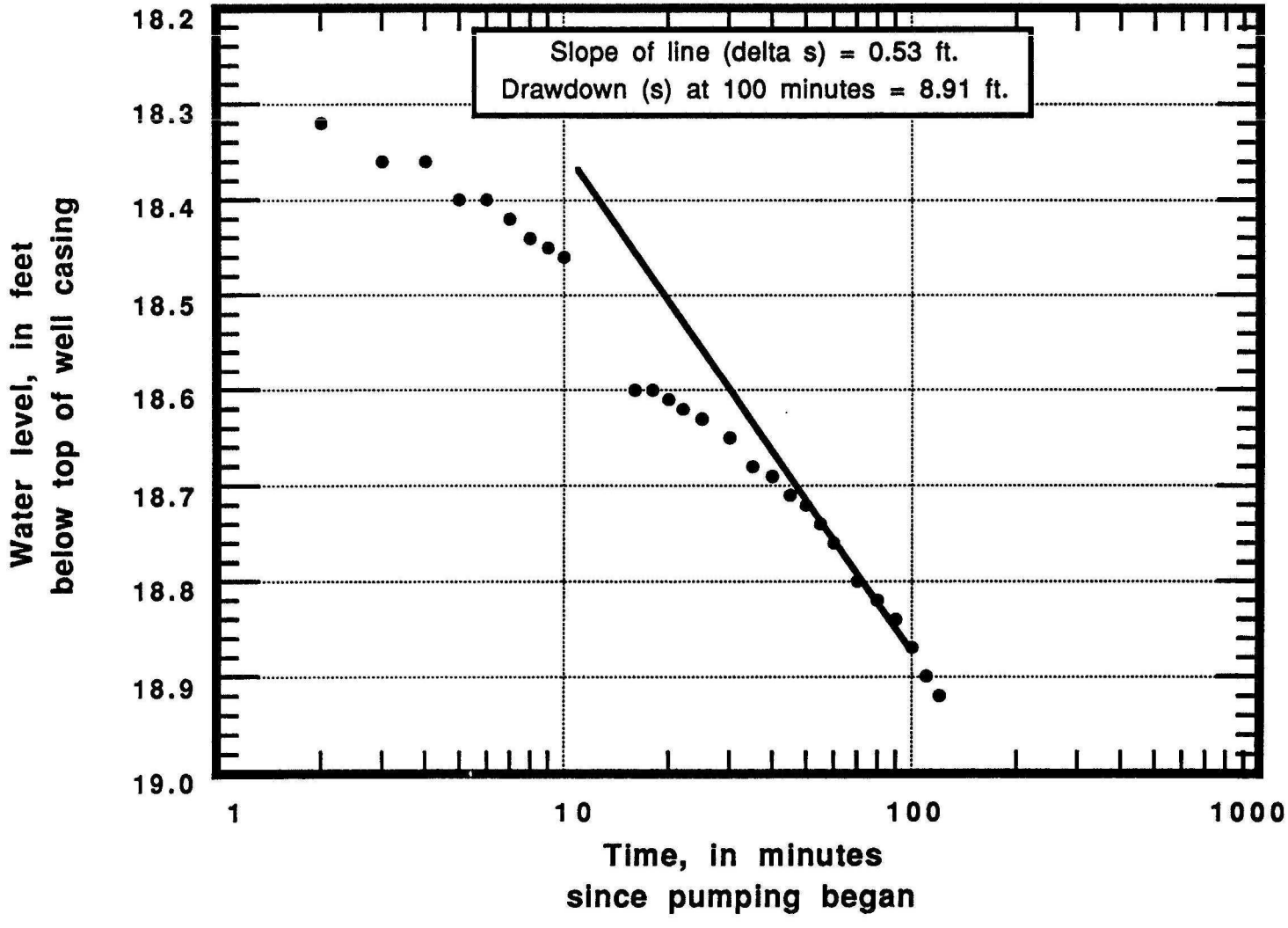

PUMP TEST
WELL #10
Discharge (Q) = 225 g.p.m.
Slope of line (delta s) = 0.30 ft.
Drawdown (s) at 100 minutes = 6.66 ft.
Water level, in feet
below top of well casing
15.1
15.2
15.3
15.4
15.5
15.6
1
10
100
1000
Time, in minutes
since pumping began

# PUMP TEST
# WELL #11
## Discharge (Q) = 150 g.p.m.

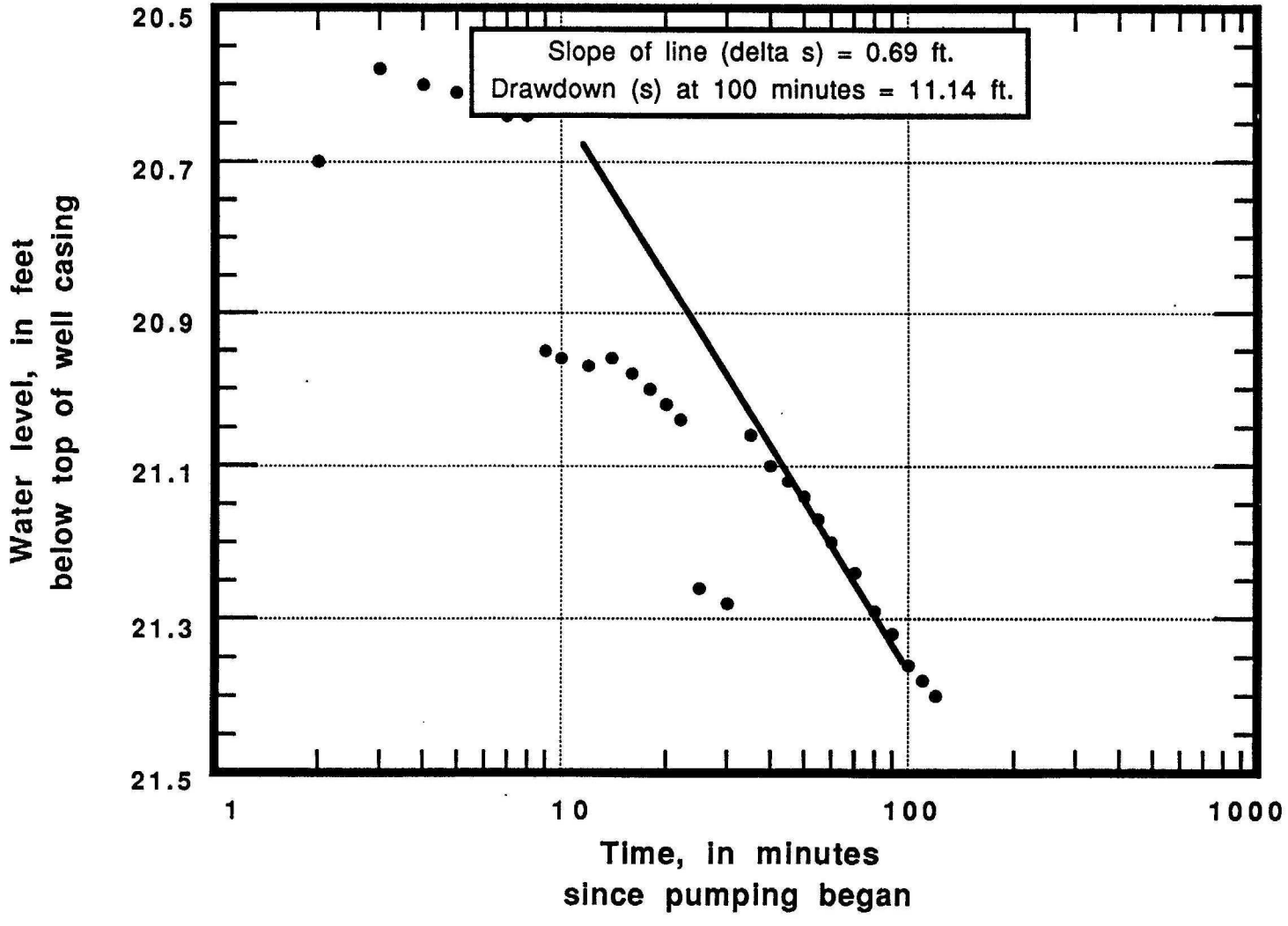



PUMP TEST
WELL #12
Discharge (Q) = 150 g.p.m.
Slope of line (delta s) = 0.40 ft.
Drawdown (s) at 100 minutes = 7.74 ft.
17.8
17.9
18.0
18.1
18.2
18.3
18.4
Water level, in feet
below top of well casing
1
10
100
1000
Time, in minutes
since pumping began

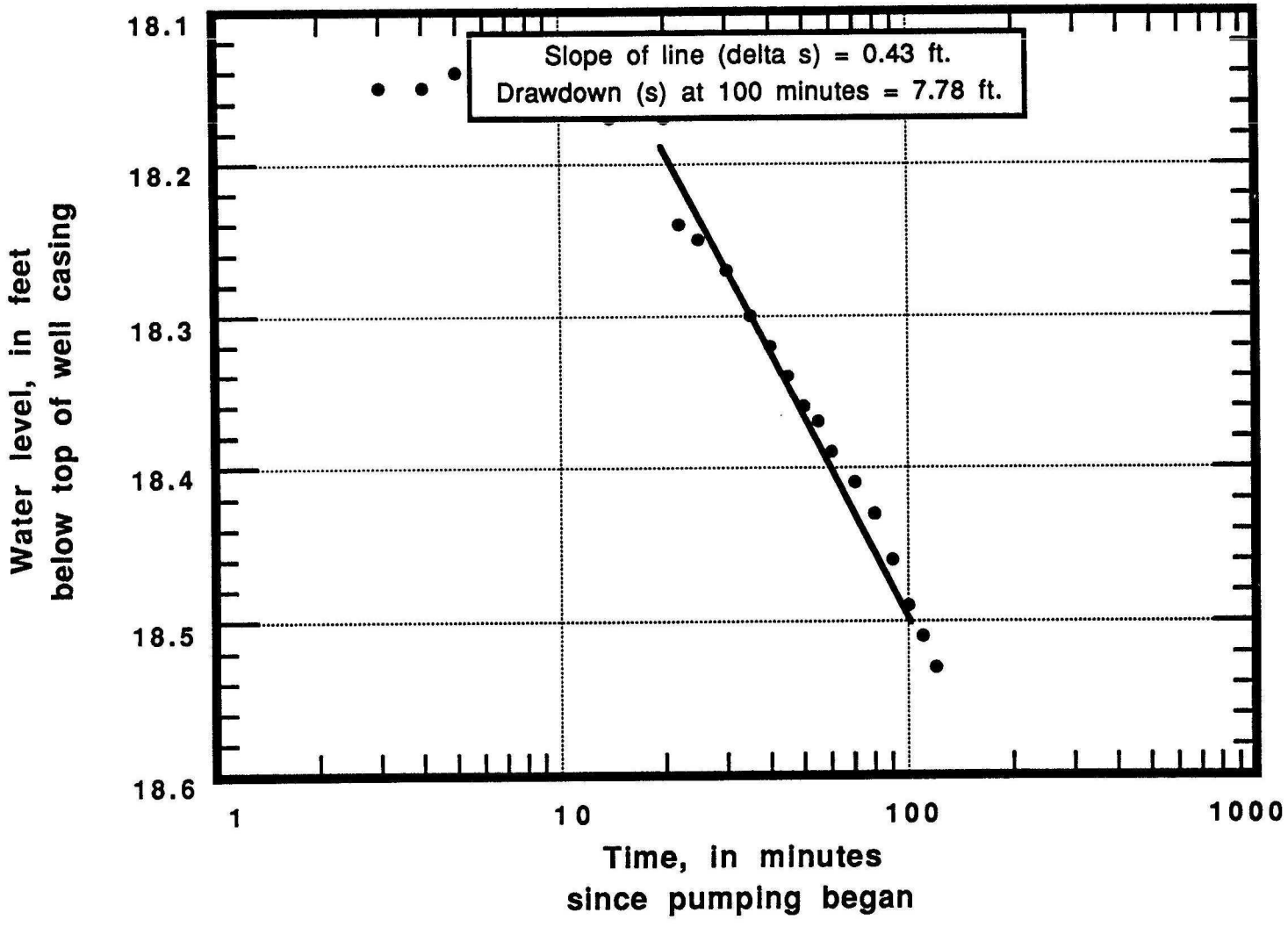
# PUMP TEST
# WELL #13
## Discharge (Q) = 150 g.p.m.



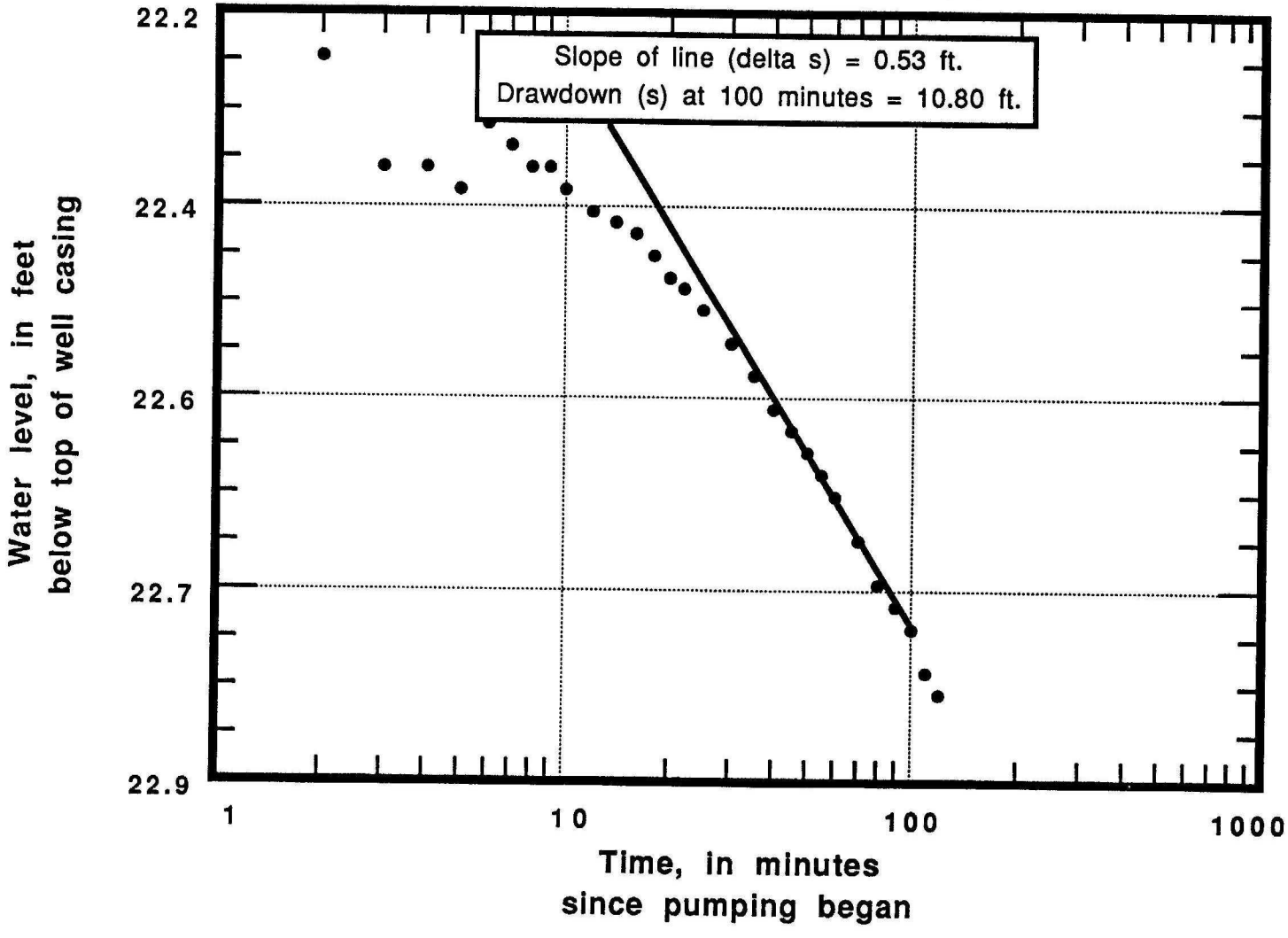
# PUMP TEST
# WELL #14
## Discharge (Q) = 110 g.p.m.



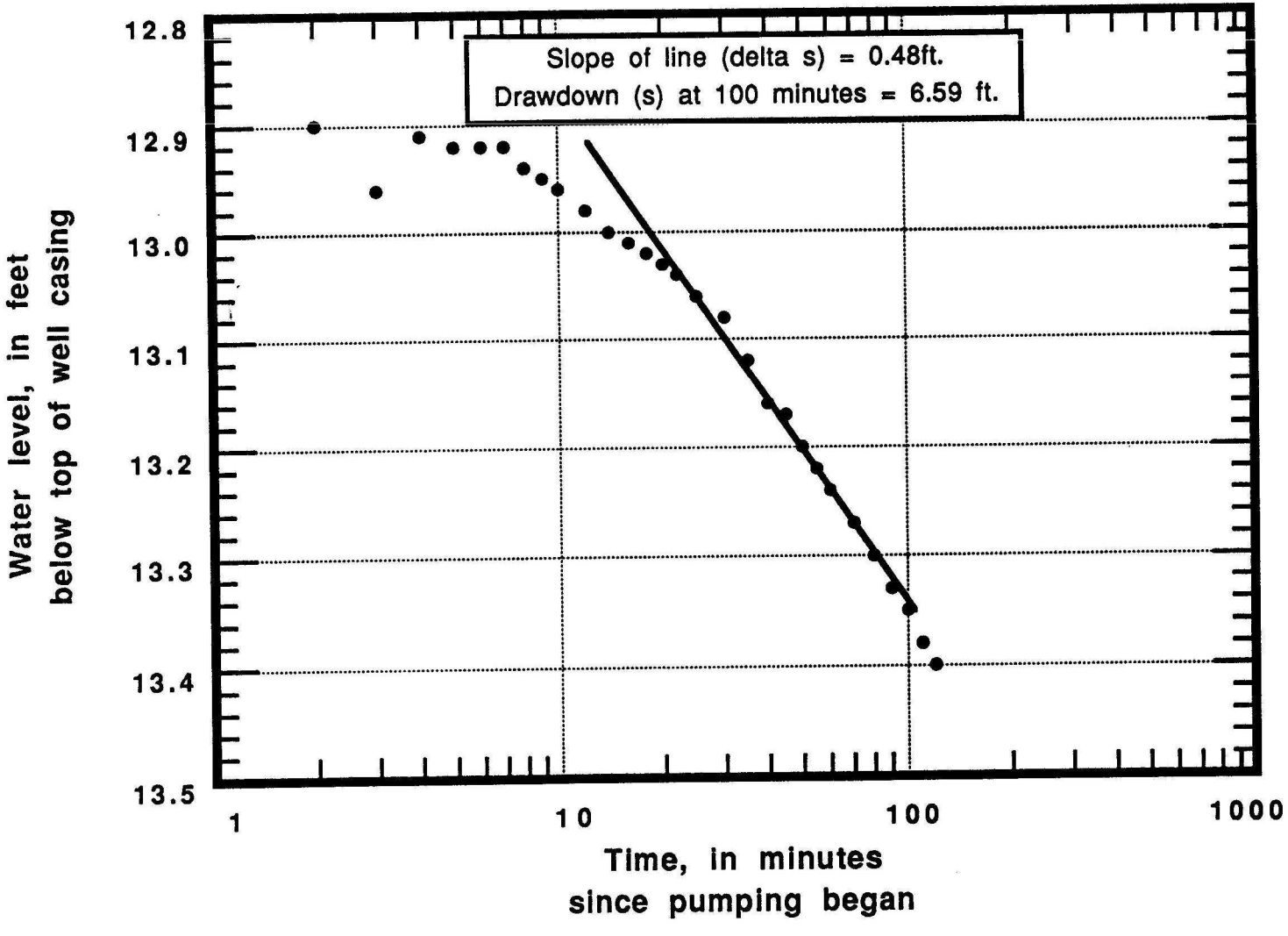
# PUMP TEST
# WELL #15
## Discharge (Q) = 100 g.p.m.



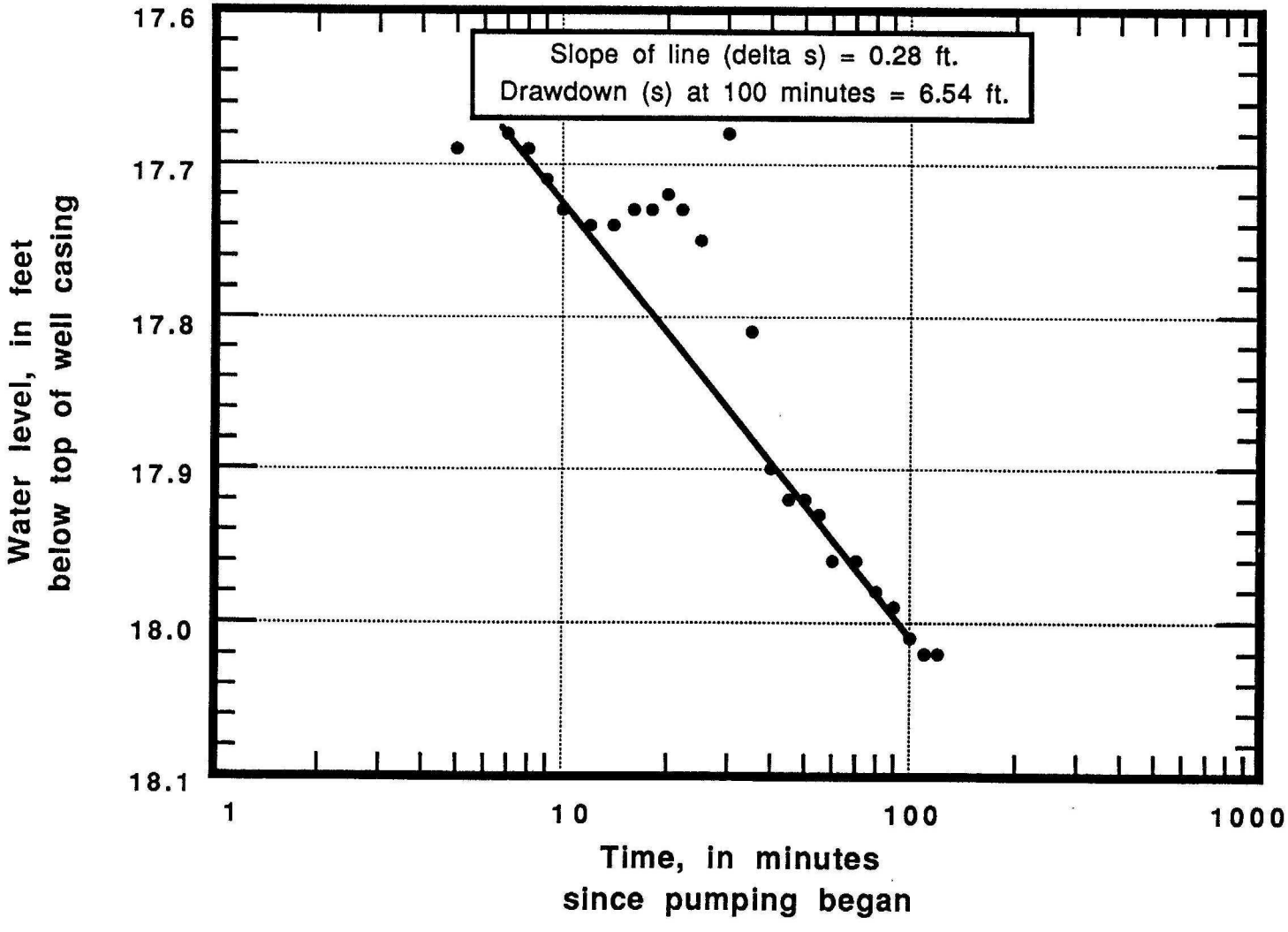
# PUMP TEST
# WELL #16
## Discharge (Q) = 200 g.p.m.



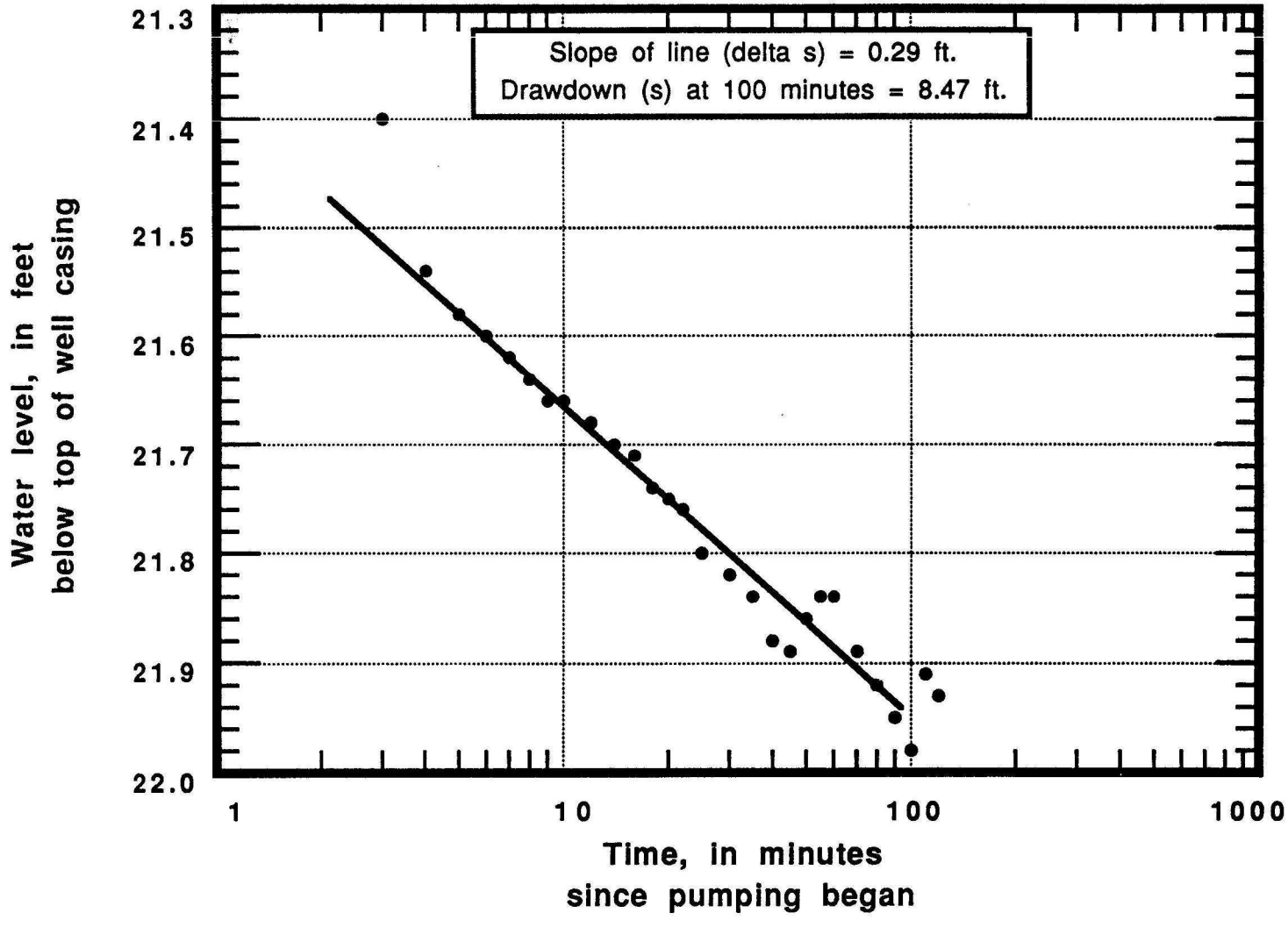
# PUMP TEST
# WELL #17
## Discharge (Q) = 100 g.p.m.

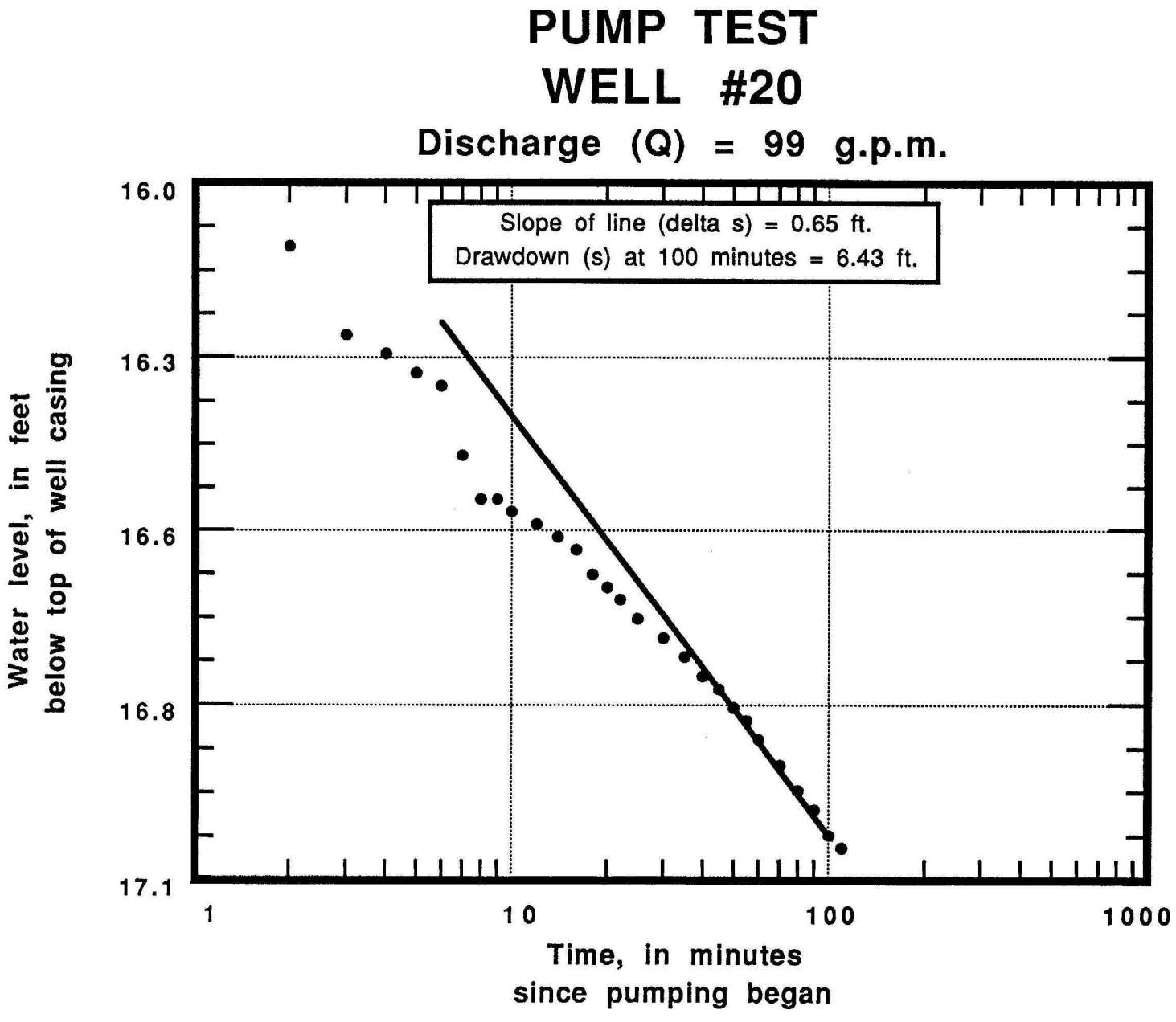


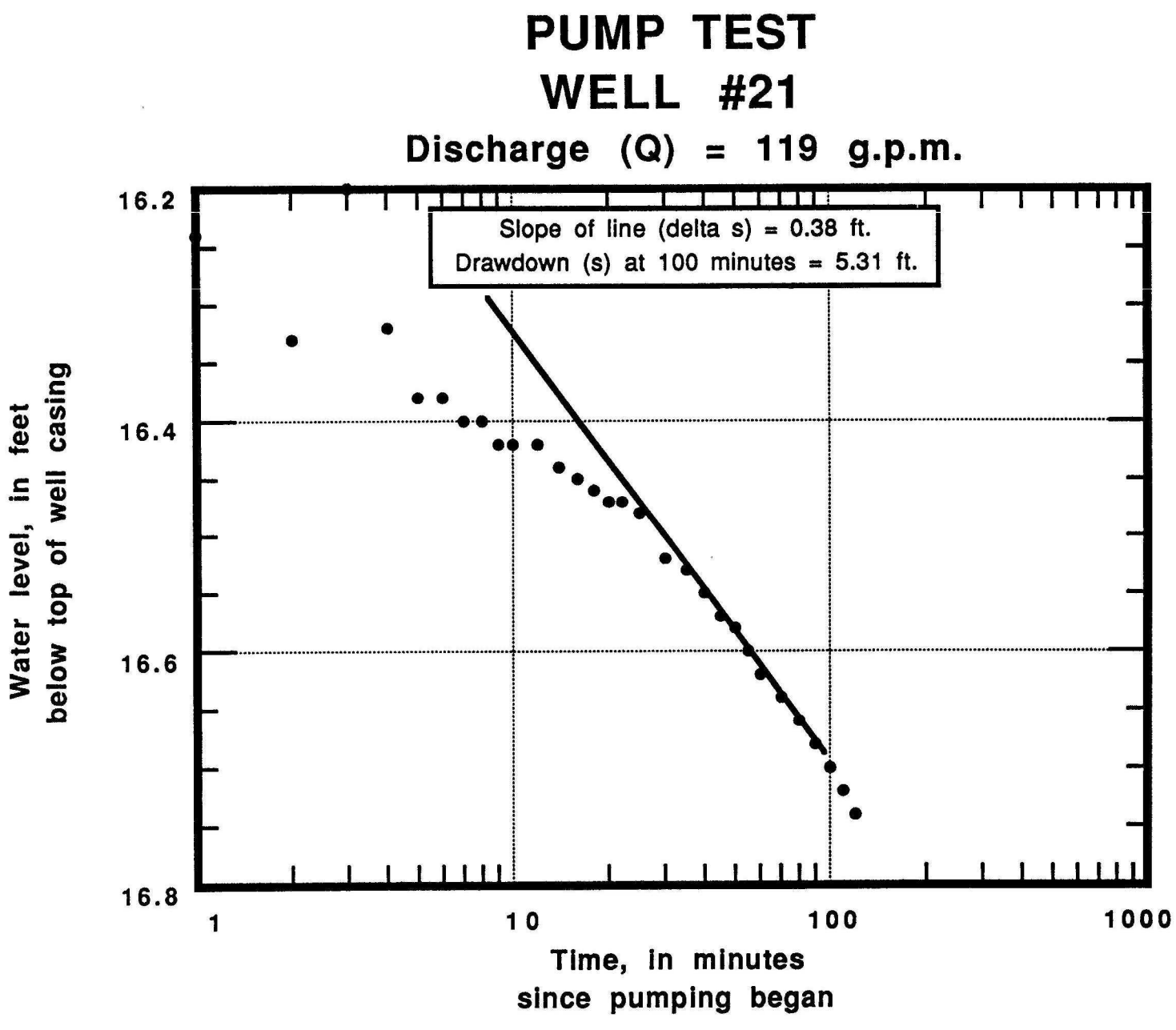
# PUMP TEST
# WELL #18
## Discharge (Q) = 100 g.p.m.

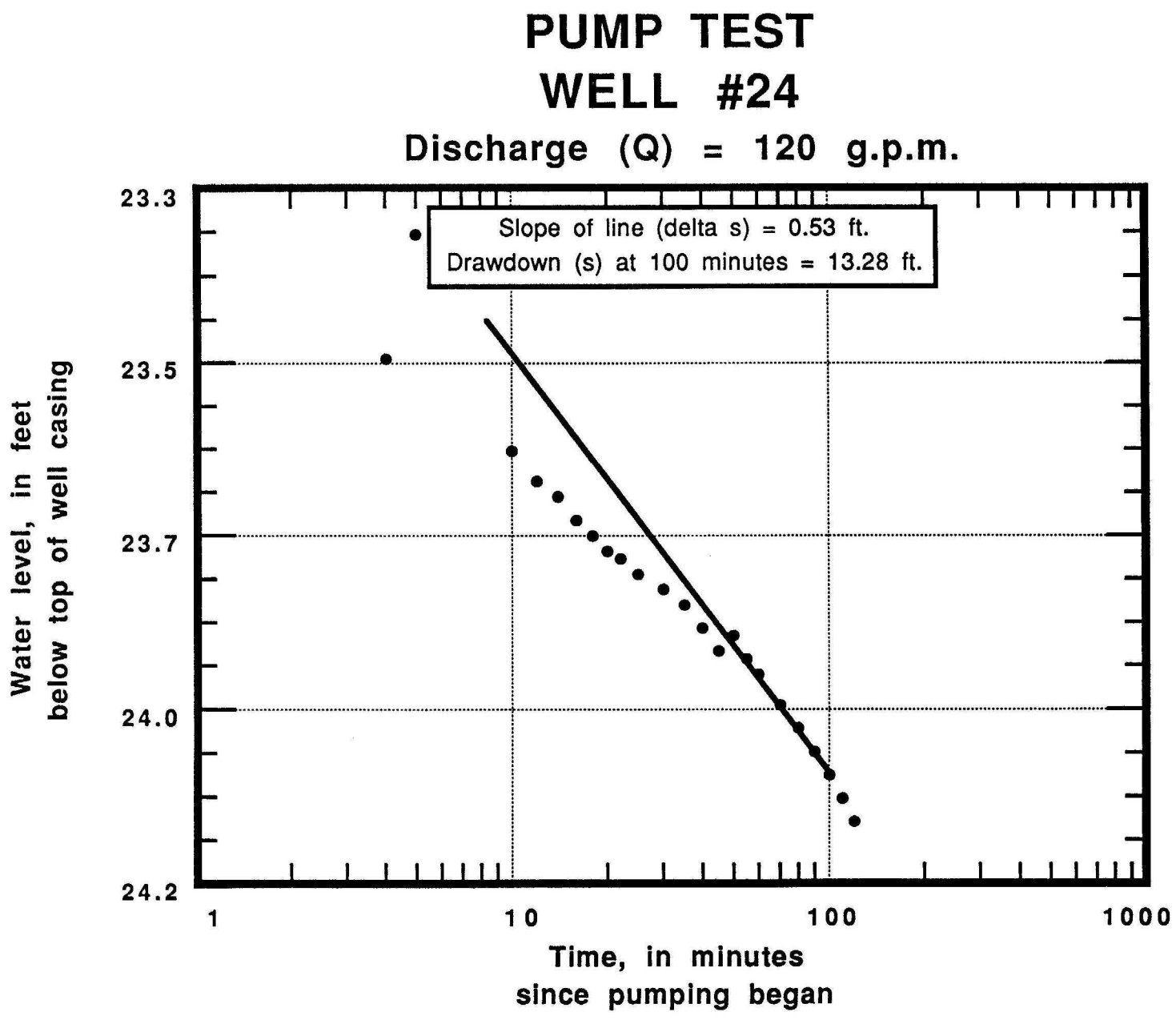


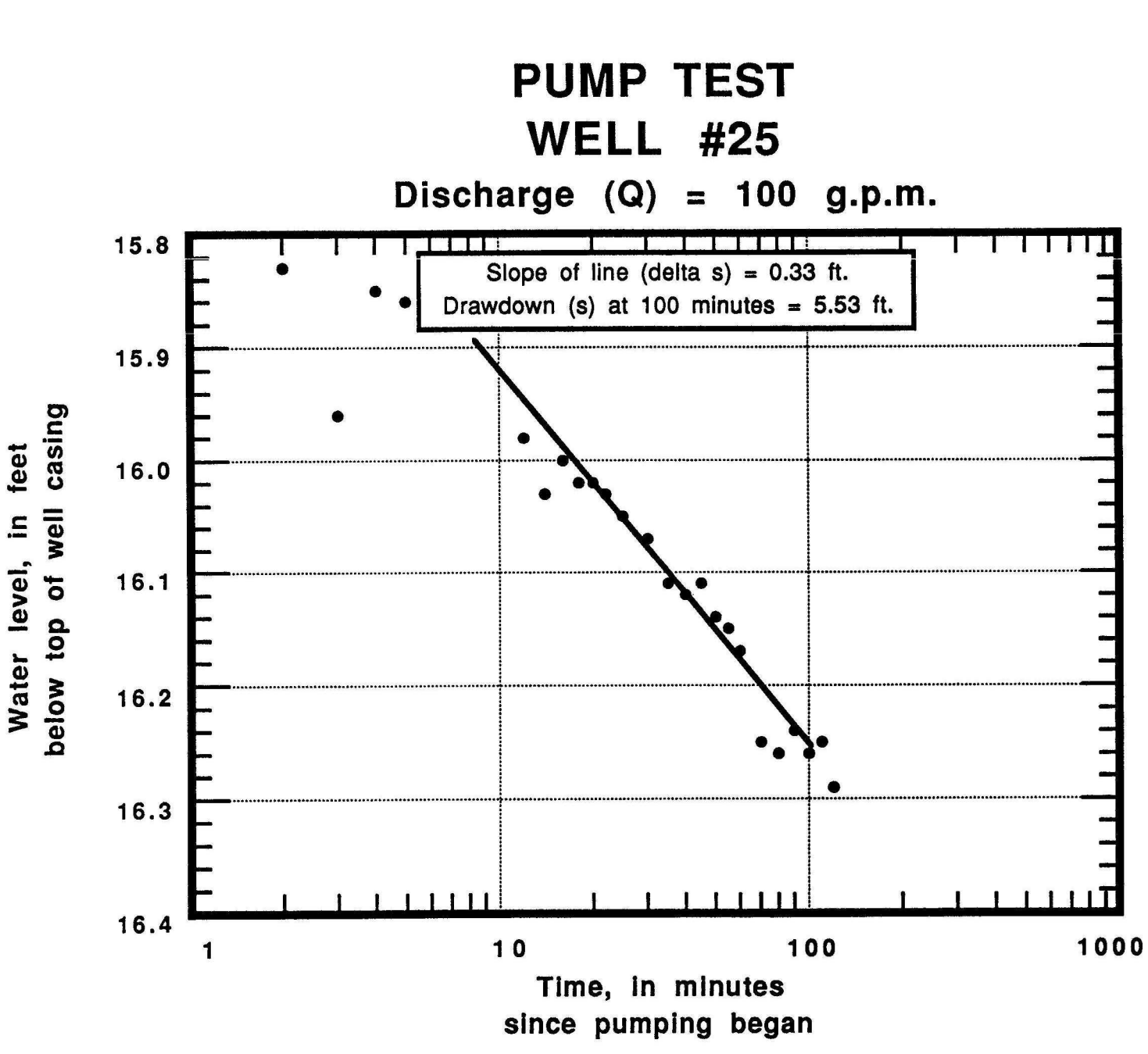
# PUMP TEST
# WELL #19
## Discharge (Q) = 150 g.p.m.

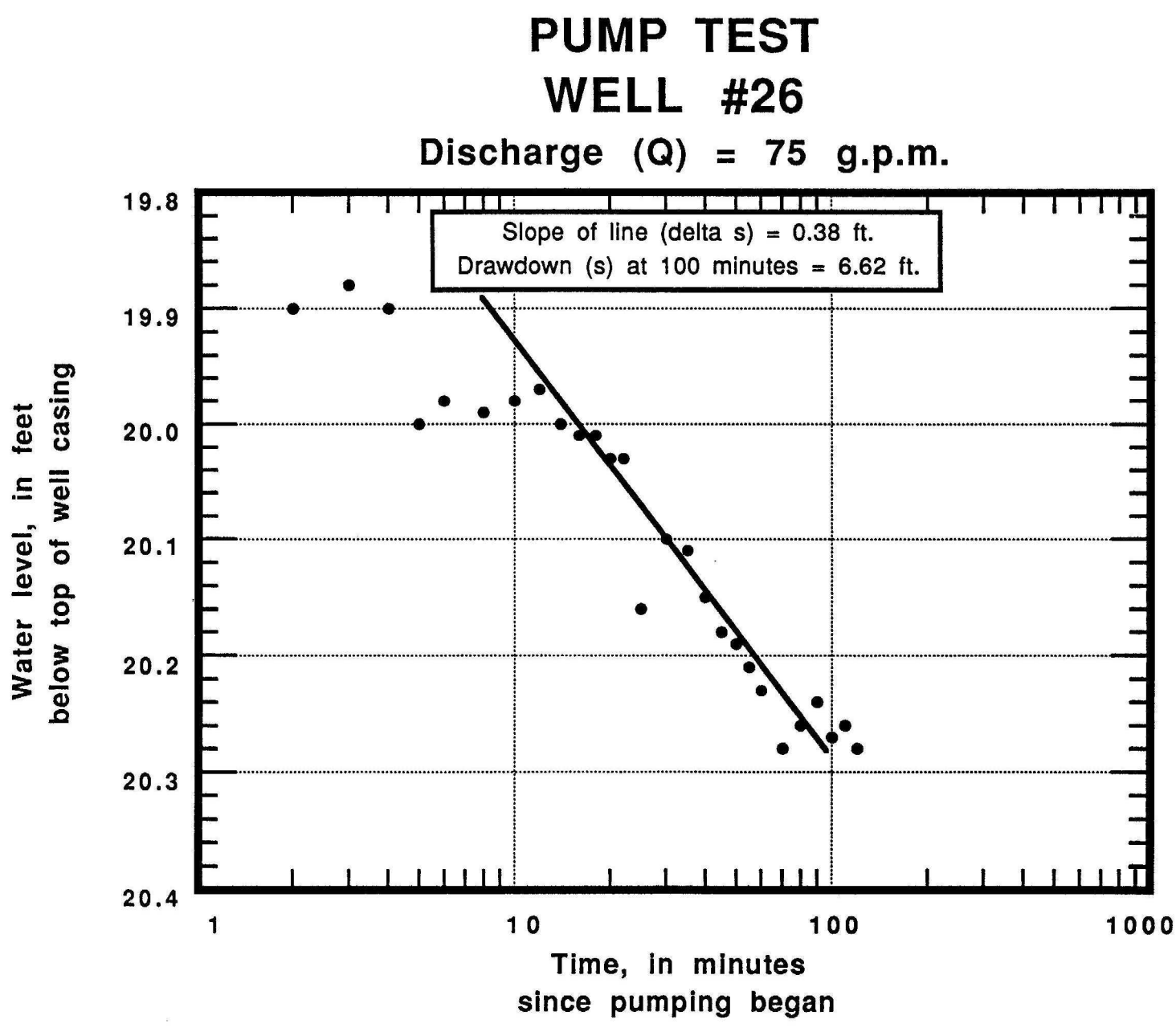



PUMP TEST
WELL #20
Discharge (Q) = 99 g.p.m.
Slope of line (delta s) = 0.65 ft.
Drawdown (s) at 100 minutes = 6.43 ft.
16.0
16.3
16.6
16.8
17.1
Water level, in feet
below top of well casing
1
10
100
1000
Time, in minutes
since pumping began

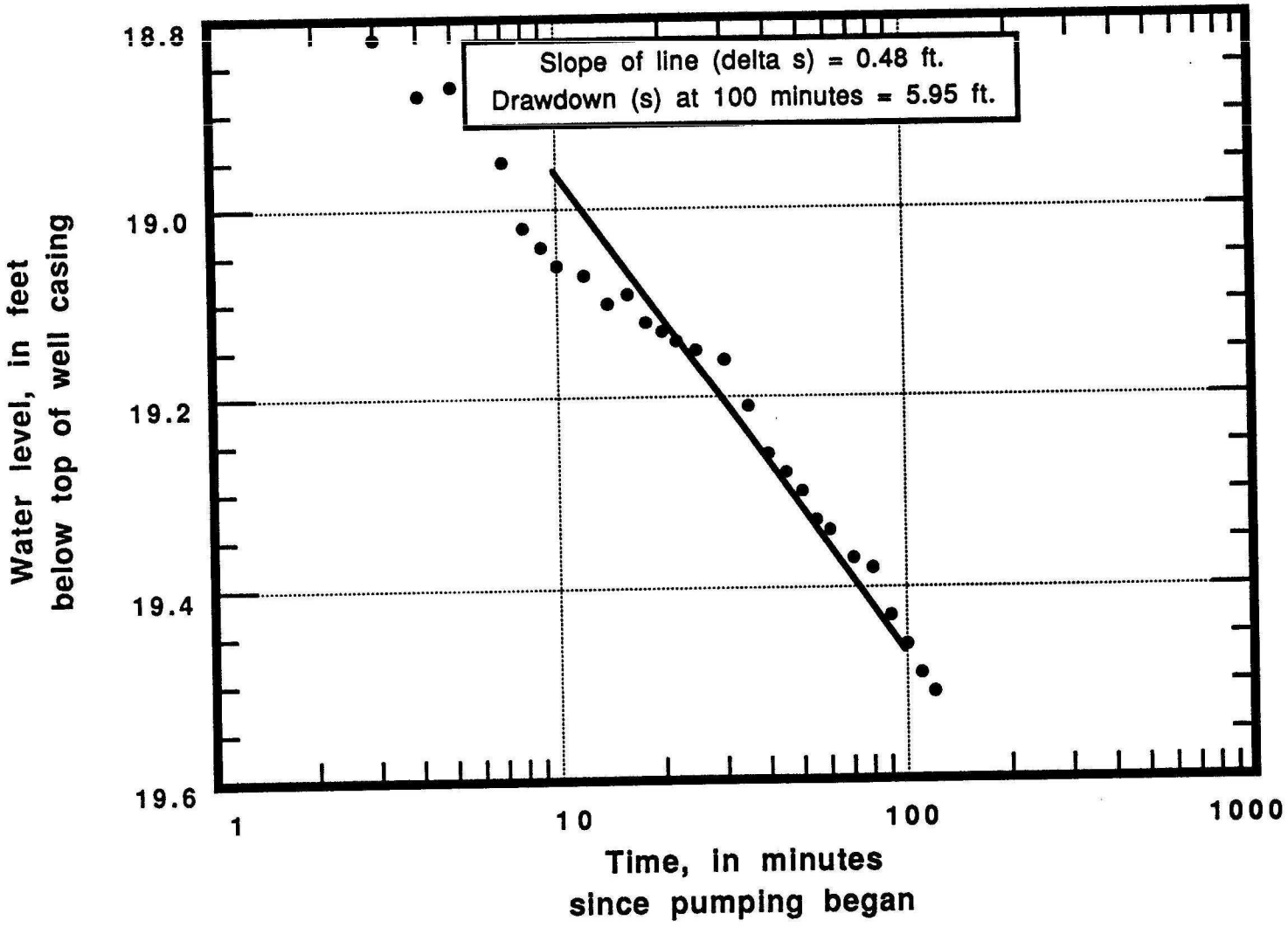

PUMP TEST
WELL #21
Discharge (Q) = 119 g.p.m.
Slope of line (delta s) = 0.38 ft.
Drawdown (s) at 100 minutes = 5.31 ft.
16.2
16.4
16.6
16.8
Water level, in feet
below top of well casing
1
10
100
1000
Time, in minutes
since pumping began


PUMP TEST
WELL #24
Discharge (Q) = 120 g.p.m.
Slope of line (delta s) = 0.53 ft.
Drawdown (s) at 100 minutes = 13.28 ft.
23.3
23.5
23.7
24.0
24.2
Water level, in feet
below top of well casing
1
10
100
1000
Time, in minutes
since pumping began

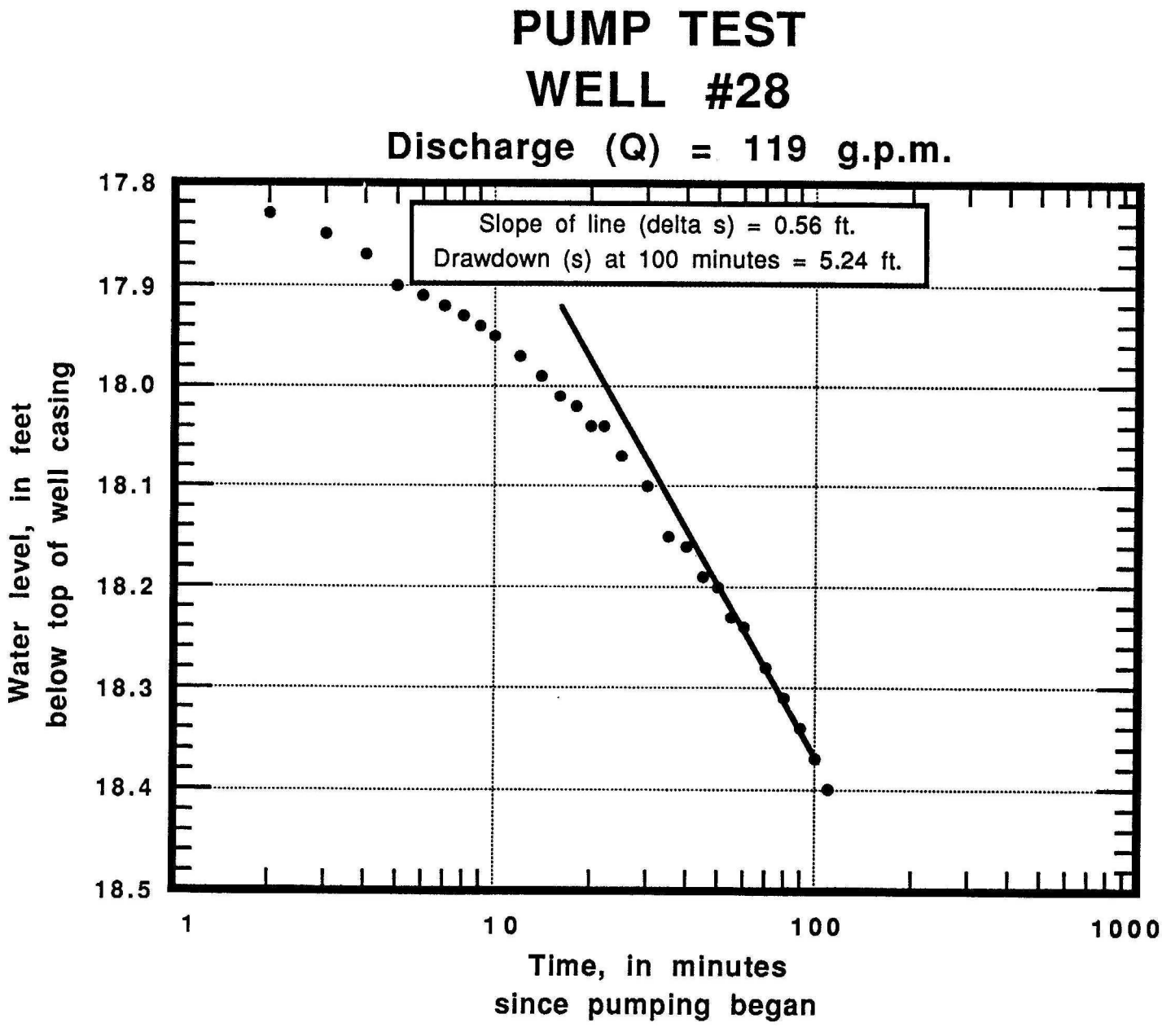

PUMP TEST
WELL #25
Discharge (Q) = 100 g.p.m.
Slope of line (delta s) = 0.33 ft.
Drawdown (s) at 100 minutes = 5.53 ft.
Water level, in feet
below top of well casing
15.8
15.9
16.0
16.1
16.2
16.3
16.4
1
10
100
1000
Time, in minutes
since pumping began


PUMP TEST
WELL #26
Discharge (Q) = 75 g.p.m.
Slope of line (delta s) = 0.38 ft.
Drawdown (s) at 100 minutes = 6.62 ft.
Water level, in feet
below top of well casing
19.8
19.9
20.0
20.1
20.2
20.3
20.4
1
10
100
1000
Time, in minutes
since pumping began

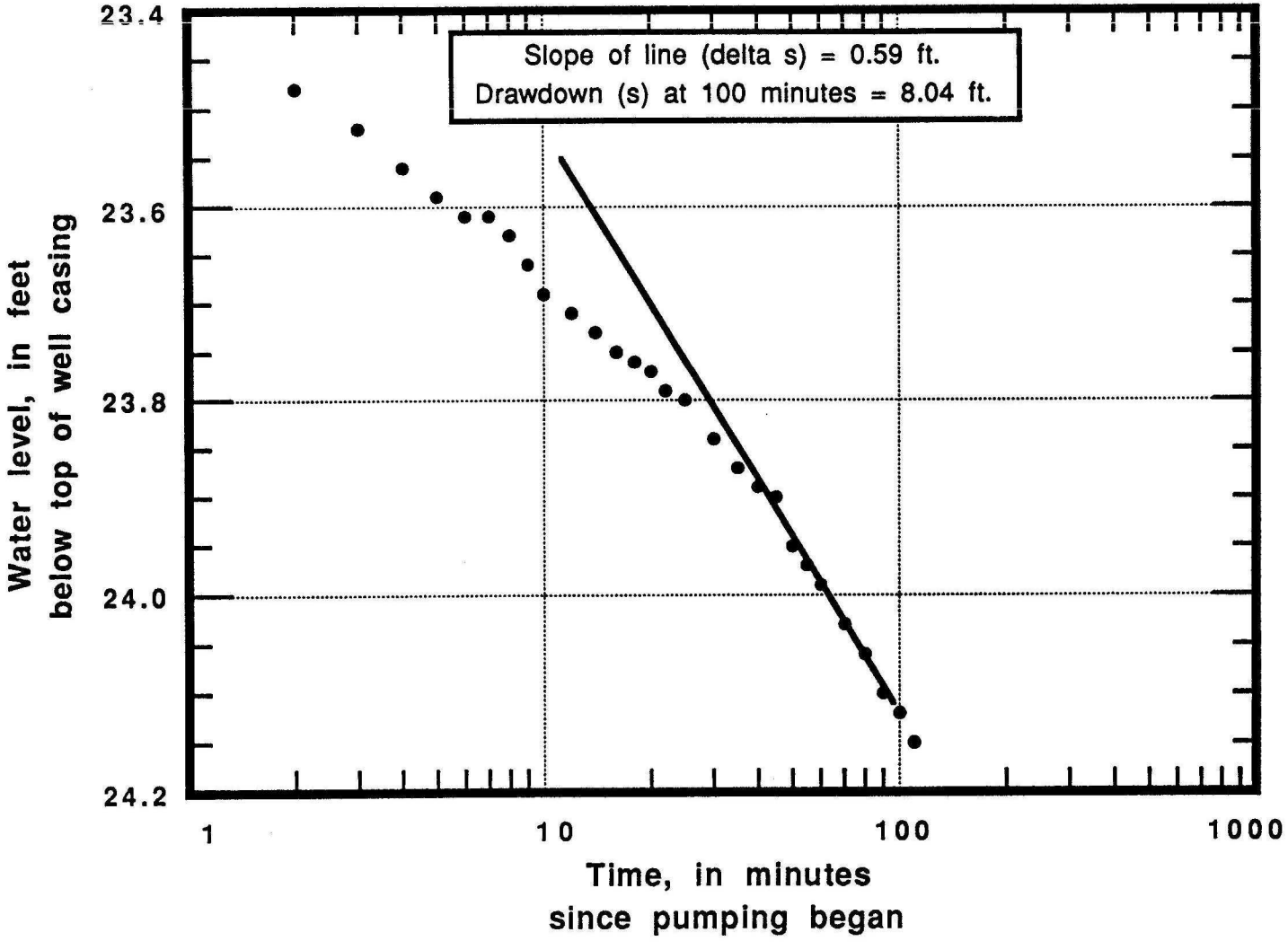
# PUMP TEST
# WELL #27
## Discharge (Q) = 121 g.p.m.



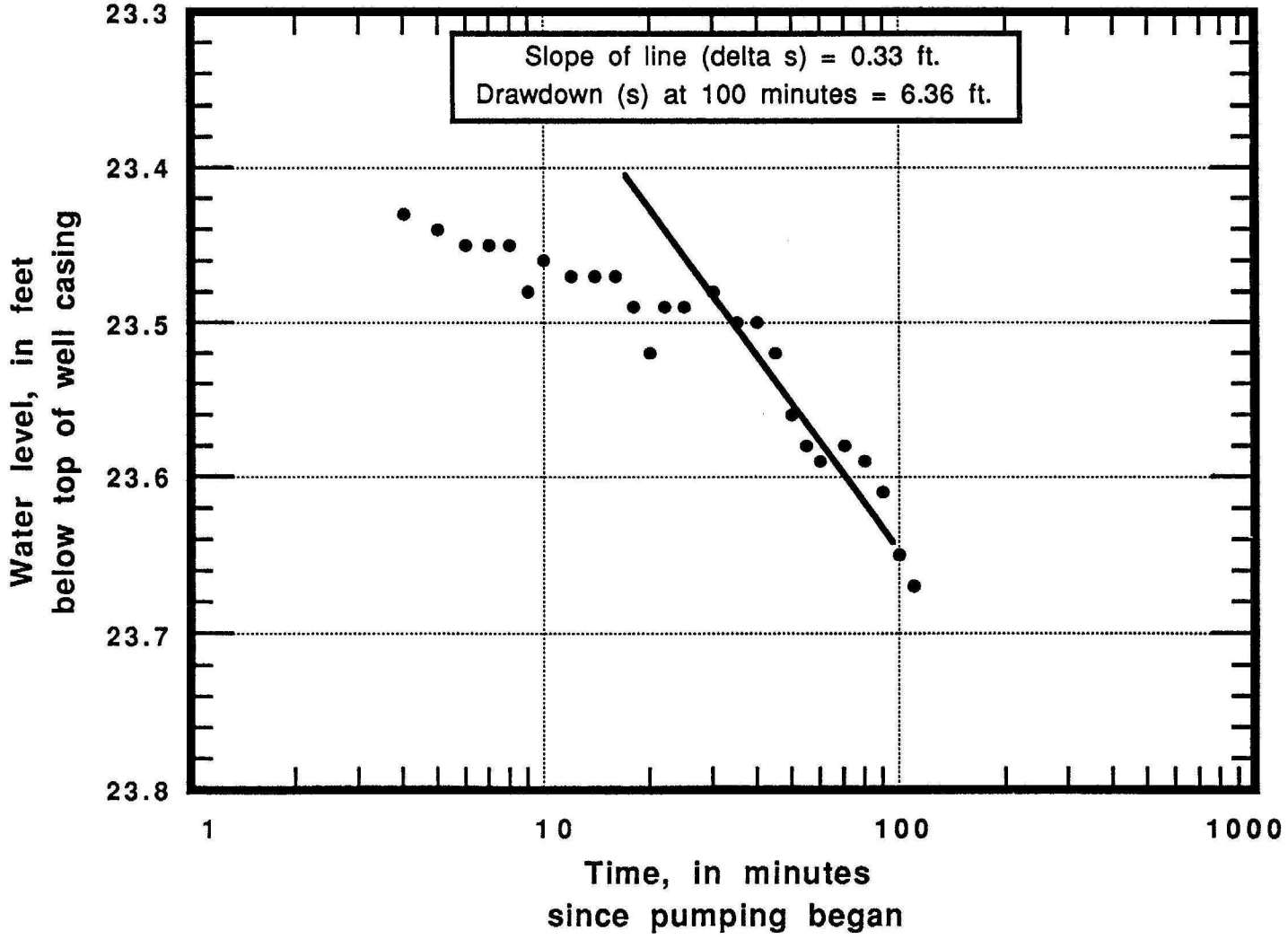

77


PUMP TEST
WELL #28
Discharge (Q) = 119 g.p.m.
Slope of line (delta s) = 0.56 ft.
Drawdown (s) at 100 minutes = 5.24 ft.
17.8
17.9
18.0
18.1
18.2
18.3
18.4
18.5
Water level, in feet below top of well casing
1
10
100
1000
Time, in minutes since pumping began

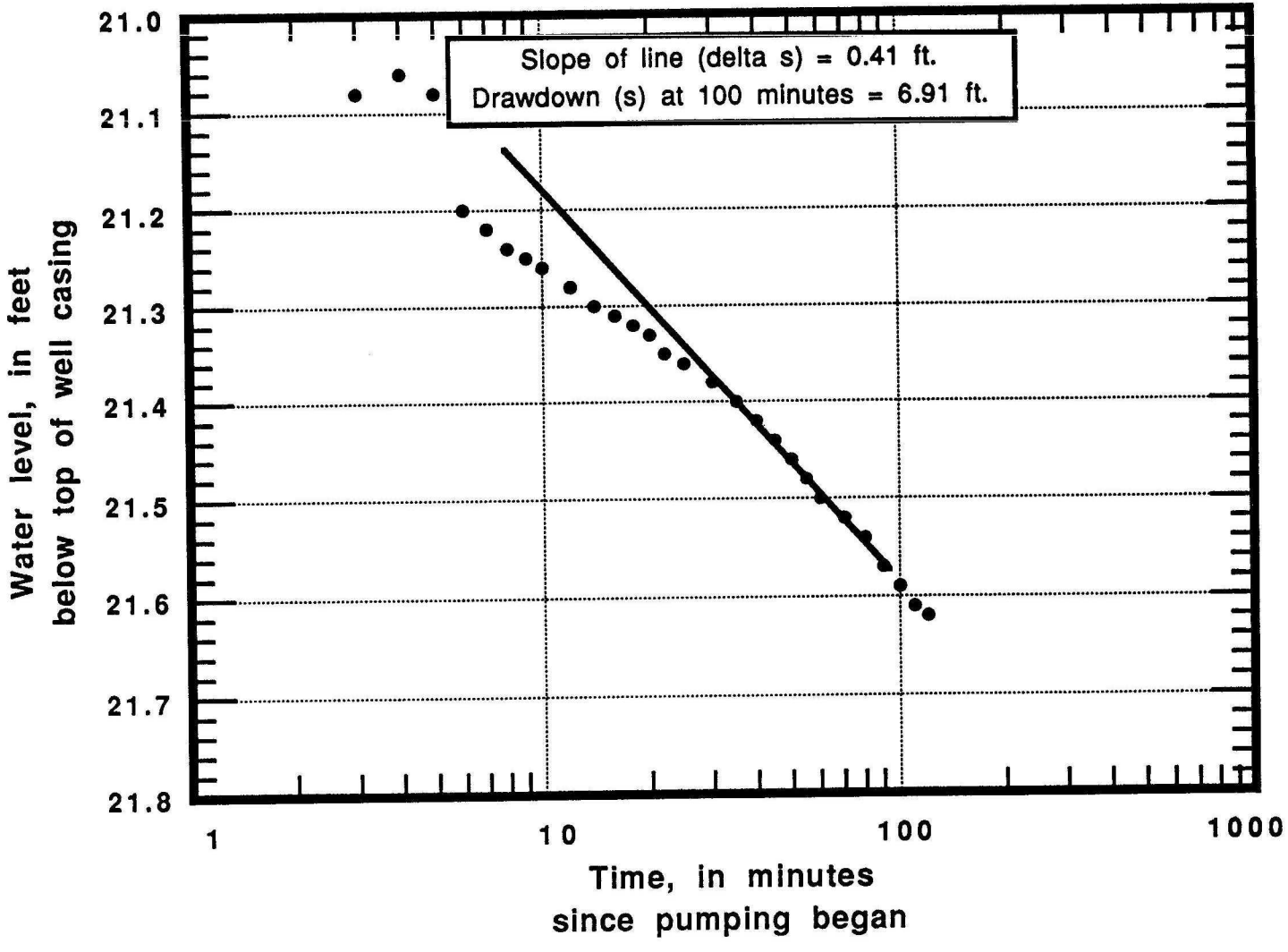
# PUMP TEST
# WELL #30
## Discharge (Q) = 120 g.p.m.



# PUMP TEST
# WELL #31
## Discharge (Q) = 75 g.p.m.



# PUMP TEST
# WELL #32
## Discharge (Q) = 110 g.p.m.



**APPENDIX 3. -- Summarized data and method to calculate sustained pumping rates for production wells 1-21, 24-28, and 30-32**

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 1

**1).** AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 18.39

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 9.80
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 28.19

**2).** SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.45

**3).** PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 250

**4).** DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 8.10

**5).** INITIAL SATURATED THICKNESS (m) (Ft.) : 27.39

**6).** CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 3

**7).** ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=267 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 2

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 22.15

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 11.54
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 33.69

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.26

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 250

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 8.00

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 32.15

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 3.2

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\ (s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\ (6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=403 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 3

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 18.87

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 9.32
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 28.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.15

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 277

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 4.34

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 27.87

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 3

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=661 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 4

**1).** AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 11.99

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 12.20
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 24.19

**2).** SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.34

**3).** PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 160

**4).** DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 5.80

**5).** INITIAL SATURATED THICKNESS (m) (Ft.) : 18.99

**6).** CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 3

**7).** ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=113 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 5

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 14.81

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 11.38
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 26.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.36

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 180

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 6.32

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 21.81

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 2

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=193 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 6

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 22.47

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 10.72
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 33.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.19

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 340

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 11.54

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 33.47

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 3

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=434 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 7

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 17.91

   A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 8.78
   B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 26.69

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.36

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 150

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 7.65

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 32.91

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 4.5

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=151 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 8

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 17.16

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 11.03
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 28.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.32

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 150

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 10.44

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 31.16

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 4.5

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=113 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 9

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 16.27

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 10.92
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 27.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.42

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 250

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 5.66

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 24.27

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 4

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=260 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 10

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 15.35

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 8.84
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 24.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.30

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 225

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 6.66

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 23.35

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 4

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=210 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 11

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 17.01

A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 10.18
B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 27.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.43

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 150

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 7.78

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 25.01

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 4

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=134 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 12

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 15.64

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 10.55
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 26.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.40

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 150

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 7.74

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 23.64

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 4.5

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\ (s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\ (6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=112 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 13

**1).** AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 17.86

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 9.96
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 27.82

**2).** SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.53

**3).** PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 150

**4).** DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 8.91

**5).** INITIAL SATURATED THICKNESS (m) (Ft.) : 25.86

**6).** CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 4

**7).** ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=123 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 14

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 15.60

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 10.22
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 25.82

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.69

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 110

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 11.14

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 22.60

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 4

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\ (s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\ (6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=54 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 15

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 15.11

   A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 10.71
   B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 25.82

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.43

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 100

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 7.78

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 23.11

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 2

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=90 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 16

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 16.86

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 11.96
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 28.82

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.53

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 200

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 10.80

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 24.86

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 3

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=142 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 17

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 14.06

   A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 6.76
   B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 20.82

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.48

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 100

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 6.59

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 20.06

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 2

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=85 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 18

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 14.35

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 11.47
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 25.82

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.28

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 100

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 6.54

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 21.35

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 2

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=108 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 19

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 15.34

A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 13.48
B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 28.82

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.29

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 150

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 8.50

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 22.34

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 2

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\ (s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\ (6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=145 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 20

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 12.59

   A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 10.60
   B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 23.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.65

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 99

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 6.43

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 18.59

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\ (s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\ (6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=69 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 21

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 12.80

   **A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 11.39
   **B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 24.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.38

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 119

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 5.31

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 18.80

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final} = \frac{Q_{test}\,(s_{avail.} - (s_{interf.} + s_{nat.}))}{(\Delta s)\,(6.75) + s_{100min.} + \frac{(\Delta s(6.75))^2}{m - s_{100min.}}}$$

$Q_{final}$ = 125 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 24

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 18.41

   **A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 10.78
   **B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 29.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.53

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 120

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 13.28

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 27.41

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\ (s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\ (6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=97 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 25

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 14.47

A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 10.72
B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 25.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.33

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 100

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 5.54

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 21.47

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=130 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 26

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 11.15

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 13.67
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 24.82

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.38

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 75

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 6.60

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 17.15

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=55 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 27

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 11.31

A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 13.51
B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 24.82

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.48

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 121

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 5.95

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 16.31

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final} = \frac{Q_{test}\,(s_{avail.} - (s_{interf.} + s_{nat.}))}{(\Delta s)\,(6.75) + s_{100min.} + \frac{(\Delta s(6.75))^2}{m - s_{100min.}}}$$

$Q_{final}$ = 87 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 28

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 13.06

**A).** STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 13.13
**B).** DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 26.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.56

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 119

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 5.24

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 20.06

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=108 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 30

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 13.99

A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 16.20
B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 30.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.59

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 120

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 7.92

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 20.99

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final} = \frac{Q_{test}\,(s_{avail.} - (s_{interf.} + s_{nat.}))}{(\Delta s)\,(6.75) + s_{100min.} + \frac{(\Delta s(6.75))^2}{m - s_{100min.}}}$$

$Q_{final}$ = 91 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 31

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 11.40

A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 17.29
B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 28.69

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.33

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 75

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 6.36

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 17.40

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\ (s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\ (6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=61 G.P.M.

## CALCULATION OF PUMPING RATE ($Q_{final}$)

**WELL NUMBER :** 32

1). AVAILABLE DRAWDOWN TO TOP OF SCREEN ($s_{avail.}$) (Ft.) : 12.51

A). STATIC WATER LEVEL BELOW TOP OF CASING (Ft.) : 14.68
B). DEPTH BELOW TOP OF CASING TO TOP OF SCREEN (Ft.) 27.19

2). SLOPE OF SEMILOGARITHMIC TIME VERSUS DRAWDOWN PLOT FOR FIRST 100 MINUTES OF TWO HOUR PUMP TEST ($\Delta s$) (Ft.) : 0.41

3). PUMPING RATE OF TWO HOUR PUMP TEST ($Q_{test}$) (G.P.M.) : 110

4). DRAWDOWN AFTER 100 MINUTES OF PUMPING DURING TWO HOUR PUMP TEST ($s_{100min.}$) (Ft.) : 6.91

5). INITIAL SATURATED THICKNESS (m) (Ft.) : 19.51

6). CALCULATED INTERFERENCE FROM OTHER WELLS ($s_{interf.}$) (Ft.) : 1

7). ESTIMATED NATURAL WATER TABLE DECLINE OVER A TYPICAL IRRIGATION SEASON ($s_{nat.}$) (Ft.) : 3

**FORMULA**

$$Q_{final}=\frac{Q_{test}\,(s_{avail.}-(s_{interf.}+s_{nat.}))}{(\Delta s)\,(6.75)+s_{100min.}+\frac{(\Delta s(6.75))^2}{m-s_{100min.}}}$$

$Q_{final}$=91 G.P.M.

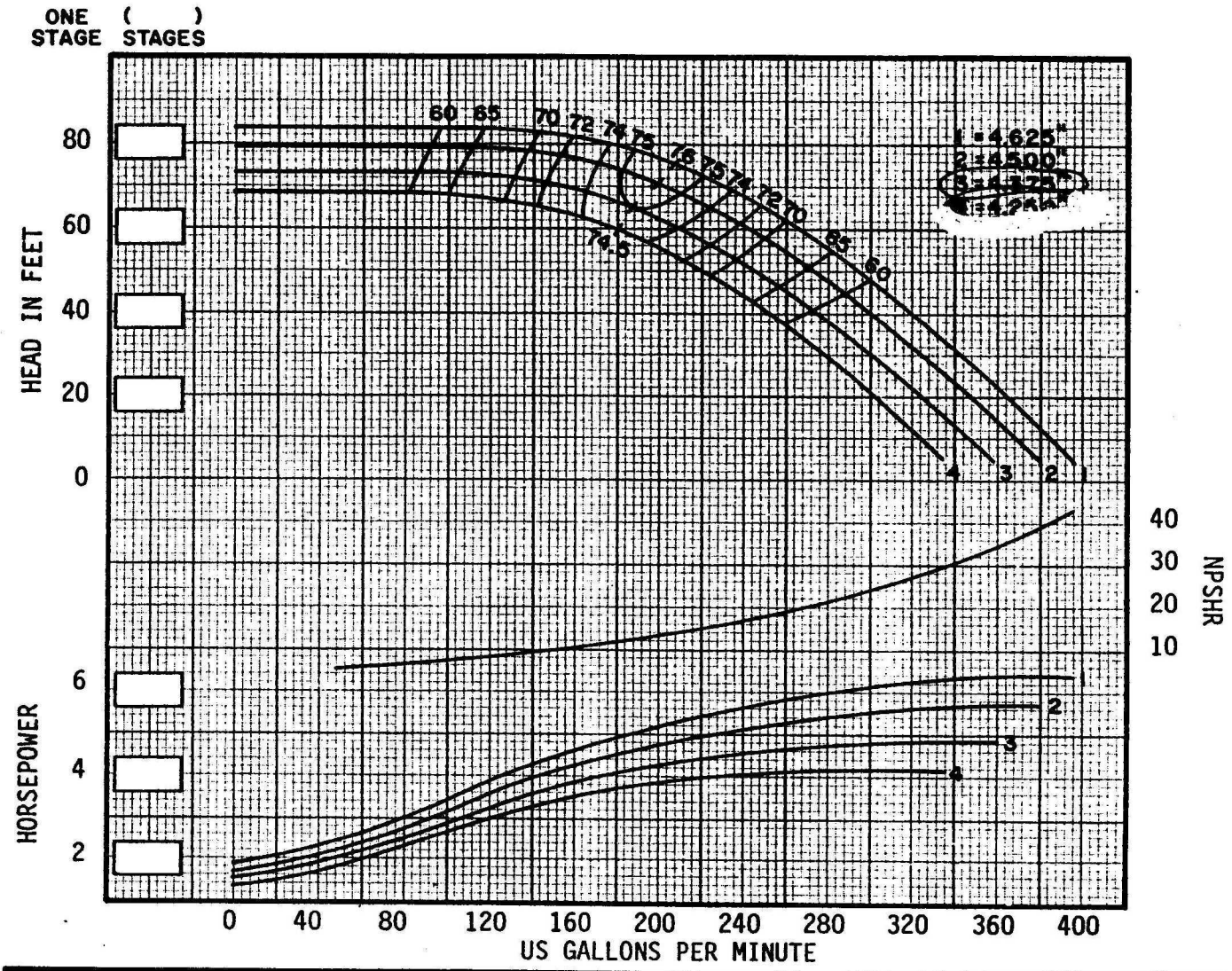
**APPENDIX 4. -- Pump curves for pumps in production wells 1-21, 24-28, and 30-32**

# SIMMONS SS6H

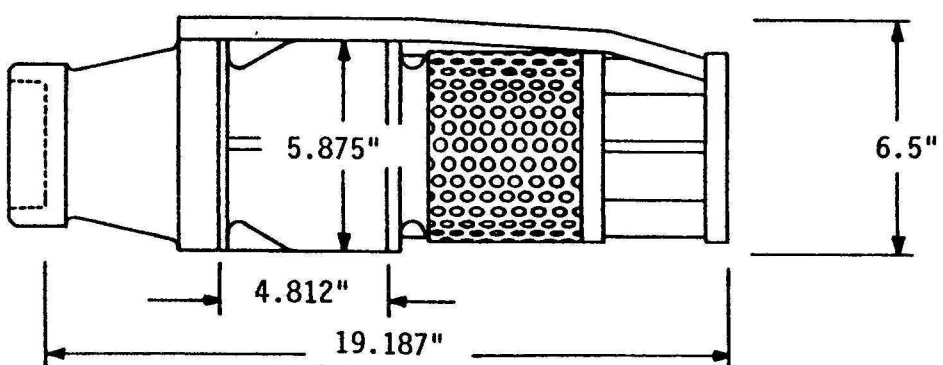
Well #1
5 H.P.
2506PM → 39'
3450 R.P.M.

1 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 1.00" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 3" - 4" | IMPELLER NO. | = SS6H | | |
| ONE STAGE WT.-LBS. | = 55 | MAX. SPHERE SIZE | = 0.375" | 1 | -4 |
| ADD'L STAGE WT. | = 18.7 | K-FACTOR, MAX. | = 2.36 | 2 | -3 |
| IMPELLER WT.-LBS. | = 2.75 | MAX. OPERATING PSIG | = 341 | 3 | -2 |
| ONE STAGE $WR^2$ | = 0.034 | MIN. SUBMERGENCE | = 11" | 4 | -1 |
| SPECIFIC SPEED | = 2011 | IMPELLER EYE AREA | = 5.695 Sq. In. | 5 | 0 |

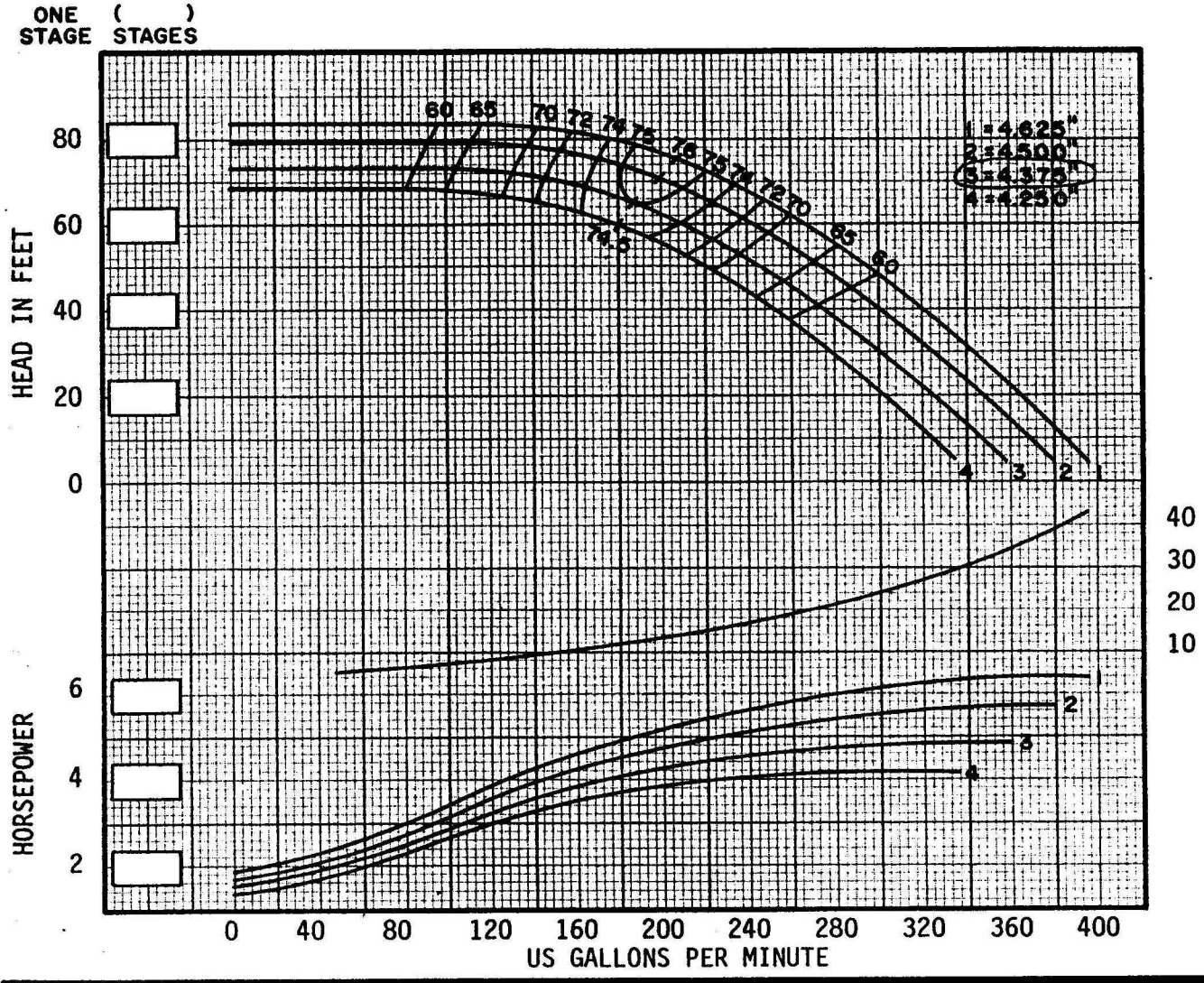


# SIMMONS SS6H

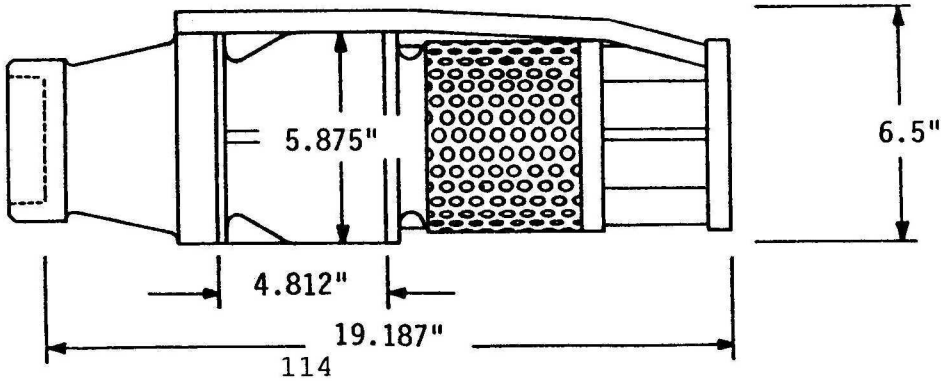
Well #2
5 H.P.
2906PM → 42'
3450 R.P.M.

1 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6H | | |
| ONE STAGE WT.-LBS.= 55 | MAX. SPHERE SIZE = 0.375" | 1 | -4 |
| ADD'L STAGE WT. = 18.7 | K-FACTOR, MAX. = 2.36 | 2 | -3 |
| IMPELLER WT.-LBS. = 2.75 | MAX. OPERATING PSIG = 341 | 3 | -2 |
| ONE STAGE WR$^2$ = 0.034 | MIN. SUBMERGENCE = 11" | 4 | -1 |
| SPECIFIC SPEED = 2011 | IMPELLER EYE AREA = 5.695 Sq. In. | 5 | 0 |



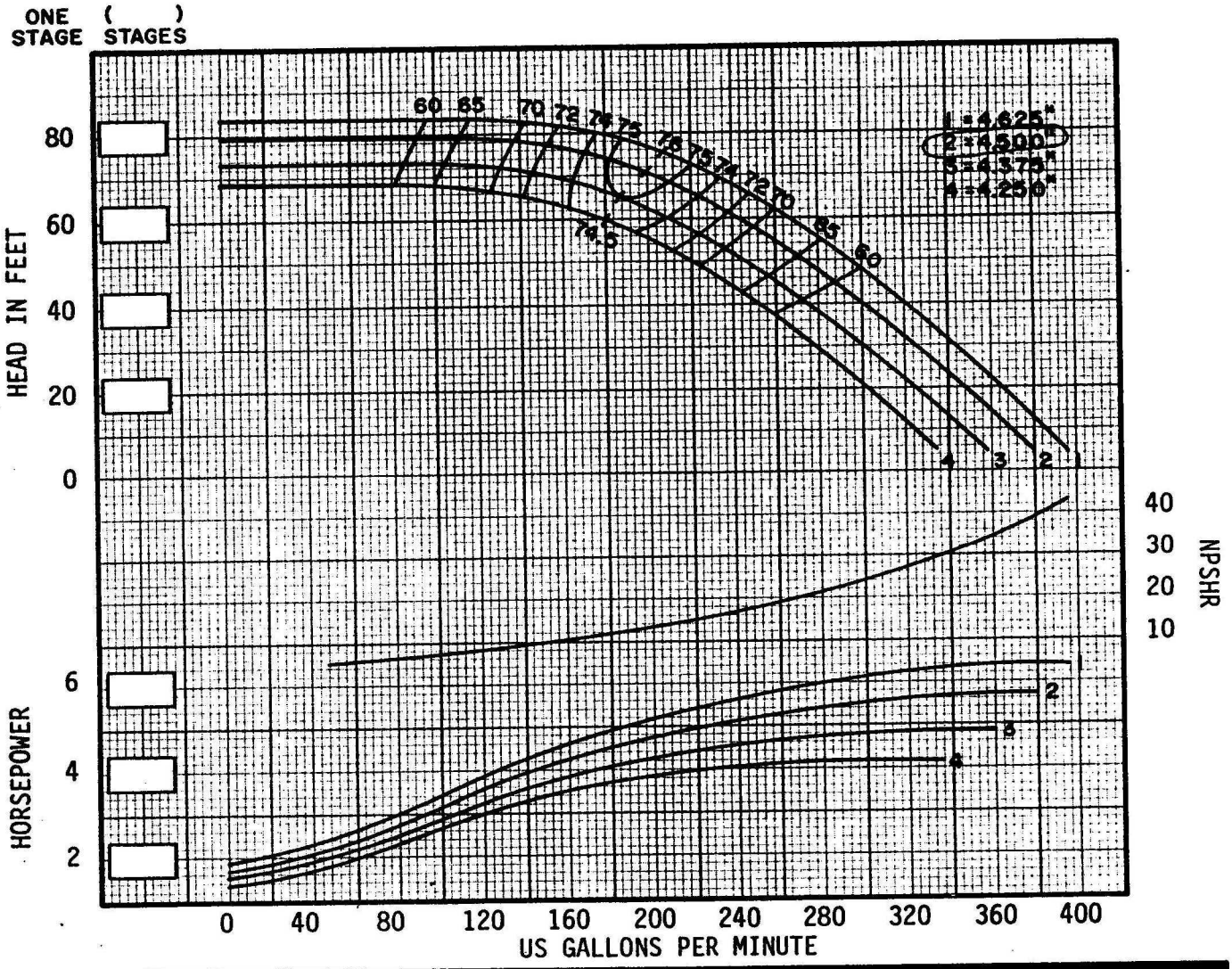
# SIMMONS SS6H

Well #3
5 H.P.
3106PM → 35'

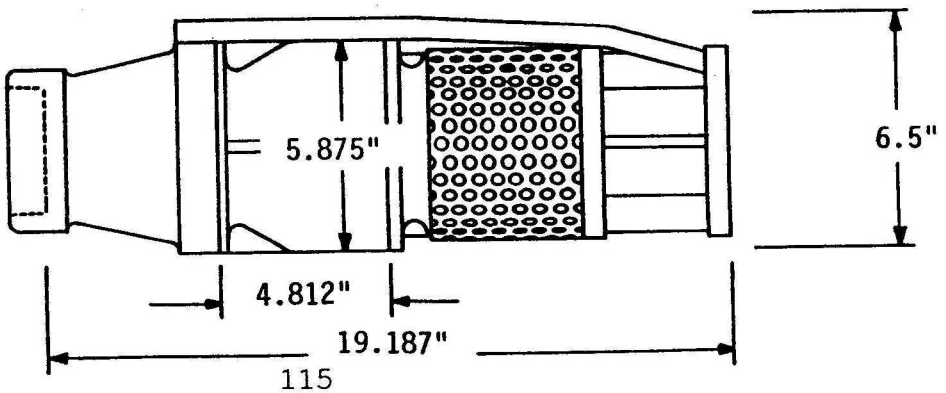
1 STAGE

3450 R.P.M.

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 1.00" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 3" - 4" | IMPELLER NO. | = SS6H | 1 | -4 |
| ONE STAGE WT.-LBS. | = 55 | MAX. SPHERE SIZE | = 0.375" | 2 | -3 |
| ADD'L STAGE WT. | = 18.7 | K-FACTOR, MAX. | = 2.36 | 3 | -2 |
| IMPELLER WT.-LBS. | = 2.75 | MAX. OPERATING PSIG | = 341 | 4 | -1 |
| ONE STAGE WR$^2$ | = 0.034 | MIN. SUBMERGENCE | = 11" | 5 | 0 |
| SPECIFIC SPEED | = 2011 | IMPELLER EYE AREA | = 5.695 Sq. In. | | |



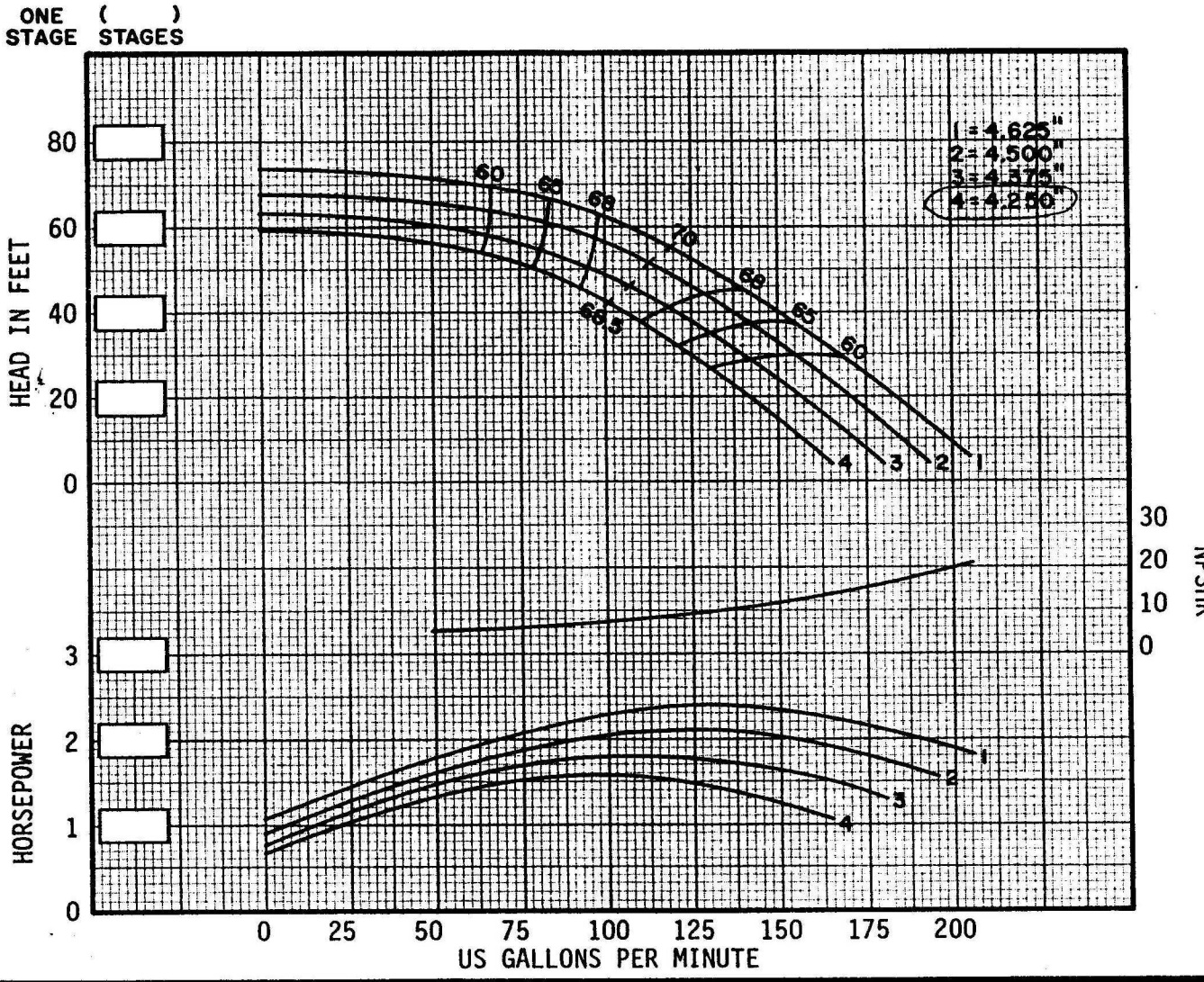
# SIMMONS SS6L

Well #4
1.5 H.P.
1266PM → 27'

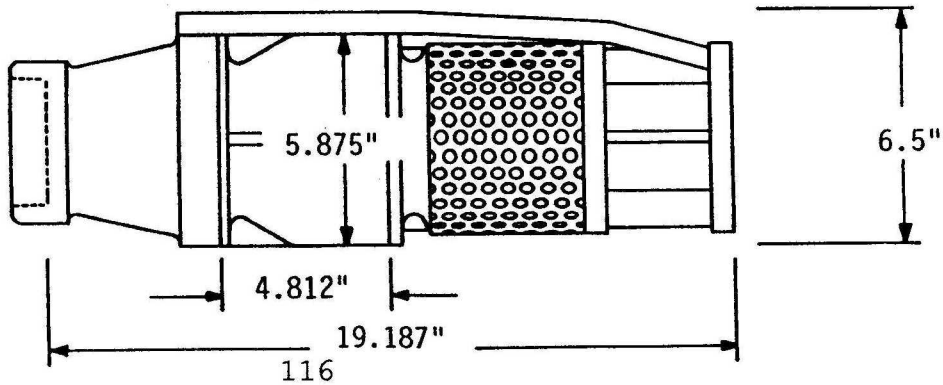
1 STAGE

3450 R.P.M.

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 1.00" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 3" - 4" | IMPELLER NO. | = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS. | = 55 | MAX. SPHERE SIZE | = 0.375" | 2 | -3 |
| ADD'L STAGE WT. | = 18.5 | K-FACTOR, MAX. | = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. | = 2.55 | MAX. OPERATING PSIG | = 341 | 4 | -1 |
| ONE STAGE WR$^2$ | = 0.037 | MIN. SUBMERGENCE | = 11" | 5 | 0 |
| SPECIFIC SPEED | = 1842 | IMPELLER EYE AREA | = 4.749 Sq. In. | | |

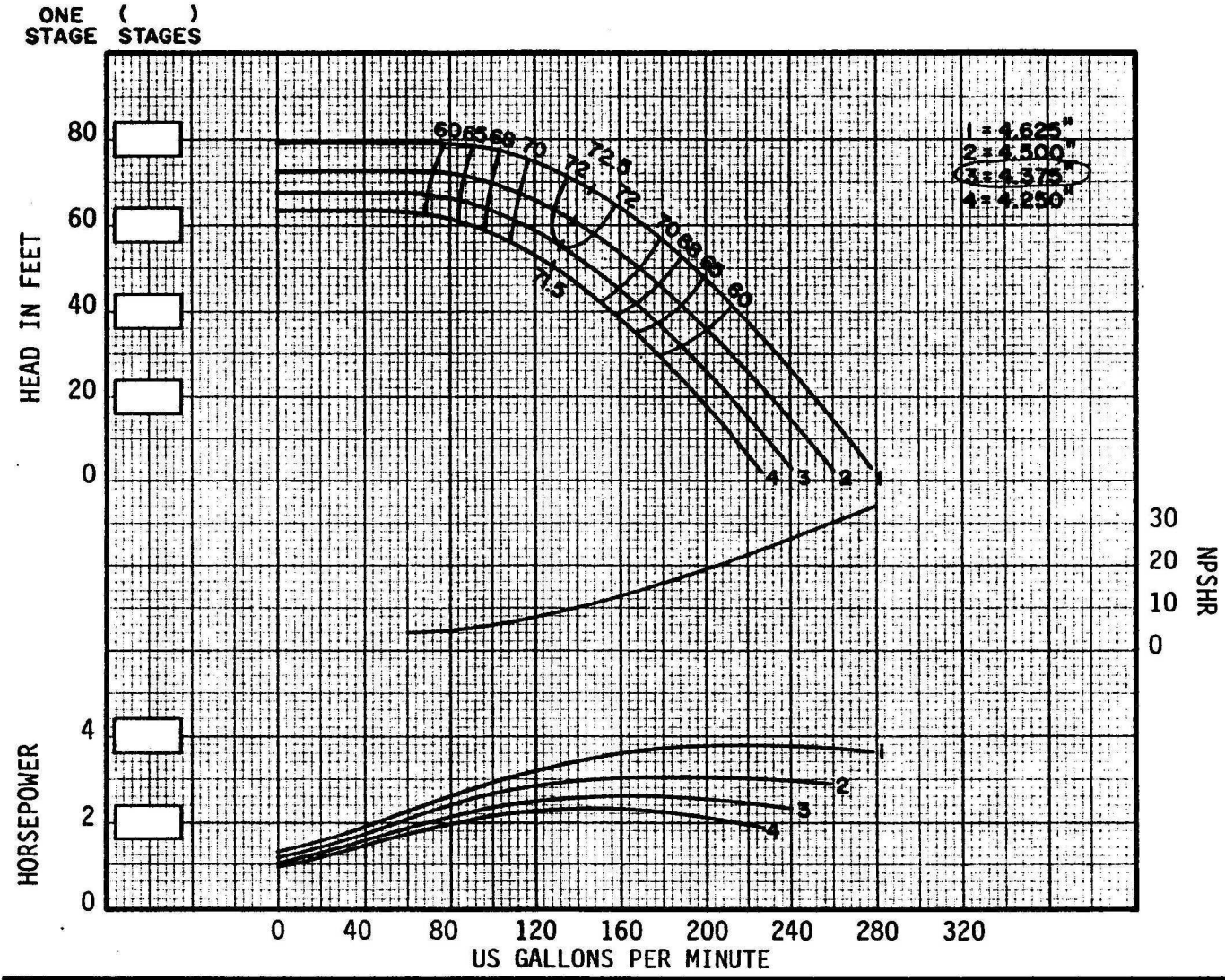


# SIMMONS SS6M

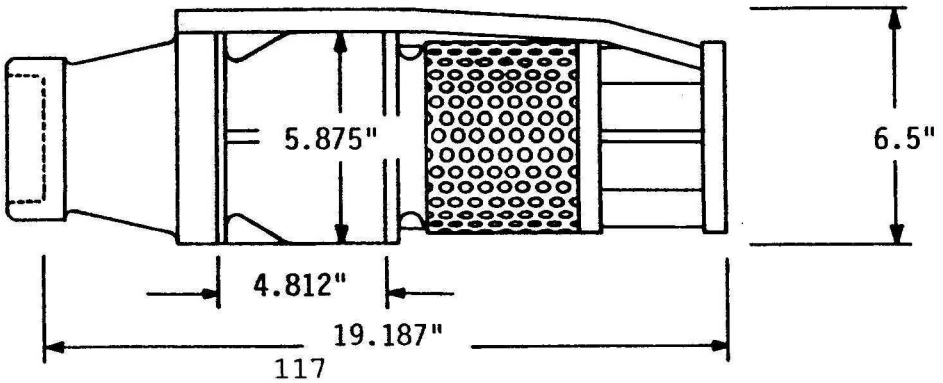
Well #5
3 H.P.
1706 PM → 29'
3450 R.P.M.

1 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 1.00" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 3" - 4" | IMPELLER NO. | = SS6M | | |
| ONE STAGE WT.-LBS. | = 56 | MAX. SPHERE SIZE | = 0.312" | 1 | -4 |
| ADD'L STAGE WT. | = 19 | K-FACTOR, MAX. | = 2.34 | 2 | -3 |
| IMPELLER WT.-LBS. | = 2.95 | MAX. OPERATING PSIG | = 341 | 3 | -2 |
| ONE STAGE $WR^2$ | = 0.037 | MIN. SUBMERGENCE | = 11" | 4 | -1 |
| SPECIFIC SPEED | = 1856 | IMPELLER EYE AREA | = 4.977 Sq. In. | 5 | 0 |



Well #6
10 H.P.
400 GPM → 73'

1 stage E



# MODEL 7 H-400
# PERFORMANCE CHARACTERISTIC

BOWL — CAST IRON or NI-RESIST — DIA. 7"
IMPELLER BRONZE or NI-RESIST
DISCHARGE 4" STANDARD — 5" OPT.
K FACTOR 4.5
MAX. O.D. W/CABLE GUARD 7¾"
BEARING: CUTLESS RUBBER or BRONZE

CHANGE EFFICIENCY AS FOLLOWS

| No. of Points | No. of Stages |
|---|---|
| -4 | 1 |
| -2 | 2 |
| -1 | 3 |
| 0 | 4 |

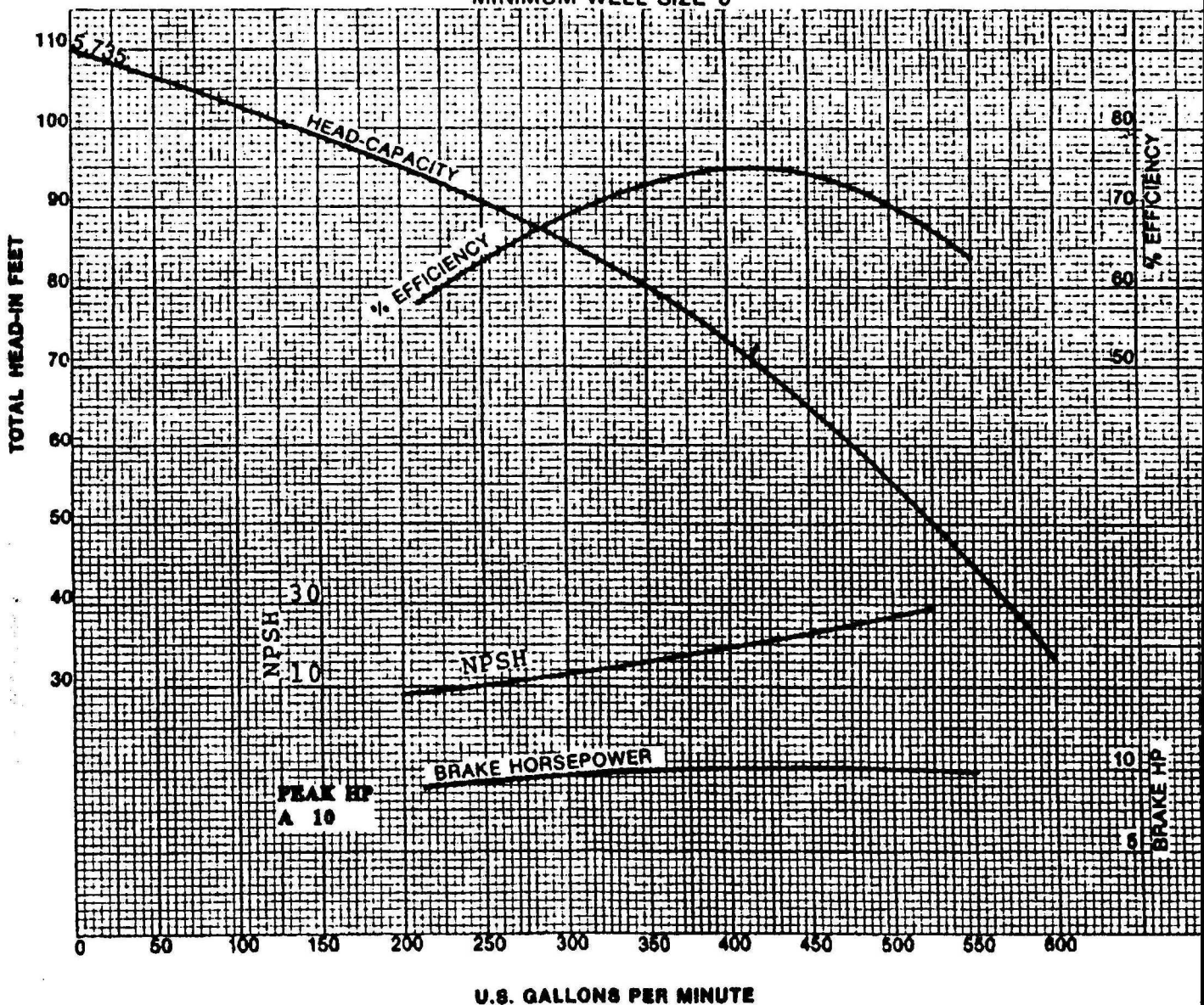
POWER: ELECTRIC
CYCLE: 60 Hz
R P M: 3450
IMPELLER TYPE: ENCLOSED
BOWL TYPE: FLANGED
CURVE SHEET NO. 1

**NOTE:** EFFICIENCY PERFORMANCE BASED ON CAST IRON BOWLS - POLISHED BRONZE IMPELLERS AND 6 FEET SUBMERGENCE.

THIS CHARACTERISTIC CURVE IS BASED ON FACTORY TESTS WHEN PUMPING CLEAR, FRESH, NON-AERATED WATER AT A TEMPERATURE NOT EXCEEDING 85° F. AND UNDER SUCTION CONDITIONS AS INDICATED.

PUMP PERFORMANCE RATING IS FOR THE DESIGNATED POINT ONLY AND IS SUBJECT TO TEST TOLERANCES AND PROCEDURES AS SPECIFIED IN THE STANDARD OF THE HYDRAULIC INSTITUTE.

MINIMUM WELL SIZE 8"

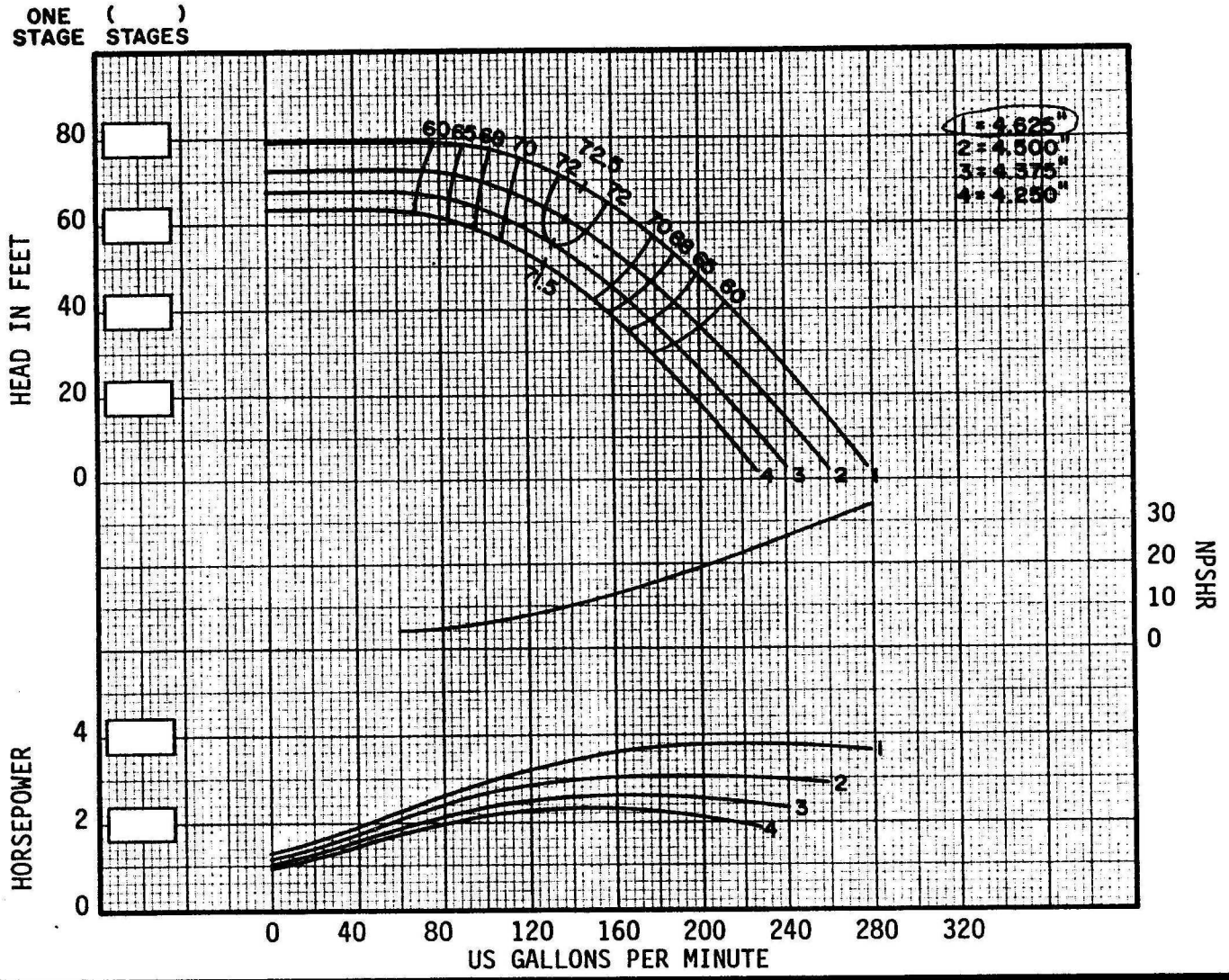


# SIMMONS SS6M

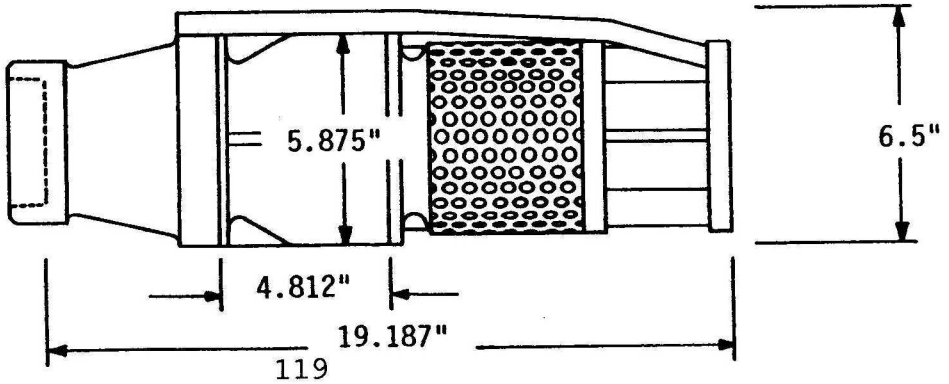
Well #7
5 H.P.
150 GPM → 65'
3450 R.P.M.

1 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 1.00" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 3" - 4" | IMPELLER NO. | = SS6M | 1 | -4 |
| ONE STAGE WT.-LBS. | = 56 | MAX. SPHERE SIZE | = 0.312" | 2 | -3 |
| ADD'L STAGE WT. | = 19 | K-FACTOR, MAX. | = 2.34 | 3 | -2 |
| IMPELLER WT.-LBS. | = 2.95 | MAX. OPERATING PSIG | = 341 | 4 | -1 |
| ONE STAGE $WR^2$ | = 0.037 | MIN. SUBMERGENCE | = 11" | 5 | 0 |
| SPECIFIC SPEED | = 1856 | IMPELLER EYE AREA | = 4.977 Sq. In. | | |



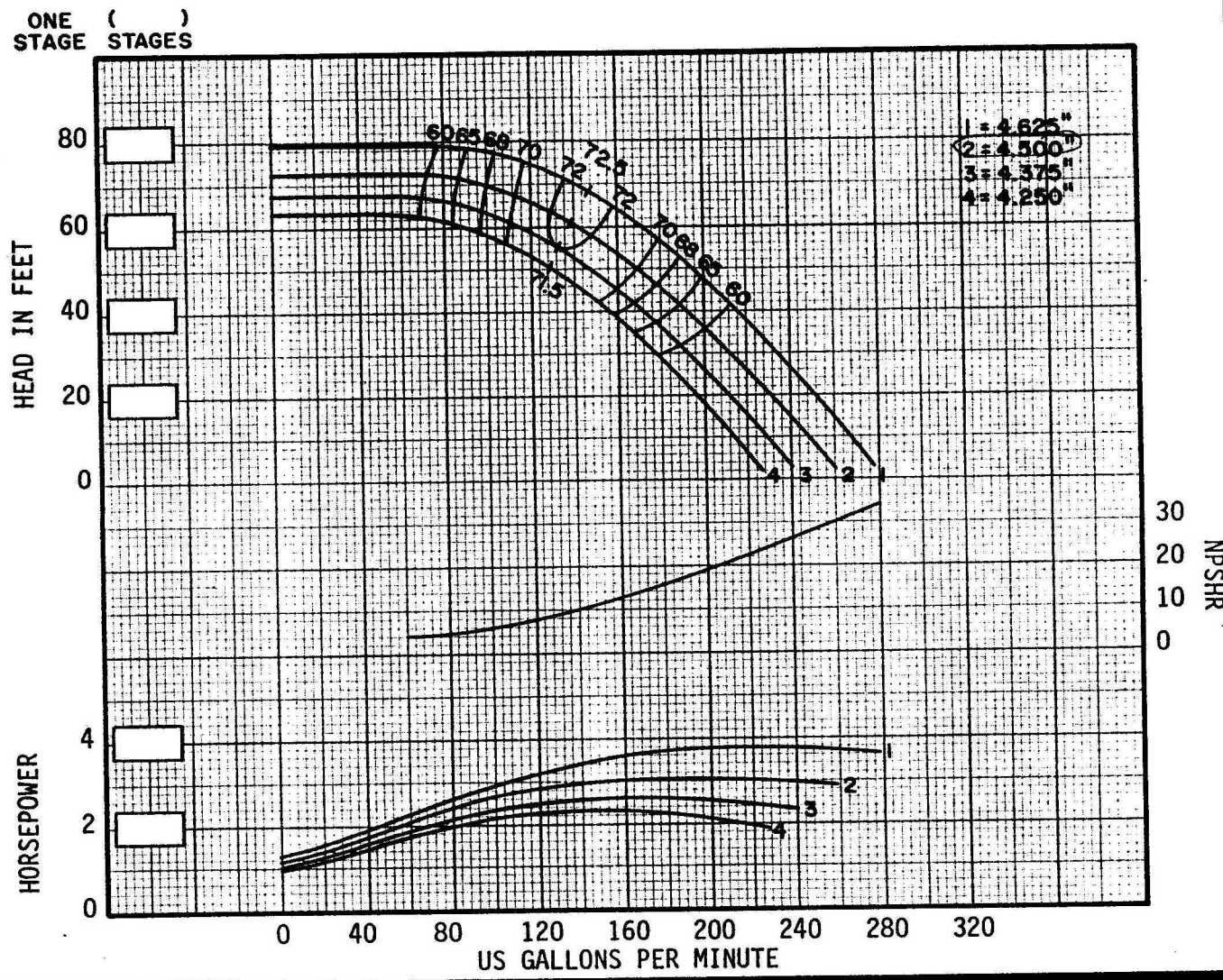
# SIMMONS SS6M

Well #8
3 H.P. 60'
115 ~ 6PM →.

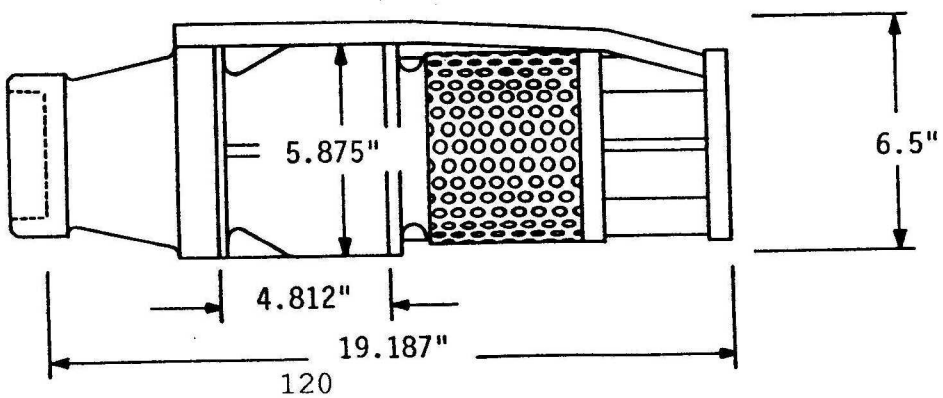
1 STAGE

3450 R.P.M.

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6M | 1 | -4 |
| ONE STAGE WT.-LBS.= 56 | MAX. SPHERE SIZE = 0.312" | 2 | -3 |
| ADD'L STAGE WT. = 19 | K-FACTOR, MAX. = 2.34 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.95 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1856 | IMPELLER EYE AREA = 4.977 Sq.In. | | |



Well #9 — 1 stage E
7.5 H.P.
280 GPM → 57'

# 6 H-300

## MODEL 6 H-300
## PERFORMANCE CHARACTERISTIC

BOWL — CAST IRON or NI-RESIST — DIA. 6"
IMPELLER BRONZE or NI-RESIST
DISCHARGE 4" STANDARD
K FACTOR 2.8
MAX. O.D. W/CABLE GUARD 6⅛"
BEARING — CUTLESS RUBBER OR BRONZE

CHANGE EFFICIENCY AS FOLLOWS

| No. of Points | No. of Stages |
|---|---|
| -3 | 1 |
| -2 | 2 |
| -1 | 3 |
| 0 | 4 |

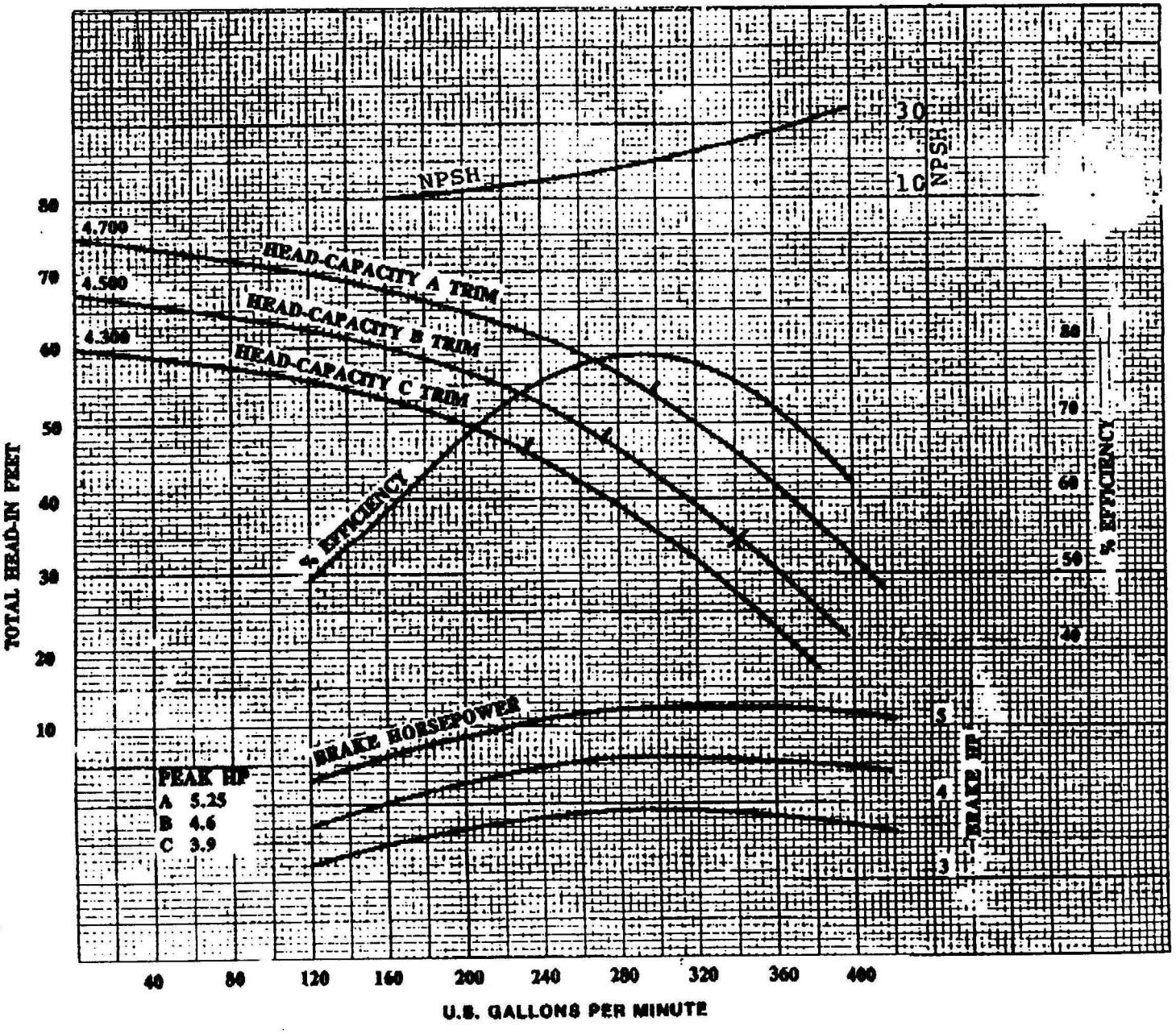
POWER: ELECTRIC
CYCLE: 60 Hz
R P M: 3450
IMPELLER TYPE: ENCLOSED
BOWL TYPE: FLANGED
CURVE SHEET NO. 1

**NOTE:** EFFICIENCY PERFORMANCE BASED ON CAST IRON BOWLS - POLISHED BRONZE IMPELLERS AND 6 FEET SUBMERGENCE.

THIS CHARACTERISTIC CURVE IS BASED ON FACTORY TESTS WHEN PUMPING CLEAR, FRESH, NON-AERATED WATER AT A TEMPERATURE NOT EXCEEDING 85° F. AND UNDER SUCTION CONDITIONS AS INDICATED.

PUMP PERFORMANCE RATING IS FOR THE DESIGNATED POINT ONLY AND IS SUBJECT TO TEST TOLERANCES AND PROCEDURES AS SPECIFIED IN THE STANDARD OF THE HYDRAULIC INSTITUTE.

MINIMUM WELL SIZE 7"



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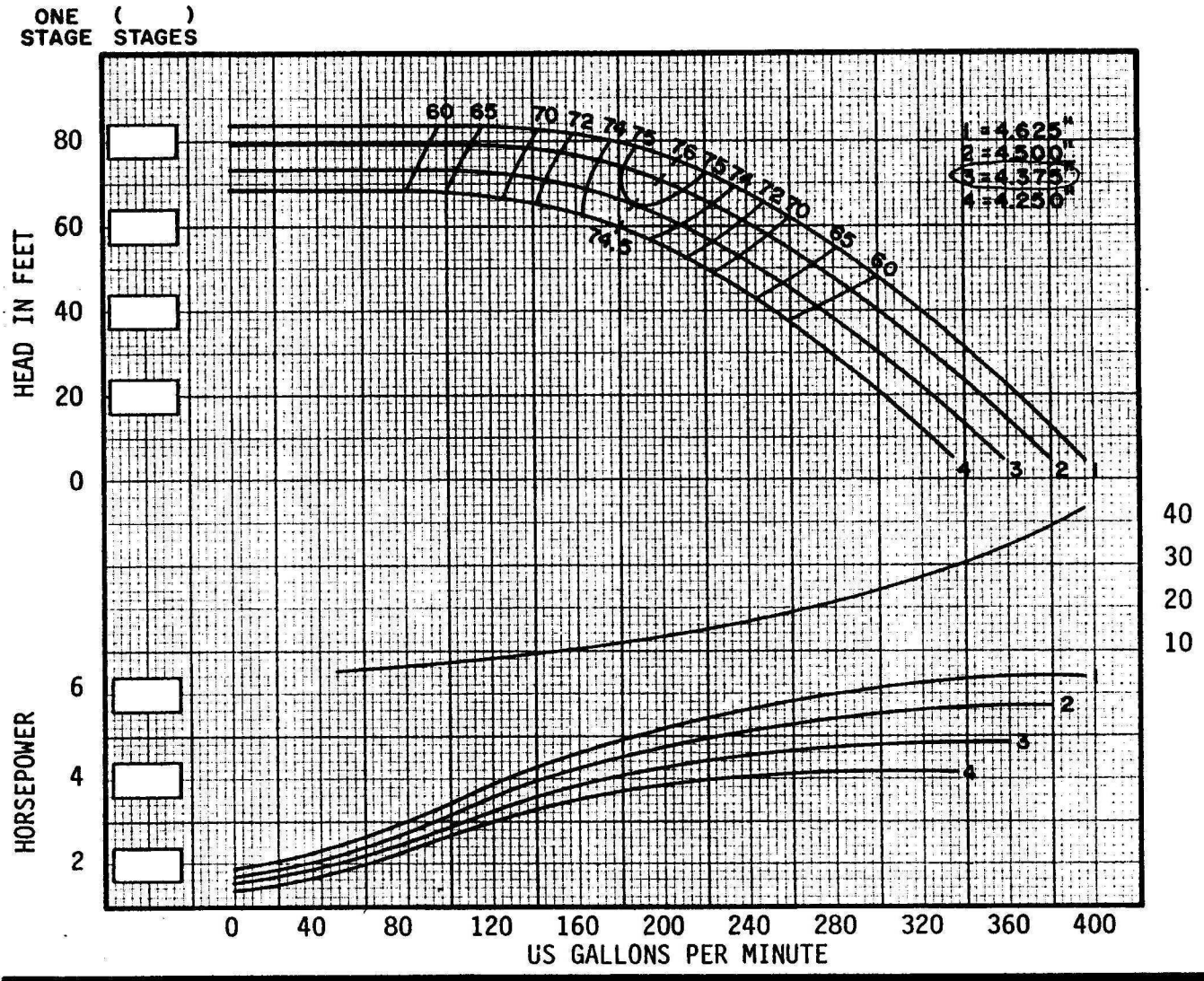
# SIMMONS SS6H

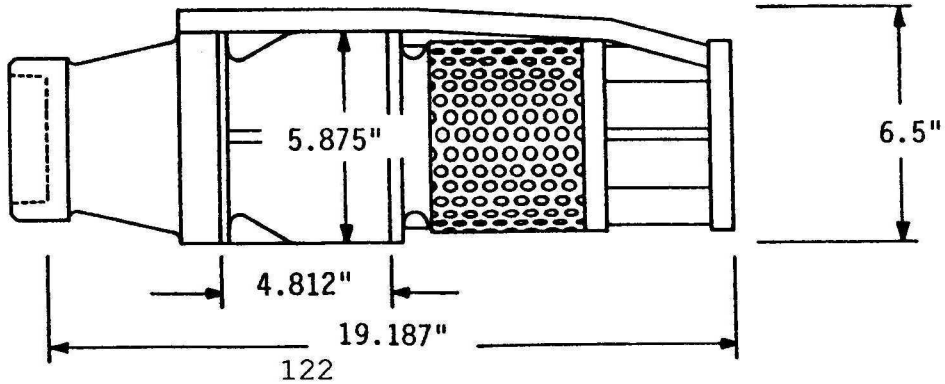
Well #10
5 H.P.
2056 PM → 51'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6H | | |
| ONE STAGE WT.-LBS.= 55 | MAX. SPHERE SIZE = 0.375" | 1 | -4 |
| ADD'L STAGE WT. = 18.7 | K-FACTOR, MAX. = 2.36 | 2 | -3 |
| IMPELLER WT.-LBS. = 2.75 | MAX. OPERATING PSIG = 341 | 3 | -2 |
| ONE STAGE $WR^2$ = 0.034 | MIN. SUBMERGENCE = 11" | 4 | -1 |
| SPECIFIC SPEED = 2011 | IMPELLER EYE AREA = 5.695 Sq. In. | 5 | 0 |

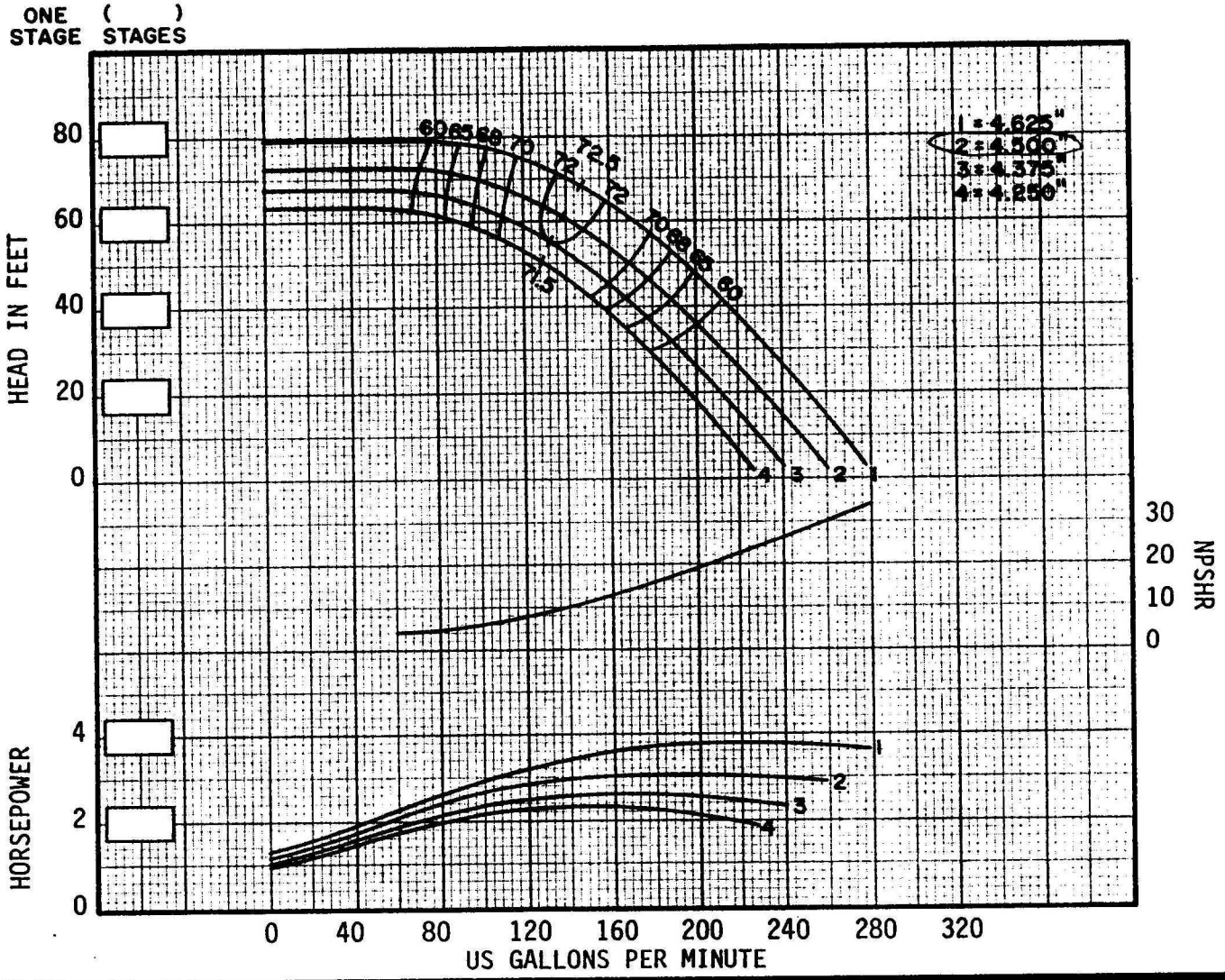


# SIMMONS SS6M

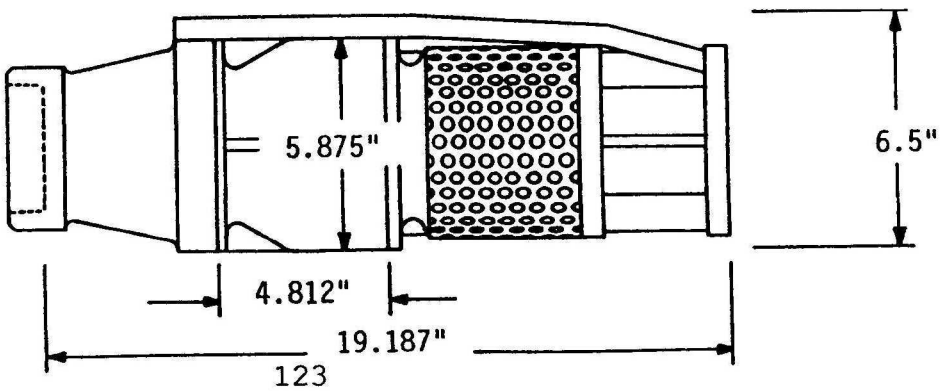
Well #11
3 H.P.
1356PM → 58'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6M | 1 | -4 |
| ONE STAGE WT.-LBS.= 56 | MAX. SPHERE SIZE = 0.312" | 2 | -3 |
| ADD'L STAGE WT. = 19 | K-FACTOR, MAX. = 2.34 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.95 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1856 | IMPELLER EYE AREA = 4.977 Sq. In. | | |



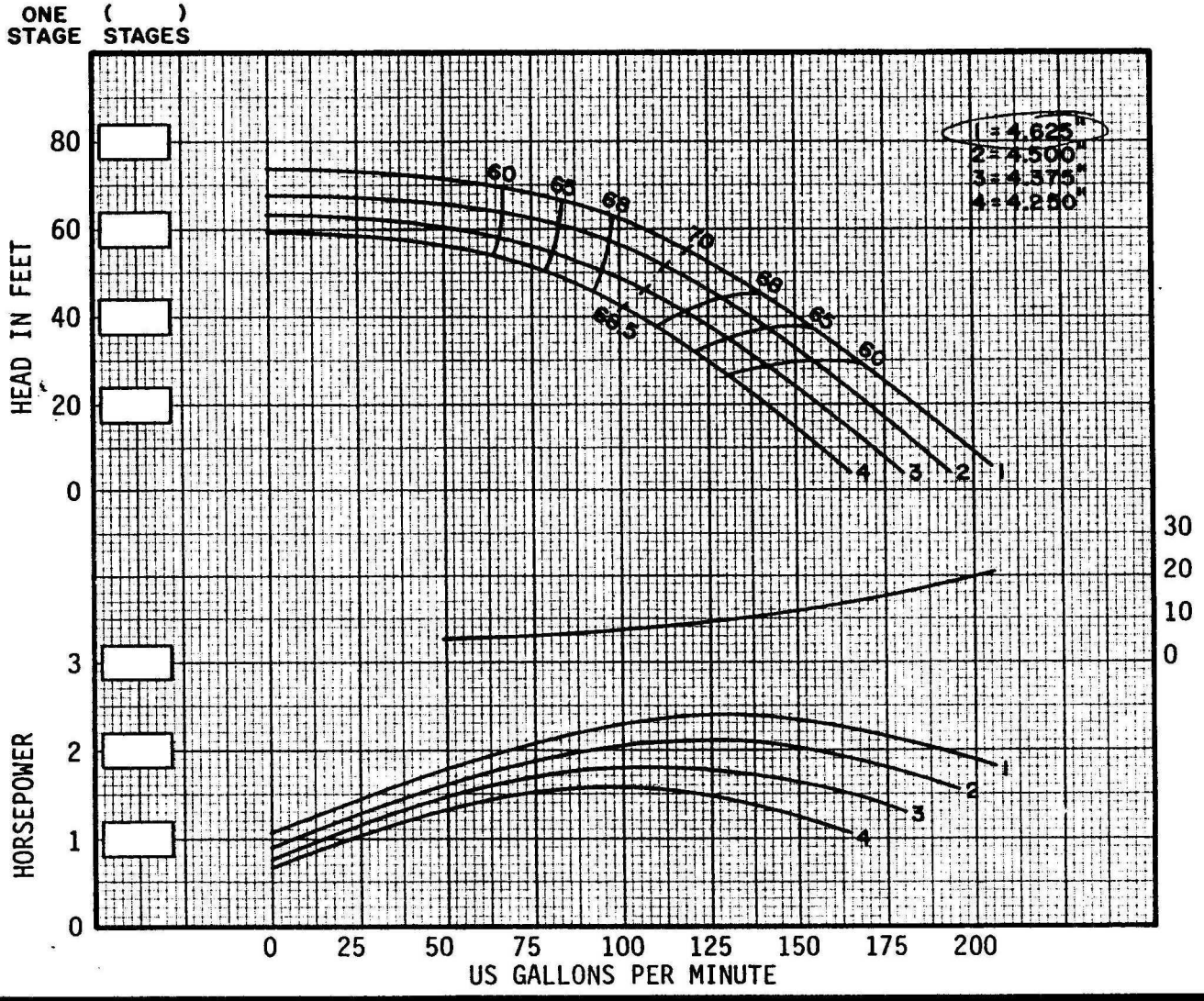
# SIMMONS SS6L

Well #12
3 H.P.
110 GPM → 58'

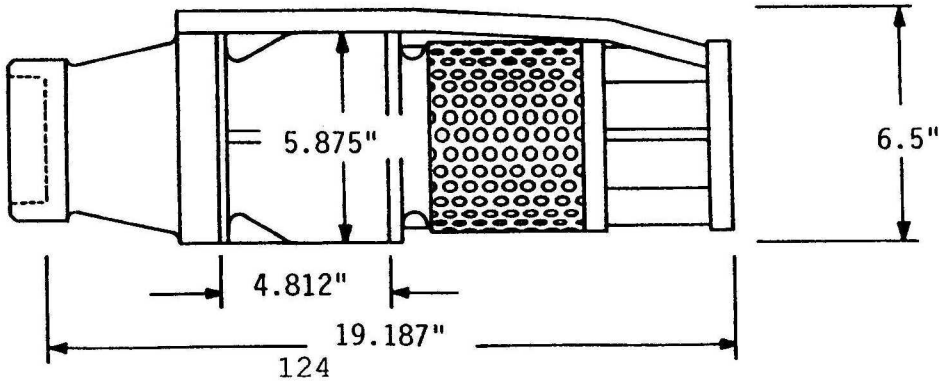
1 STAGE

3450 R.P.M.

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 1.00" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 3" - 4" | IMPELLER NO. | = SS6L | | |
| ONE STAGE WT.-LBS. | = 55 | MAX. SPHERE SIZE | = 0.375" | 1 | -4 |
| ADD'L STAGE WT. | = 18.5 | K-FACTOR, MAX. | = 2.30 | 2 | -3 |
| IMPELLER WT.-LBS. | = 2.55 | MAX. OPERATING PSIG | = 341 | 3 | -2 |
| ONE STAGE $WR^2$ | = 0.037 | MIN. SUBMERGENCE | = 11" | 4 | -1 |
| SPECIFIC SPEED | = 1842 | IMPELLER EYE AREA | = 4.749 Sq. In. | 5 | 0 |

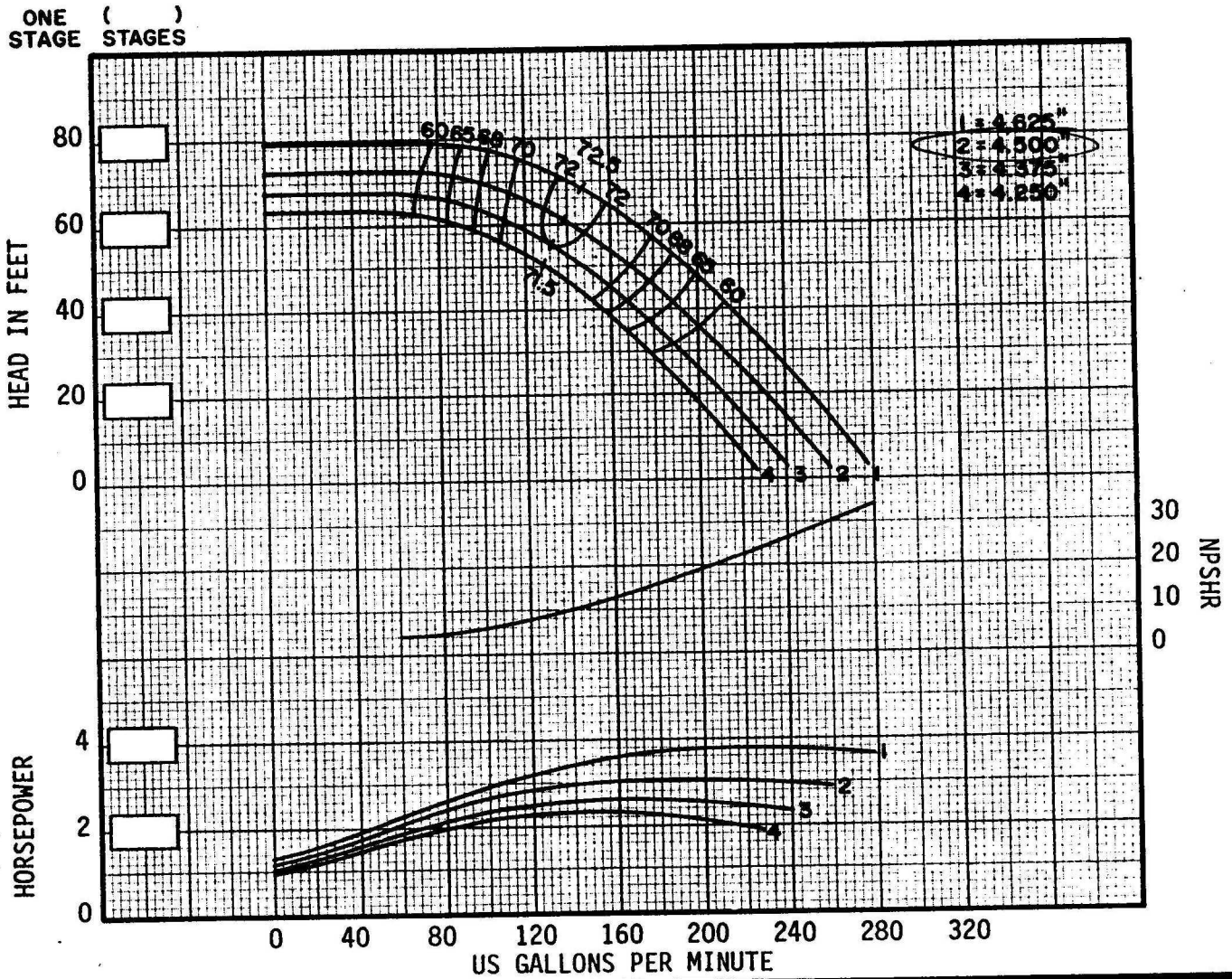


# SIMMONS SS6M

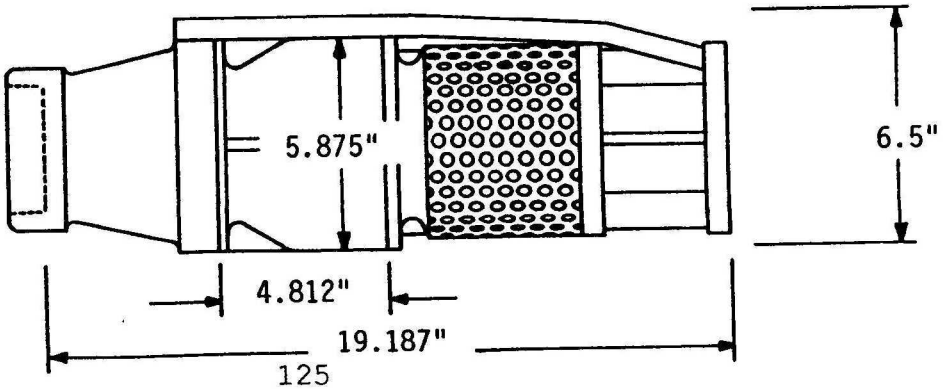
Well #13
3 H.P.
1256PM → 61'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6M | 1 | -4 |
| ONE STAGE WT.-LBS.= 56 | MAX. SPHERE SIZE = 0.312" | 2 | -3 |
| ADD'L STAGE WT. = 19 | K-FACTOR, MAX. = 2.34 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.95 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1856 | IMPELLER EYE AREA = 4.977 Sq. In. | | |

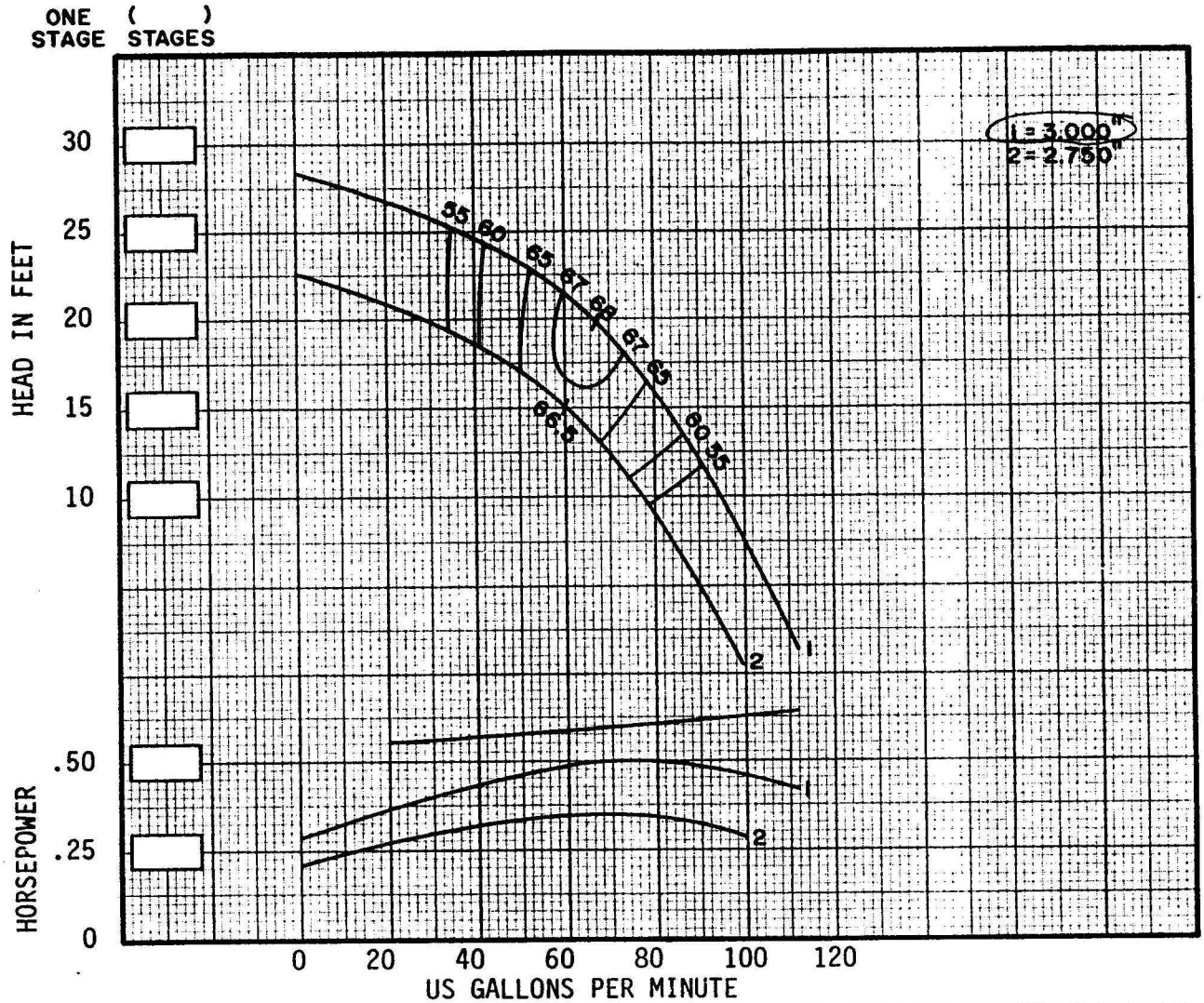


# SIMMONS SS4M

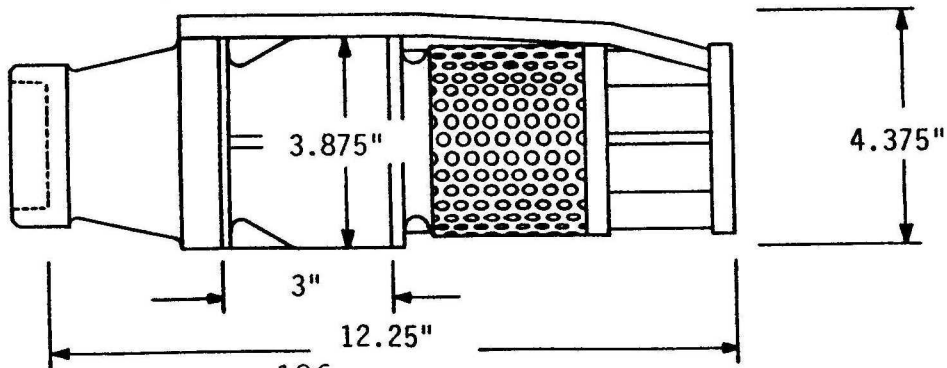
Well # 14
2 H.P.
60 GPM → 60'
3450 R.P.M.

3 STAGES

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 0.875" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 2.5" | IMPELLER NO. = SS4M | 1 | -6.5 |
| ONE STAGE WT.-LBS. = 20 | MAX. SPHERE SIZE = 0.250" | 2 | -5.0 |
| ADD'L STAGE WT. = 5.8 | K-FACTOR, MAX. = 1.2 | 3 | -3.5 |
| IMPELLER WT.-LBS. = 0.90 | MAX. OPERATING PSIG = 345 | 4 | -2.0 |
| ONE STAGE $WR^2$ = 0.005 | MIN. SUBMERGENCE = 6" | 5 | -1.0 |
| SPECIFIC SPEED = 3039 | IMPELLER EYE AREA = 2.00 Sq. In. | | |

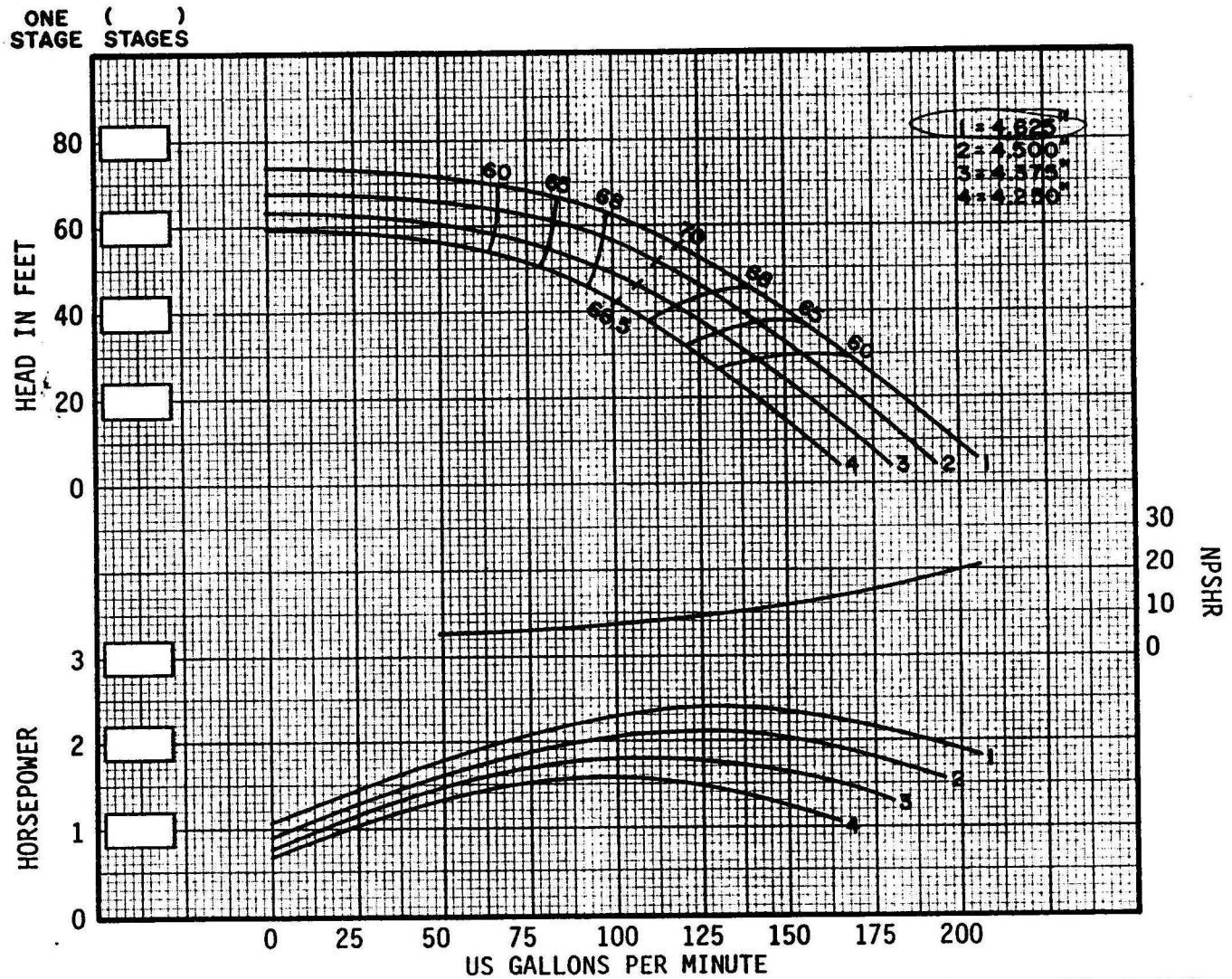


# SIMMONS SS6L

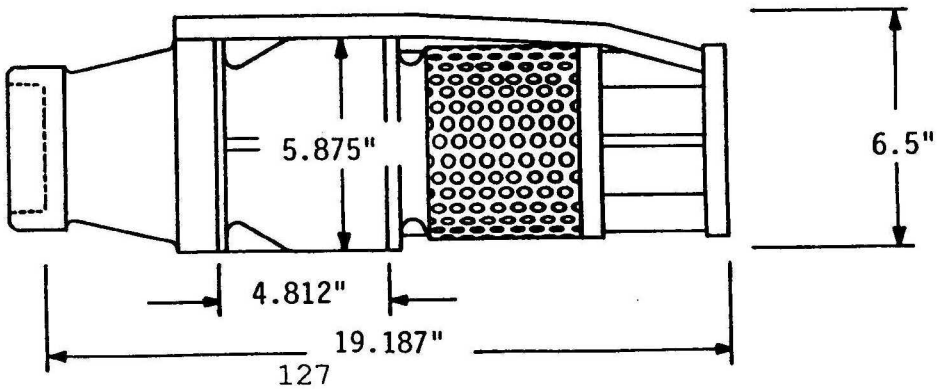
Well #15
3 H.P.
1006PM → 60'
3450 R.P.M.

1 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 1.00" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 3" - 4" | IMPELLER NO. | = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS. | = 55 | MAX. SPHERE SIZE | = 0.375" | 2 | -3 |
| ADD'L STAGE WT. | = 18.5 | K-FACTOR, MAX. | = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. | = 2.55 | MAX. OPERATING PSIG | = 341 | 4 | -1 |
| ONE STAGE $WR^2$ | = 0.037 | MIN. SUBMERGENCE | = 11" | 5 | 0 |
| SPECIFIC SPEED | = 1842 | IMPELLER EYE AREA | = 4.749 Sq. In. | | |

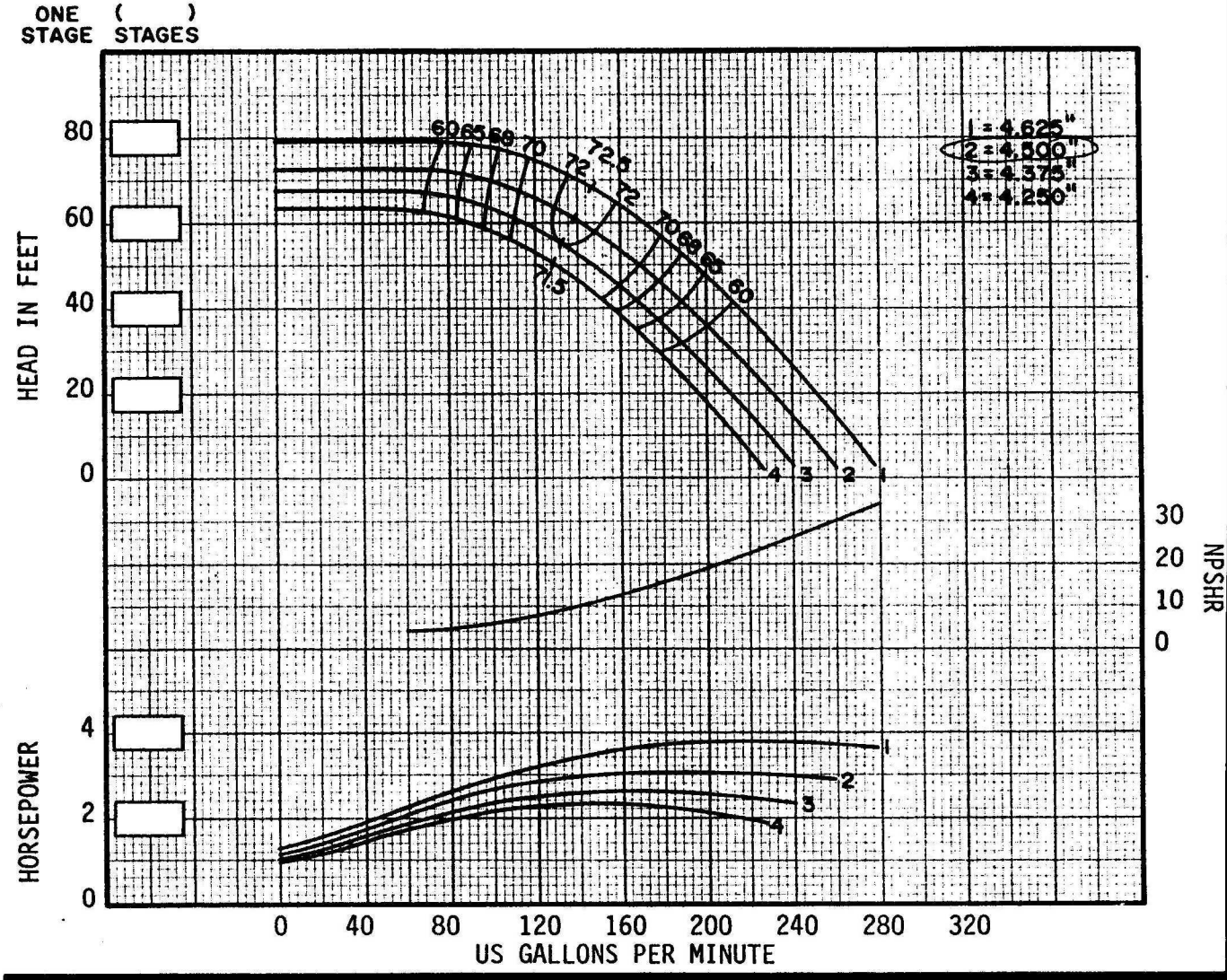


# SIMMONS SS6M

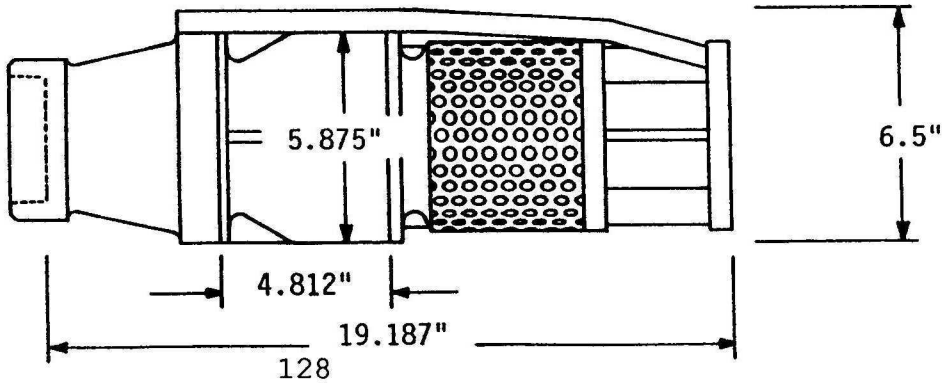
Well #16
3H.P.
145 GPM → 56'
3450 R.P.M.

1 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 1.00" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 3" - 4" | IMPELLER NO. | = SS6M | | |
| ONE STAGE WT.-LBS. | = 56 | MAX. SPHERE SIZE | = 0.312" | 1 | -4 |
| ADD'L STAGE WT. | = 19 | K-FACTOR, MAX. | = 2.34 | 2 | -3 |
| IMPELLER WT.-LBS. | = 2.95 | MAX. OPERATING PSIG | = 341 | 3 | -2 |
| ONE STAGE $WR^2$ | = 0.037 | MIN. SUBMERGENCE | = 11" | 4 | -1 |
| SPECIFIC SPEED | = 1856 | IMPELLER EYE AREA | = 4.977 Sq. In. | 5 | 0 |

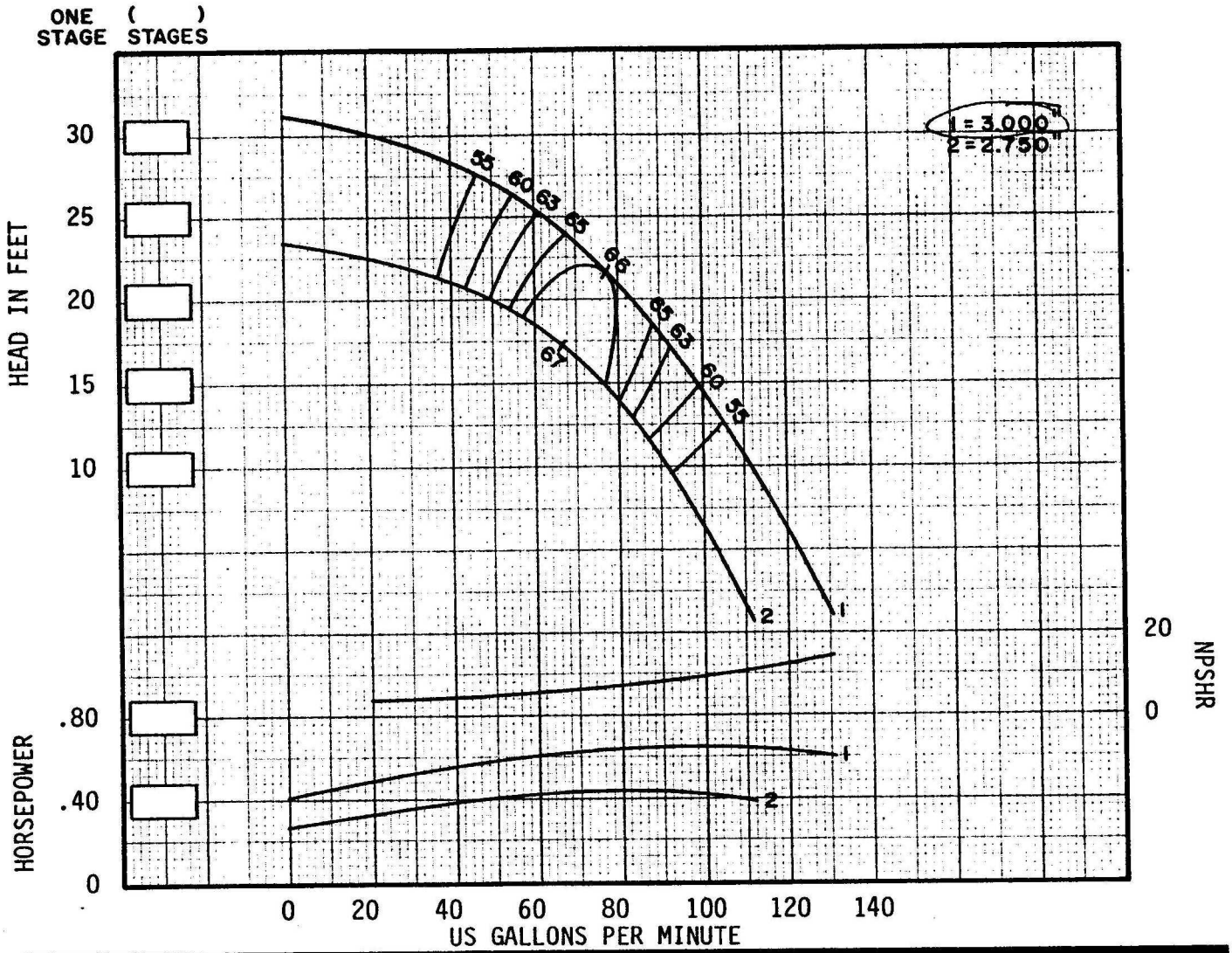


# SIMMONS SS4H

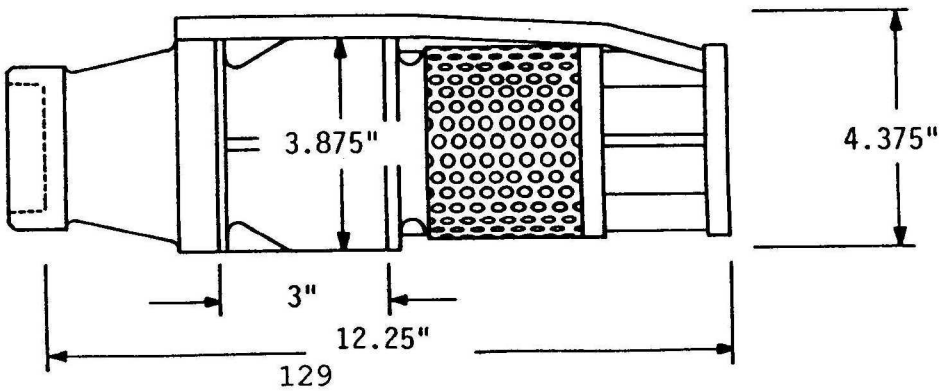
Well #17
2 H.P.
85 GPM → 71'
3450 R.P.M. 49'

3 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 0.875" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 2.5" | IMPELLER NO. | = SS4H | 1 | -6.5 |
| ONE STAGE WT.-LBS. | = 20 | MAX. SPHERE SIZE | = 0.250" | 2 | -5.0 |
| ADD'L STAGE WT. | = 5.65 | K-FACTOR, MAX. | = 1.22 | 3 | -3.5 |
| IMPELLER WT.-LBS. | = 0.75 | MAX. OPERATING PSIG | = 345 | 4 | -2.0 |
| ONE STAGE $WR^2$ | = 0.004 | MIN. SUBMERGENCE | = 6" | 5 | -1.0 |
| SPECIFIC SPEED | = 2963 | IMPELLER EYE AREA | = 2.60 Sq. In. | | |

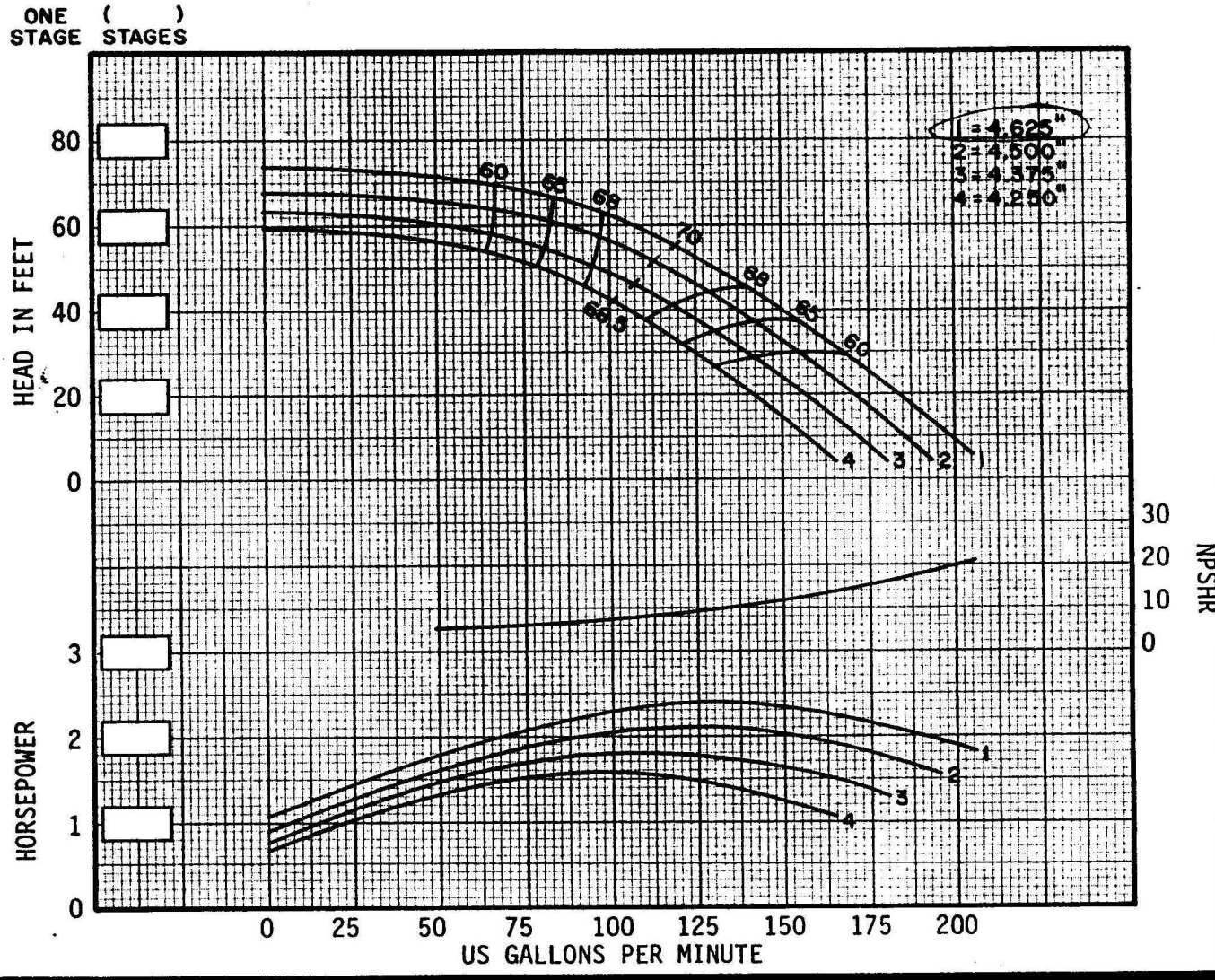


# SIMMONS SS6L

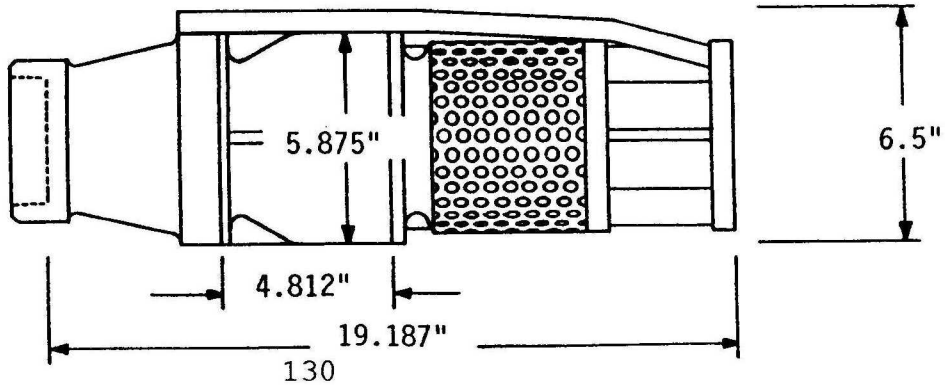
Well #18
3H.P.
1106PM -> 58'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS.= 55 | MAX. SPHERE SIZE = 0.375" | 2 | -3 |
| ADD'L STAGE WT. = 18.5 | K-FACTOR, MAX. = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.55 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1842 | IMPELLER EYE AREA = 4.749 Sq. In. | | |

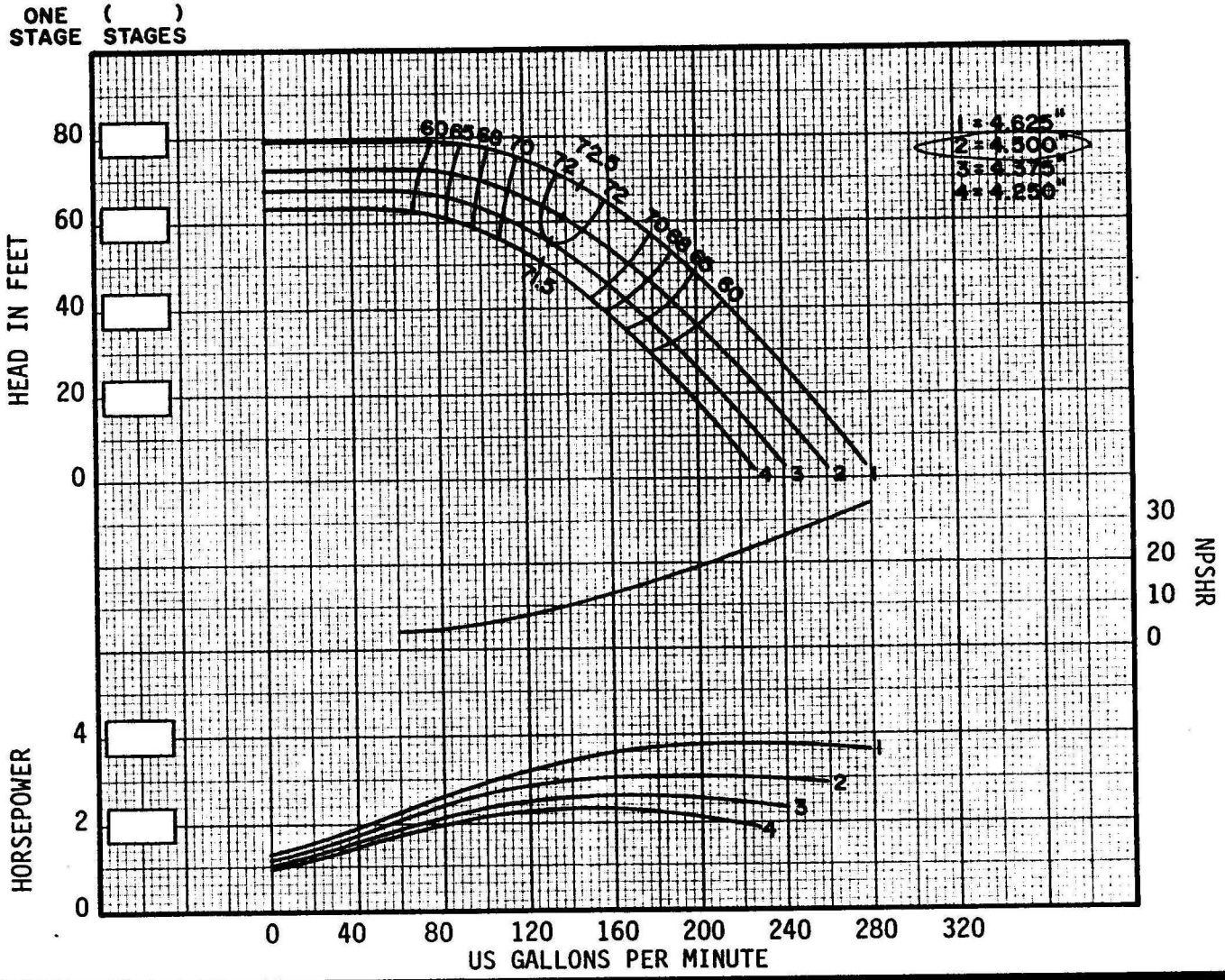


# SIMMONS SS6M

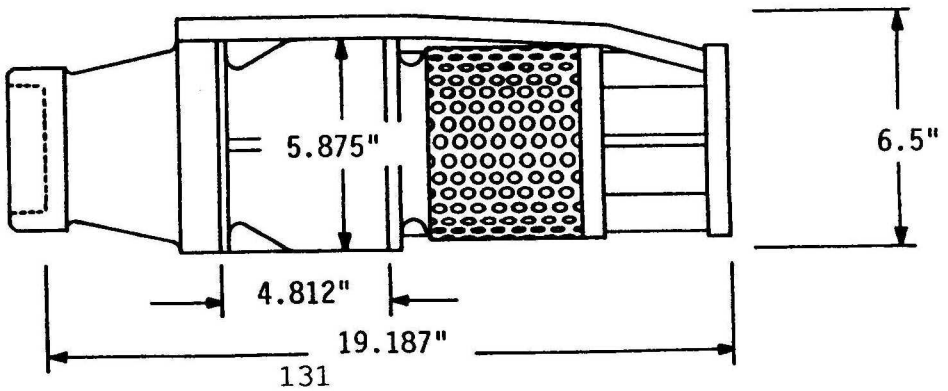
Well # 19
5 H.P.
145 GPM → 161'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6M | 1 | -4 |
| ONE STAGE WT.-LBS. = 56 | MAX. SPHERE SIZE = 0.312" | 2 | -3 |
| ADD'L STAGE WT. = 19 | K-FACTOR, MAX. = 2.34 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.95 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1856 | IMPELLER EYE AREA = 4.977 Sq. In. | | |

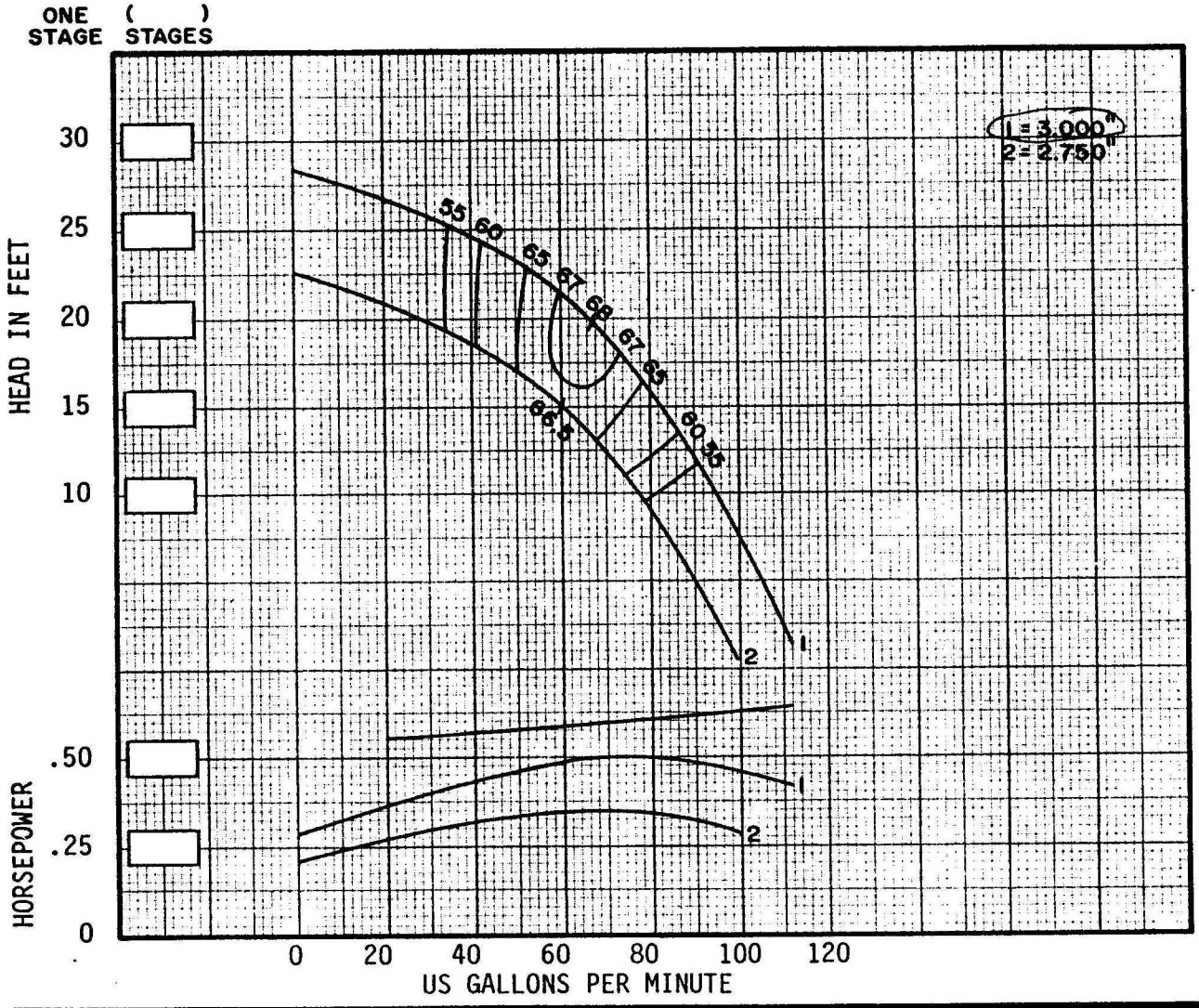


# SIMMONS SS4M

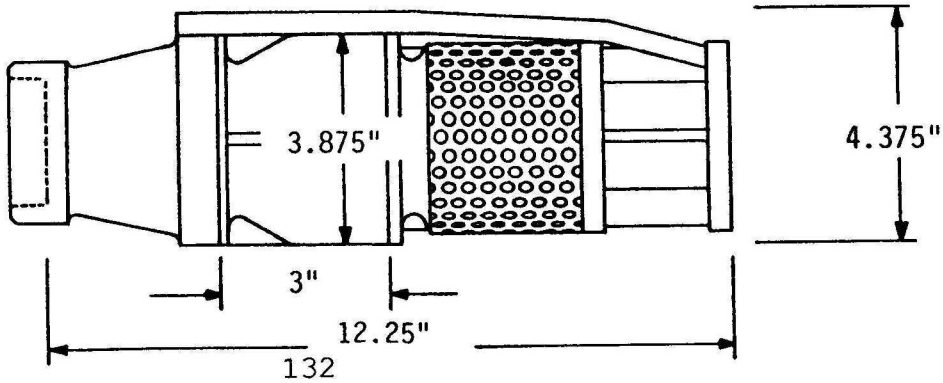
Well #20
2 H.P.
706PM – 36'
3450 R.P.M.

2 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 0.875" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 2.5" | IMPELLER NO. | = SS4M | 1 | -6.5 |
| ONE STAGE WT.-LBS. | = 20 | MAX. SPHERE SIZE | = 0.250" | 2 | -5.0 |
| ADD'L STAGE WT. | = 5.8 | K-FACTOR, MAX. | = 1.2 | 3 | -3.5 |
| IMPELLER WT.-LBS. | = 0.90 | MAX. OPERATING PSIG | = 345 | 4 | -2.0 |
| ONE STAGE $WR^2$ | = 0.005 | MIN. SUBMERGENCE | = 6" | 5 | -1.0 |
| SPECIFIC SPEED | = 3039 | IMPELLER EYE AREA | = 2.00 Sq. In. | | |

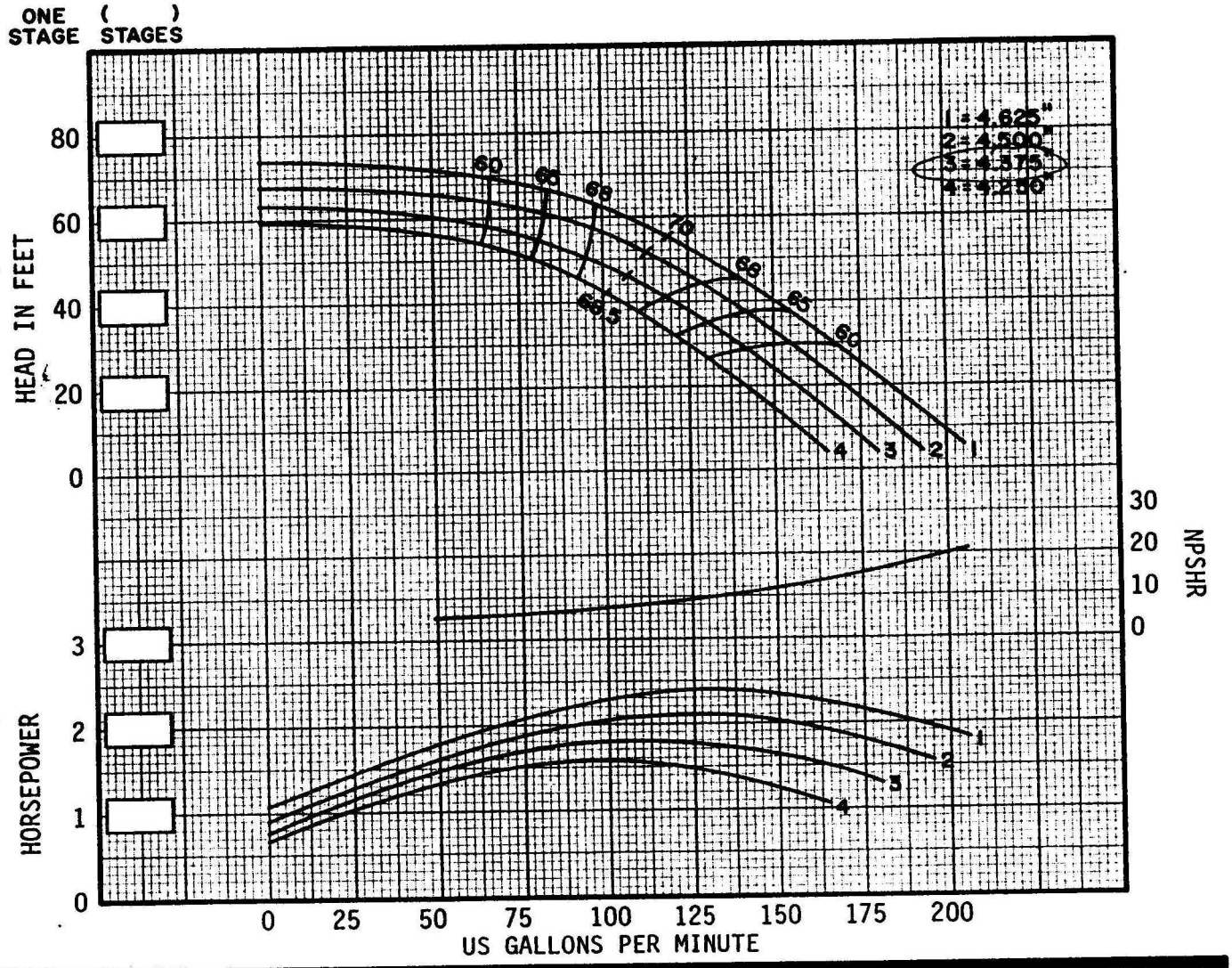


# SIMMONS SS6L

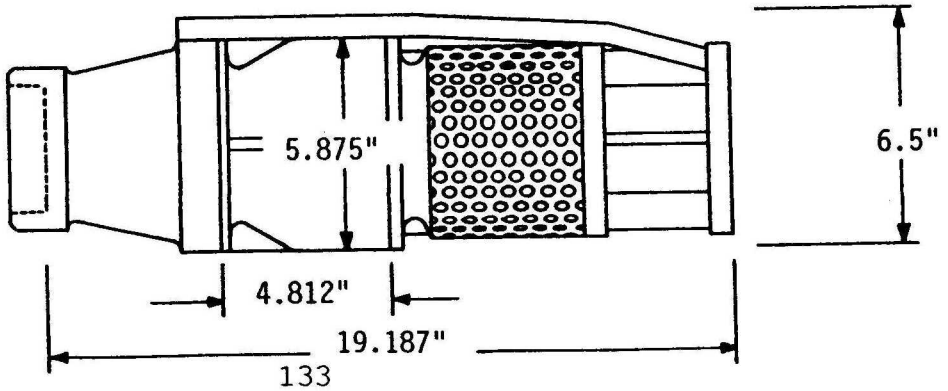
Well #21
2 H.P.
120 GPM → 35'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS. = 55 | MAX. SPHERE SIZE = 0.375" | 2 | -3 |
| ADD'L STAGE WT. = 18.5 | K-FACTOR, MAX. = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.55 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1842 | IMPELLER EYE AREA = 4.749 Sq. In. | | |

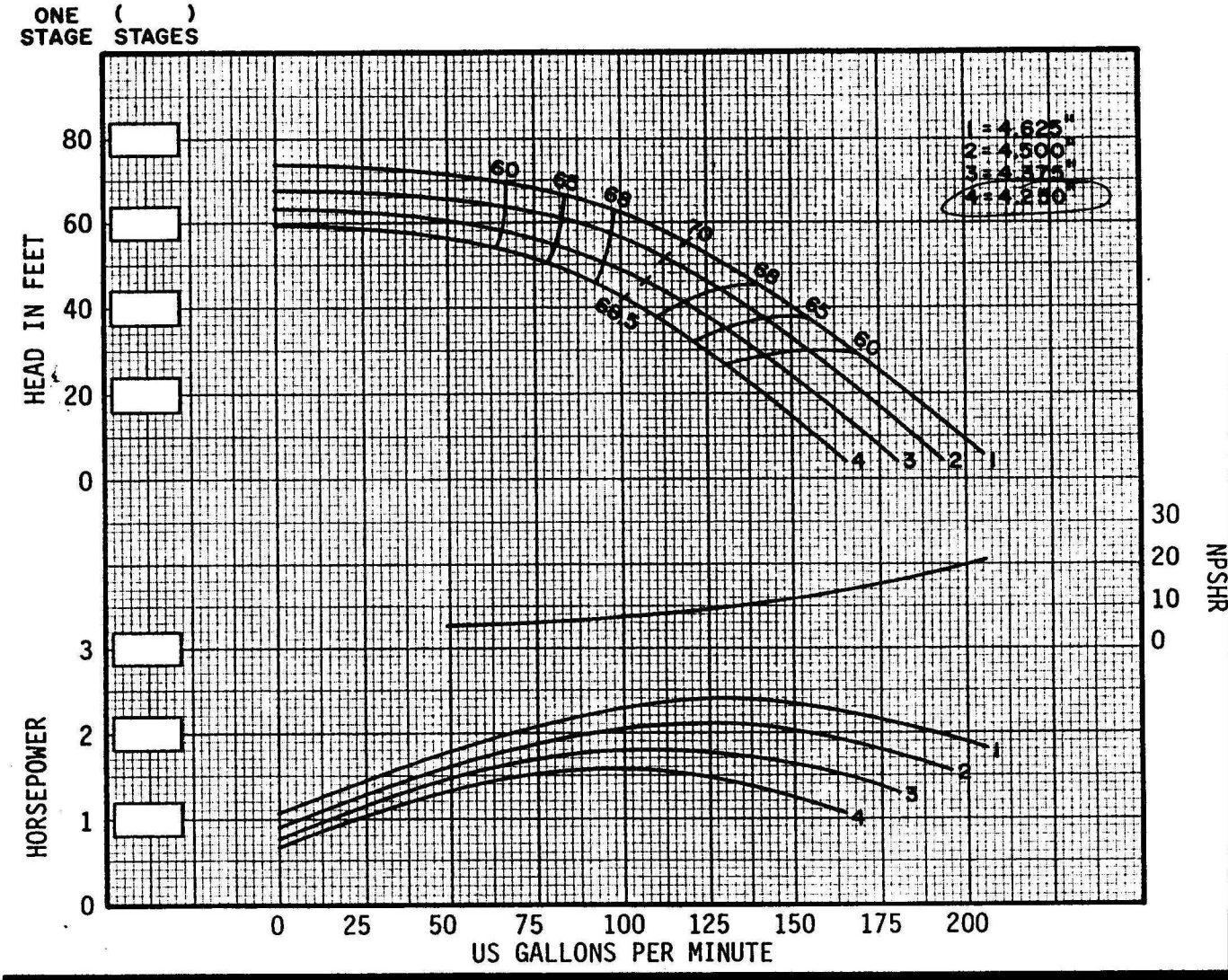


# SIMMONS SS6L

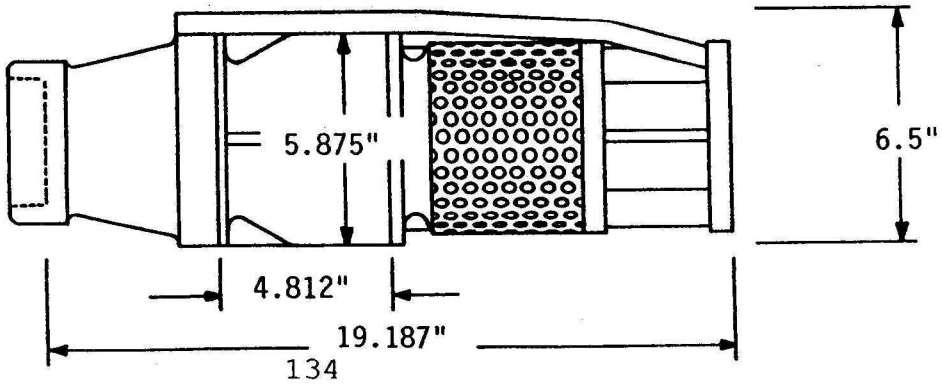
Well #24
2 H.P.
100 GPM → 37'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS. = 55 | MAX. SPHERE SIZE = 0.375" | 2 | -3 |
| ADD'L STAGE WT. = 18.5 | K-FACTOR, MAX. = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.55 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1842 | IMPELLER EYE AREA = 4.749 Sq. In. | | |

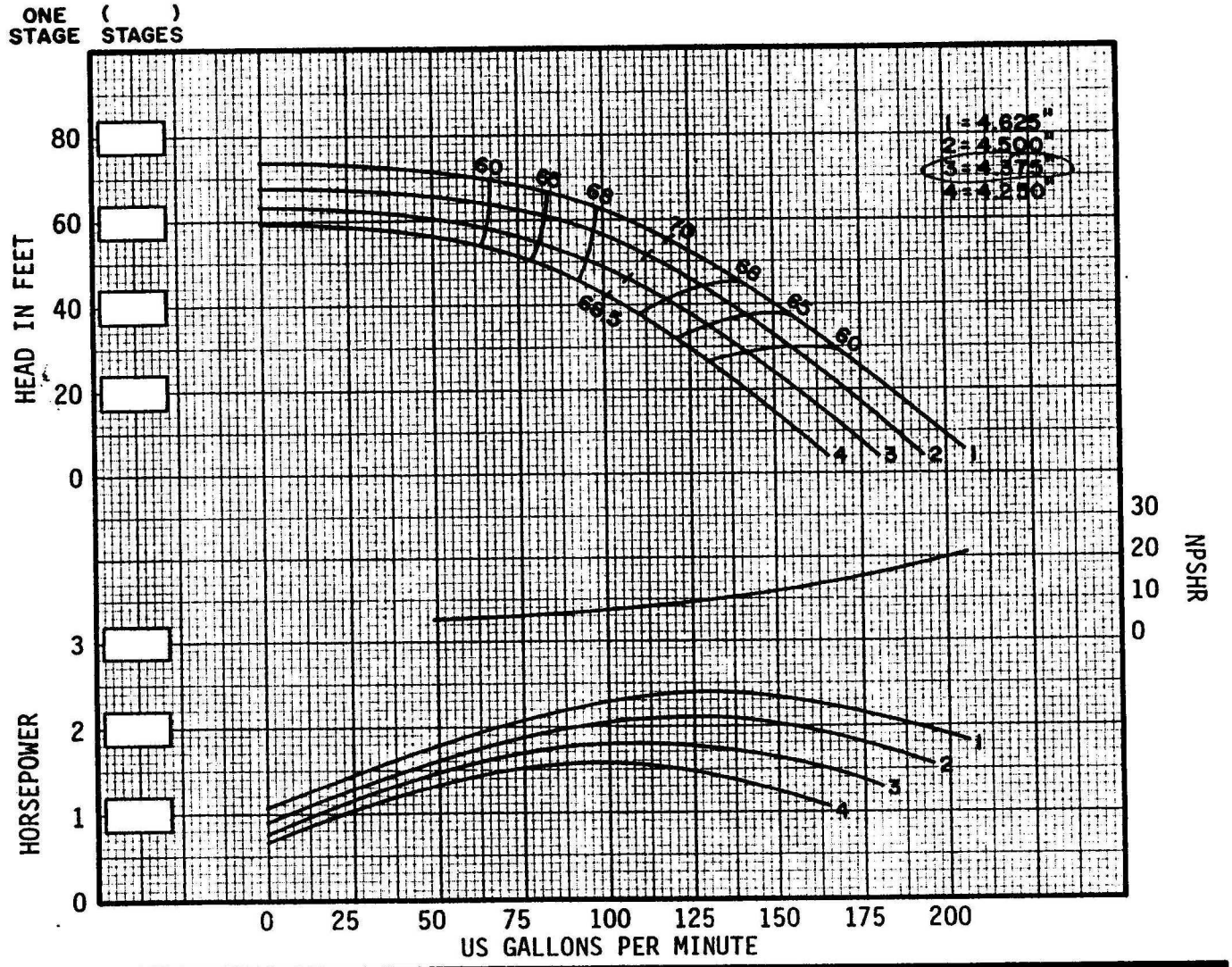


# SIMMONS SS6L

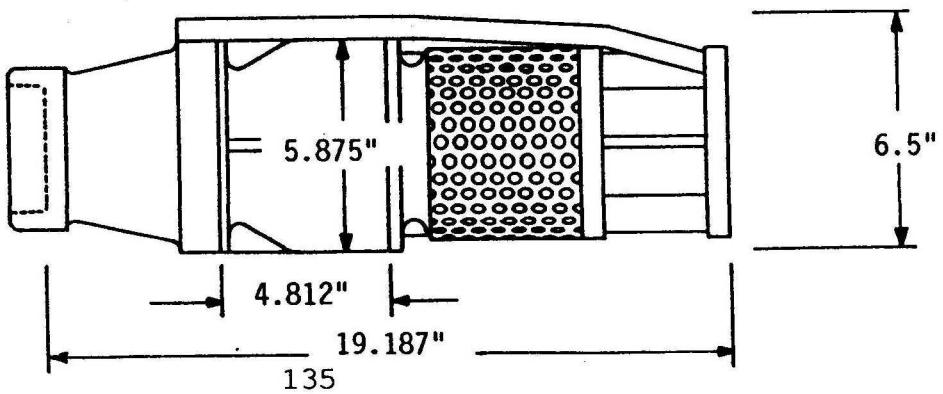
Well #25
2 H.P.
130 GPM → 33'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS. = 55 | MAX. SPHERE SIZE = 0.375" | 2 | -3 |
| ADD'L STAGE WT. = 18.5 | K-FACTOR, MAX. = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.55 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1842 | IMPELLER EYE AREA = 4.749 Sq. In. | | |

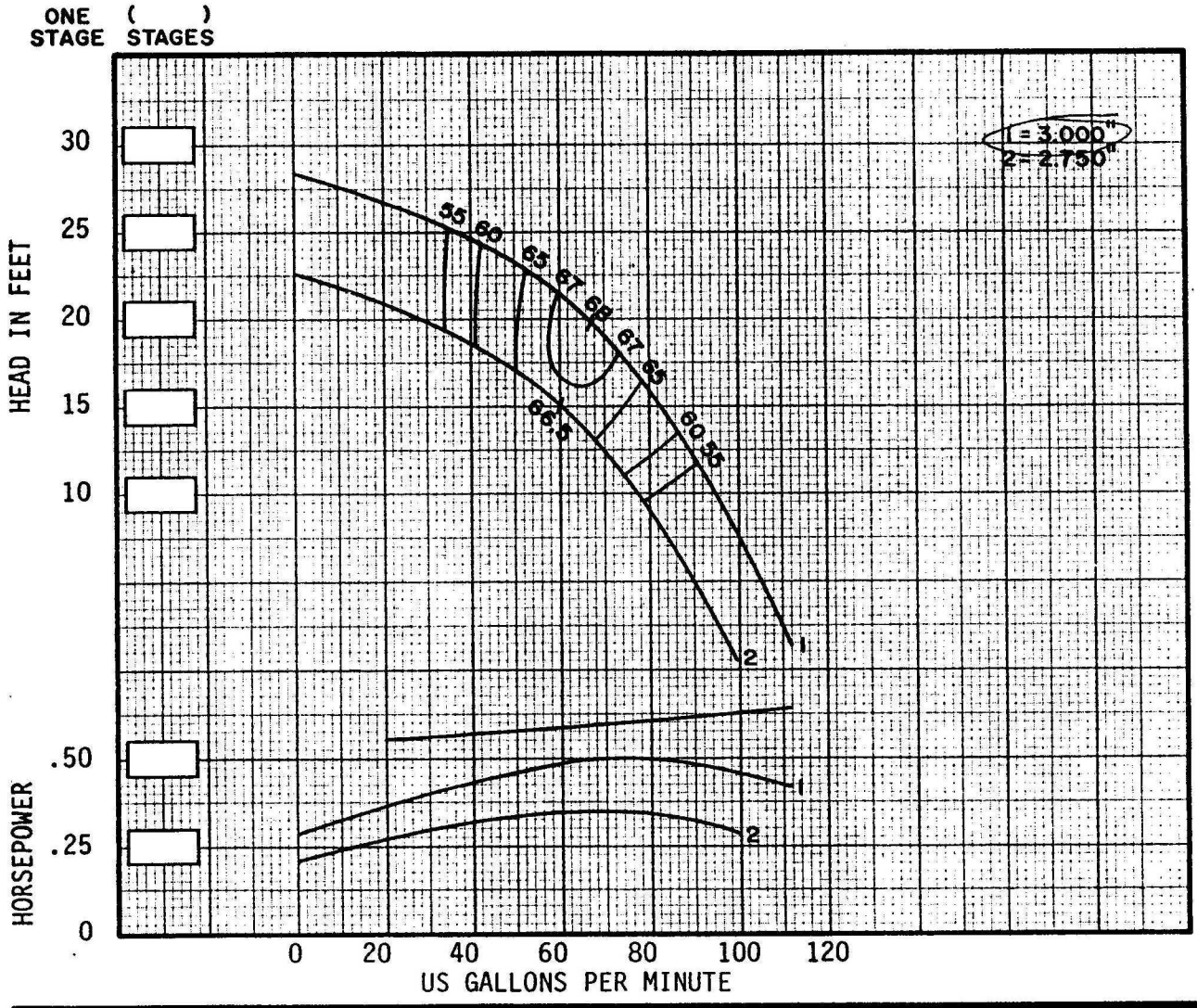


# SIMMONS SS4M

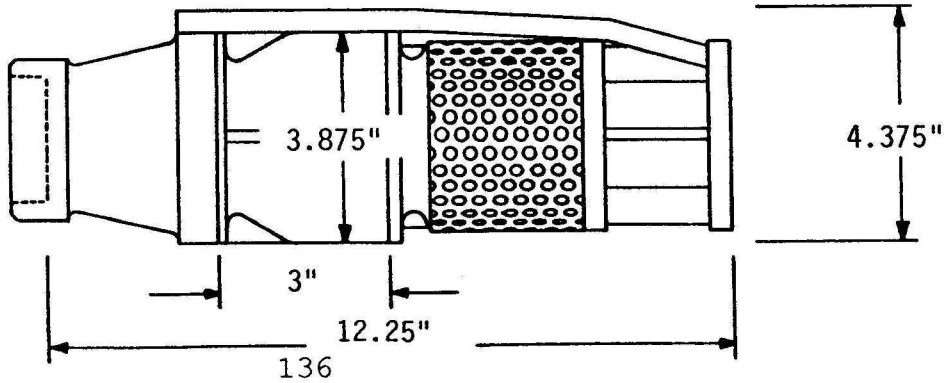
Well #26
2 H.P.
55 GPM → 40'
3450 R.P.M.

2 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 0.875" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 2.5" | IMPELLER NO. | = SS4M | | |
| ONE STAGE WT.-LBS. | = 20 | MAX. SPHERE SIZE | = 0.250" | 1 | -6.5 |
| ADD'L STAGE WT. | = 5.8 | K-FACTOR, MAX. | = 1.2 | 2 | -5.0 |
| IMPELLER WT.-LBS. | = 0.90 | MAX. OPERATING PSIG | = 345 | 3 | -3.5 |
| ONE STAGE $WR^2$ | = 0.005 | MIN. SUBMERGENCE | = 6" | 4 | -2.0 |
| SPECIFIC SPEED | = 3039 | IMPELLER EYE AREA | = 2.00 Sq. In. | 5 | -1.0 |

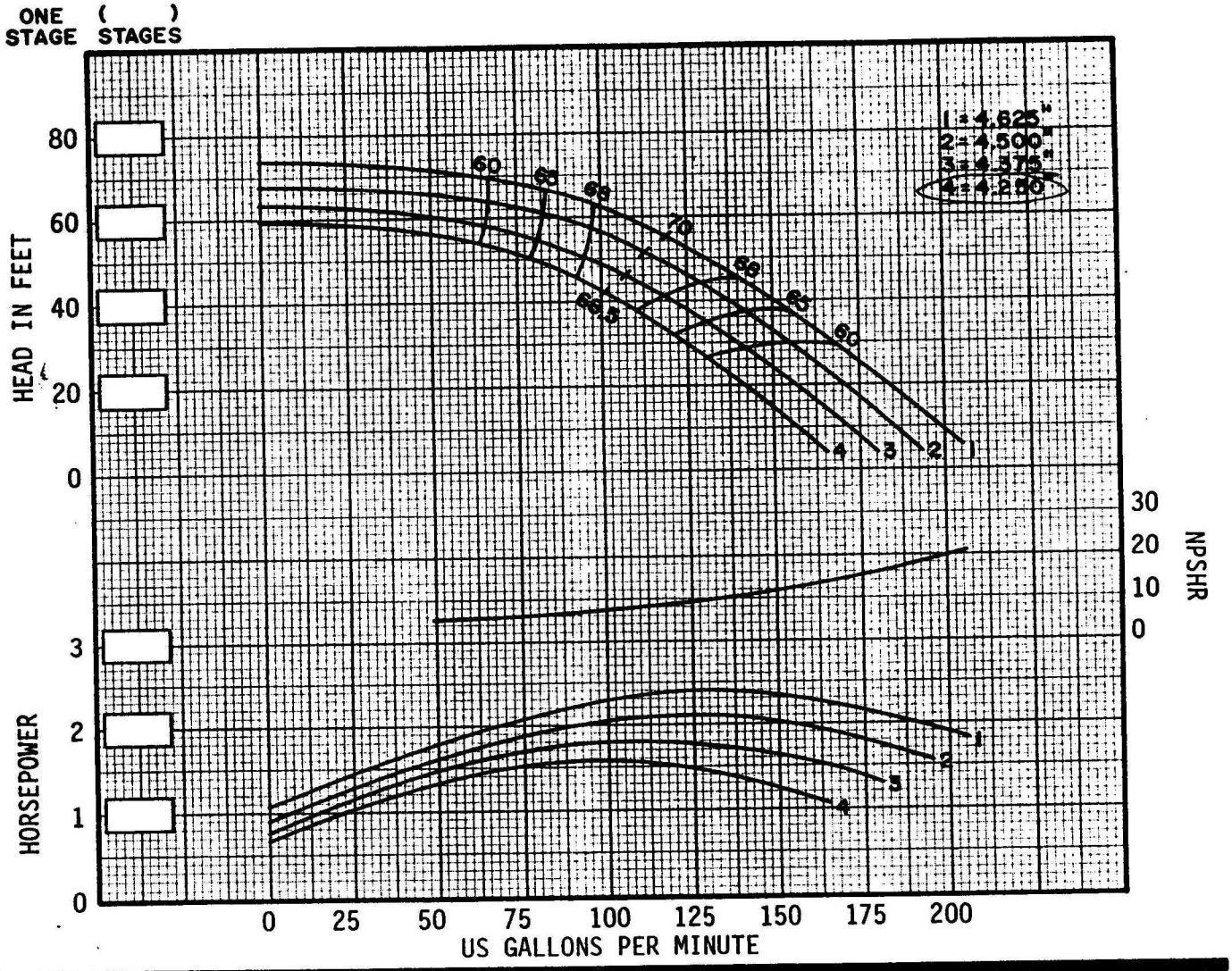


# SIMMONS SS6L

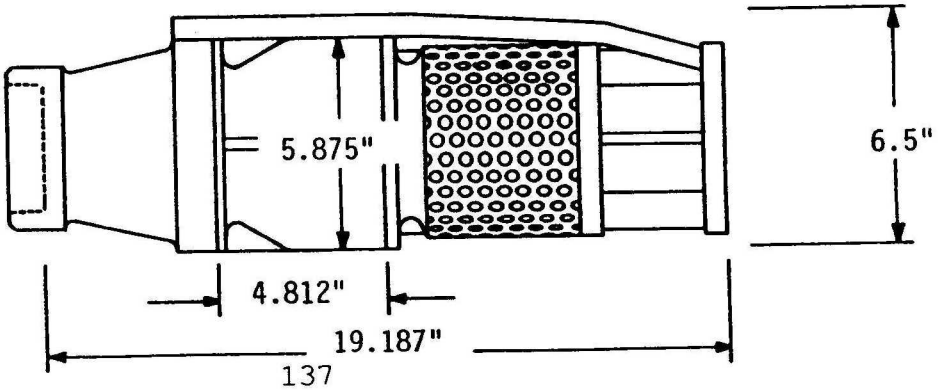
Well #27
2 H.P.
90 GPM → 40'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS. = 55 | MAX. SPHERE SIZE = 0.375" | 2 | -3 |
| ADD'L STAGE WT. = 18.5 | K-FACTOR, MAX. = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.55 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR² = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1842 | IMPELLER EYE AREA = 4.749 Sq. In. | | |

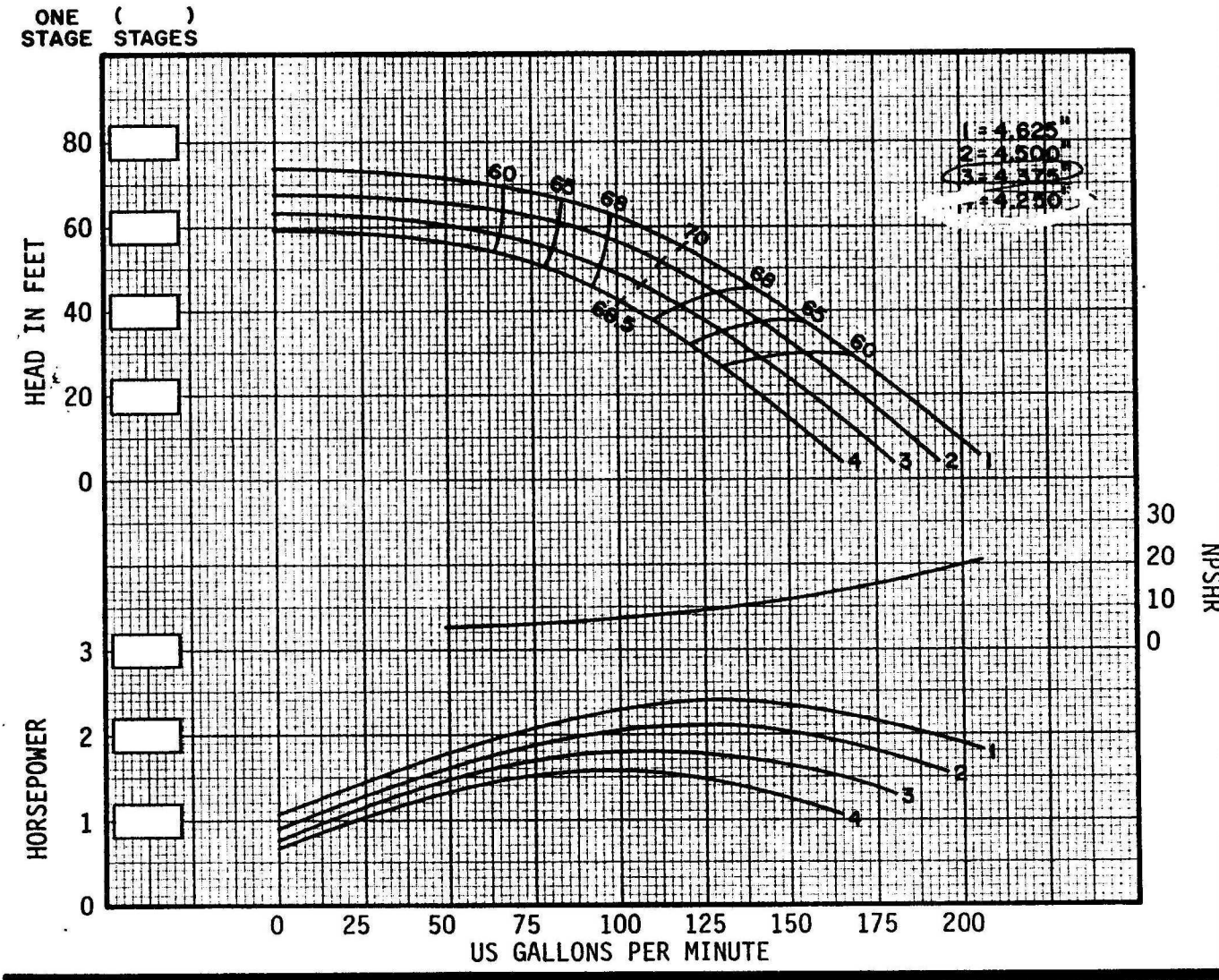


# SIMMONS SS6L

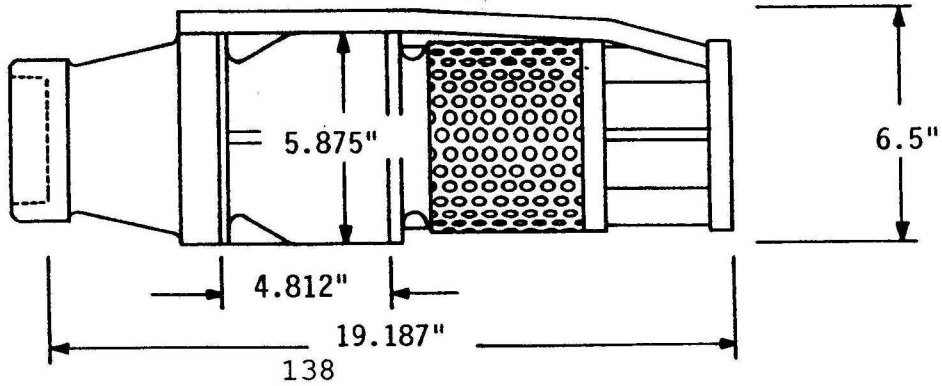
Well #28
2 H.P.
1106PM -> 40'
3450 R.P.M.

1 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 1.00" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 3" - 4" | IMPELLER NO. | = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS. | = 55 | MAX. SPHERE SIZE | = 0.375" | 2 | -3 |
| ADD'L STAGE WT. | = 18.5 | K-FACTOR, MAX. | = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. | = 2.55 | MAX. OPERATING PSIG | = 341 | 4 | -1 |
| ONE STAGE WR$^2$ | = 0.037 | MIN. SUBMERGENCE | = 11" | 5 | 0 |
| SPECIFIC SPEED | = 1842 | IMPELLER EYE AREA | = 4.749 Sq. In. | | |

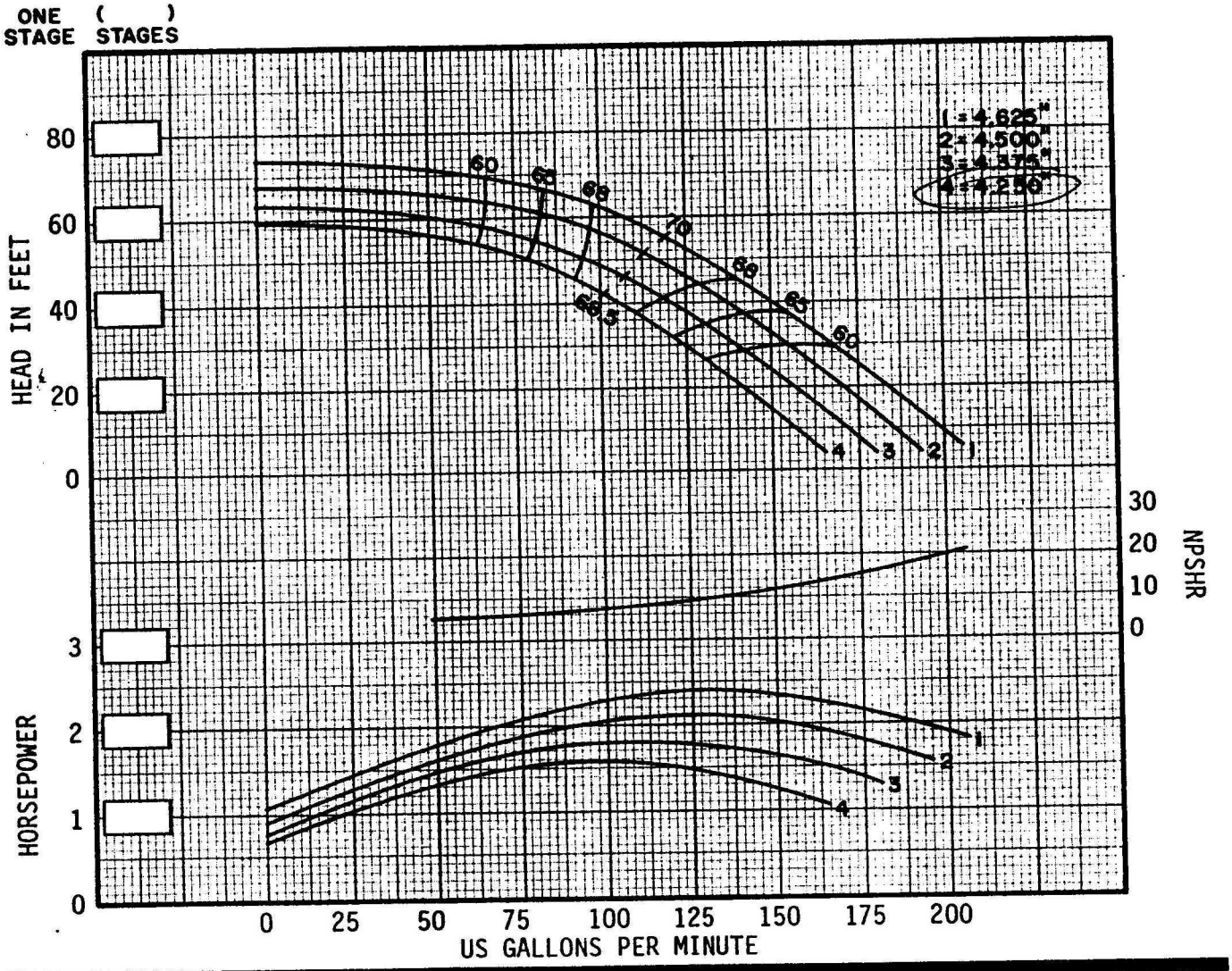


# SIMMONS SS6L

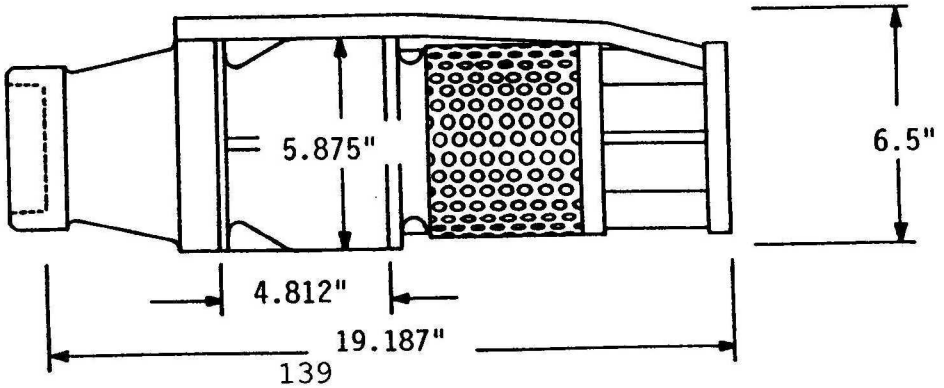
Well # 30
2 H.P.
956 pm -> 40'
3450 R.P.M.

1 STAGE

12-1-88




| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS. = 55 | MAX. SPHERE SIZE = 0.375" | 2 | -3 |
| ADD'L STAGE WT. = 18.5 | K-FACTOR, MAX. = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.55 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1842 | IMPELLER EYE AREA = 4.749 Sq. In. | | |

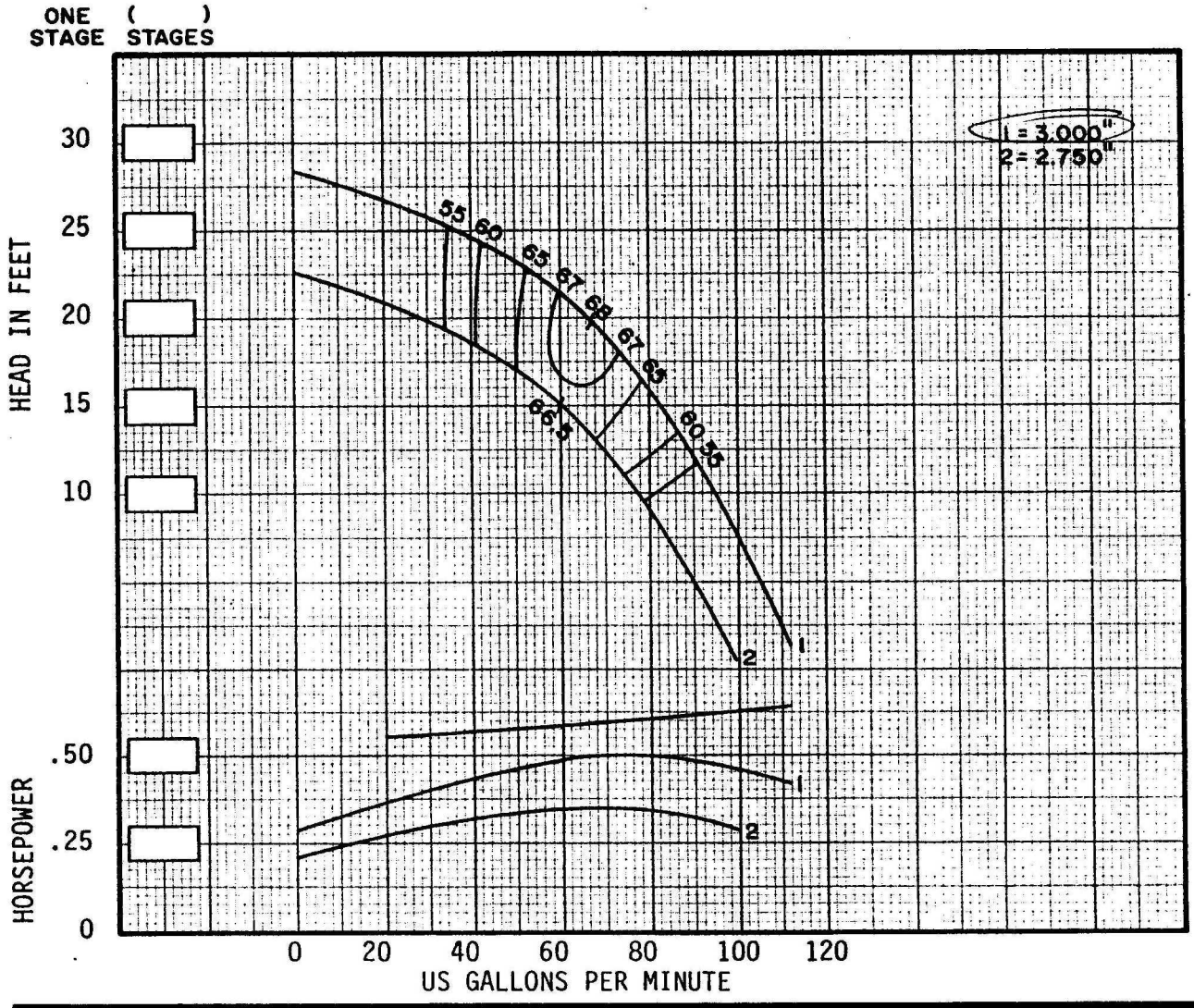


# SIMMONS SS4M

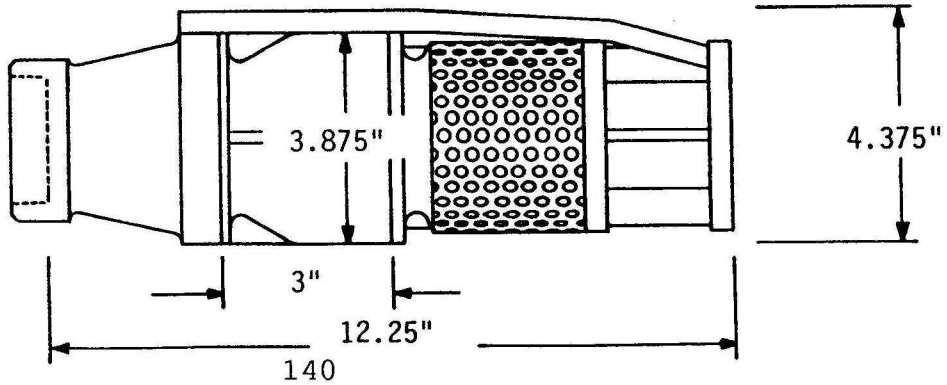
Well #31
2 H.P.
606PM → 38
3450 R.P.M.

2 STAGE

12-1-88




| | | | | | |
|---|---|---|---|---|---|
| STD. SHAFT DIA. | = 0.875" | IMPELLER TYPE | = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES | = 2.5" | IMPELLER NO. | = SS4M | | |
| ONE STAGE WT.-LBS. | = 20 | MAX. SPHERE SIZE | = 0.250" | 1 | -6.5 |
| ADD'L STAGE WT. | = 5.8 | K-FACTOR, MAX. | = 1.2 | 2 | -5.0 |
| IMPELLER WT.-LBS. | = 0.90 | MAX. OPERATING PSIG | = 345 | 3 | -3.5 |
| ONE STAGE $WR^2$ | = 0.005 | MIN. SUBMERGENCE | = 6" | 4 | -2.0 |
| SPECIFIC SPEED | = 3039 | IMPELLER EYE AREA | = 2.00 Sq. In. | 5 | -1.0 |

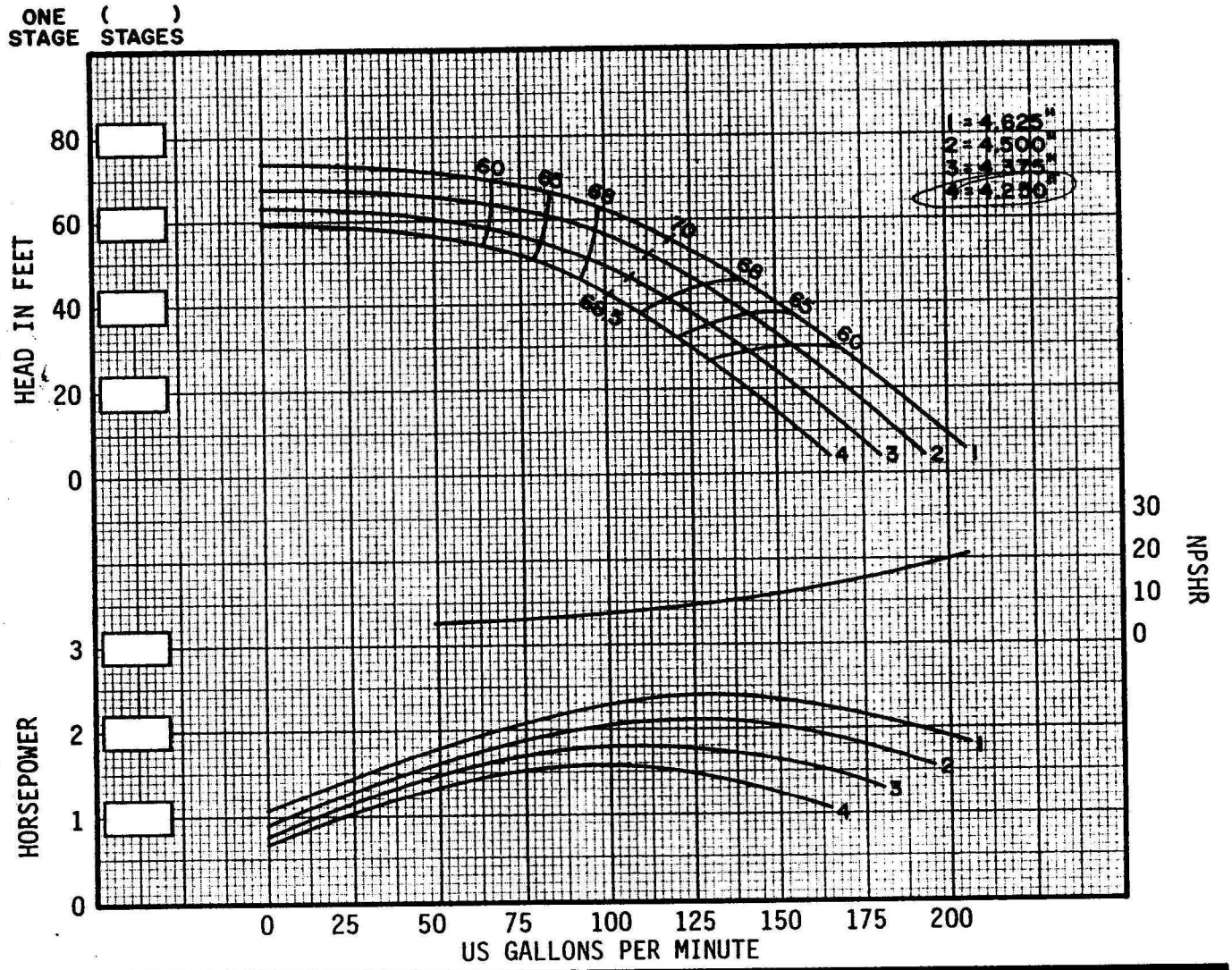


# SIMMONS SS6L

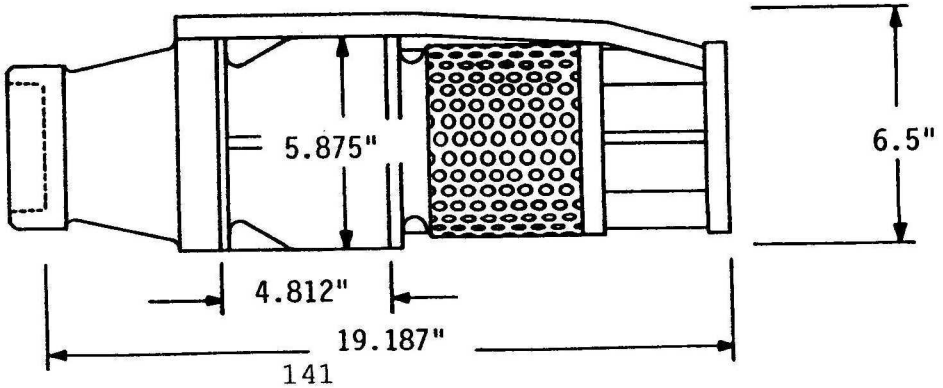
Well #32
2 H.P.
956 RPM → 36'
3450 R.P.M.

1 STAGE

12-1-88



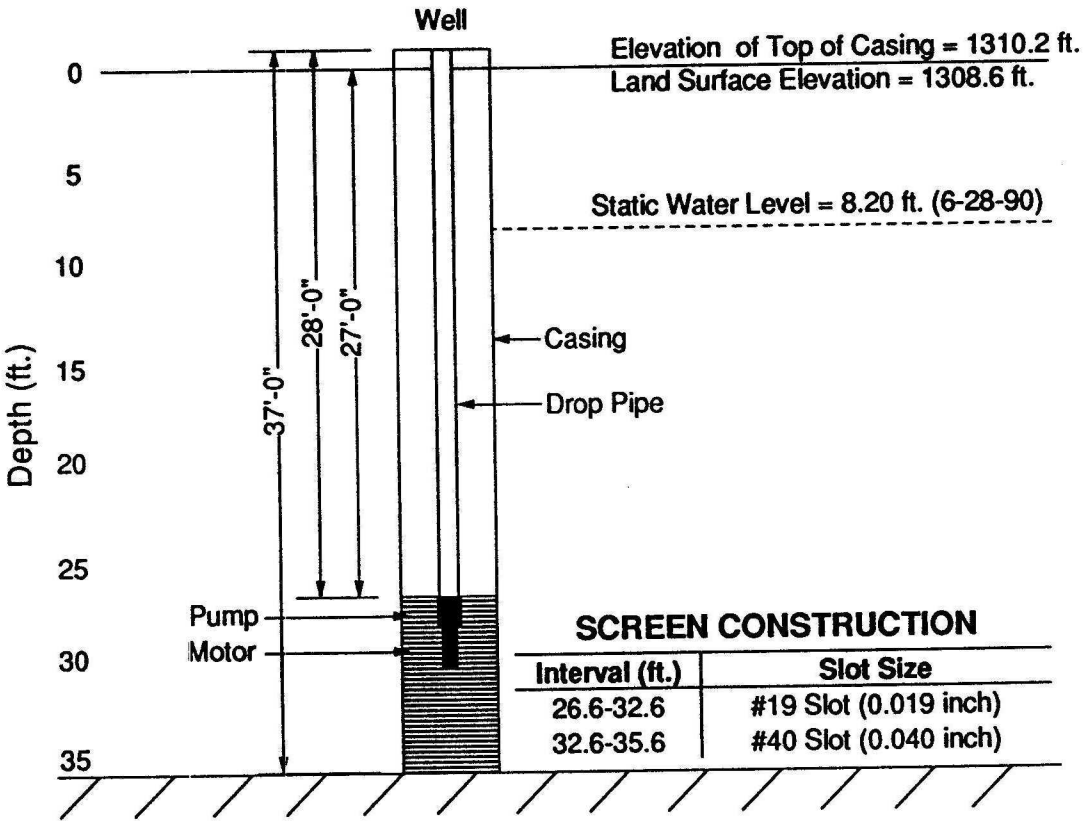

| | | | |
|---|---|---|---|
| STD. SHAFT DIA. = 1.00" | IMPELLER TYPE = ENCLOSED | NO. STAGES | EFF. CHANGE |
| DISCHARGE SIZES = 3" - 4" | IMPELLER NO. = SS6L | 1 | -4 |
| ONE STAGE WT.-LBS.= 55 | MAX. SPHERE SIZE = 0.375" | 2 | -3 |
| ADD'L STAGE WT. = 18.5 | K-FACTOR, MAX. = 2.30 | 3 | -2 |
| IMPELLER WT.-LBS. = 2.55 | MAX. OPERATING PSIG = 341 | 4 | -1 |
| ONE STAGE WR$^2$ = 0.037 | MIN. SUBMERGENCE = 11" | 5 | 0 |
| SPECIFIC SPEED = 1842 | IMPELLER EYE AREA = 4.749 Sq. In. | | |



**APPENDIX 5. -- As-built production well diagrams**

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 1 |
| USBR LINE NUMBER | 4B LAT |
| USBR SITE NUMBER | 34+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 26.6-32.6 | #19 Slot (0.019 inch) |
| 32.6-35.6 | #40 Slot (0.040 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 28 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

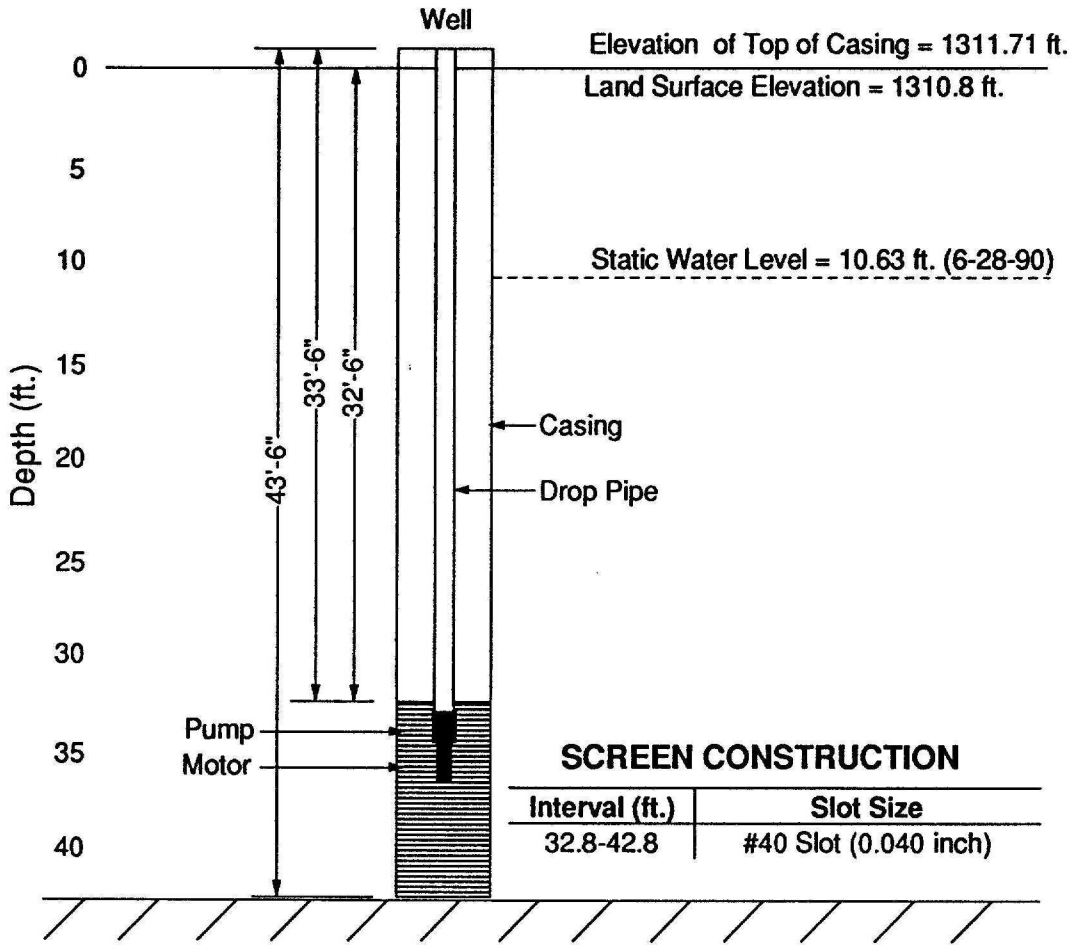
| | |
|---|---|
| Screen Length (ft.) | 9 |
| Screened Interval (ft.) | 26.6-35.6 |

| | |
|---|---|
| Drop Pipe Type | 4-inch steel |
| Drop Pipe Length (ft.) | 28 |

| | |
|---|---|
| Pump Motor Type | Franklin 5 h.p. |
| Pump Type | Simmons SS6H<br>(1 stage) Trim #3 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 2 |
| USBR LINE NUMBER | 4B LAT |
| USBR SITE NUMBER | 38+00 |




## SCREEN CONSTRUCTION

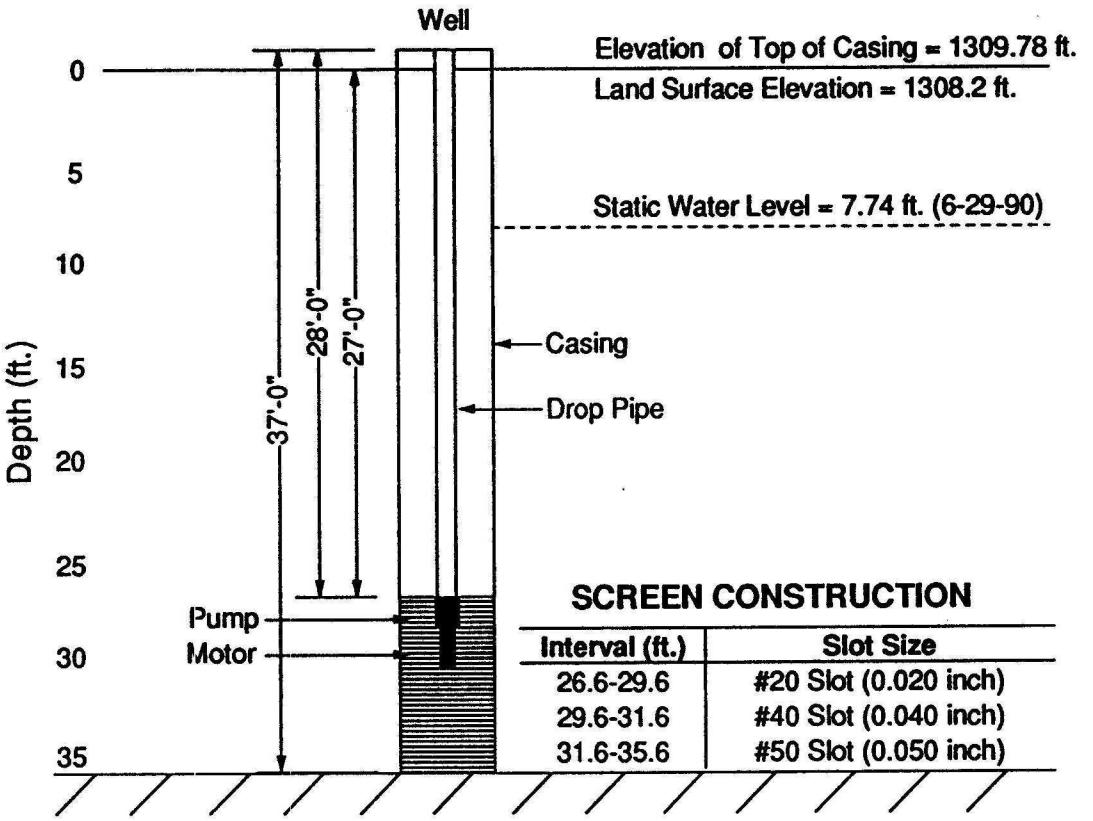
| Interval (ft.) | Slot Size |
|---|---|
| 32.8-42.8 | #40 Slot (0.040 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |
| Casing Length (ft.) | 33.5 |
| Screen Type | Johnson, High-Q 8 - inch Diameter Stainless Steel V - Slot |
| Screen Length (ft.) | 10 |
| Screened Interval (ft.) | 32.8-42.8 |
| Drop Pipe Type | 4-inch steel |
| Drop Pipe Length (ft.) | 34 |
| Pump Motor Type | Franklin 5 h.p. |
| Pump Type | Simmons SS6H (1 stage) Trim #3 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 3 |
| USBR LINE NUMBER | 4B LAT |
| USBR SITE NUMBER | 42+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 26.6-29.6 | #20 Slot (0.020 inch) |
| 29.6-31.6 | #40 Slot (0.040 inch) |
| 31.6-35.6 | #50 Slot (0.050 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 28 |

| | |
|---|---|
| Screen Type | Johnson, High-Q 8 - inch Diameter Stainless Steel V - Slot |

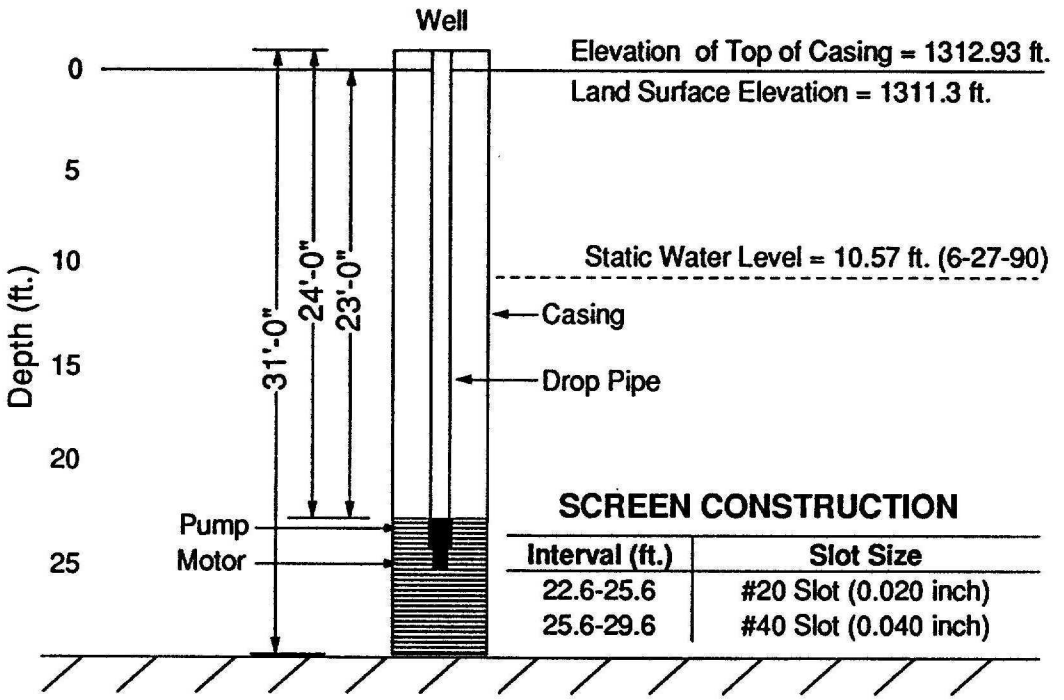
| | |
|---|---|
| Screen Length (ft.) | 9 |
| Screened Interval (ft.) | 26.6-35.6 |

| | |
|---|---|
| Drop Pipe Type | 4-inch steel |
| Drop Pipe Length (ft.) | 28 |

| | |
|---|---|
| Pump Motor Type | Franklin 5 h.p. |
| Pump Type | Simmons SS6H (1 stage) Trim #2 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 4 |
| USBR LINE NUMBER | 4C LAT |
| USBR SITE NUMBER | 46+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 22.6-25.6 | #20 Slot (0.020 inch) |
| 25.6-29.6 | #40 Slot (0.040 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 24 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

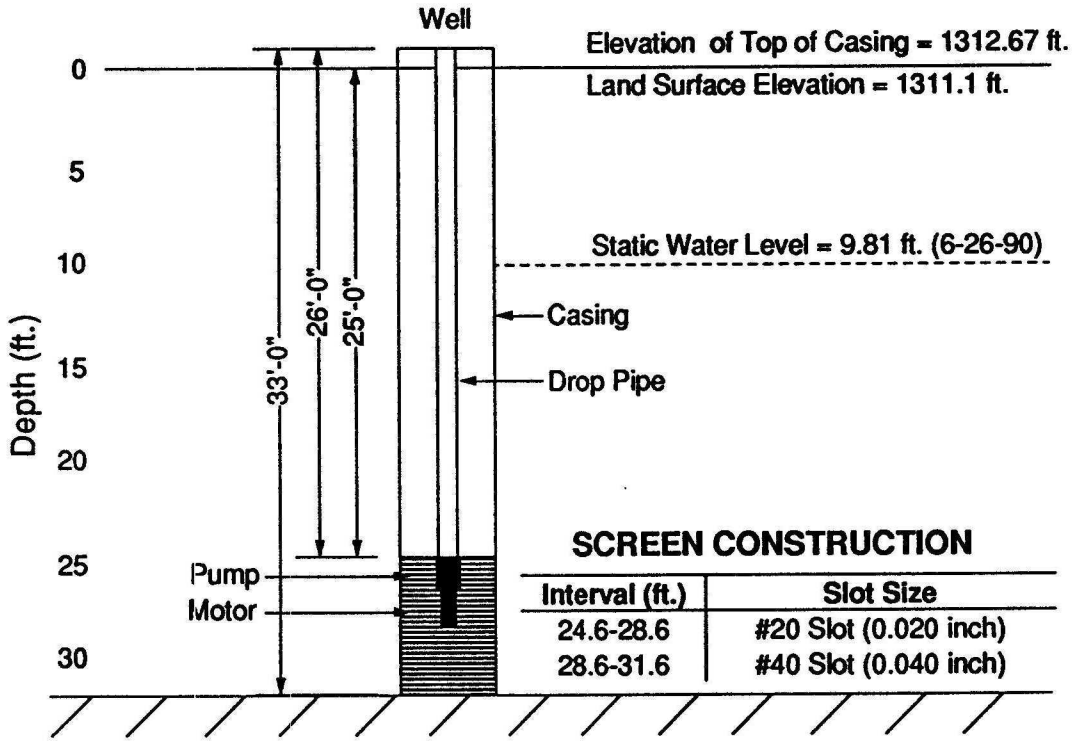
| | |
|---|---|
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 22.6-29.6 |

| | |
|---|---|
| Drop Pipe Type | 2-inch steel |
| Drop Pipe Length (ft.) | 24 |

| | |
|---|---|
| Pump Motor Type | Franklin 1.5 h.p. |
| Pump Type | Simmons SS6L (1 stage) Trim #4 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 5 |
| USBR LINE NUMBER | 4C LAT |
| USBR SITE NUMBER | 50+00 |




## SCREEN CONSTRUCTION

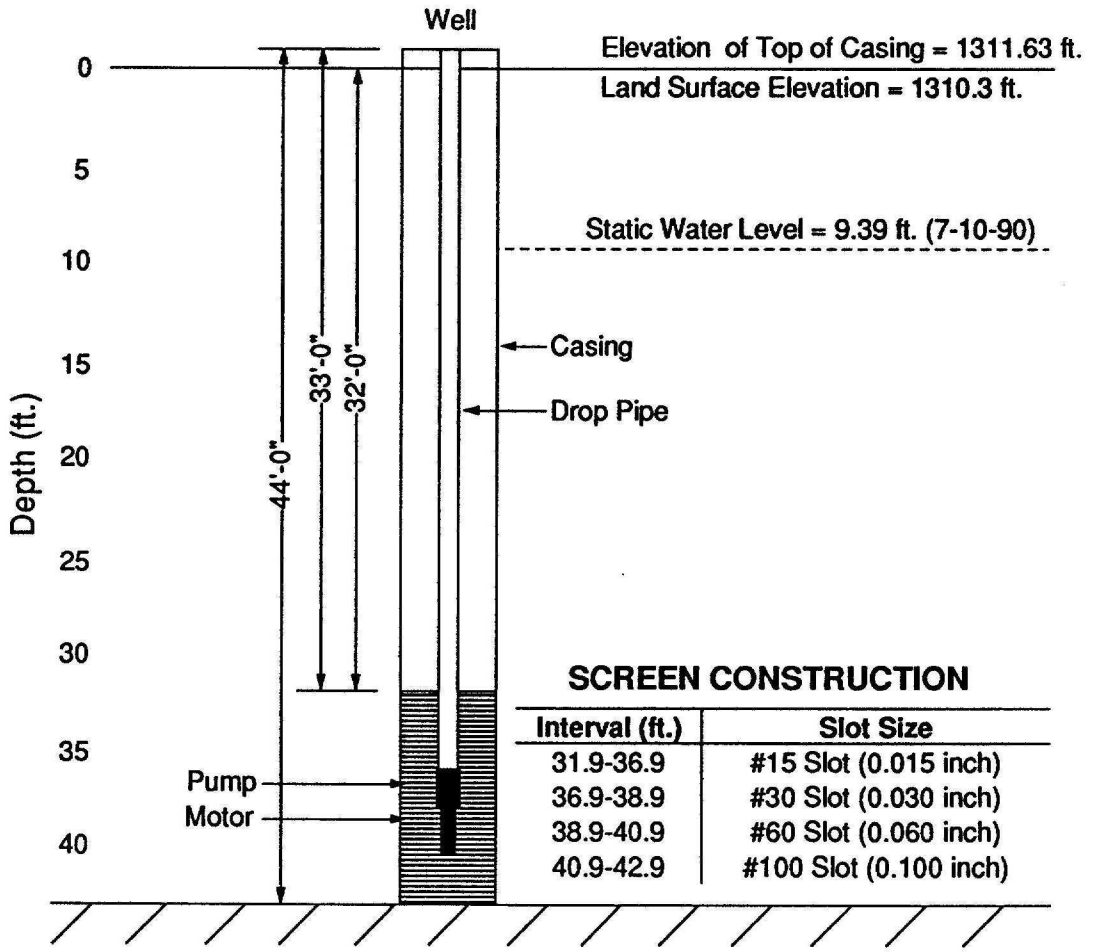
| Interval (ft.) | Slot Size |
|---|---|
| 24.6-28.6 | #20 Slot (0.020 inch) |
| 28.6-31.6 | #40 Slot (0.040 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |
| Casing Length (ft.) | 26 |
| Screen Type | Johnson, High-Q 8 - inch Diameter Stainless Steel V - Slot |
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 24.6-28.6 |
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 26 |
| Pump Motor Type | Franklin 3 h.p. |
| Pump Type | Simmons SS6M (1 stage) Trim #3 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 6 |
| USBR LINE NUMBER | 3C2 |
| USBR SITE NUMBER | 2+00 |




## SCREEN CONSTRUCTION

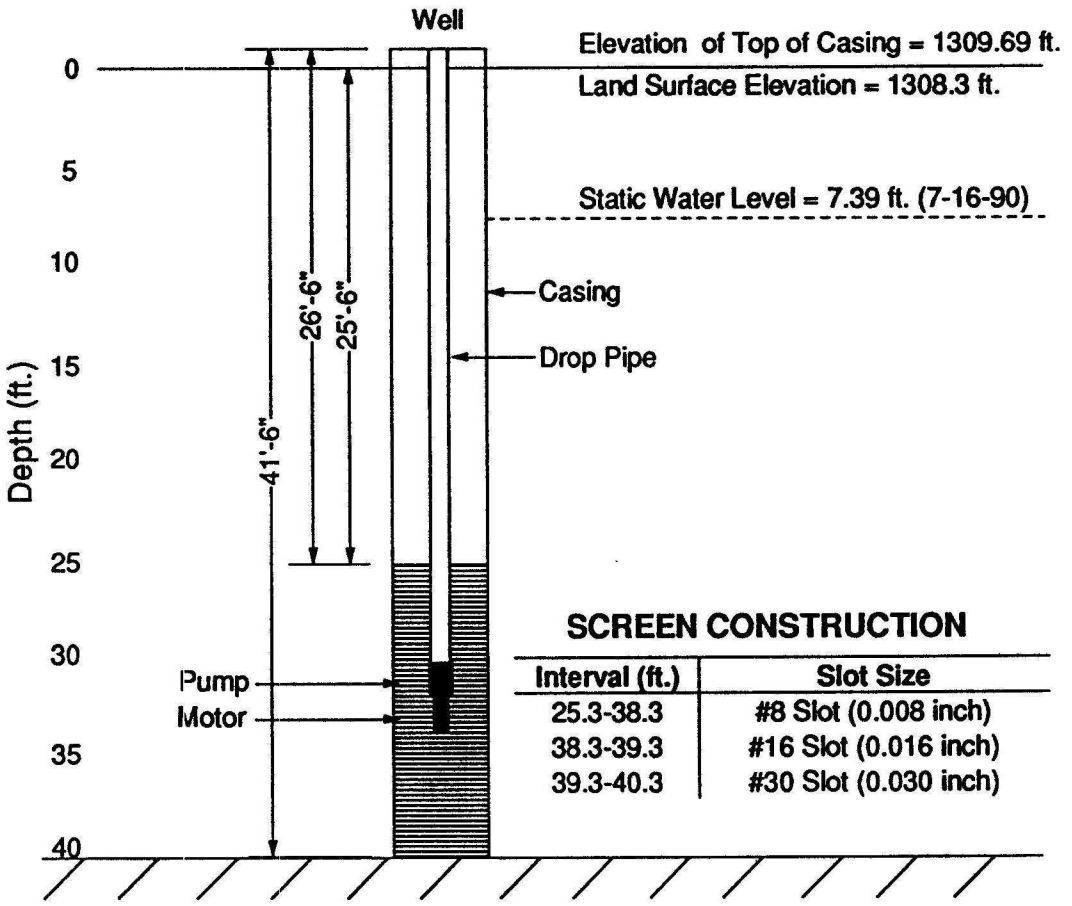
| Interval (ft.) | Slot Size |
|---|---|
| 31.9-36.9 | #15 Slot (0.015 inch) |
| 36.9-38.9 | #30 Slot (0.030 inch) |
| 38.9-40.9 | #60 Slot (0.060 inch) |
| 40.9-42.9 | #100 Slot (0.100 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |
| Casing Length (ft.) | 33 |
| Screen Type | Johnson, High-Q 8 - inch Diameter Stainless Steel V - Slot |
| Screen Length (ft.) | 11 |
| Screened Interval (ft.) | 31.9-42.9 |
| Drop Pipe Type | 4-inch steel |
| Drop Pipe Length (ft.) | 37 |
| Pump Motor Type | Franklin 10 h.p. |
| Pump Type | Crown 7H-400 (1 stage) |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 7 |
| USBR LINE NUMBER | 3C1 |
| USBR SITE NUMBER | 4+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 25.3-38.3 | #8 Slot (0.008 inch) |
| 38.3-39.3 | #16 Slot (0.016 inch) |
| 39.3-40.3 | #30 Slot (0.030 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 26.5 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

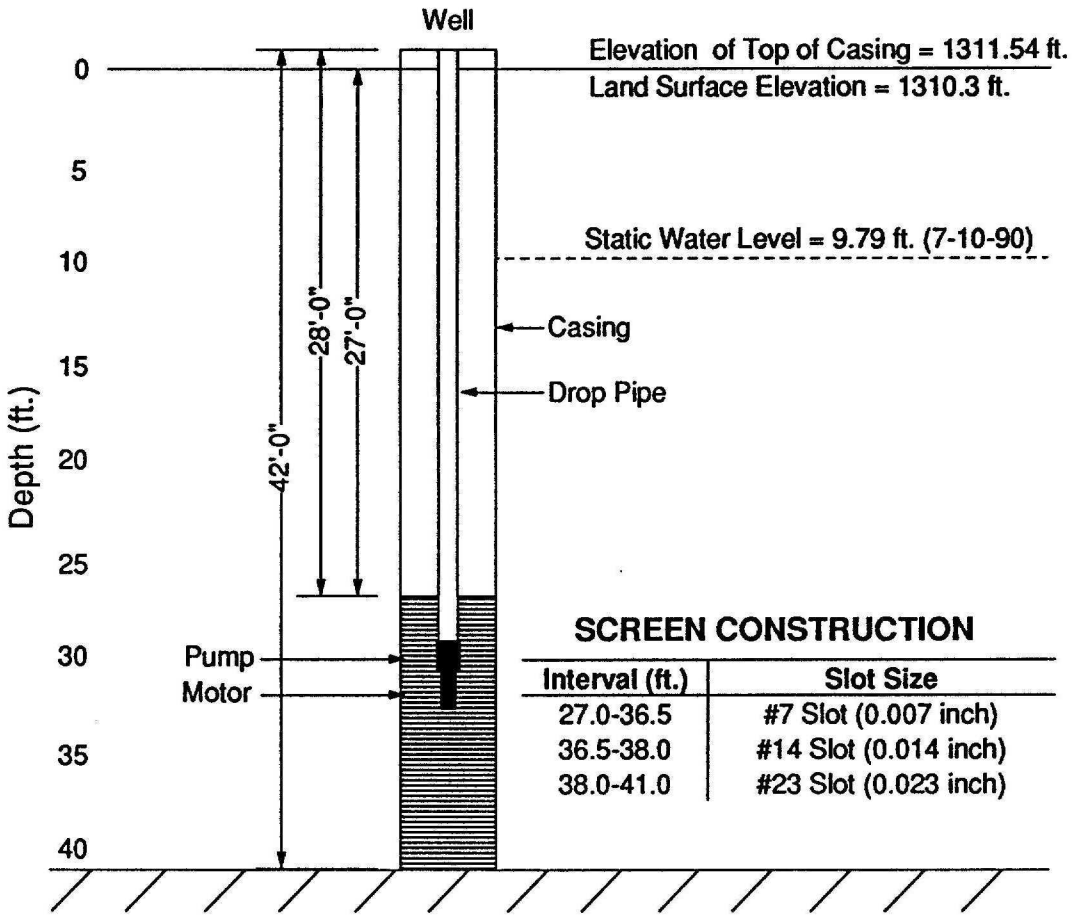
| | |
|---|---|
| Screen Length (ft.) | 15 |
| Screened Interval (ft.) | 25.3-40.3 |

| | |
|---|---|
| Drop Pipe Type | 4-inch steel |
| Drop Pipe Length (ft.) | 31.5 |

| | |
|---|---|
| Pump Motor Type | Franklin 5 h.p. |
| Pump Type | Simmons SS6M<br>(1 stage) Trim #1 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 8 |
| USBR LINE NUMBER | 3C1 |
| USBR SITE NUMBER | 8+00 |




## SCREEN CONSTRUCTION

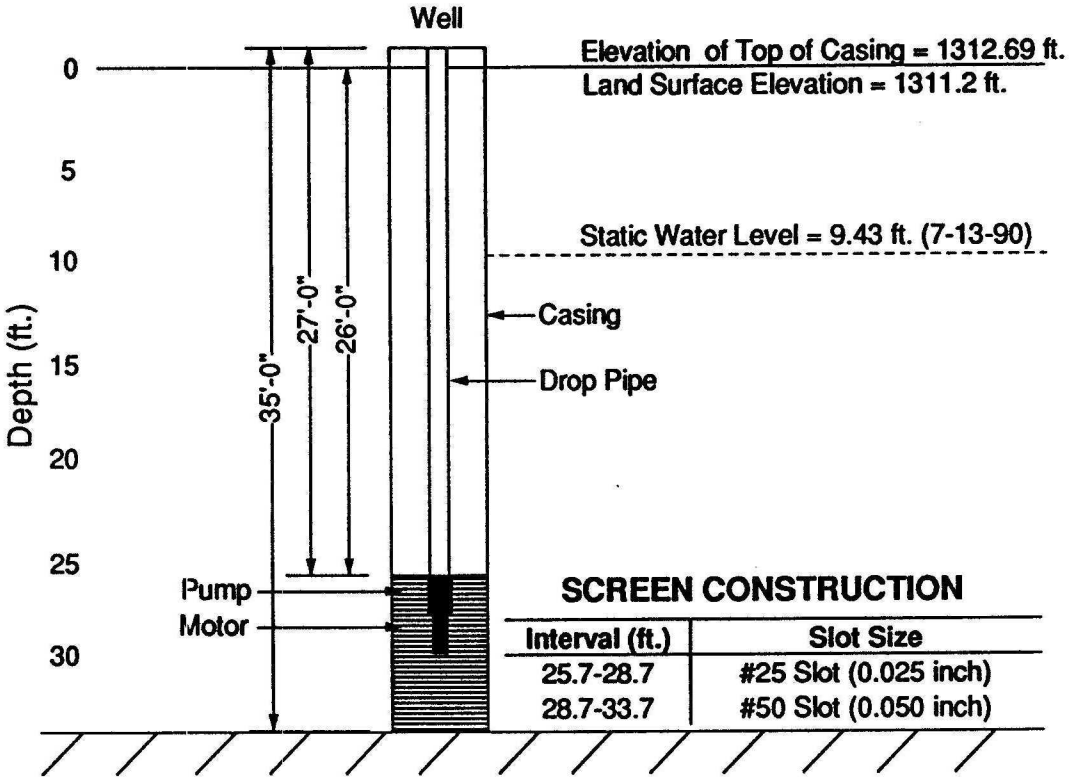
| Interval (ft.) | Slot Size |
|---|---|
| 27.0-36.5 | #7 Slot (0.007 inch) |
| 36.5-38.0 | #14 Slot (0.014 inch) |
| 38.0-41.0 | #23 Slot (0.023 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |
| Casing Length (ft.) | 28 |
| Screen Type | Johnson, High-Q 8 - inch Diameter Stainless Steel V - Slot |
| Screen Length (ft.) | 14 |
| Screened Interval (ft.) | 27-41 |
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 30.3 |
| Pump Motor Type | Franklin 3 h.p. |
| Pump Type | Simmons SS6M (1 stage) Trim #2 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 9 |
| USBR LINE NUMBER | 3C1 |
| USBR SITE NUMBER | 16+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 25.7-28.7 | #25 Slot (0.025 inch) |
| 28.7-33.7 | #50 Slot (0.050 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 27 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

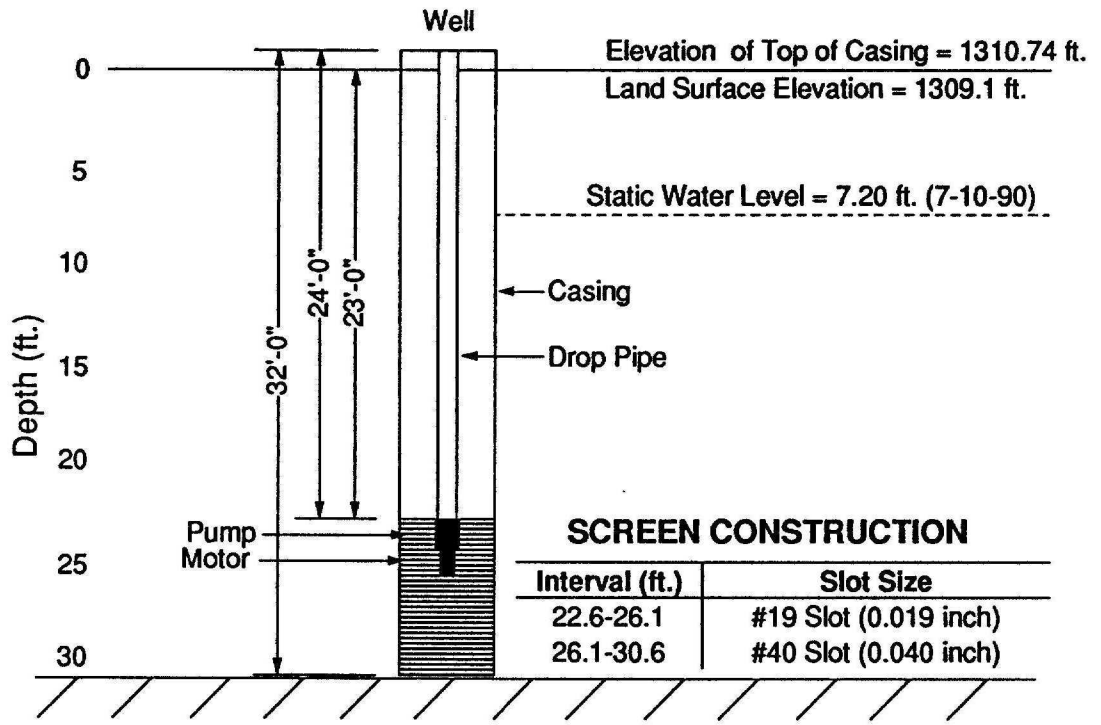
| | |
|---|---|
| Screen Length (ft.) | 8 |
| Screened Interval (ft.) | 25.7-33.7 |

| | |
|---|---|
| Drop Pipe Type | 4-inch steel |
| Drop Pipe Length (ft.) | 27 |

| | |
|---|---|
| Pump Motor Type | Franklin 7.5 h.p. |
| Pump Type | Crown 6H-300<br>(1 stage) Trim A |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 10 |
| USBR LINE NUMBER | 3C1 |
| USBR SITE NUMBER | 20+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 22.6-26.1 | #19 Slot (0.019 inch) |
| 26.1-30.6 | #40 Slot (0.040 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 24 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

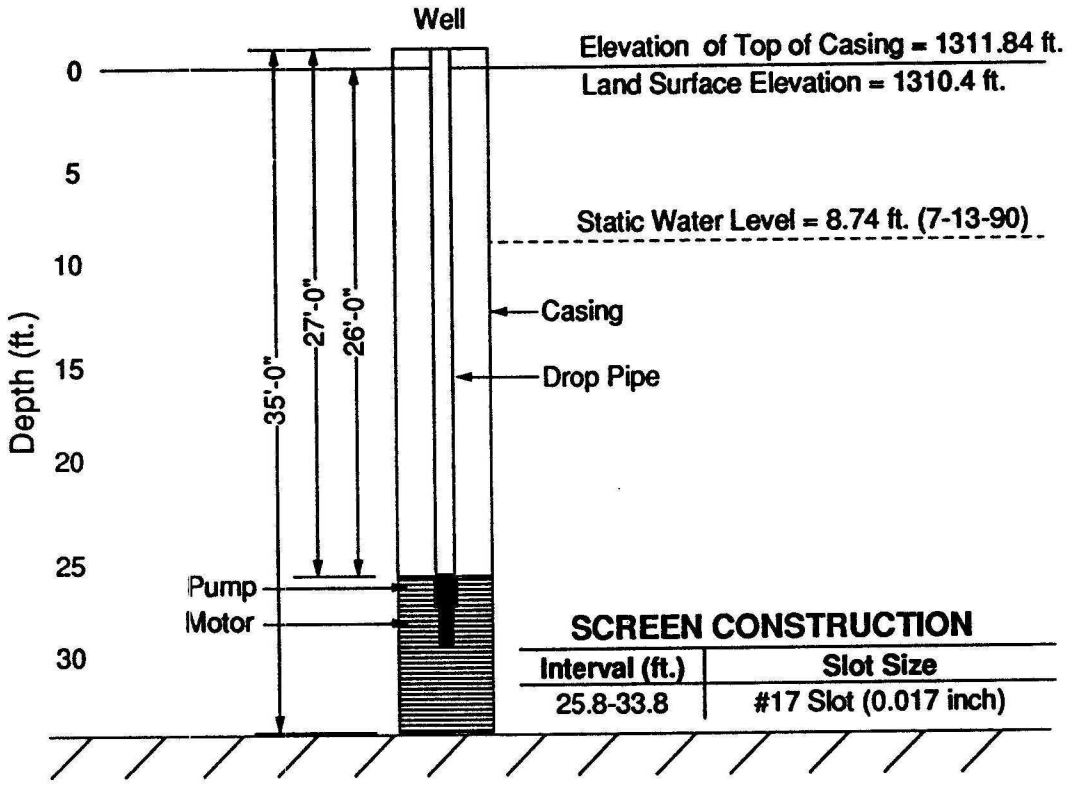
| | |
|---|---|
| Screen Length (ft.) | 8 |
| Screened Interval (ft.) | 22.6-30.6 |

| | |
|---|---|
| Drop Pipe Type | 4-inch steel |
| Drop Pipe Length (ft.) | 24 |

| | |
|---|---|
| Pump Motor Type | Franklin 5 h.p. |
| Pump Type | Simmons SS6H<br>(1 stage) Trim #3 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 11 |
| USBR LINE NUMBER | 3C3 |
| USBR SITE NUMBER | 8+00 |




**SCREEN CONSTRUCTION**

| Interval (ft.) | Slot Size |
|---|---|
| 25.8-33.8 | #17 Slot (0.017 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 27 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

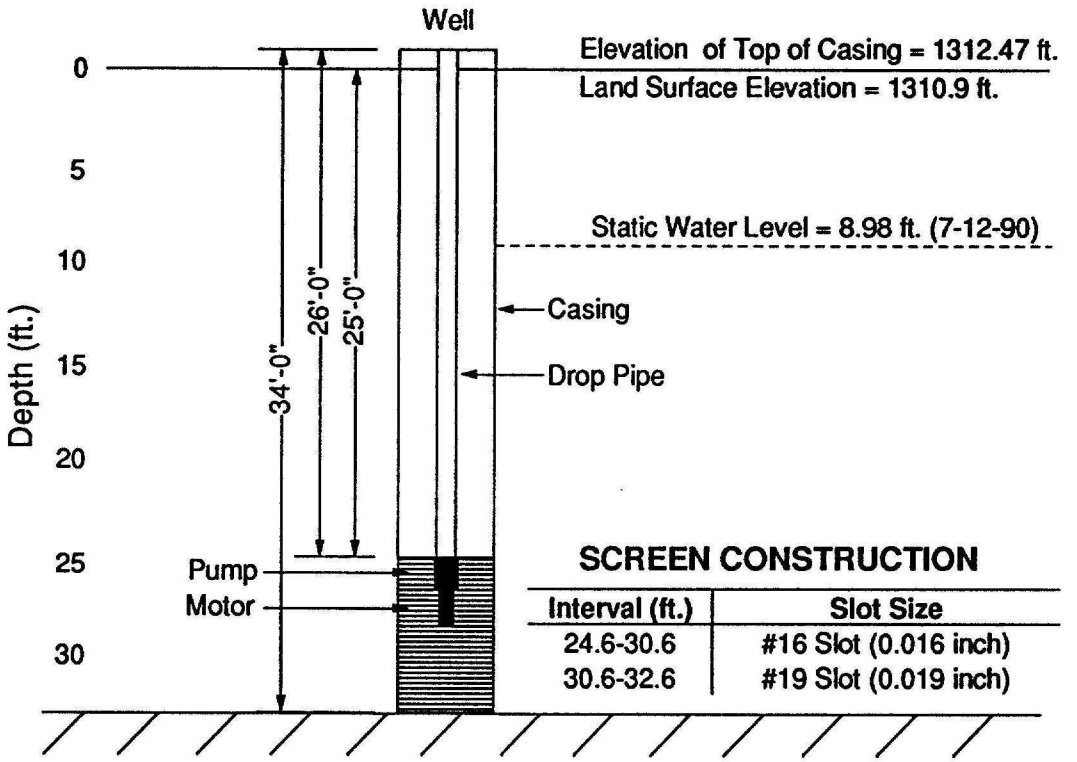
| | |
|---|---|
| Screen Length (ft.) | 8 |
| Screened Interval (ft.) | 25.8-33.8 |

| | |
|---|---|
| Drop Pipe Type | 4-inch steel |
| Drop Pipe Length (ft.) | 26.9 |

| | |
|---|---|
| Pump Motor Type | Franklin 3 h.p. |
| Pump Type | Simmons SS6M (1 stage) Trim #2 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 12 |
| USBR LINE NUMBER | 3C3 |
| USBR SITE NUMBER | 12+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 24.6-30.6 | #16 Slot (0.016 inch) |
| 30.6-32.6 | #19 Slot (0.019 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 26 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

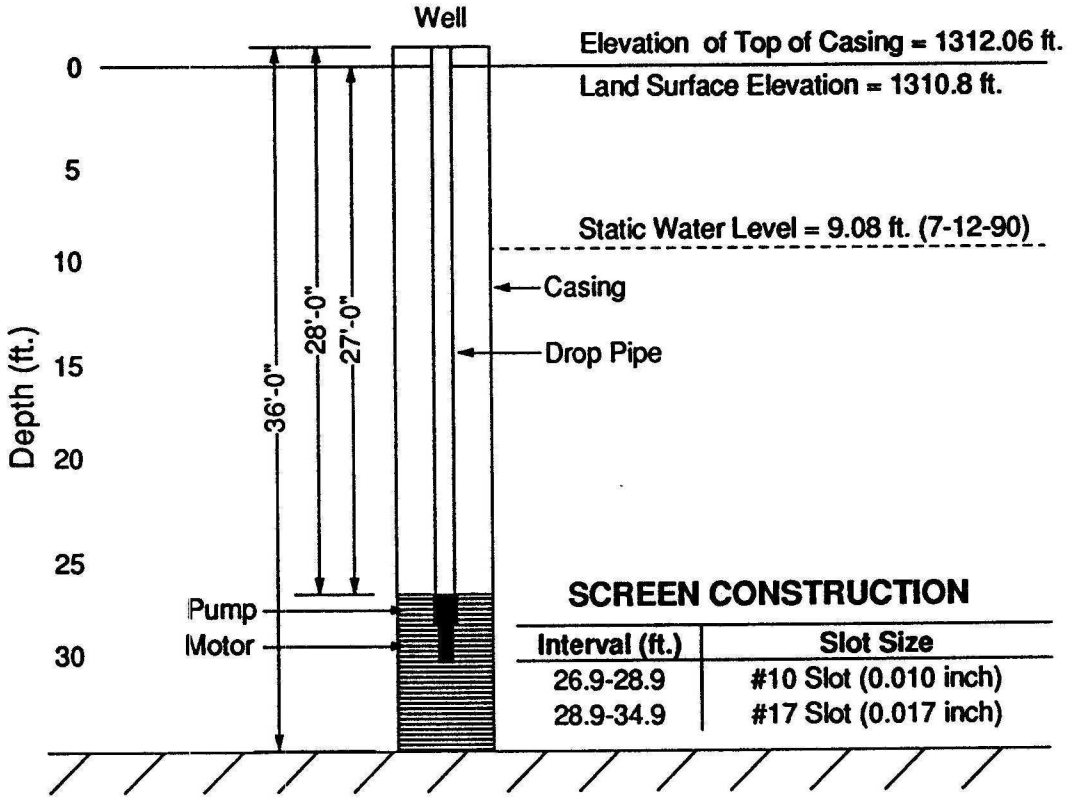
| | |
|---|---|
| Screen Length (ft.) | 8 |
| Screened Interval (ft.) | 24.6-32.6 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 26 |

| | |
|---|---|
| Pump Motor Type | Franklin 3 h.p. |
| Pump Type | Simmons SS6L (1 stage) Trim #1 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 13 |
| USBR LINE NUMBER | 3C3 |
| USBR SITE NUMBER | 16+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 26.9-28.9 | #10 Slot (0.010 inch) |
| 28.9-34.9 | #17 Slot (0.017 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 28 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

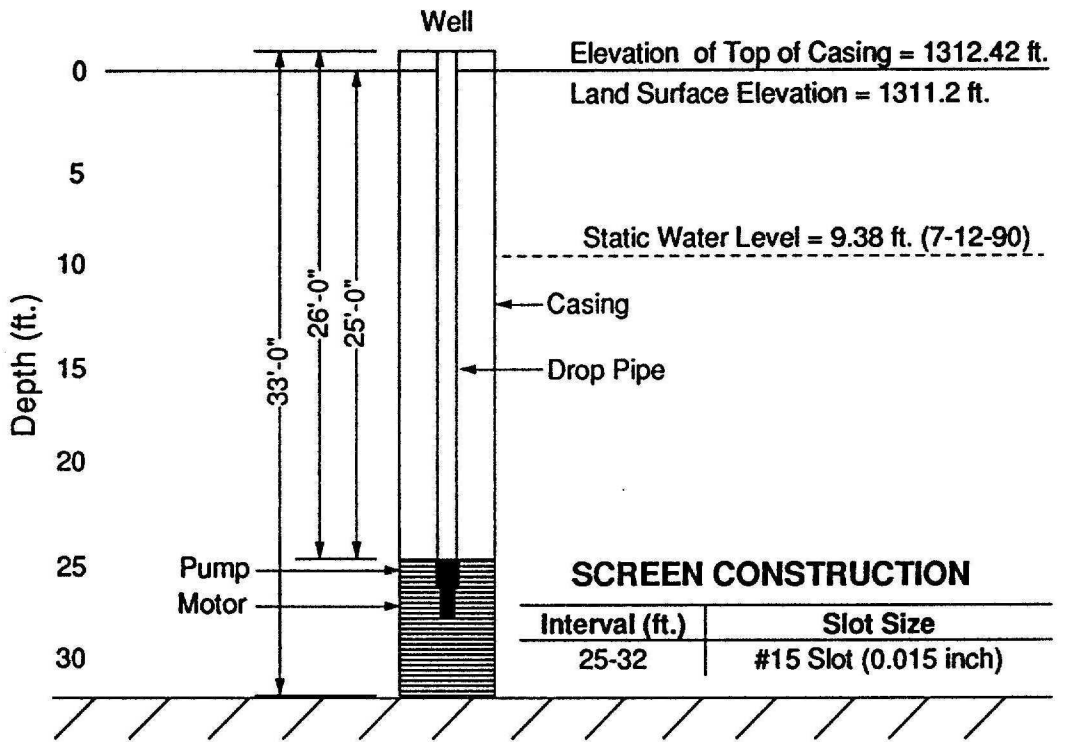
| | |
|---|---|
| Screen Length (ft.) | 8 |
| Screened Interval (ft.) | 26.9-34.9 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 28 |

| | |
|---|---|
| Pump Motor Type | Franklin 3 h.p. |
| Pump Type | Simmons SS6M (1 stage) Trim #2 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 14 |
| USBR LINE NUMBER | 3C3 |
| USBR SITE NUMBER | 20+00 |




## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 26 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

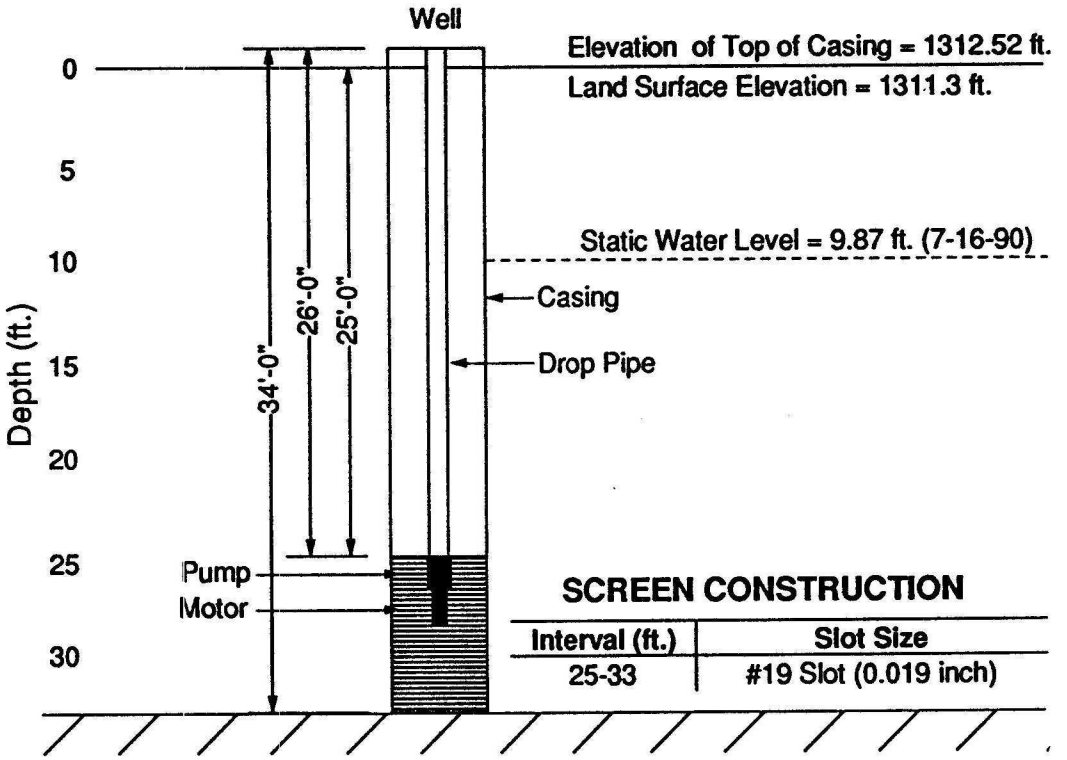
| | |
|---|---|
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 25-32 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 26 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS4M (3 stage) Trim #1 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 15 |
| USBR LINE NUMBER | 3C3 |
| USBR SITE NUMBER | 24+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 25-33 | #19 Slot (0.019 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 26 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

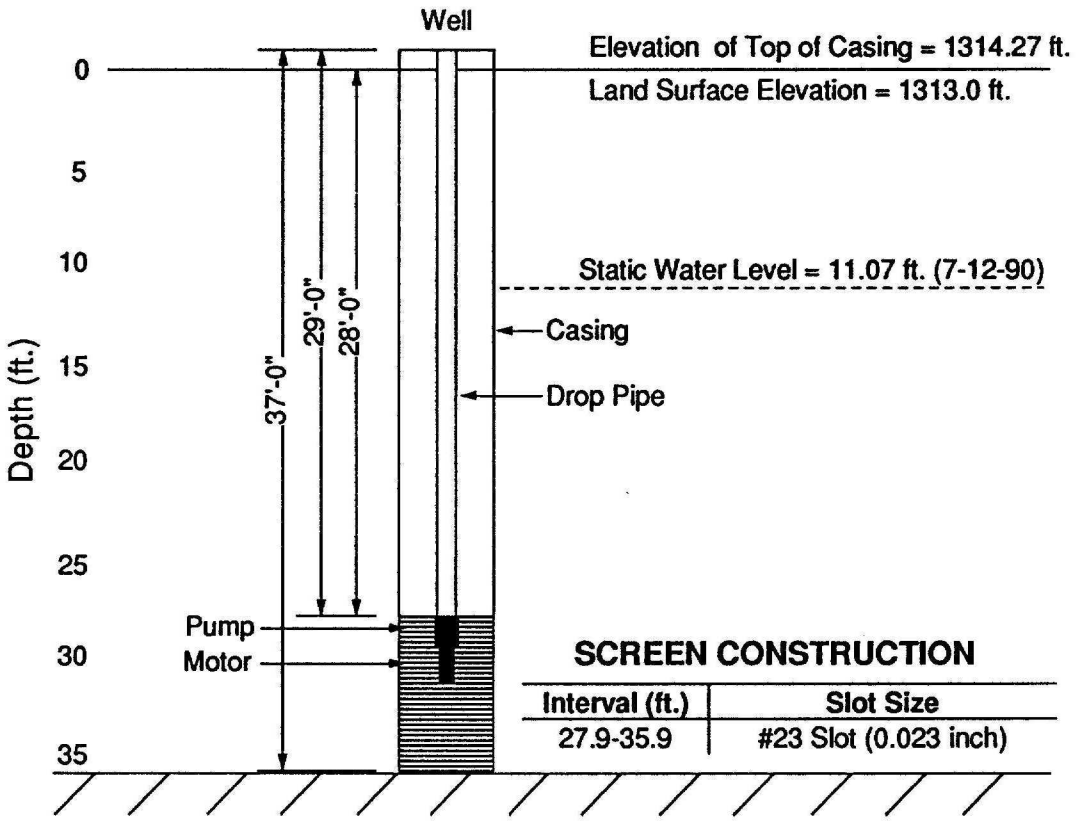
| | |
|---|---|
| Screen Length (ft.) | 8 |
| Screened Interval (ft.) | 25-33 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 26 |

| | |
|---|---|
| Pump Motor Type | Franklin 3 h.p. |
| Pump Type | Simmons SS6L (1 stage) Trim #1 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 16 |
| USBR LINE NUMBER | 3C4 |
| USBR SITE NUMBER | 9+93 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 27.9-35.9 | #23 Slot (0.023 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 29 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

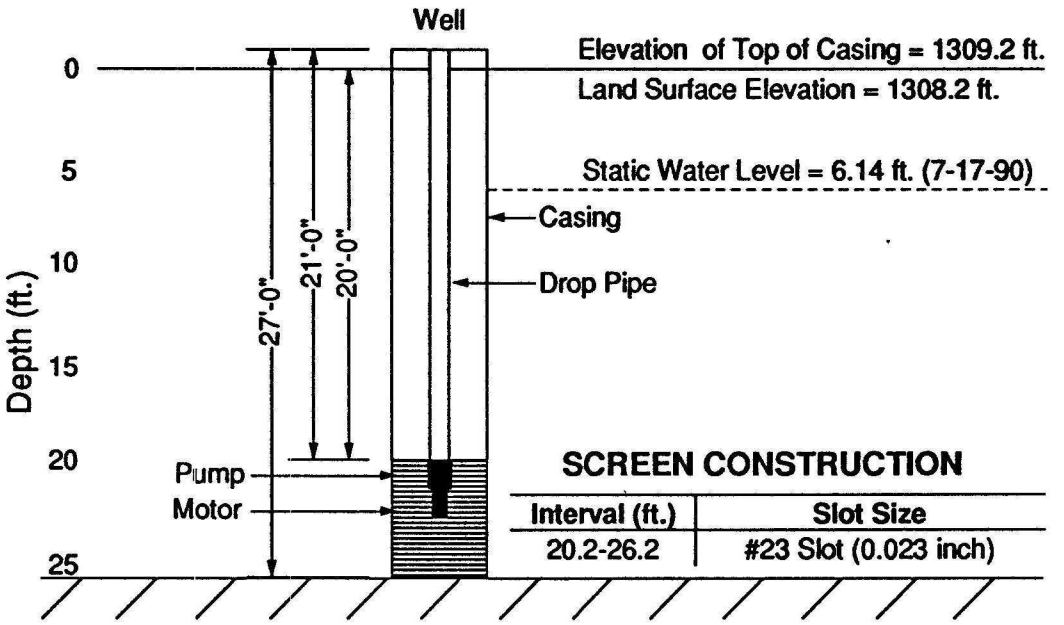
| | |
|---|---|
| Screen Length (ft.) | 8 |
| Screened Interval (ft.) | 27.9-35.9 |

| | |
|---|---|
| Drop Pipe Type | 4-inch steel |
| Drop Pipe Length (ft.) | 29 |

| | |
|---|---|
| Pump Motor Type | Franklin 3 h.p. |
| Pump Type | Simmons SS6M (1 stage) Trim #2 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 17 |
| USBR LINE NUMBER | 3C4 |
| USBR SITE NUMBER | 14+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 20.2-26.2 | #23 Slot (0.023 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 21 |

| | |
|---|---|
| Screen Type | Johnson, High-Q 8 - inch Diameter Stainless Steel V - Slot |

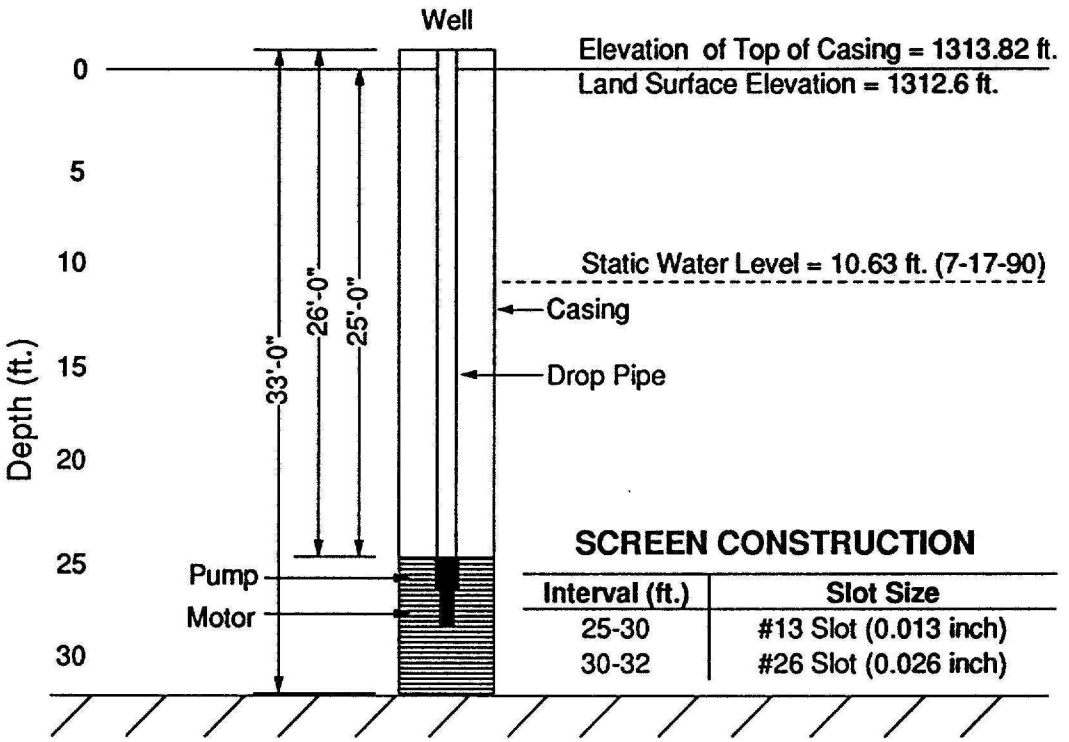
| | |
|---|---|
| Screen Length (ft.) | 6 |
| Screened Interval (ft.) | 20.2-26.2 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 21 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS4H (3 stage) Trim #1 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 18 |
| USBR LINE NUMBER | 3C4 |
| USBR SITE NUMBER | 22+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 25-30 | #13 Slot (0.013 inch) |
| 30-32 | #26 Slot (0.026 inch) |

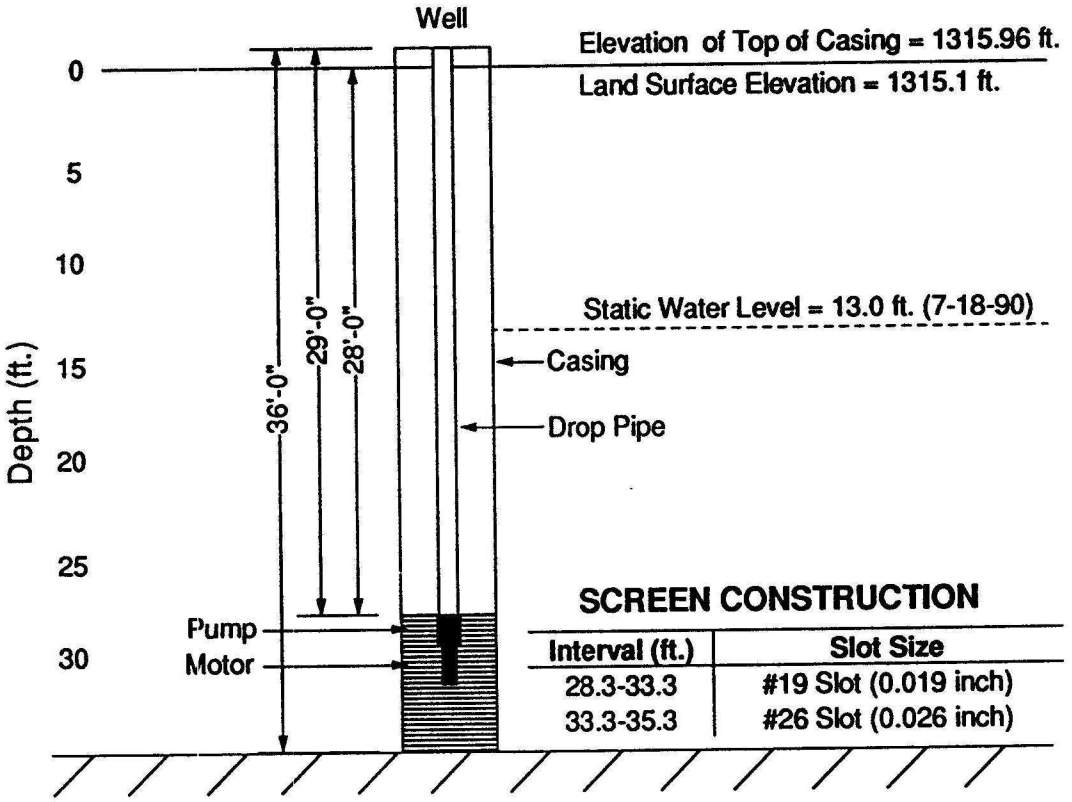
## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |
| Screen Type | Johnson, High-Q 8 - inch Diameter Stainless Steel V - Slot |
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 26 |

| | |
|---|---|
| | 26 |
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 25-32 |
| Pump Motor Type | Franklin 3 h.p. |
| Pump Type | Simmons SS6L (1 stage) Trim #1 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 19 |
| USBR LINE NUMBER | 3C4 |
| USBR SITE NUMBER | 26+00 |




## SCREEN CONSTRUCTION

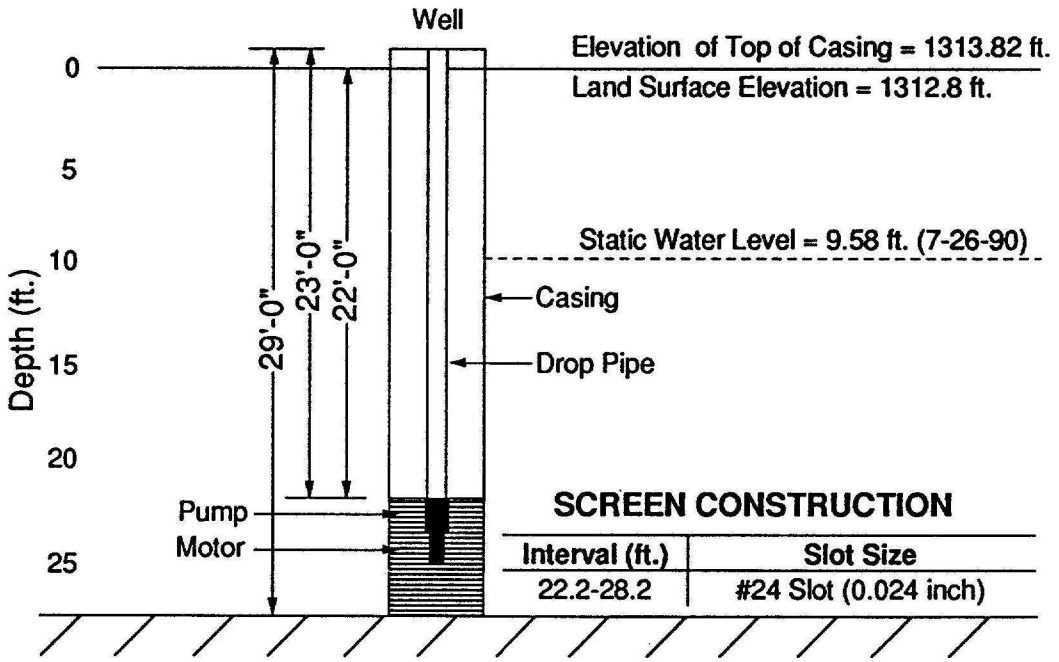
| Interval (ft.) | Slot Size |
|---|---|
| 28.3-33.3 | #19 Slot (0.019 inch) |
| 33.3-35.3 | #26 Slot (0.026 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |
| Casing Length (ft.) | 29 |
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 28.3-35.3 |
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 29 |
| Pump Motor Type | Franklin 5 h.p. |
| Pump Type | Simmons SS6M (1 stage) Trim #2 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 20 |
| USBR LINE NUMBER | 16A2 |
| USBR SITE NUMBER | 2+00 |




## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 23 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

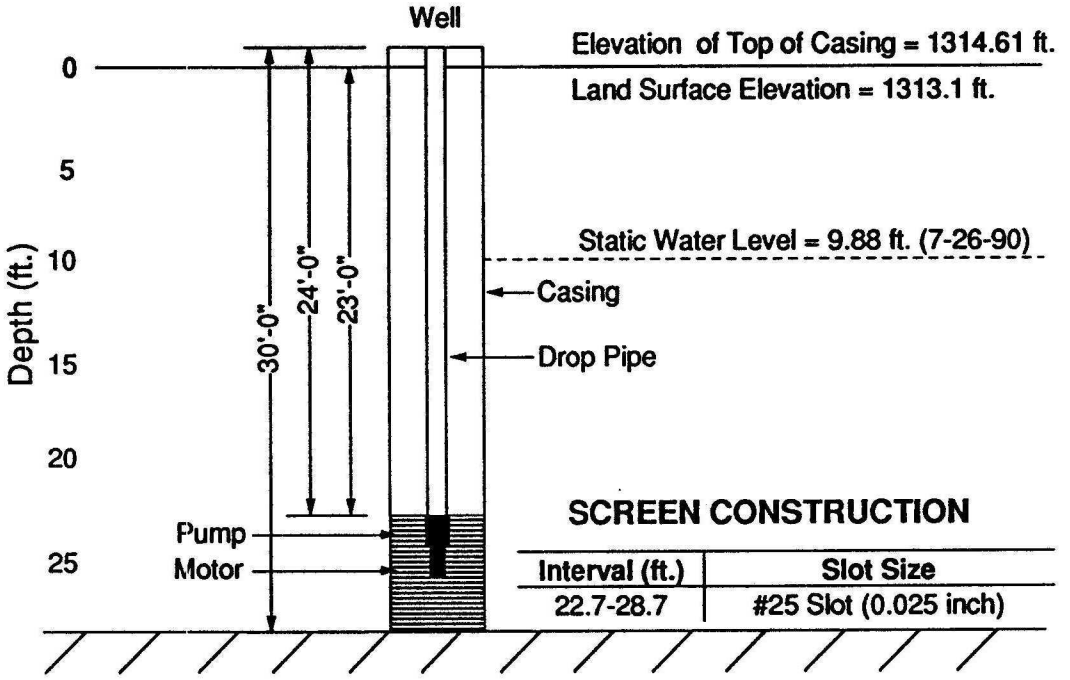
| | |
|---|---|
| Screen Length (ft.) | 6 |
| Screened Interval (ft.) | 22.2-28.2 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 23 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS4M (2 stage) Trim #1 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 21 |
| USBR LINE NUMBER | 16A2 |
| USBR SITE NUMBER | 6+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 22.7-28.7 | #25 Slot (0.025 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 24 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

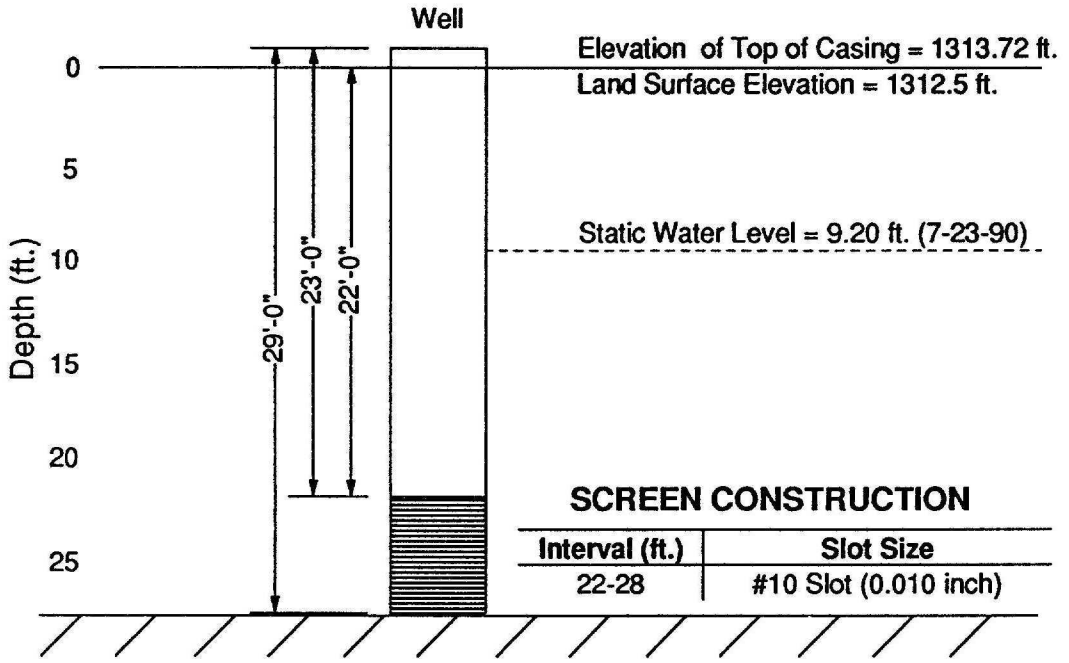
| | |
|---|---|
| Screen Length (ft.) | 6 |
| Screened Interval (ft.) | 22.7-28.7 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 24 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS6L (1 stage) Trim #3 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 22 |
| USBR LINE NUMBER | 16A2 |
| USBR SITE NUMBER | 10+00 |



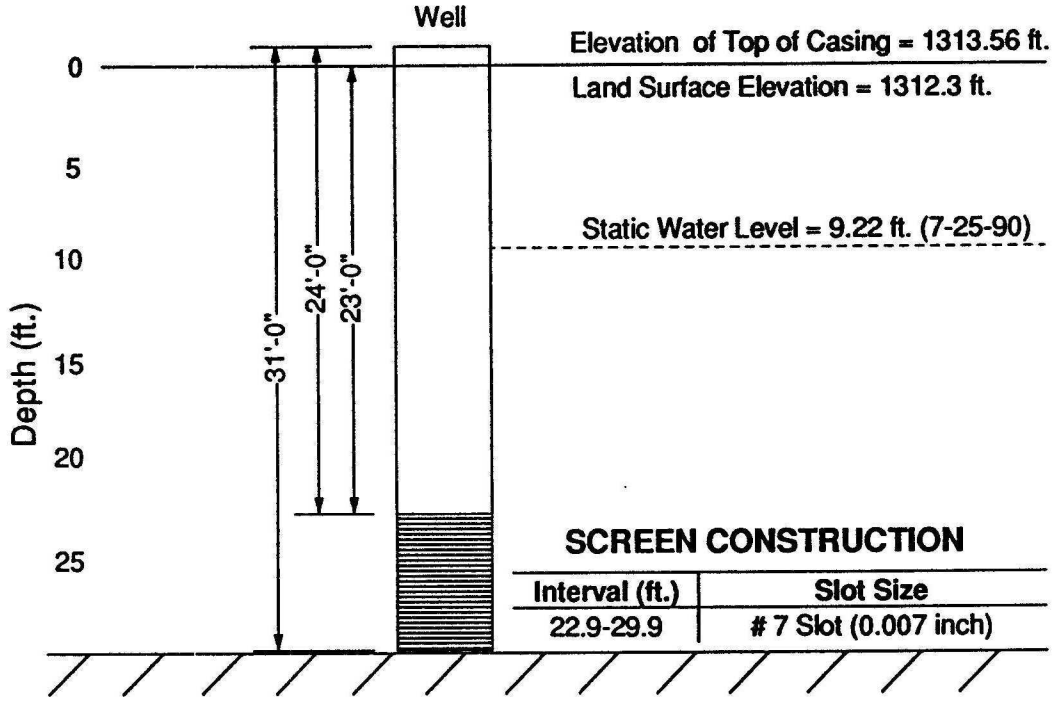

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |
| Screen Type | Johnson, High-Q 8 - inch Diameter Stainless Steel V - Slot |
| Drop Pipe Type | none |
| Drop Pipe Length (ft.) | 0 |

| | |
|---|---|
| Casing Length (ft.) | 23 |
| Screen Length (ft.) | 6 |
| Screened Interval (ft.) | 22-28 |
| Pump Motor Type | None |
| Pump Type | None |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 23 |
| USBR LINE NUMBER | 16A2 |
| USBR SITE NUMBER | 14+00 |




**SCREEN CONSTRUCTION**

| Interval (ft.) | Slot Size |
|---|---|
| 22.9-29.9 | # 7 Slot (0.007 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 24 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

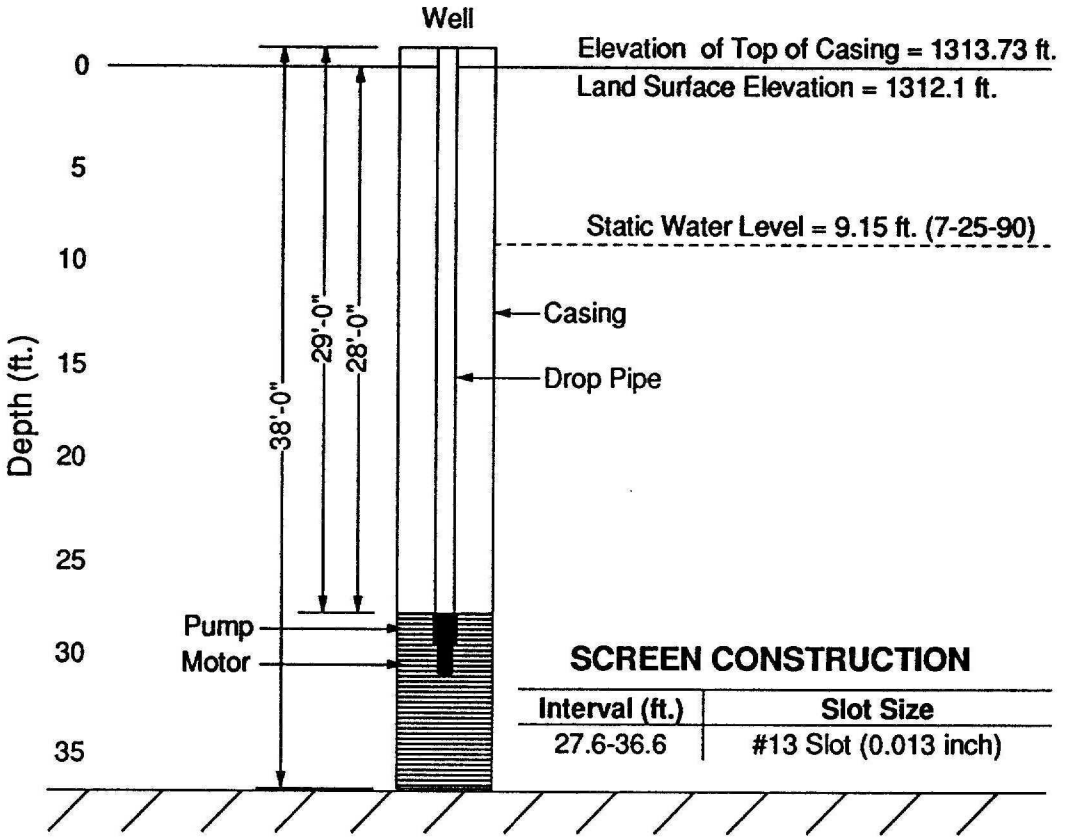
| | |
|---|---|
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 22.9-29.9 |

| | |
|---|---|
| Drop Pipe Type | none |
| Drop Pipe Length (ft.) | 0 |

| | |
|---|---|
| Pump Motor Type | none |
| Pump Type | none |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 24 |
| USBR LINE NUMBER | 16A2 |
| USBR SITE NUMBER | 18+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 27.6-36.6 | #13 Slot (0.013 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 29 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

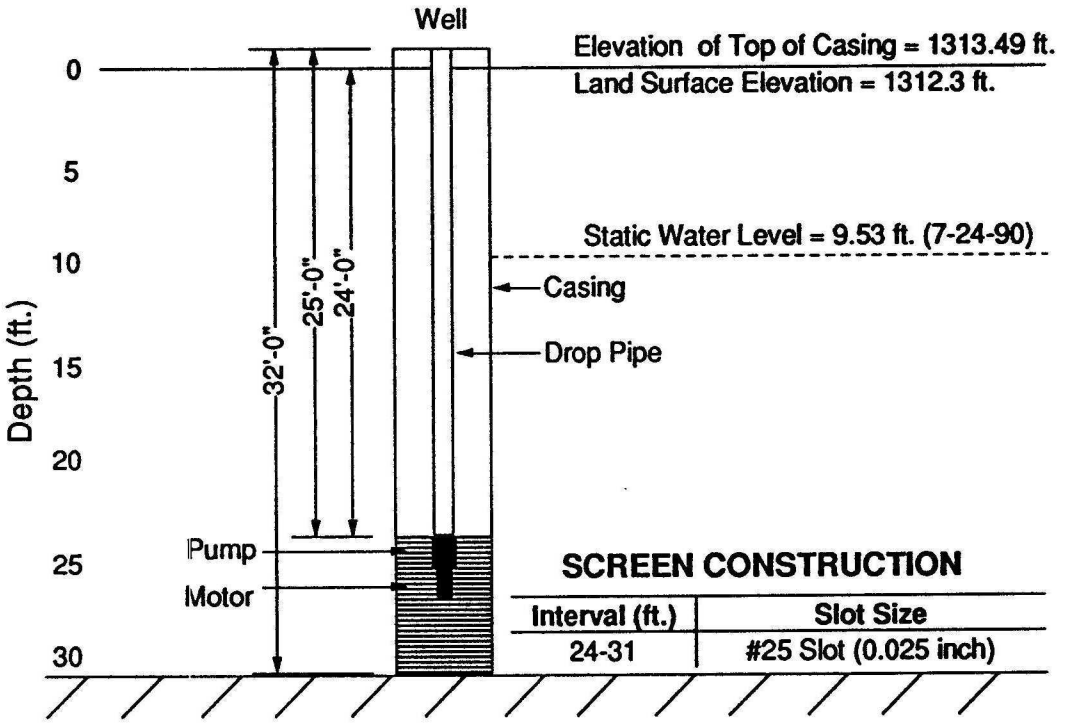
| | |
|---|---|
| Screen Length (ft.) | 9 |
| Screened Interval (ft.) | 27.6-36.6 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 29 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS6L (1 stage) Trim #4 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 25 |
| USBR LINE NUMBER | 16A2 |
| USBR SITE NUMBER | 22+00 |




**SCREEN CONSTRUCTION**

| Interval (ft.) | Slot Size |
|---|---|
| 24-31 | #25 Slot (0.025 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 25 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

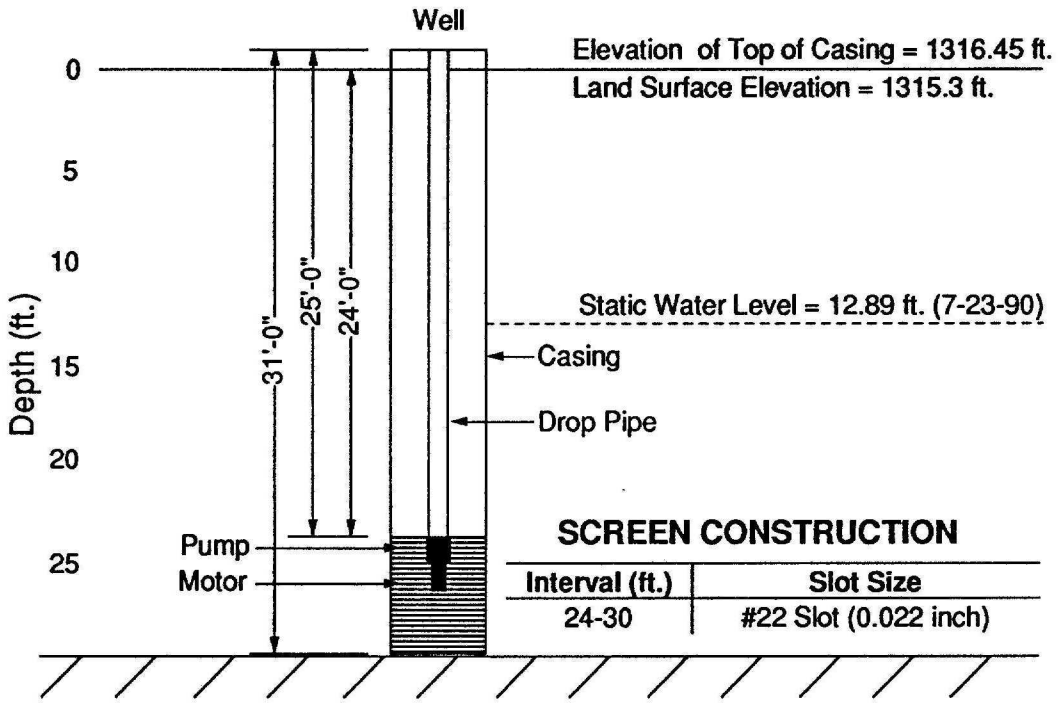
| | |
|---|---|
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 24-31 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 24.9 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS6L<br>(1 stage) Trim #3 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 26 |
| USBR LINE NUMBER | 16A3 |
| USBR SITE NUMBER | 2+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 24-30 | #22 Slot (0.022 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 25 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

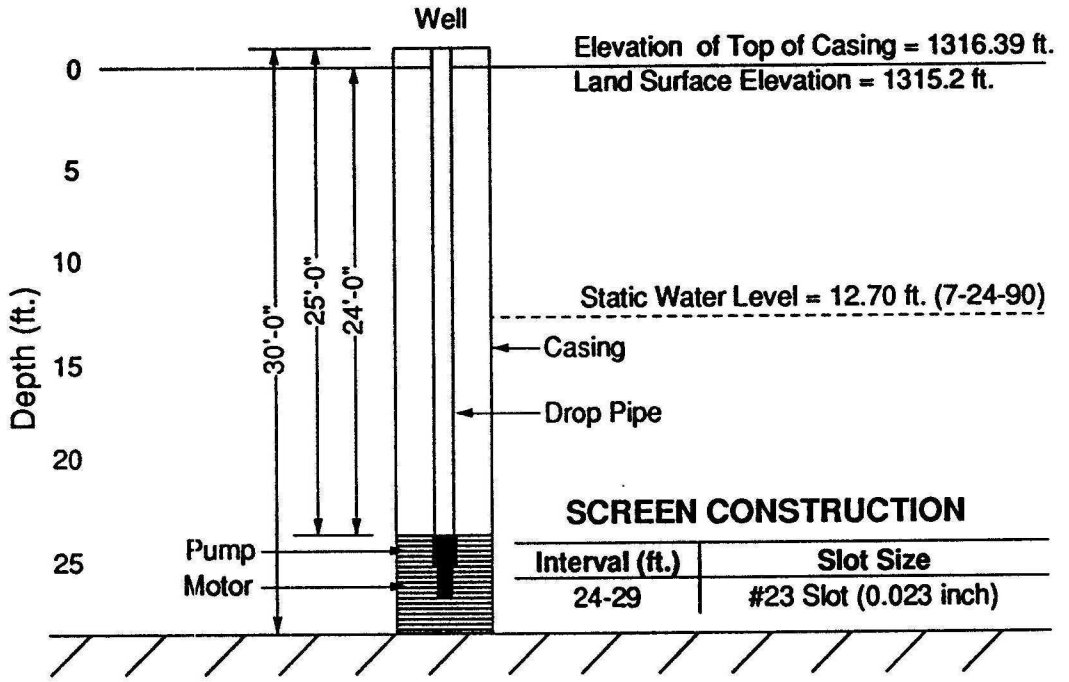
| | |
|---|---|
| Screen Length (ft.) | 6 |
| Screened Interval (ft.) | 24-30 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 25 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS4M (2 stage) Trim #1 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 27 |
| USBR LINE NUMBER | 16A3 |
| USBR SITE NUMBER | 6+00 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 24-29 | #23 Slot (0.023 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 25 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

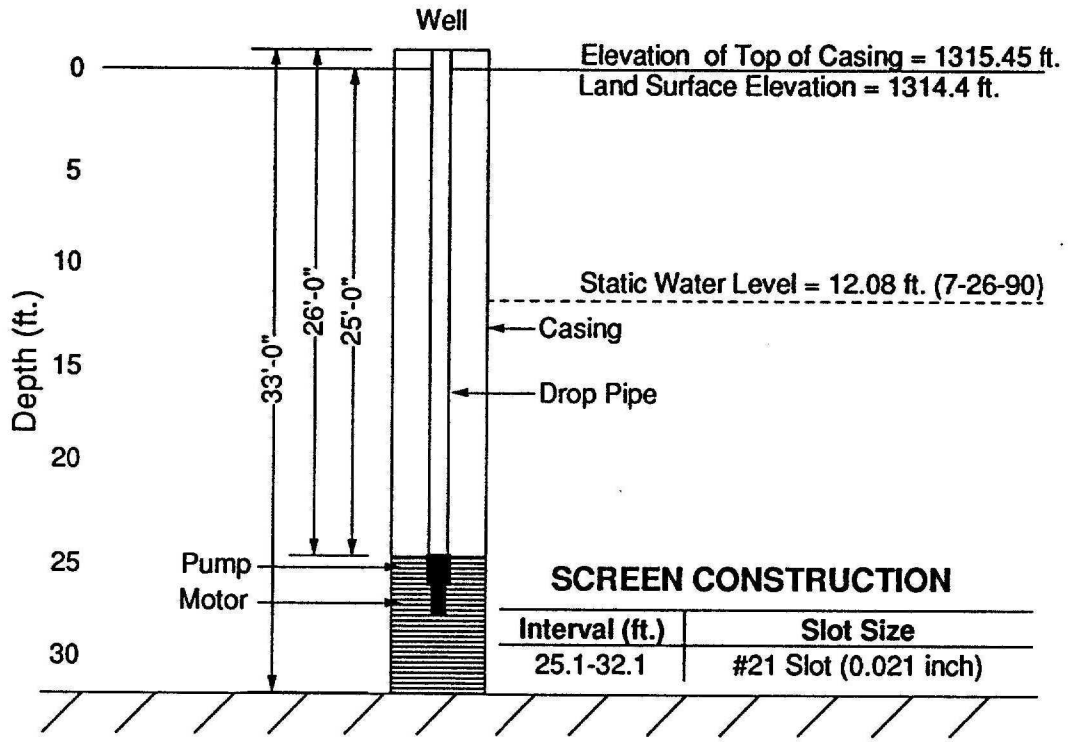
| | |
|---|---|
| Screen Length (ft.) | 5 |
| Screened Interval (ft.) | 24-29 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 25 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS6L<br>(1 stage) Trim #4 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 28 |
| USBR LINE NUMBER | 16A3 |
| USBR SITE NUMBER | 10+00 |



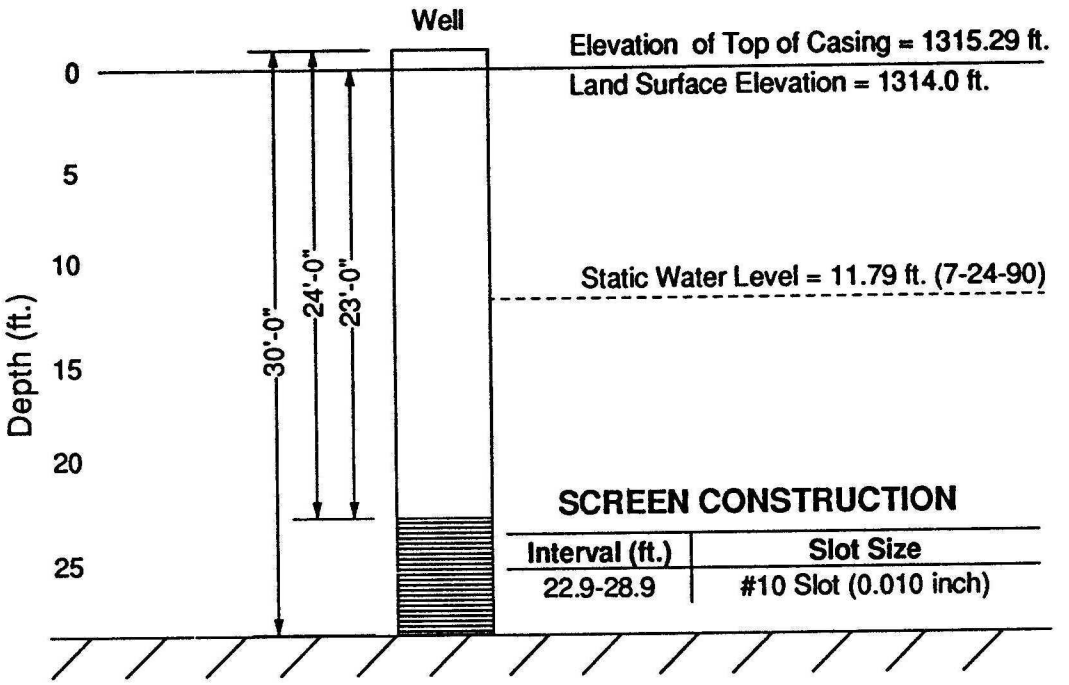

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |
| Screen Type | Johnson, High-Q 8 - inch Diameter Stainless Steel V - Slot |
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 25.9 |

| | |
|---|---|
| Casing Length (ft.) | 26 |
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 25.1-32.1 |
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS6L (1 stage) Trim #3 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 29 |
| USBR LINE NUMBER | 16A3 |
| USBR SITE NUMBER | 14+00 |




## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 24 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

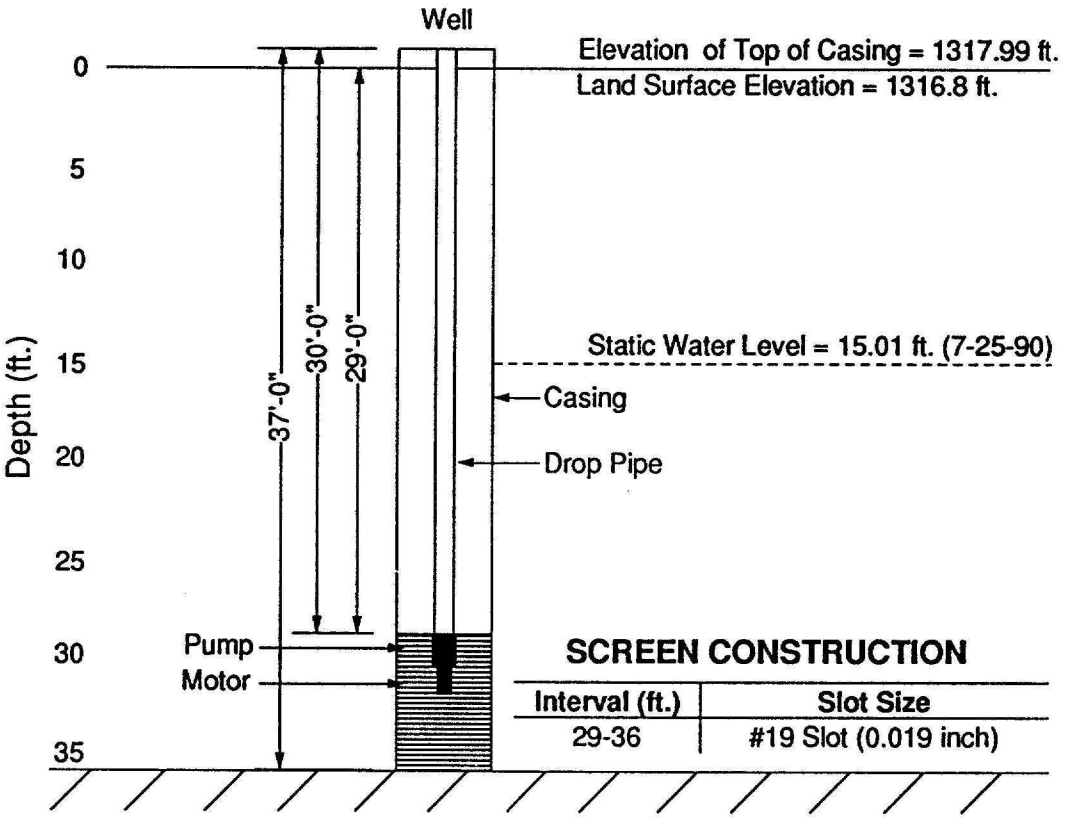
| | |
|---|---|
| Screen Length (ft.) | 6 |
| Screened Interval (ft.) | 22.9-28.9 |

| | |
|---|---|
| Drop Pipe Type | none |
| Drop Pipe Length (ft.) | 0 |

| | |
|---|---|
| Pump Motor Type | none |
| Pump Type | none |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 30 |
| USBR LINE NUMBER | 16A3 |
| USBR SITE NUMBER | 17+00 |




**SCREEN CONSTRUCTION**

| Interval (ft.) | Slot Size |
|---|---|
| 29-36 | #19 Slot (0.019 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 30 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

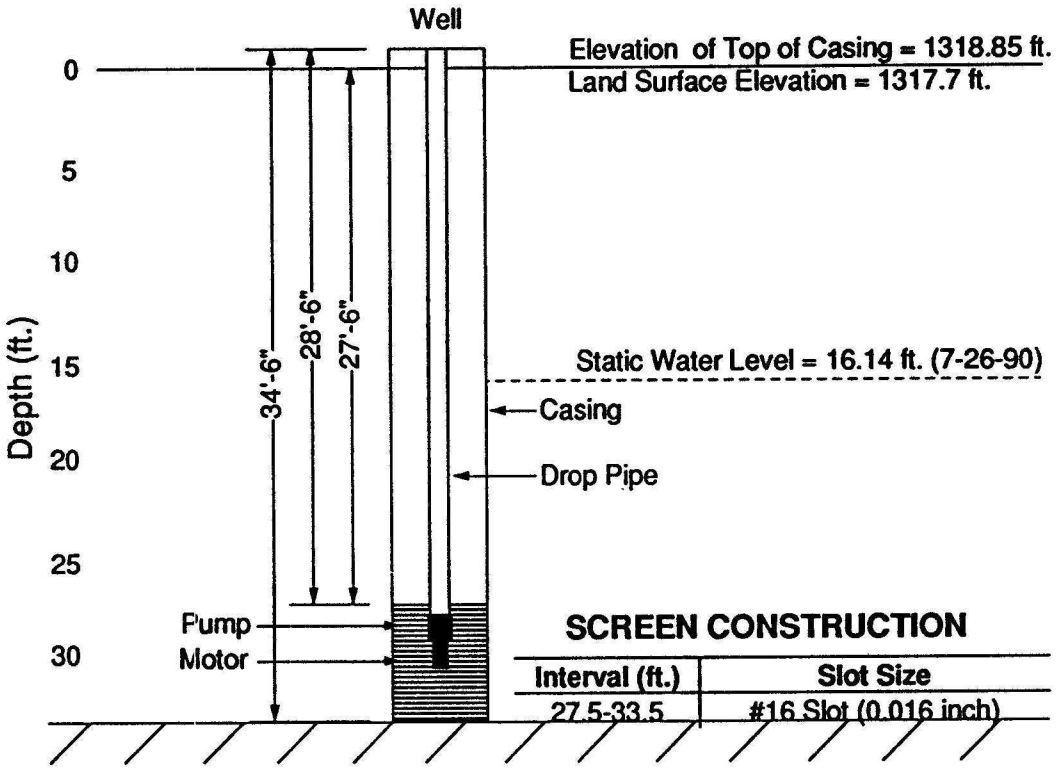
| | |
|---|---|
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 29-36 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 30 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS6L (1 stage) Trim #4 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 31 |
| USBR LINE NUMBER | 16A3 |
| USBR SITE NUMBER | 22+00 |




## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 28.5 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

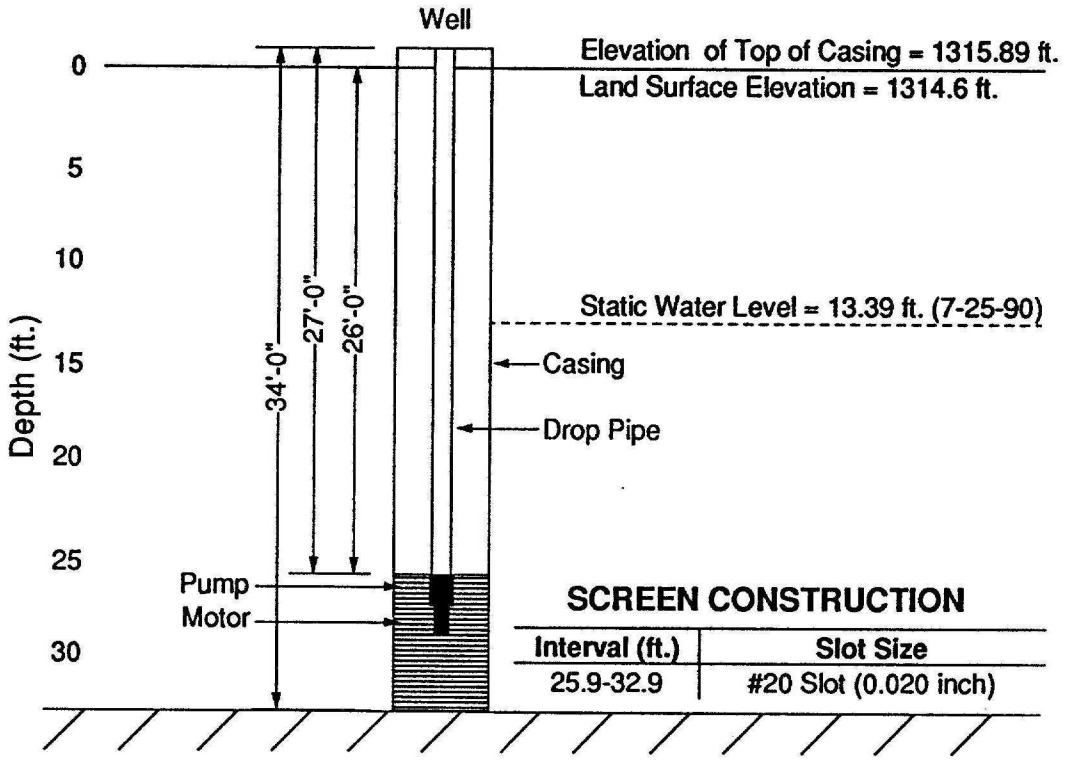
| | |
|---|---|
| Screen Length (ft.) | 6 |
| Screened Interval (ft.) | 27.5-33.5 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 29 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS4M (2 stage) Trim #1 |

# INTERIM GROUND-WATER SUPPLY, WEST OAKES IRRIGATION AREA AS-BUILT DIAGRAM

| | |
|---|---|
| WELL NUMBER | 32 |
| USBR LINE NUMBER | 16A3 |
| USBR SITE NUMBER | 25+77 |




## SCREEN CONSTRUCTION

| Interval (ft.) | Slot Size |
|---|---|
| 25.9-32.9 | #20 Slot (0.020 inch) |

## WELL CONSTRUCTION DETAILS

| | |
|---|---|
| Casing Type | 8 - inch Diameter PVC SDR-21 |

| | |
|---|---|
| Casing Length (ft.) | 27 |

| | |
|---|---|
| Screen Type | Johnson, High-Q<br>8 - inch Diameter<br>Stainless Steel<br>V - Slot |

| | |
|---|---|
| Screen Length (ft.) | 7 |
| Screened Interval (ft.) | 25.9-32.9 |

| | |
|---|---|
| Drop Pipe Type | 3-inch steel |
| Drop Pipe Length (ft.) | 27 |

| | |
|---|---|
| Pump Motor Type | Franklin 2 h.p. |
| Pump Type | Simmons SS6L<br>(1 stage) Trim #4 |