Draft Report

PUMPING TESTS OF FOUR WELLS IN LOWER CARMEL VALLEY, CALIFORNIA FOR THE CALIFORNIA-AMERICAN WATER COMPANY

Draft Report

PUMPING TESTS OF FOUR WELLS IN LOWER CARMEL VALLEY, CALIFORNIA FOR THE CALIFORNIA-AMERICAN WATER COMPANY

Submitted by:

J. Russell Mount
Geologist

Summary of Conclusions

Following the analysis of pumping tests of the four new wells in Lower Carmel Valley, it is concluded that:

1. The wells are conducive to long term pumping without significant reduction in yield.

2. The alluvial aquifer in the lower valley responds to pumping as a confined leaky aquifer on a short term basis, but over the long term it can be considered unconfined.

3. There is an upward component of ground-water movement through the confining layer.

4. Aquifer hydraulic coefficients estimated on the basis of the tests to be applicable to the lower valley on long term considerations are approximately as follows:

   Permeability; 2000 gpd/sq. ft
   Specific Yield; 0.10

PUMPING TESTS OF FOUR WELLS
IN LOWER CARMEL VALLEY, CALIFORNIA
FOR THE
CALIFORNIA-AMERICAN WATER COMPANY

Introduction

Following the 1976-1977 drought, California-American Water Company (Cal-Am) expanded its delivery capacity with the addition of four wells in Lower Carmel Valley. These wells were constructed in 1981. Locations of the four wells are shown on the map of figure 1.

In partial fulfillment of the Monterey County permit governing the operation of these wells, Cal-Am was required to provide pumping tests of each of the wells, with the condition that the procedures used would have the approval of the Monterey Peninsula Water Management District (MPWMD).

This report describes the procedures that were followed and discusses the results that were obtained in the subsequent pumping tests of the four wells. Tabulations of measurements made are presented in the report appendix.

Scope of Work

The four wells were test pumped separately during the period September 20 to November 8, 1982. In each test the well was pumped at a constant rate near maximum capacity for a period of time that ranged from seven to twenty days. Water pumped from the wells was discharged into the distribution system. At least twice daily, the discharge rate was measured, and water levels were measured in both the pumped well and numerous observation wells. Thirty eight observation wells were included in the tests of the four production wells. The total area of testing, including observation wells, comprises about four miles of the valley length, from Manor Well to near the Rancho Canada Shopping Center.

The data from the tests were reduced and analyzed to obtain aquifer hydraulic coefficients, which in turn were used to provide estimates of

water-level changes that could occur with future pumping.

Hydrogeology

Planning for the pumping tests, their duration, and selection of observation wells was based on the knowledge of aquifer conditions that had been gained from previous pumping tests and hydrogeologic studies, including well drilling. Hydrogeologic conditions in Lower Carmel Valley are summarized in this section of the report.

The alluvium, which comprises the principal aquifer in Lower Carmel Valley, is considered as consisting of two layers -- a lower layer of highly permeable coarse granular material, and an upper layer composed mainly of fine grained sediments including silty and clay-like lenses. The contact between these two layers rises in elevation to the east, and the contact is gradational rather than distinct. Roughly the upper layer comprises about one half of the total sedimentary section, approximately fifty feet. The upper layer is believed to represent a depositional condition of alluvial sediments merging with deltaic and lagoonal deposits that resulted when a transgressive-regressive sea moved into Carmel Valley many thousands of years ago. Hydraulically, the significance of the two layers is such that ground water in the lower layer is confined by the upper layer.

The principal source of water in the Carmel Valley alluvium is the river flow, which usually ceases in the summer, at which time ground water in the alluvuim drains back into the river channel. The movement of ground water is toward the west as well as into the river channel. The confining layer serves to restrict movement of water upward from the lower layer. Because of this upward movement of water through the confining layer, there remain pools and small seepage flows in the lower valley riverbed long after streamflow has ceased.

When water is pumped from the lower layer, the vertical flow component is reversed, and water seeps downward through the confining layer. Initially, the aquifer responds as under confined conditions, and the cone of depression spreads rapidly, causing water-level declines in wells more than 1000 feet away within a few hours. But as the time of pumping

lengthens, there is a slow delayed drainage from the confining layer, eventually enabling the concept of a single homogeneous unconfined aquifer, having a high permeability but a low specific yield. This concept is tractable mathematically, if not hydrogeologically.

During the first few hours of pumping, while the aquifer is responding as confined, the cone of depression expands rapidly toward the boundaries comprising the buried valley walls, which eventually results in greater greater drawdown than would have occurred had the aquifer been more areally extensive. The boundary effect must be considered when calculating aquifer hydraulic coefficients and projecting drawdown that would occur from future pumping.

Field Procedures

The four wells were test pumped using production pumps that had been installed in the wells following completion and development. The normal practice for conducting long term pumping tests calls for the testing to proceed following well development and using the engine-powered test pump temporarily installed in the well at the time of well completion. But as a condition for well construction, the Monterey County permit restricted operations to daylight hours owing to noise considerations. Pump testing was therefore postponed until after the submersible-type production pumps had been installed and checked out.

Discharge rates for the tests were selected near maximum capacity of the pumping equipment, and discharge was into the transmission main. Discharge rates held relatively constant during testing, indicating sustainable well yield with prolonged pumping.

During tests, water levels were measured in nearby observation wells, whose distances from the pumped well were preferably in the range of 200 to 1000 feet, but were at both greater and shorter distances, as most of the wells used were those already in place. Obtaining landowner permission to construct wells at desired locations is often neither feasible nor practical.

Water-level measurements were started about a week before pumping began in order to identify any regional trends of water level change, which would have to be factored into subsequent data analyses.

A summary of the pumping tests is presented on table 1. This table contains test dates, durations, pumping rates and values of drawdown at various specified distances from the pumped wells. Most of these drawdown values were estimated by interpolating between observation wells.

Wells used for monitoring water levels are described in table 2, and are given approximate location coordinates, which are sufficiently accurate for establishing positions of wells relative to one another. Most of these wells were existing wells either in active use or abandoned. Some wells were installed specifically for water-level observation purposes; they are designated as monitor wells in table 2. As a special requirement of MPWMD, shallow observation wells about 25 feet deep were installed for water level measurement during the pumping tests. Location maps for all pumping and observation wells are presented on figures 1 through 4.

Duration of pumping ranged from seven days at Pearce to twelve days at Rancho Canada. After pumping had stopped, measurements of water-level recovery were continued for several days.

In general, water levels were measured with a chalked steel tape; this method of measurement is considered accurate to about 0.01 ft., and measurements are recorded to that accuracy. In a Cal-Am production well, water level was measured using the air line and pressure gauge installed in the well; the measurement accuracy is considered not better than to about one-half foot. This accuracy is realistic for pumped wells because of water-level surges.

Measurements of discharge were made using the totalizer meter permanently installed on each well.

Water-level measurements were made frequently during the first hour

of pumping as the water level was declining rapidly. Subsequent measurements were less frequent as water levels began to stabilize: eventually water levels were measured on a twice daily basis, except for wells at distances much greater than 200 feet, in which measurements were made daily or every two days.

Reliability of water-level measurements in some of the observation wells could be considered questionable owing to pumping influence of wells other than the Cal-Am production wells tested. Also the apparent lack of drawdown response in some observation wells indicated that the wells might not be in good hydraulic contact with the aquifer.

The observation wells whose water levels were influenced by pumping from wells other than the Cal-Am production wells were:

Williams East,
Quail East,
Quail West,
Oppenheimer,
Hacienda Carmel, and
wells used in the Rancho Canada test.

The data from these wells were nevertheless useful because in most instances, the pumping effect could be adjusted for. By taking electric power meter readings, it could be determined whether the interfering well had been pumped since the last water-level measurement. In some cases, the on/off times could be calculated from power meter readings.

Some observation wells did not appear to have good hydraulic connection with the waterbearing intervals screened by the Cal-Am production wells due to possible collapse of casing or clogging of perforations. These observation wells were:

Williams West #1,
Williams West #2,
Quail Central, and
Golf Course Irrigation #5 Old.

Elevations were obtained for all wells. Some wells had been surveyed previously, and their elevations are recorded in this report to an accuracy of 0.1 ft. These wells are the Cal-Am production wells, Schulte Test Well, and the MPWMD shallow wells near San Carlos Bridge. Other well elevations were obtained by hand-held level, a method which is less accurate than using the field surveyor's telescopetype level. Most elevations obtained with the hand-held level are recorded in this report to the nearest foot, and are considered accurate to about five feet. However, within a distance of about 300 feet, higher accuracy is possible. Therefore hand-level elevations determined within about 300 feet of the surveyed wells are recorded in this report to an accuracy of 0.1 ft.

Water-level and elevation data for all wells monitored are listed in the tables of the appendix to this report. Hydrographs of water-level drawdown are presented on figures 5 through 8.

Descriptions of the Tests

The pumping tests were conducted toward the end of the dry serson. The riverbed was dry, except for isolated small pools and seepage in the reach downstream from Cypress Well.

In the following discussions, as well as in the data organization, the tests are presented in the order in which the wells are situated geographically, from east to west, rather than the time sequence of testing.

Pearce Well Test

The Pearce Well was the first to be tested because it was the only production well where the necessary array of observation wells were already in place when tests were scheduled to begin. Additional observation wells were installed at the other production well sites while the Pearce Well pumping test was in progress.

The Pearce Well test was started on September 20, 1982. Pumping was stopped on September 27, 1982. The duration of pumping was 167.5 hours. The well was pumped at an average discharge of 2142 gallons per minute

(gpm). Static water level was 20 feet below land surface. At the time pumping stopped, the water level in the well had declined to 62 feet. Water levels were monitored in fourteen wells, as far east as Manor Well, and as far west as Quail Central Well, each slightly over a mile away. Well locations and descriptions are given on figures 1 and 2 and in table 2. The most distant well influenced was Cypress, at about 1500 feet. Values of drawdown estimated to have occurred at various distances from Pearce when pumping stopped are presented in table 1.

Manor Production and Schulte Test wells were monitored to establish any regional trend of a rising or falling water level that might have to be factored into the data analysis. Both Manor and Schulte production wells had been idle for at least a week. Any regional water-level trend could not be detected from the measurements at either location. Manor Well water level was influenced by a leaky valve that allowed water to flow from the transmission main into the well. There was a rising water level at Schulte which was attributed to recovery from Schulte Production Well pumping.

Williams East Irrigation Well was pumped intermittently before, during, and after the pumping at Pearce. The irrigation well pump, however, probably has a relatively low capacity, estimated to be about 100-200 gpm, on the basis of observing the amount of irrigation flow. The water level in the Williams East Well was measured only when the well was idle. Electric power meter readings were taken at the time of each water-level measurement to determine whether the well had been pumped since the previous measurement, as an indication of the quality of the water-level data.

The Williams West #1 and #2 wells are abandoned irrigation wells about ten feet apart. A pump remains in the #2 well, presenting somewhat of an obstruction to measurement. Because of difficulty of measurement and because of inconsistent readings, measurements on this well were discontinued after several days.

The Williams West #1 Well was monitored throughout the Pearce and Cypress

tests. The well was sounded and found to be only 35 feet deep. It is believed that the well is either collapsed or filled in. It must have been drilled much deeper to enable it to function as an irrigation well. Although there was some drawdown response in the well, the drawdown values were later questioned because of the well's apparent collapsed condition.

Two deep wells near Pearce Production Well are Pearce Irrigation and Pearce Deep. The water level in Pearce Irrigation was drawn down more than it was in Pearce Deep even though Pearce Irrigation is slightly farther from the pumped well. An apparent reason is that Pearce Irrigation Well penetrates more of the aquifer than Pearce Deep Well.

The onsite shallow well is 29 feet deep. Its water-level decline lagged that of Pearce Irrigation Well by about four feet when pumping stopped.

After pumping stopped, measurements were continued on most wells to track the water-level recovery. These measurements were continued up to and throughout the pumping test of Cypress Well.

The water-level measurements are tabuluated in section A of the appendix. Hydrographs showing drawdown in some of the observation wells are presented on figure 5.

Cypress Well Test

The pumping test of Cypress Production Well had to be delayed until water levels in its vicinity had recovered sufficiently following the Pearce test. When pumping started at Cypress, recovery from pumping at Pearce had been in progress for 18 days, and there was some residual rise of water level. Because water levels had been monitored throughout the 18-day recovery period, the necessary adjustments to water-level measurements could be facilitated for the Cypress test. However, the water-level measurements tabulated in the appendix to this report are the actual field data unadjusted. The drawdown values, however, as presented in tabular and graphic form reflect adjustments to compensate for the rising water level.

The Cypress test was started on October 15, 1982, and pumping was terminated on October 25, 1982, for a total pumping duration of 239 hours. The average discharge was 2150 gpm. There was a regional power outage during the test, but the resulting interruption of pumping was not long enough to significantly affect the test.

At the beginning of the test, static water level in Cypress Production Well was 19 feet below ground. The static level was 0.4 feet lower than it was at the beginning of the Pearce test some four weeks earlier. By the end of the Cypress test, water level in the pumped well had declined to a depth of 57 feet.

Water levels were measured in sixteen wells, as far east as Manor and as far west as Quail Central. The well locations are shown on the maps of figures 1 and 2. Coordinates and well descriptions are listed in table 2. The influence of pumping could be detected as far as Quail Clubhouse Well, which is located about 2800 feet west. Values of drawdown that are estimated to have occurred at various distances from the well when pumping was stopped are presented in table 1.

Williams East Well was pumped considerably during the test., with the result that the few water-level measurements that were obtained might not have been reliable for subsequent aquifer analysis work. This is unfortunate because of the large gap created in terms of distance between observation wells. The closest is Cypress Deep, and the next closest would be Pearce, some 1500 feet away, assuming Williams East measurements to be inadequate. Water level decline in the shallow well lagged that of its deep counterpart by ten feet.

After pumping stopped, recovery measurements were continued for nine days in most observation wells affected by the pumping.

Water-level measurements are tabulated in section B of the appendix. Hydrographs of water-level drawdown are presented on figure 6.

San Carlos Well Test

The San Carlos Production Well was test pumped while water-level recovery was in progress in the Pearce-Cypress area. Water levels in the San Carlos area were not affected by pumping from Pearce nor were water levels in the Cypress area affected by pumping at San Carlos because of the large distance involved.

The San Carlos pumping test started on October 2, 1982, and the pumping was stopped on October 12, 1982, for a total duration of 242.25 hours. The average discharge was 1029 gpm. Static water level at the start of the test was 12 feet below ground. The pumping level was measured only once, and that was shortly after pumping started, because the water level rapidly declined below the bottom of the air line. The pumping level was estimated to have reached a depth of 49 feet, on the basis of water-level correlations with the adjacent observation well. Water levels were measured in eleven wells, with Quail Central being the easternmost well and Hacienda Carmel being the westernmost well. The well locations are shown on the maps of figures 1 and 3. Well descriptions and coordinates are listed in table 2. Drawdown influence could be detected as far as Quail West Well, which is located about 1500 feet south of the pumped well. Values of drawdown that are estimated to have occurred at various distances from the production well when pumping was stopped are presented in table 1.

The Oppenheimer Well, located about 800 feet south, is an active irrigation well, but fortunately it was idle during the test, and provided reliable water-level data.

At Quail West Well, water level was affected by pumping at an adjacent golf course irrigation well. The irrigation well's hours of daily operation seemed to be fairly predictable, however, and daily water-level measurements were scheduled at times an hour or so before irrigating started, with the result that data obtained were considered to be of reasonable value in subsequent analytical work.

In the shallow/deep observation well pair, located about 150 feet west

of San Carlos Production Well, water-level decline in the shallow well lagged that in the deep well by five feet.

After pumping stopped, measurements of water-level recovery were continued for as long as 21 days, providing water-level trend data for the Rancho Canada Well test.

Tabulations of water-level measurements are listed in section C of the appendix. Hydrographs of water-level drawdown are presented on figure 7.

Rancho Canada Well Test

The Rancho Canada Production Well pumping test was scheduled as the last one of the tests, because it was was hoped that with the approach of cooler fall weather, pumping from the four Rancho Canada golf course irrigation wells would diminish and minimize drawdown interference. One of the wells, designated Golf Course Irrigation Well #1, is less than 100 feet from the Cal-Am production well, and interference from the #1 well seemed to impose considerable difficulty in analyzing drawdown data from the proposed test. Furthermore the irrigation wells were not pumped on a consistent schedule.

In an effort to filter the effects of well #1 in subsequent analytical procedures, field tests were made of its performance before the Cal-Am production well test was started. Measurements were made of discharge, pumping level, and power consumption. Well on/off times would later be determined by electrical meter readings, supplemented by inspection of water-level recorder charts for Rancho Canada Deep Observation Well, located about 90 feet away. The interference effect of well #1 pumping is clearly visible on these charts. The results of the field test of #1 well and the times of its operations are presented in part 2 of table D5 in the appendix.

The Rancho Canada pumping test was started on October 27, 1982. Pumping was stopped on November 8 after 287.08 hours of continuous flow averaging 2021 gpm. The test was carried out longer than the other tests in order for the effects of #1 well pumping to be assessed. For

the entire length of the test it was calculated that the volume of water pumped from well #1 was only three percent of what was pumped from the Cal-Am production well, and that the interference effect was not significant on a long term basis.

At the start of the Rancho Canada pumping test, water level in the production well was 18 feet below grade. At the end of pumping, the water level had declined to 49 feet. Water-level measurements were made in twelve wells, which were located between and included Hacienda Carmel Well to the east and Golf Course Irrigation Well #3 to the west. Well locations are shown on the maps of figures 1 and 4. Well descriptions and coordinates are provided in table 2.

Water-level measurements in the Rancho Canada North Deep Observation Well had been in progress since September 29 in order to establish the regional water-level trend in this rather intensely irrigated area. During the month of water-level observation, there was a net decline of one foot, which is scarcely significant in view of the "noise" generated by intermittent pumping of well #1.

Golf Course Irrigation wells #2, #3, and #4 are pumped intermittently, and their locations are too far from Rancho Canada Production Well to be affected measureably by its pumping. Water-level measurements could not be made in well #2, and only two measurements could be made in well #4. Water-level measurements were made in well #3 mainly to provide water-level trend information.

Drawdown influence was detected as far away as Hacienda Carmel Well, which is located approximately 2200 feet east. The small amount of water level decline that is believed to have occurred at this well, about 0.2 feet, is somewhat subjective because the well was pumped for irrigation on a daily basis, and the water level pattern was not very consistent.

Values of drawdown that are estimated to have occurred at various distances from the production well when pumping was stopped are presented

in table 1. The values represent somewhat of a compromise because there were ambiguous differences in drawdown in observation wells located about the same distance from the production well.

The water-level drawdown at Rancho Canada South Observation Well appears to be anomalously large, for which there is no apparent explanation. Nor is there any apparent explanation for the anomalously small draw-down in Irrigation Well #5 Old, which had been producing about 1500 gpm until its pump was pulled in 1981. This well was sounded, and was found to have the same depth as when constructed, hence was not collapsed.

At the end of the pumping test, it was observed that water-level decline in the Rancho Canada Shallow Observation Well lagged that in the Rancho Canada Deep Observation Well by seven feet.

After pumping stopped, measurements of water-level recovery were continued for eight days.

Tabulations of water-level measurements are listed in section D of the appendix. Hydrographs of water-level drawdown are presented on figure 8.

Analysis of Data

The data obtained from the pumping tests were analyzed for the purpose of calculating aquifer hydraulic coefficients, which in turn were used to project future drawdown under proposed pumping conditions.

Conventional methods of pumping test analysis, though referenced in this report, were not applicable under the conditions encountered in the Lower Carmel Valley tests. In the conventional methods, it is assumed that:

1. the pumped well is infinitesimally small;
2. the aquifer is homogeneous, isotropic, and of unlimited areal extent;
3. water is released from storage instantaneously upon reduction of head;

4. the aquifer is confined;
5. leakage can occur through the confining layer(s), but the head in the confining layer(s) remains fixed; and
6. pumping and observation wells fully penetrate the aquifer.

In Lower Carmel Valley, conventional pumping test analysis is complicated mainly because of impervious boundaries created by the buried valley walls, and because of the slow drainage characteristics of the confining layer. Also the drawdown data obtained from partially penetrating observation wells very close to large diameter production wells might not be applicable under the restrictive assumptions of pumping test theory.

After the field data had been reduced to drawdown values and plotted graphically, it was decided to determine aquifer coefficents through simulation studies, a tedious yet acceptable procedure, in which through trial and errer, various combinations of aquifer coefficients are fitted to a theoretical mathematical model until the theoretically calculated values of drawdown are in reasonably close agreement with the field-measurement data.

The procedures that were followed involved image theory for simulating the impervious boundaries, a technique in which the aquifer is considered of infinite areal extent, but flow barriers are simulated by ficticious pumping wells (called image wells) on the opposite side of the trace of the barrier. Image theory and applications are described by Ferris and others (1962).

In the simulation studies, it was further assumed that the analytical constraints imposed on delayed yield from storage could be overcome by conducting the simulation studies to work only with end-of-test drawdown. It was assumed under this condition that drainage above water table was essentially complete by the end of the test.

It was further assumed that drawdown near end of pumping at two deep observation wells would serve to fit the assumptions of the theoretical non-equilibrium radial flow formula (Theis, 1935) applied to to a pumping

order to calculate aquifer hydraulic coefficients.

The choice of observation well data to use in the analyses was based on subjective but logical procedures. First the drawdown data were plotted against logarithms of distance. These graphs are presented in figures 9 through 12. It was then decided that if a straight line could be drawn through at least three end-of-test drawdown points, that line would comprise the drawdown profile to be applied to the theoretical drawdown formula. Such a line could be found for all the tests except San Carlos. For the San Carlos test, a straight line was fitted to the data using regression. The results of the studies are summarized in table 3.

The simulation studies demonstrated that although the aquifer initially responds to pumping as a confined aquifer, on a long term basis it can be considered homogeneous unconfined.

In review of the quality of the field data, it is believed that the results are most reliable for the Pearce test and least reliable at San Carlos. The Pearce test had the most observation wells and at desirable distance range, 100 to 1000 feet. The San Carlos drawdown data could not fit the straight-line concept, and the line chosen may be incorrect, even though it was selected using a procedure that is valid from the standpoint of statistical analysis. The drawdown at San Carlos might be influenced by a steeply sloping base of aquifer, which is not accounted for in the aquifer analytical techniques.

At Cypress there was insufficient observation well coverage in the 100 to 1000-ft range. And at Rancho Canada, there were anomalous and unexplainable responses in many of the observation wells.

In spite of the deficiciencies demonstrated the agreement of aquifer coefficients among the four wells is quite good.

Projections of Drawdown

The data obtained from each of the pumping tests were used to construct families of curves that would yield the drawdown values due to pumping from a single well at a constant rate for various periods of time and at various distances from the pumped well, assuming the existence of boundaries. A nominal pumping rate of 1000 gpm was selected for each well, except for San Carlos, where that high a discharge is not believed to be sustainable over long periods. A 500-gpm rate was selected for San Carlos.

Because drawdown is directly proportional to discharge, the drawdown resulting from pumping rates other than those selected can be easily calculated. For example the drawdown at 800 gpm is 80 percent of the drawdown at 1000 gpm under the same conditions of time, distance, and aquifer coefficients.

The time-distance-drawdown graphs are presented in figures 13 through 16. In using the graphs, some care should be exercised in recognizing that they were derived assuming constant aquifer saturated thickness. The assumption, though not strictly valid for unconfined aquifers, is nevertheless reasonable provided the saturated thickness does not decrease to less than about 80 percent of the original value. Methods of dealing with radial flow where there is significant change in saturated thickness are provided by Jacob (1949).

References

Bruin, Jack, and Hudson, H. E., Jr., 1955, Selected methods for pumping test analysis: Ill. State Water Survey Rept. Inv. 25.

Ferris, J. G., Knowles, D. B., and Stallman, R. W., 1962, Theory of aquifer tests: U. S. Geol. Survey Water-Supply Paper 1536-E, p. 69-174.

Hantush, M. S., 1960, Modification of the theory of leaky aquifers: Jour. Geophys. Research, v. 65, no. 11, p. 3713-3725.

Hantush, M. S., and Jacob, C. E., 1955, Non-steady radial flow in an infinite leaky aquifer: Am. Geophys. Union Trans., v. 36, no. 1, p. 95-100.

Jacob, C. E., 1949, Flow of ground water, chap. 5 in Rouse, Hunter, Engineering hydraulics: New York, John Wiley & Sons.

Theis, C. V., 1935, Relation between the lowering of the piezometric surface and the rate and duration of discharge of a well using ground-water storage: Am. Geophys. Union Trans., pt. 2, p. 519-524.

The following tables, figures, and appendix are attached and complete this report:

Table 1. -- Summary of Tests
Table 2. -- Descriptions of Wells Monitored during Pumping Tests
Table 3. -- Results of Aquifer Simulation Studies
Figure 1. -- Vicinity Map
Figure 2. -- Plot Plan, Pearce and Cypress Well Sites
Figure 3. -- Plot Plan, San Carlos Well Site
Figure 4. -- Plot Plan, Rancho Canada Well Site
Figure 5. -- Hydrographs, Pearce Well Pumping Test
Figure 6. -- Hydrographs, Cypress Well Pumping Test
Figure 7. -- Hydrographs, San Carlos Well Pumping Test
Figure 8. -- Hydrographs, Rancho Canada Well Pumping Test
Figure 9. -- Distance-Drawdown Graphs, Pearce Well Pumping Test
Figure 10. -- Distance-Drawdown Graphs, Cypress Well Pumping Test
Figure 11. -- Distance-Drawdown Graphs, San Carlos Well Pumping Test
Figure 12. -- Distance-Drawdown Graphs, Rancho Canada Well Pumping Test
Figure 13. -- Projected Drawdown, Pearce Well Pumping
Figure 14. -- Projected Drawdown, Cypress Well Pumping
Figure 15. -- Projected Drawdown, San Carlos Well Pumping
Figure 16. -- Projected Drawdown, Rancho Canada Well Pumping
Appendix -- Field Data, Pumping and Observation Wells
Section A. -- Pearce Well Pumping Test
Section B. -- Cypress Well Pumping Test
Section C. -- San Carlos Well Pumping Test
Section D. -- Rancho Canada Well Pumping Test

Submitted by;

J. Russell Mount
Geologist

(date)
Reno, Nevada

LOWER CARMEL VALLEY PUMPING TESTS -- 1982

Table 1. -- Summary of Tests

Well Pumped	Dates of Pumping (1982) Start	Stop	Duration of Pumping (hrs.)	Average Discharge (gpm)	Drawdown at End of Pumping at Indicated Distance from Pumped Well (ft.) 0	100	500	1000	2000
Pearce	9-20	9-27	167.50	2142	42	10.1	5.6	3.9	2.3
Cypress	10-15	10-25	239.00	2150	38	10.8	6.5	4.3	1.3
San Carlos	10-2	10-12	242.25	1029	37	7.7	3.2	1.1	0.3
Rancho Canada	10-27	11-8	287.08	2021	32	10.0	5.0	2.9	0.7

Table 2. -- Descriptions of Wells Monitored during Pumping Tests

Well Name	Coordinates 1/ (ft.) East	North	Well Depth (ft.)	Perforated Interval (ft.)	Table No. for Water-level Data	Well Use/Status
Manor Production	23800	7400	105	50-100	A2, B2	Active public-supply well
Schulte Test	21600	8000	100	86-96	A3, B3	Monitor well adjacent to Schulte Production Well
Pearce Shallow Obs.	18473	8100	29	28-29	A4, B5	Monitor well, 2-in. PVC
Pearce North Obs.	18420	8360	49	45-49	A7, B8	Monitor well, 3-in. PVC
Pearce Production	18420	8110	165	55-140	A1. B4	Active public-supply well
Pearce Irrigation	18405	8152	115		A6, B7	Abandoned irrigation well
Pearce Deep Obs.	18385	8115	100	51-100	A5, B6	Monitor well, 4-in. PVC
Clark Irrigation	18400	9200	96		B6	Abandoned irrigation well
Williams East Irr.	17600	8930			A9, B10	Active irrigation well, 15-hp motor
Williams West Irr. #1	17080	9030	35		A10, B11	Abandoned irrigation well, possibly collapsed
Williams West Irr. #2	17070	9030			A11	Abandoned irrigation well, possibly collapsed
Cypress Production	16880	8350	122	55-102	B1	Active public-supply well
Cypress Shallow Obs.	16862	8380	22	0-22	B12	Monitor well, 2-in. PVC
Cypress Deep Obs.	16850	8350	100	50-100	A12, B13	Monitor well, 4-in. PVC
Quail East Irrigation	14950	10090	50		A13, B14	Abandoned irr. well, 20 ft. from active irr. well
Quail Clubhouse Irr.	14300	9330	102		B15	Abandoned irrigation well
Quail Central Irr.	13080	10170	83	43-79	A14, B16, C2	Abandoned irrigation well
Quail West Irr.	10925	10676	83		C3	Abandoned irr. well, 20 ft from active irr. well
Valley Greens Obs.	10900	10568	48		C4	Monitor well, 3-in. PVC, MPWMD
Brookdale Obs.	11025	11927	39	30-35	C5	Monitor well, 3-in. PVC, MCWMD
WMD Observation	10925	11557	18	17-18	C6	Monitor well, 2-in. well point, MCWMD
Oppenheimer Irr.	10784	11359	137	41-137	C7	Active irrigation well
San Carlos Production	10300	12040	80	50-75	C1	Active public-supply well
San Carlos Deep Obs.	10300	12060	60	40-60	C8	Monitor well, 2-in. PVC
San Carlos West Deep Observation	10146	12040	68	48-68	C10	Monitor well, 2-in. PVC
San Carlos West Shallow Observation	10119	12040	19	0-19	C9	Monitor well, 2-in. PVC

Table 2. -- Descriptions of Wells Monitored during Pumping Tests -- continued

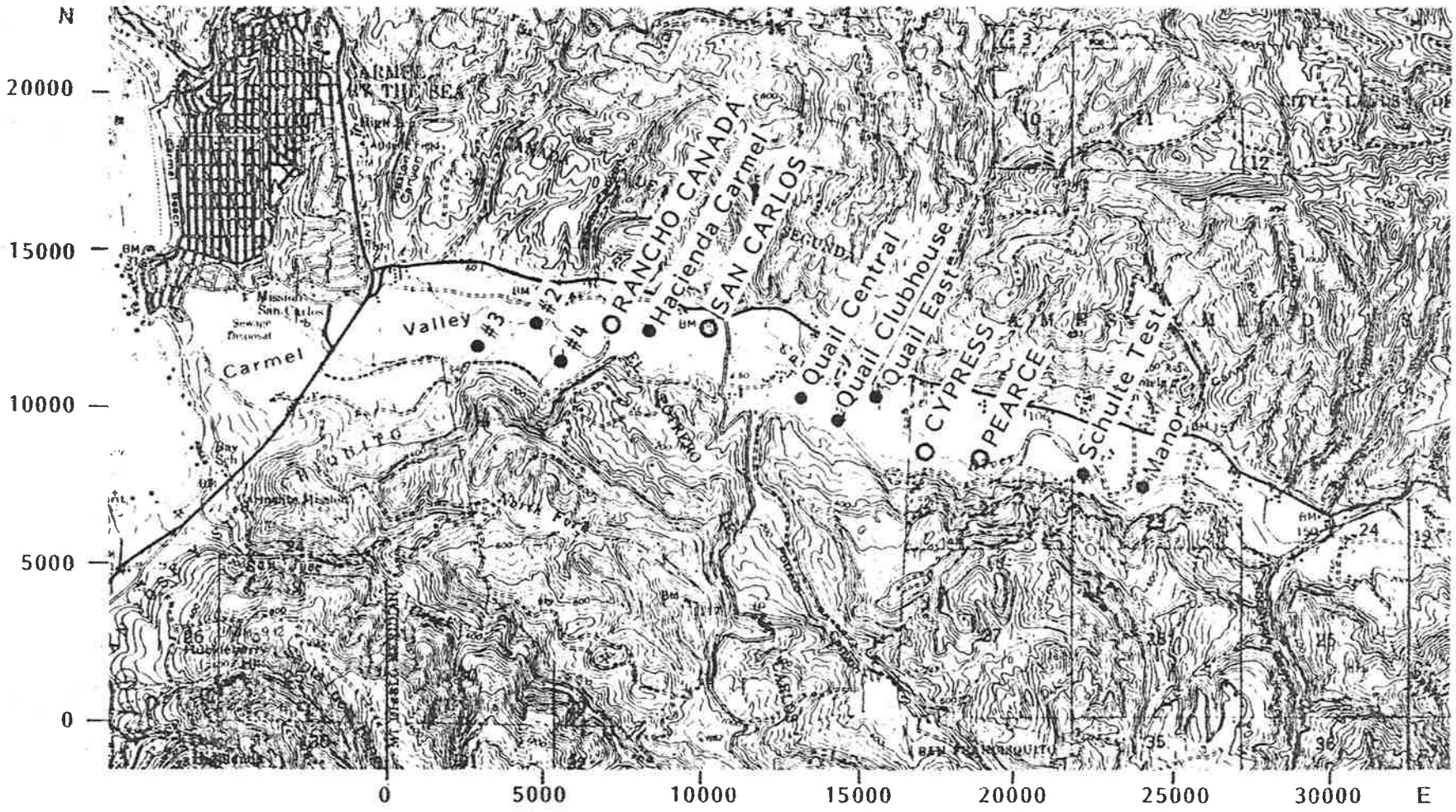
Well Name	Coordinates 1/ (ft.) East	North	Well Depth (ft.)	Perforated Interval (ft.)	Table No. for Water-level Data	Well Use/Status
Hacienda Carmel	9100	12040			C11, D2	Active irrigation well, 15-hp motor
Golf Course Irr. #1	7023	12387	120	24-120	D5	Active irrigation well
Rancho Canada North Shallow Obs.	7014	12676	25	22-25	D3	Monitor well, 2-in. PVC
Rancho Canada North Deep Obs.	7014	12662	80		D4	Monitor well, 6-in. PVC
Rancho Canada Shallow Obs.	6962	12392	27	26-27	D6	Monitor well, 2-in. well point
Golf Course Irr. #5, Old	6962	12383	125	80-120	D8	Abandoned irrigation well, possibly clogged
Rancho Canada Prod.	6940	12360	148	55-128	D1	Active public-supply well
Rancho Canada Deep Obs.	6932	12378	100	50-100	D7	Monitor well, 4-in. PVC
Rancho Canada South Obs.	6802	11952	114		D9	Monitor well, drilled as test, 6-in. PVC
Golf Course Irr. #5, New	6640	12046			D10	Inactive during tests
Golf Course Irr. #4	5078	11191	148	48-150	D11	Active irrigation well
Golf Course Irr. #2	4718	12321	85	41-85		Active irrigation well, unable to measure water level
Golf Course Irr. #3	2692	11579	84	54-84	D12	Active irrigation well

1/ Coordinates of well locations are referenced to the southwest corner of Sec. 30, T16S, R1E. These coordinates are approximate, and are provided only for the purpose of obtaining reasonably accurate distances between pumped wells and points of water-level measurements. Well locations are shown on the maps of figures 1 through 4.

LOWER CARMEL VALLEY PUMPING TESTS -- 1982

Table 3. -- Results of Aquifer Simulation Studies

Production Well	Discharge (gpm)	100-hour Specific Capacity (gpm/ft)	Saturated Thickness (ft)	Transmissivity (gpd/ft)	Permeability (gpd/sq. ft)	Specific Yield
Pearce	2142	51.0	120	250,000	2080	0.07
Cypress	2150	59.7	83	175,000	2110	0.10
San Carlos	1029	28.6	63	100,000	1590	0.20
Rancho Canada	2021	63.2	110	165,000	1500	0.15



Base map: U. S. Geol. Survey, 1947,
Monterey, Calif. 15-min. topographic sheet

KEY

O Pumped Well

• Observation Well

Coordinates in feet (table 2)

Figure 1. -- Vicinity Map

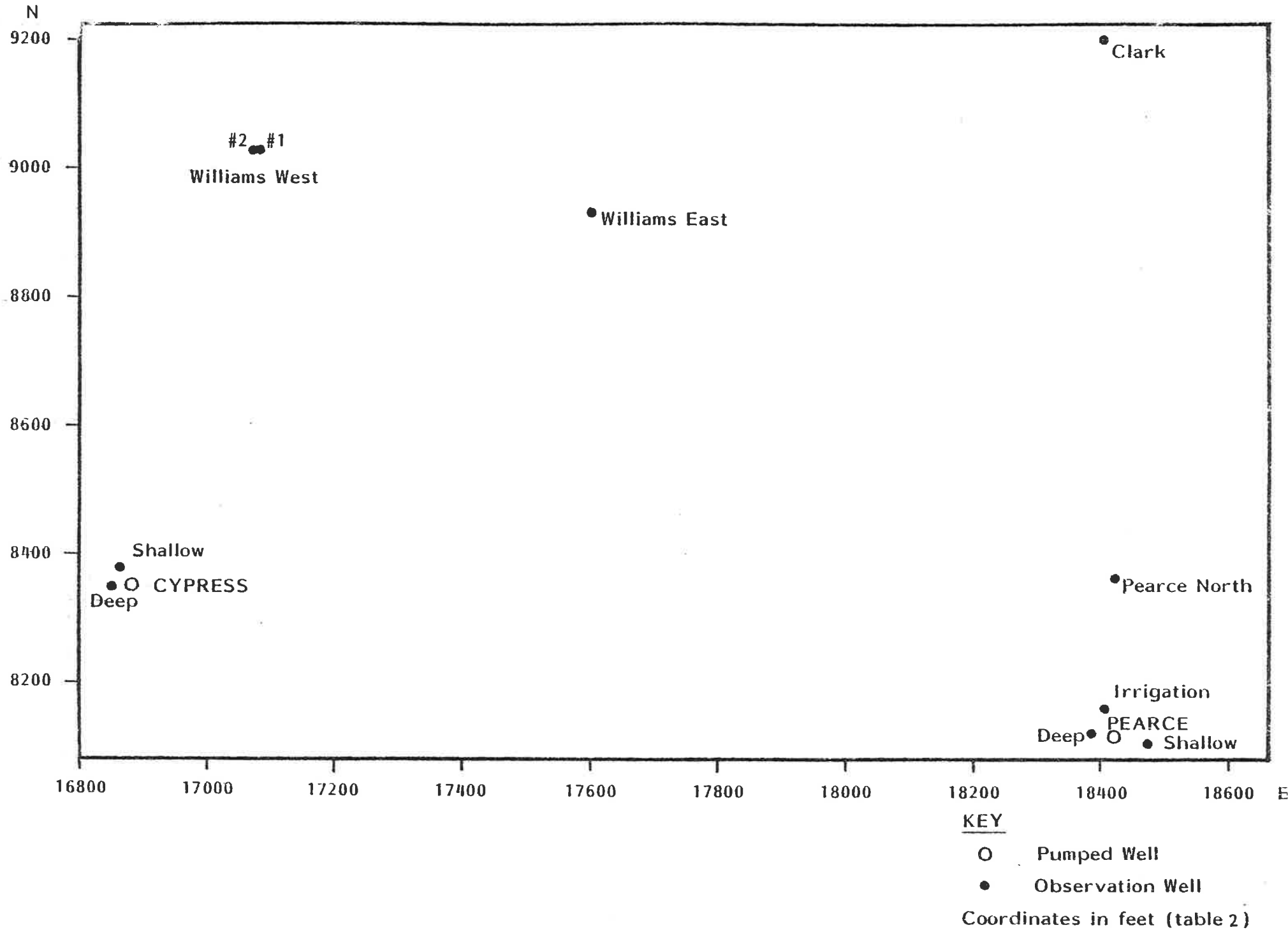


Figure 2. -- Plot Plan, Pearce and Cypress Well Sites

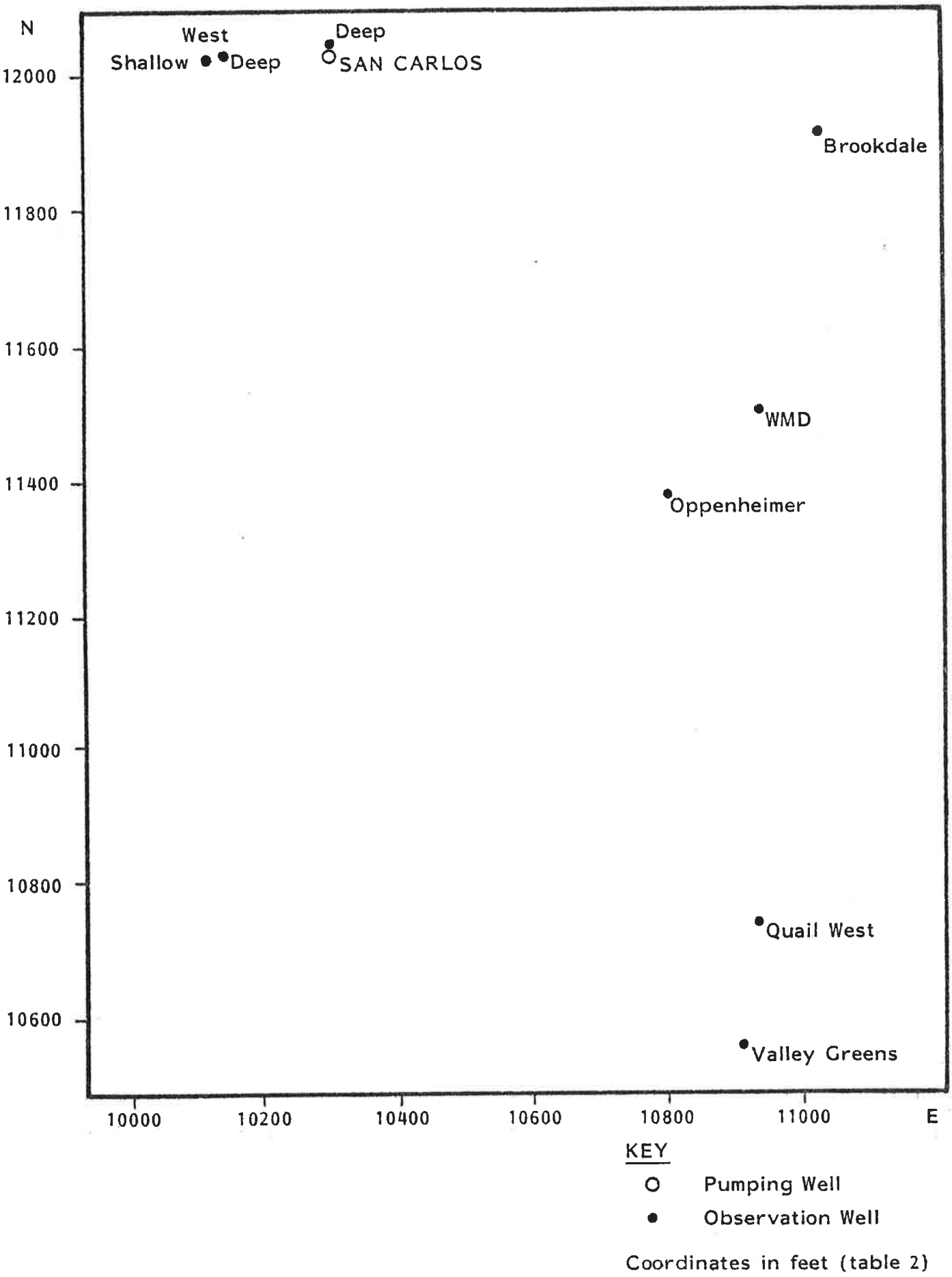


Figure 3. -- Plot Plan, San Carlos Well Site

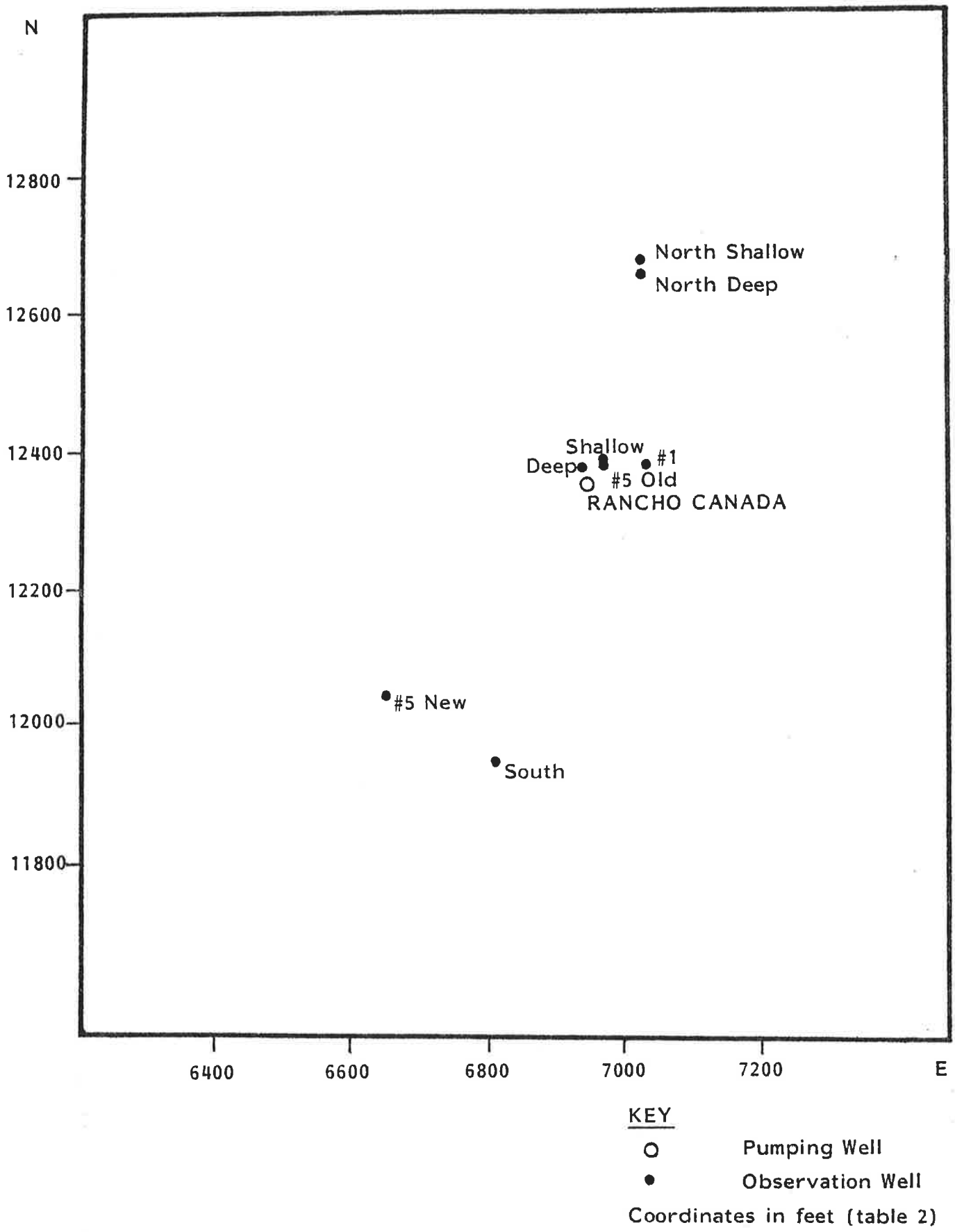


Figure 4. -- Plot Plan, Rancho Canada Well Site

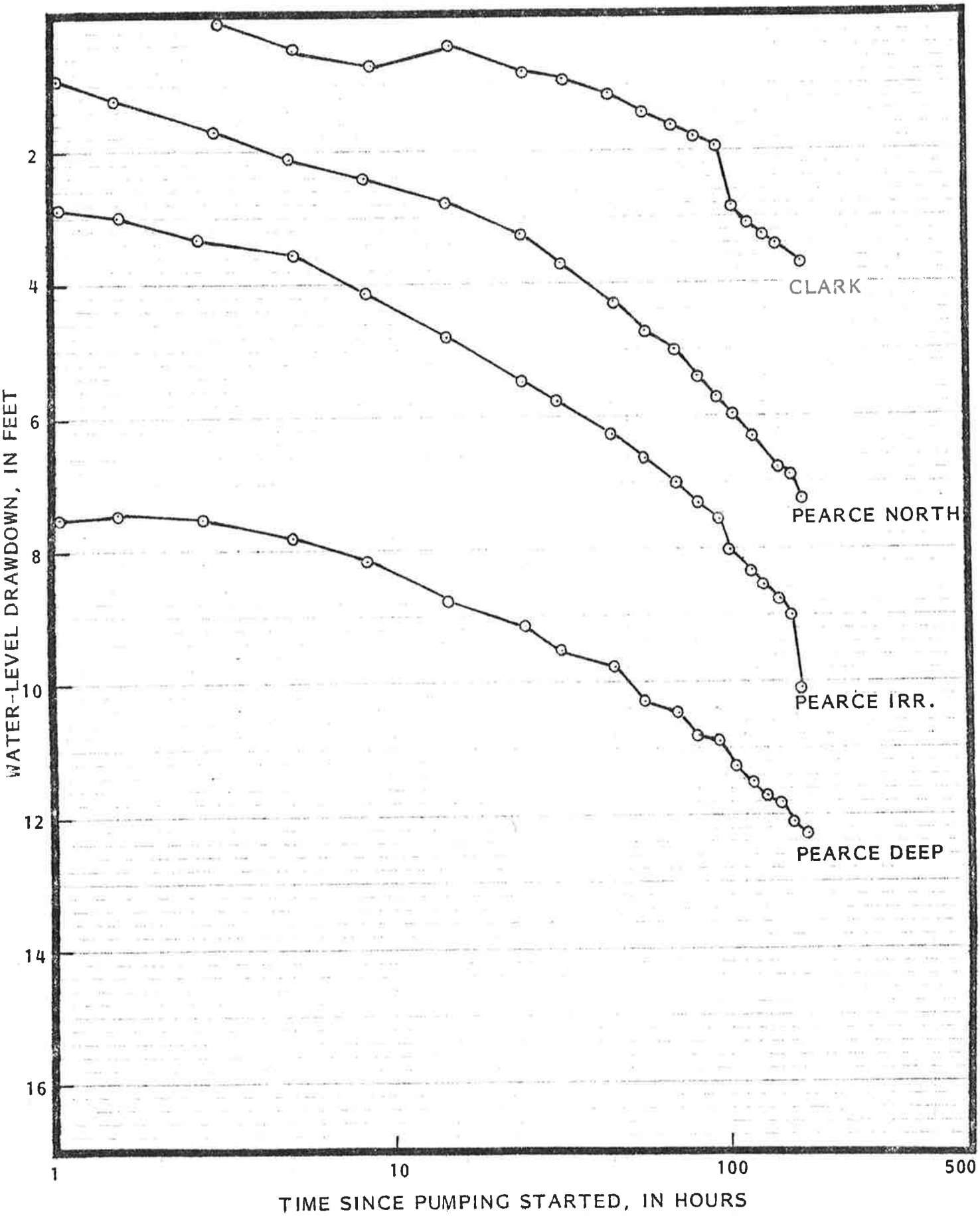


Figure 5. -- Hydrographs, Pearce Well Pumping Test

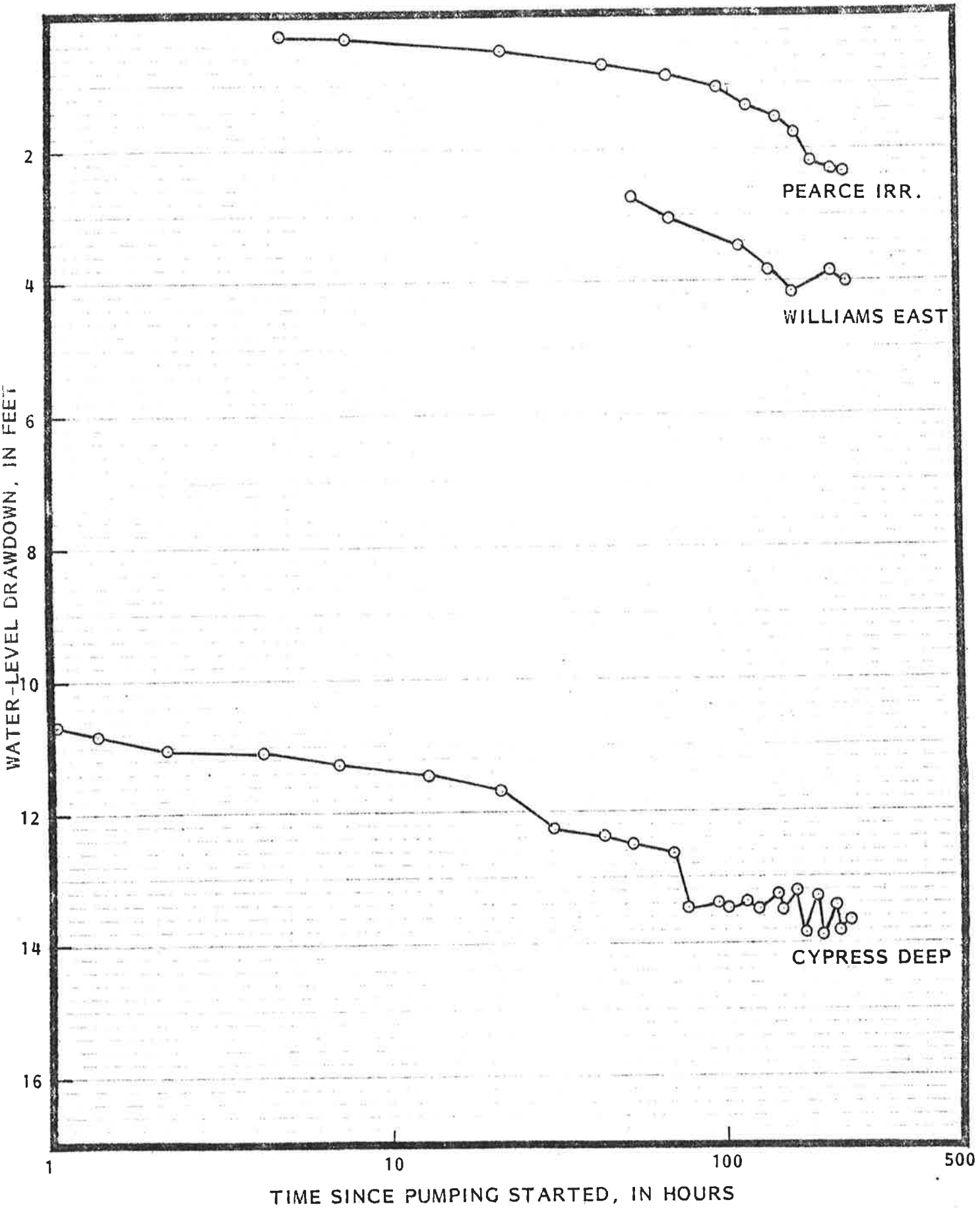


Figure 6. -- Hydrographs, Cypress Well Pumping Test

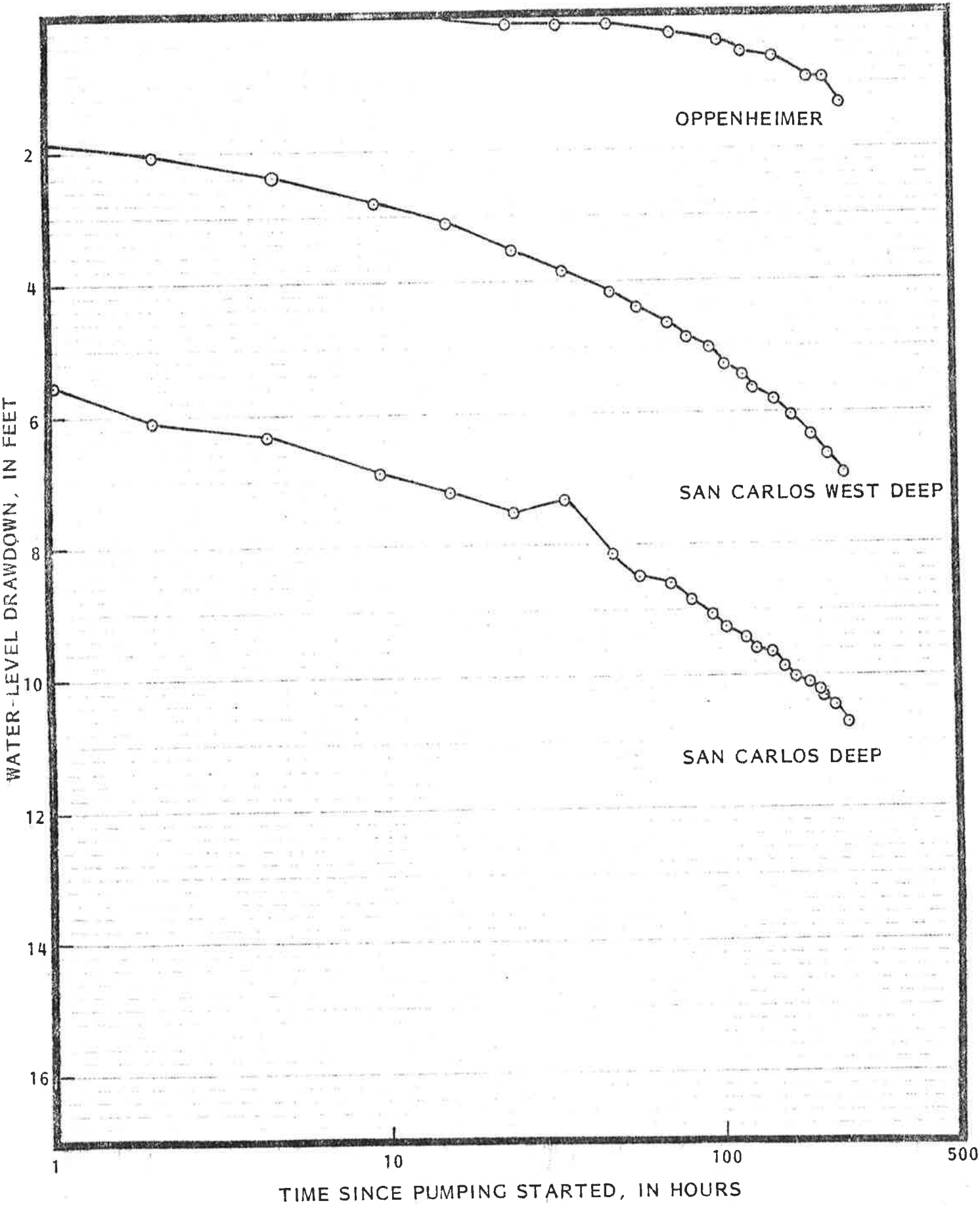


Figure 7. -- Hydrographs, San Carlos Well Pumping Test

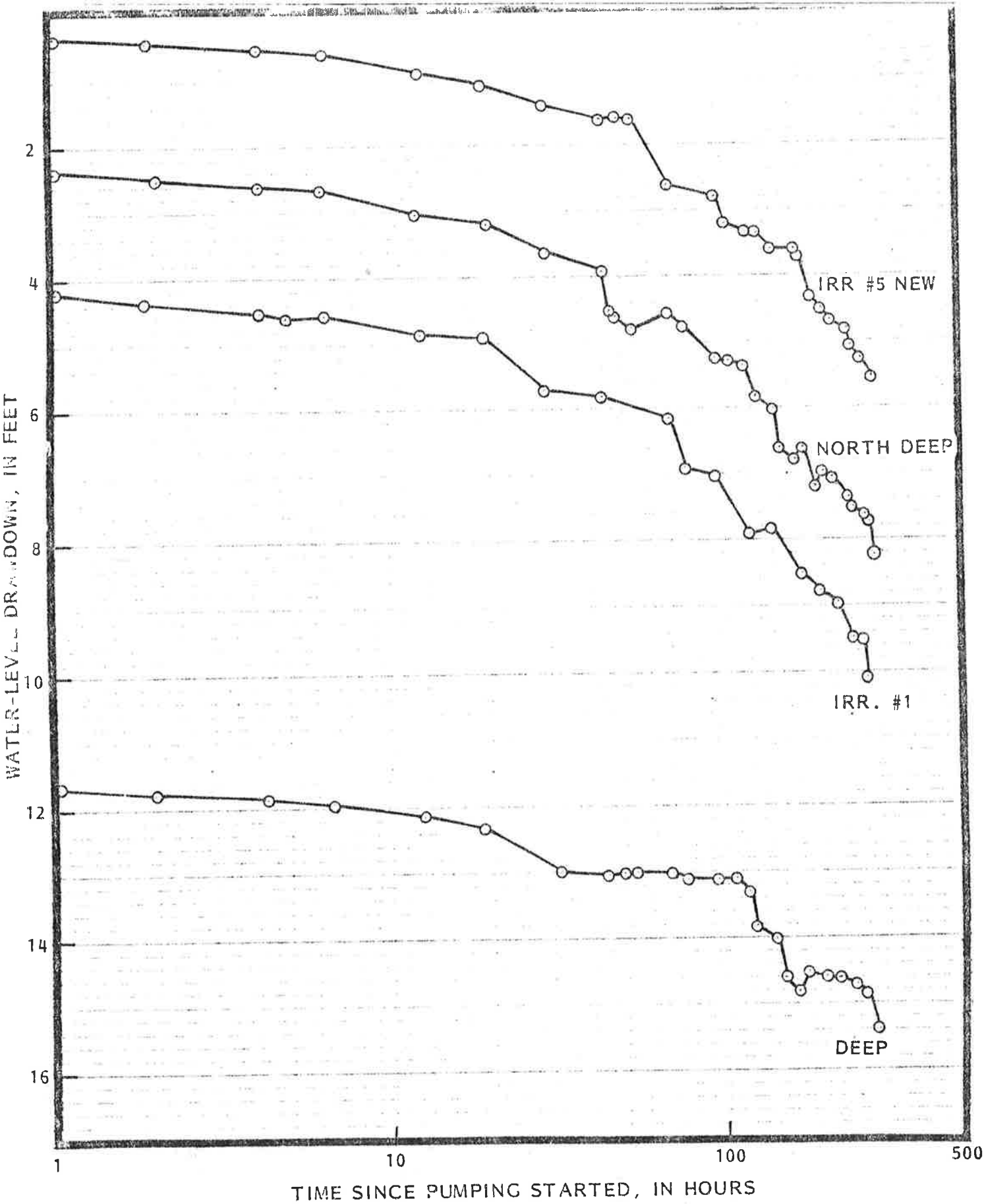


Figure 8. -- Hydrographs, Rancho Canada Well Pumping Test

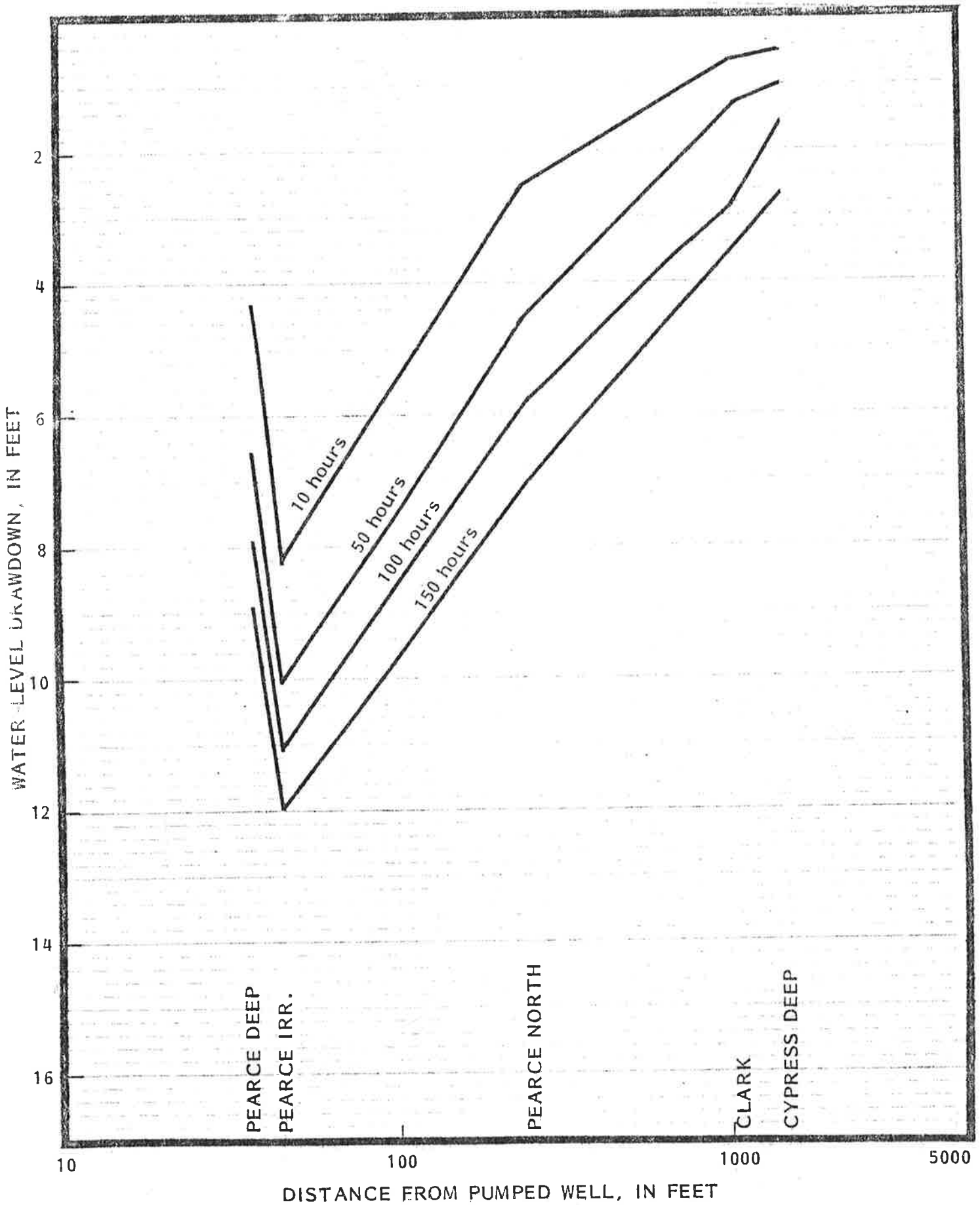


Figure 9. -- Distance-Drawdown Graphs, Pearce Well Pumping Test

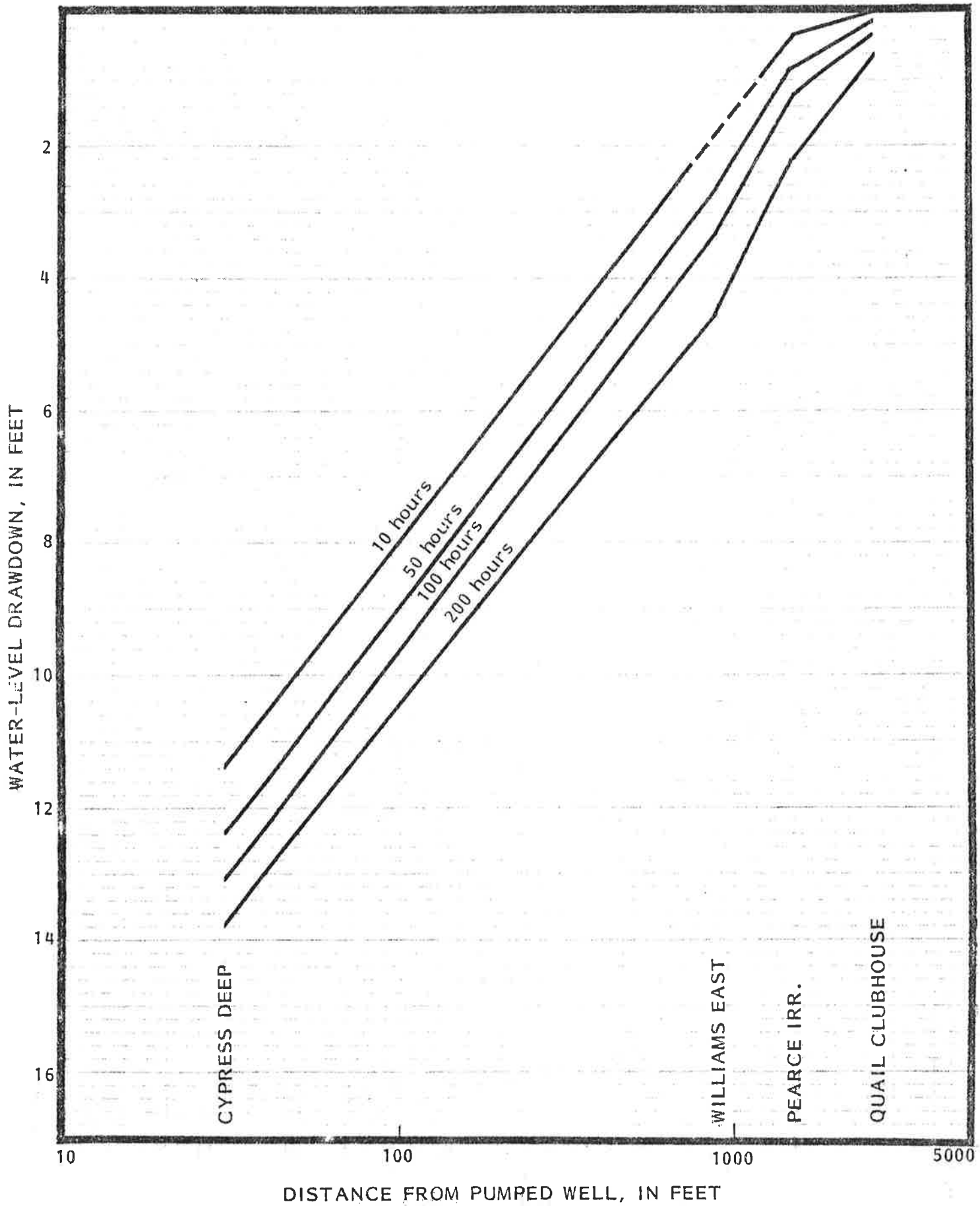


Figure 10. -- Distance-Drawdown Graphs, Cypress Well Pumping Test

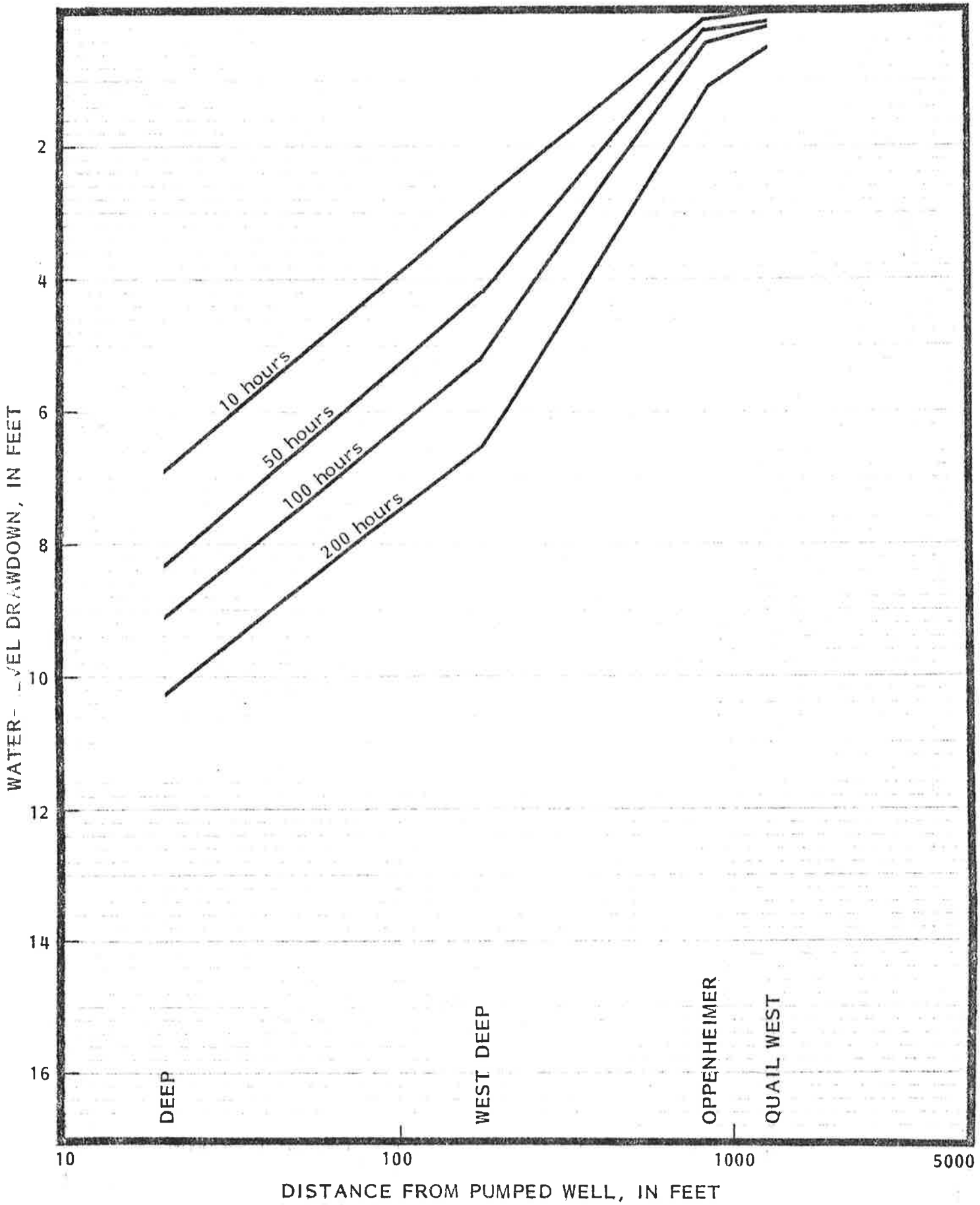


Figure 11. -- Distance-Drawdown Graphs, San Carlos Well Pumping Test

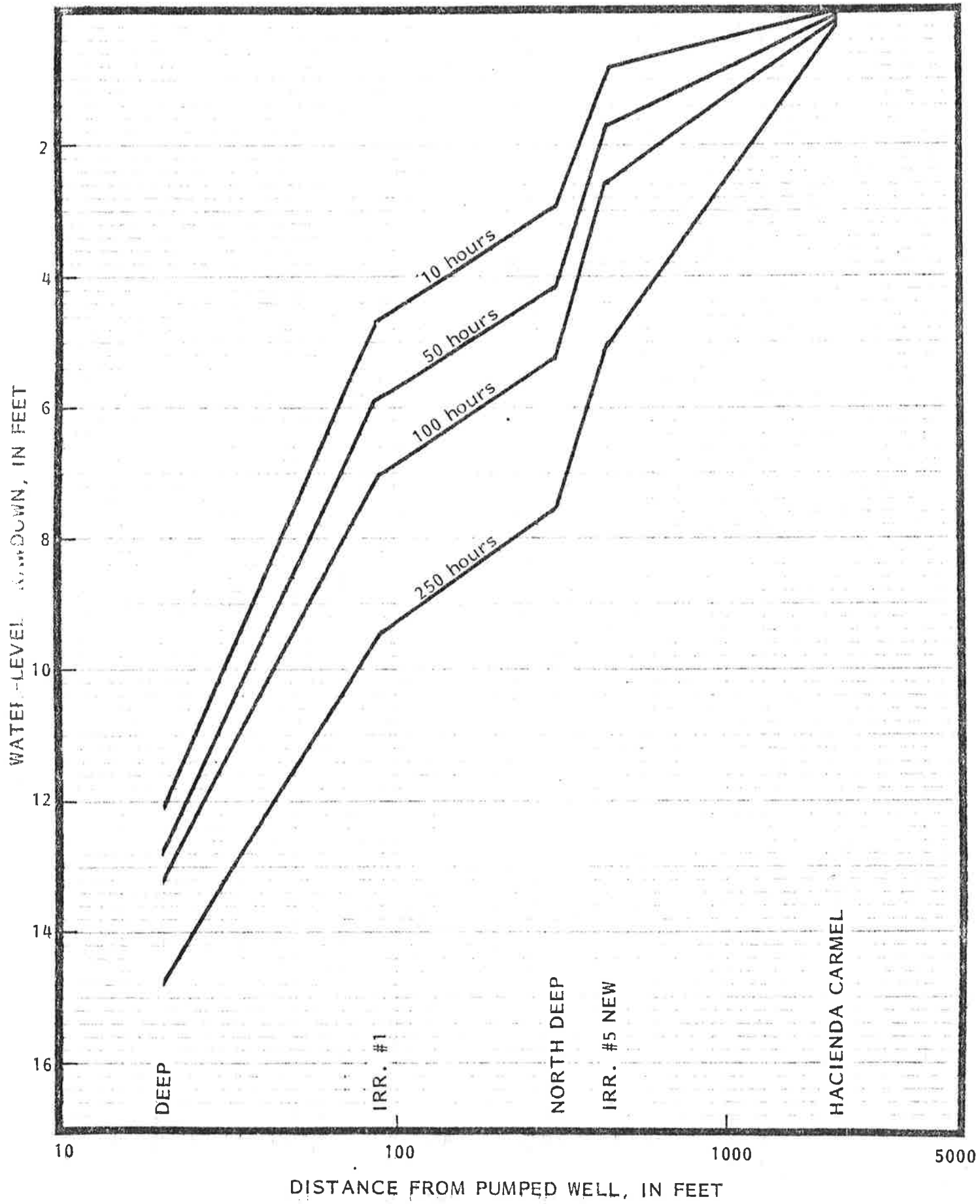


Figure 12. -- Distance-Drawdown Graphs, Rancho Canada Well Pumping Test

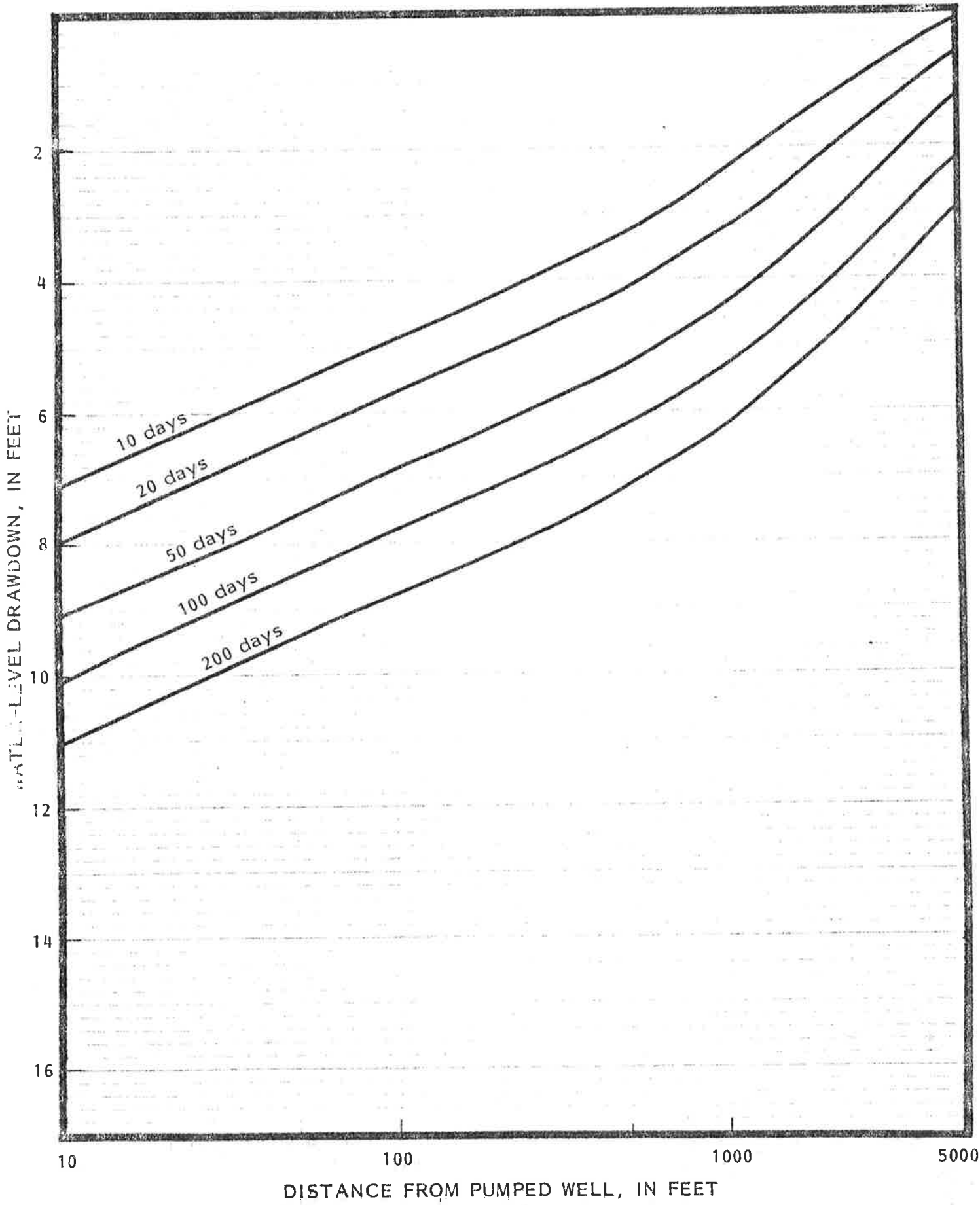


Figure 13. -- Projected Drawdown, Pearce Well Pumping

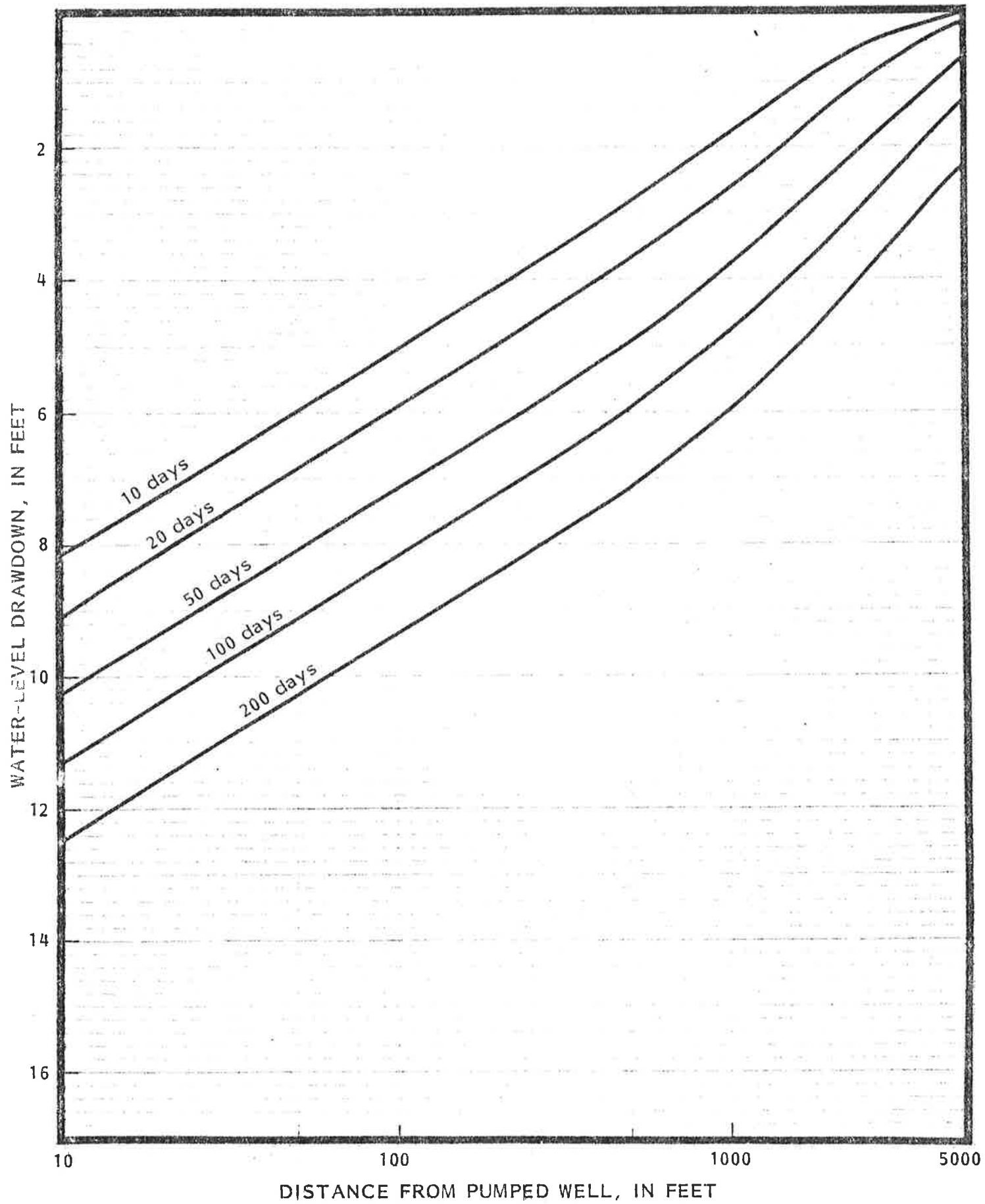


Figure 14. -- Projected Drawdown, Cypress Well Pumping

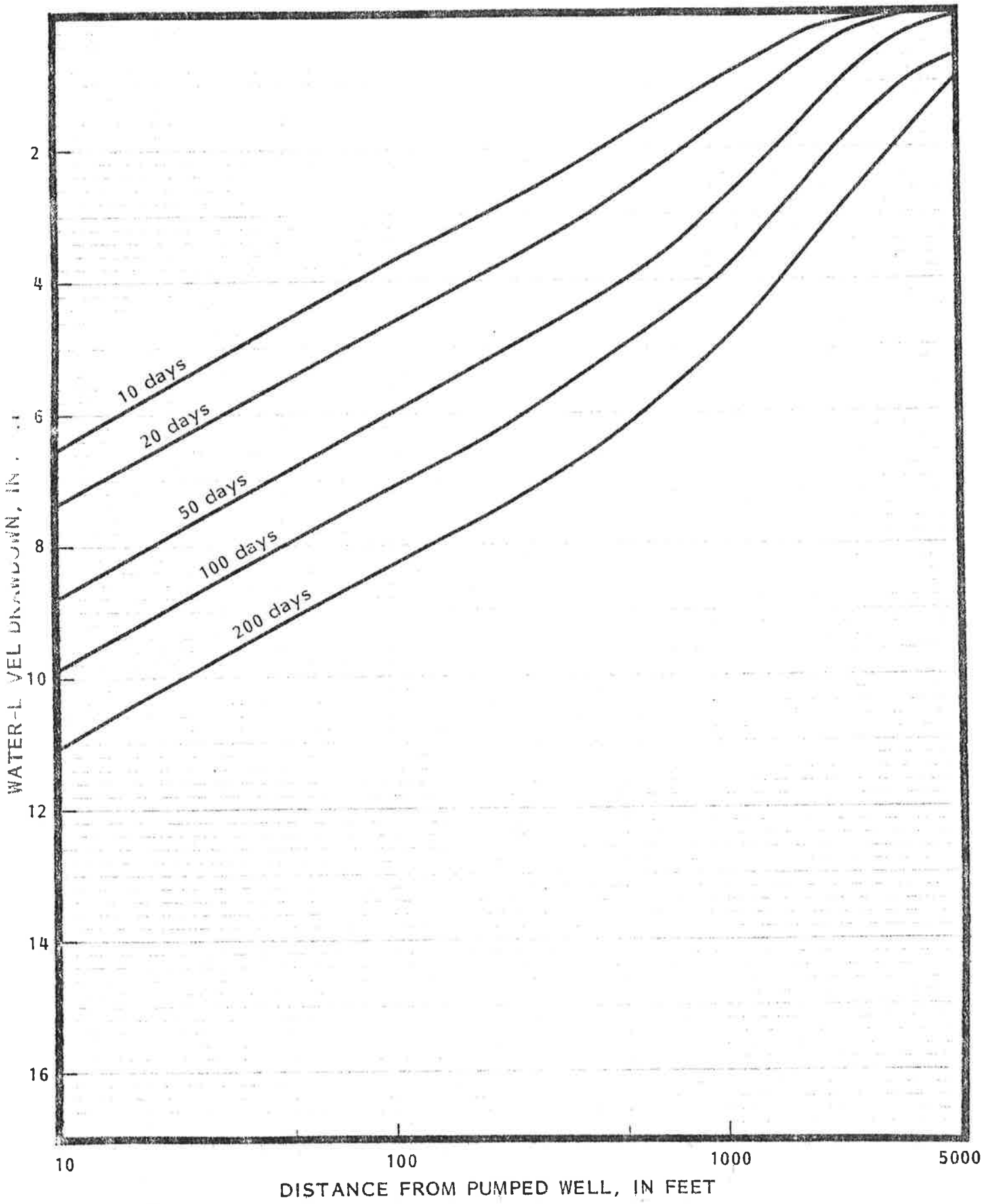


Figure 15. -- Projected Drawdown, San Carlos Well Pumping

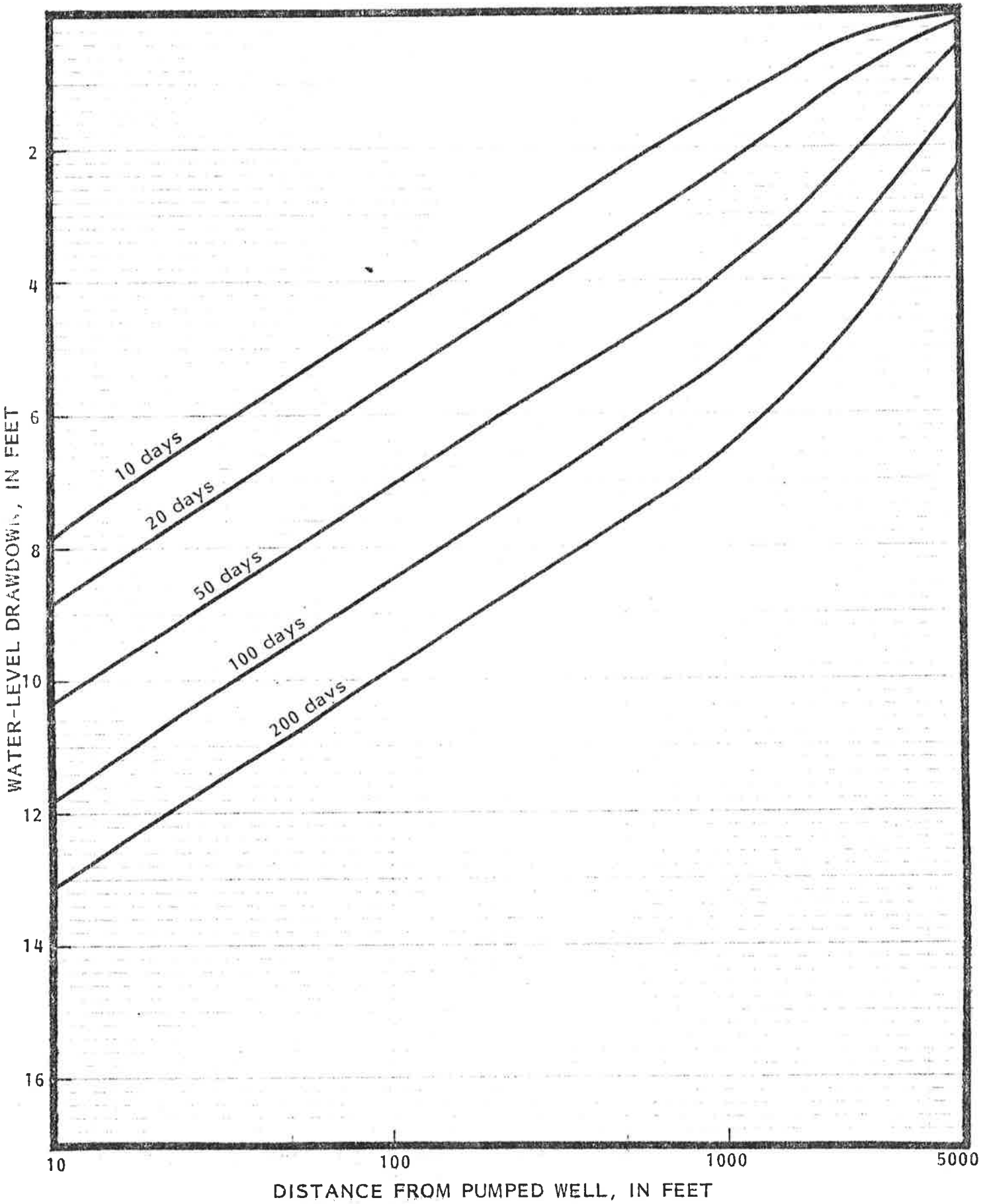


Figure 16. -- Projected Drawdown, Rancho Canada Well Pumping

APPENDIX

Field Data, Pumping and Observation Wells

- Section A. -- Pearce Well Pumping Test
- Section B. -- Cypress Well Pumping Test
- Section C. -- San Carlos Well Pumping Test
- Section D. -- Rancho Canada Well Pumping Test

PEARCE WELL PUMPING TEST

Table A1. -- Pumping Well Data

(Water-level measurements referenced to lower edge of slant access tube, which is at ground level elevation 89.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Discharge (gpm)	Remarks
9-20	0920	20.28		Depth to water measured with steel tape.
		20		Depths to water measured with air line.
	1030			Pumping started.
	1037		682	
	1102		2195	
	1122		2380	
	1129	59		
	1205	59	2148	
	1306	59	2212	
	1529	59	2204	
	1851	59½	2197	
9-21	0111		2206	
	1048	60½	2230	
	1810	61	2176	
9-22	0728	61	2177	
	1836	61	2153	
9-23	0718	61	2142	
	1910	61	2135	
9-24	0726	61	2105	
	1837	62	2174	
9-25	0838	62	2128	
	1852	62	2150	
9-26	0851	62	2137	
	1845	62	2144	
9-27	0750	62	2129	
	1000		2121	Pumping stopped.
	1005	27.05		Depths to water measured with steel tape.
	1016	26.40		
	1020	26.32		
	1024	26.18		
	1035	26.21		
	1041	26.15		
	1048	26.12		
	1054	26.10		
	1100	26.07		
	1226	25.85		
	1346	25.73		

Table A1. -- Pumping Well Data -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Discharge (gpm)	Remarks
9-27	1527	25.58		
	1837	25.39		
9-28	0052	24.96		
	0722	24.69		
9-29	1148	23.89		
9-30	1144	23.42		
10-1	0912	23.16		
10-2	1210	23.08		
10-3	1051	22.65		
10-5	0954	22.31		
10-7	1123	22.14		
10-9	0923	21.86		
10-11	0950	21.70		
10-13	1454	21.53		Water-level measurements continued on this well for Cypress Well pumping test.

PEARCE WELL PUMPING TEST

Table A2. -- Observation Well Data, Manor Production Well

(Water-level measurements referenced to upper edge of slant access tube, which is 3.8 feet above ground level elevation 104.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16		17.6	Pump has been shut off since 9-13-82.
9-17	1930	17.23	
9-18	1220	16.91	
9-19	1055	16.98	
9-20	0930	15.14	
	1205	15.66	
	1515	14.96	Sound of running water in discharge pipe.
9-21	1734	17.00	do
9-22	0745	16.88	do
9-23	0657	17.00	
9-24	0706	16.38	
9-25	0757	14.79	
9-26	0831	14.42	
9-27	0800	14.50	
			Water-level measurements discontinued, excessively erratic, but resumed for Cypress Well pumping test.

PEARCE WELL PUMPING TEST

Table A3. -- Observation Well Data, Schulte Test Well

(Water-level measurements referenced to top of casing, which is 4.0 feet above ground level elevation 93.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16		24.1	Schulte production well pump has been shut off since 9-13-82.
9-17	1920	24.22	
9-18	1200	23.91	
9-19	1040	23.62	
9-20	0915	23.61	
	1155	23.62	
	1452	23.72	
	1914	23.52	
9-21	1148	23.56	
	1748	23.50	
9-22	0737	23.44	
	1844	23.42	
9-23	0703	23.46	
	1920	23.44	
9-24	0710	23.26	
	1844	23.34	
9-25	0748	23.32	
	1902	23.30	
9-26	0837	23.24	
	1900	23.24	
9-27	0755	23.22	
	1847	23.16	
9-28	0100	23.18	
	0710	23.18	
9-29	1158	23.17	
9-30	1152	23.10	
10-1	0900	23.09	
10-3	1106	23.02	
10-5	0941	23.03	
10-7	1104	23.08	
10-9	0935	23.47	
10-11	1002	23.32	
10-13	1441	23.73	Water-level measurements continued on this well for Cypress Well pumping test.

PEARCE WELL PUMPING TEST

Table A4. -- Observation Well Data, Pearce Shallow Observation Well

(Water-level measurements referenced to top of casing, which is 0.4 feet above ground level elevation 89.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-17	1915	20.64	
9-18	1125	20.58	
9-19	1030	20.55	
9-20	0904	20.52	
	1844	22.92	
9-21	1055	24.54	
	1805	25.04	
9-22	0726	25.64	
	1835	26.04	
9-23	0717	26.51	
	1911	27.00	
9-24	0727	27.17	
	1836	27.48	
9-25	0740	27.78	
	1856	28.04	
9-26	0853	28.52	
	1846	28.45	
9-27	0751	28.67	
	1003	28.65	
	1014	28.48	
	1019	28.40	
	1022	28.36	
	1028	28.32	
	1040	28.22	
	1046	28.42	
	1050	28.24	
	1059	28.14	
	1228	27.78	
	1347	27.51	
	1530	27.24	
	1840	26.82	
9-28	0054	26.20	
	0723	26.17	
9-29	1150	24.59	
9-30	1146	24.08	
10-1	0913	23.73	
10-2	1203	23.36	
10-3	1054	23.13	
10-5	0955	22.75	
10-7	1124	22.45	
10-9	0925	22.19	
10-11	0951	22.02	
10-13	1456	21.84	

Water-level measurements continued on this well for Cypress Well pumping test.

PEARCE WELL PUMPING TEST

Table A5. -- Observation Well Data, Pearce Deep Observation Well

(Water-level measurements referenced to top of casing cover, which is 0.5 feet above ground level elevation 88.5 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16		20.1	
9-17	1910	20.11	
9-18	1130	20.00	
9-19	1025	20.05	
9-20	0914	19.94	
	1035	24.51	
	1040	23.42	
	1045	22.88	
	1050	22.71	
	1052	22.68	
	1100	22.71	
	1119	22.84	
	1130	22.86	
	1204	23.03	
	1311	23.25	
	1532	23.58	
	1847	24.01	
9-21	0114	24.75	
	1051	25.41	
	1800	25.73	
9-22	0723	26.22	
	1833	26.62	
9-23	0715	26.96	
	1909	27.32	
9-24	0725	27.56	
	1834	27.89	
9-25	0737	28.19	
	1851	28.40	
9-26	0850	28.63	
	1844	28.87	
9-27	0749	30.00	
	1002	29.00	
	1012	27.10	
	1018	27.00	
	1021	26.82	
	1026	26.75	
	1038	26.63	
	1045	26.57	
	1052	26.54	
	1058	26.50	
	1224	26.18	
	1345	25.94	
	1526	25.70	
	1836	25.44	

Table A6 -- Observation Well Data, Pearce Irrigation Well

(Water-level measurements referenced to top of casing cover, which is at ground level elevation 89.2 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16		20.1	
9-17	1905	20.52	
9-18	1135	20.10	
9-19	1015	20.05	
9-20	0935	20.20	
	1031	20.77	
	1032	23.40	
	1035	27.39	
	1040	26.71	
	1054	27.17	
	1101	27.25	
	1121	27.51	
	1132	27.48	
	1202	27.65	
	1317	27.76	
	1534	28.00	
	1850	28.36	
9-21	0119	28.96	
	1058	29.39	
	1758	29.72	
9-22	0721	29.99	
	1852	30.50	
9-23	0714	30.63	
	1907	31.00	
9-24	0723	31.08	
	1832	31.50	
9-25	0735	31.70	
	1847	31.93	
9-26	0848	32.06	
	1842	32.33	
9-27	0748	32.45	
	1000	32.80	
	1010	26.50	
	1017	26.29	
	1021	26.19	
	1037	26.07	
	1044	25.63	
	1051	25.93	
	1057	25.92	
	1223	25.72	
	1342	25.57	
	1525	25.40	
	1835	25.18	

Table A6 -- Observation Well Data, Pearce Irrigation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-28	0048	24.60	
	0719	24.48	
9-29	1145	23.63	
9-30	1142	23.20	
10-1	0909	22.92	
10-2	1215	22.59	
10-3	1046	22.40	
10-5	0951	22.07	
10-7	1118	21.82	
10-9	0917	21.54	
10-11	0945	21.40	
10-13	1452	21.22	Water-level measurements continued on this well for Cypress well pumping test.

PEARCE WELL PUMPING TEST

Table A7. -- Observation Well Data, Pearce North Observation Well

(Water-level measurements referenced to top of casing, which is 0.3 feet above ground level elevation 89.8 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16		21.3	
9-17	1900	21.50	
9-18	1120	21.20	
9-19	1020	21.16	
9-20	0927	21.13	
	1003	21.18	
	1030	21.18	
	1031	21.10	
	1032	21.15	
	1035	21.22	
	1040	21.36	
	1050	21.56	
	1100	21.75	
	1110	21.90	
	1120	22.01	
	1130	22.12	
	1201	22.40	
	1332	22.84	
	1539	23.21	
	1857	23.52	
9-21	0124	23.91	
	1101	24.40	
	1756	24.75	
9-22	0720	25.37	
	1830	25.79	
9-23	0711	26.17	
	1903	26.38	
9-24	0720	26.69	
	1830	27.03	
9-25	0730	27.36	
	1840	27.53	
9-26	0846	27.80	
	1839	27.89	
9-27	0746	28.20	
	1000	28.22	
	1001	28.18	
	1002	28.17	
	1005	28.14	
	1010	28.08	
	1020	28.00	
	1030	27.95	
	1040	27.90	
	1050	27.88	

Table A7 -- Observation Well Data, Pearce North Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-27	1100	27.85	
	1220	27.70	
	1339	27.54	
	1522	27.35	
	1833	27.10	
9-28	0044	26.92	
9-29	1142	25.25	
9-30	1140	24.68	
10-1	0907	24.32	
10-2	1222	23.97	
10-3	1041	23.76	
10-5	0950	23.35	
10-7	1114	23.05	
10-9	0915	22.36	
10-11	0943	22.62	
10-13	1451	22.42	Water-level measurements continued on this well for Cypress well pumping test.

Table A8 -- Observation Well Data, Clark Irrigation Well

(Water-level measurements referenced to top of casing, which is 0.7 feet above ground level elevation 101 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16		34.2	
9-17	1845	34.30	
9-18	1140	34.52	
9-19	1000	34.50	
9-20	0850	34.39	
	1030	34.35	
	1031	34.28	
	1032	34.56	
	1035	34.19	
	1040	34.20	
	1045	34.34	
	1050	34.15	
	1100	34.15	
	1110	34.19	
	1120	34.22	
	1130	34.22	
	1215	34.32	
	1238	34.38	
	1544	34.79	
	1903	34.97	
9-21	0131	34.72	
	1124	35.06	
	1752	35.16	
9-22	0716	35.34	
	1828	35.57	
9-23	0709	35.66	
	1901	35.83	
9-24	0718	35.97	
	1827	36.12	
9-25	0729	36.33	
	1838	36.44	
9-26	0844	36.58	
9-27	0743	36.80	
	1142	36.57	
	1218	36.54	
	1337	36.52	
	1520	36.50	
	1830	36.48	
9-28	0040	36.41	
	0715	36.38	
9-29	1138	36.16	
9-30	1138	36.07	
10-1	0905	36.01	

Table A5. -- Observation Well Data, Pearce Deep Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-28	0050	24.96	
	0721	24.63	
9-29	1147	23.73	
9-30	1143	23.22	
10-1	0910	22.89	
10-2	1214	22.76	
10-3	1019	22.55	
10-5	0952	22.20	
10-7	1120	21.96	
10-9	0919	21.71	
10-11	0948	21.54	
10-13	1453	21.39	Water-level measurements continued on this well for Cypress well pumping test.

Table A8 -- Observation Well Data, Clark Irrigation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-2	1228	35.92	
10-3	1037	35.75	
10-5	0947	35.74	
10-7	1112	36.10	
10-9	0911	35.34	
10-11	0941	35.35	
10-13	1449	35.25	Water-level measurements continued on this well for Cypress well pumping test.

PEARCE WELL PUMPING TEST

Table A9 -- Observation Well Data, Williams East Irrigation Well

(Water-level measurements referenced to base of pump, which is at ground level elevation 93 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16			Pumping
9-17			do
9-18			do
9-19			do
9-20	1006	29.84	
	1110	29.93	
	1353	30.27	
	1820		Pumping
9-21	0050	30.50	
	1129		Pumping
	1815	30.38	
9-22	0710	30.45	
	1815	30.77	
9-23	0724	30.67	
	1850	30.80	
9-24	0740	30.82	
	1818	30.97	
9-25	0810	31.06	
	1816	31.09	
9-26	0902	31.22	
	1822	31.19	
9-27	0733	31.22	
	1158	31.15	
	1328	31.08	
	1510	31.10	
	1820	31.04	
9-28	0024	31.11	
	0739	30.97	
9-29	1130	31.00	
9-30	1130	30.93	
10-1	0920	30.85	
10-2	1153		Pumping
10-3	1022	31.18	
10-5	0920		Pumping
10-7	1132	30.60	
10-9	0846	30.55	Pumped since last measurement.
10-11			Pumping
10-13			do
			Water-level measurements continued on this well for Cypress well pumping test.

PEARCE WELL PUMPING TEST

Table A10 -- Observation Well Data, Williams West Irrigation Well #1

(Water-level measurements referenced to top of casing, which is 0.3 feet above ground level elevation 93 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16		30.1	
9-17	1815	30.02	
9-18	1040	29.52	
9-19	0920	29.69	
9-20	1008	29.61	
	1100	29.49	
	1400	29.60	
	1824	29.56	
9-21	0103	29.68	
	1131	29.75	
	1817	29.78	
9-22	0712	29.86	
	1824	29.89	
9-23	0726	30.01	
	1852	30.02	
9-24	0742	30.07	
	1820	30.10	
9-25	0815	30.45	
	1818	30.14	
9-26	0905	30.26	
	1816	30.33	
9-27	0737	30.29	
	1201	30.30	
	1332	30.30	
	1515	30.32	
	1824	30.38	
9-28	0029	30.35	
	0742	30.34	
9-29	1133	30.42	
9-30	1133	30.48	
10-1	0821	30.47	
10-2	1152	30.45	
10-3	1029	30.47	
10-5	0923	30.51	
10-7	1136	30.51	
10-9	0839	30.51	
10-11	0936	30.59	
10-13	1502	30.50	Water-level measurements continued on this well for Cypress well pumping test.

PEARCE WELL PUMPING TEST

Table A11 -- Observation Well Data, Williams West Irrigation Well #2

(Water-level measurements referenced to base of pump, which is at ground level elevation 93 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-22	1820	30.70	
9-23	0729	30.67	
	1857	30.70	
9-24	0743	30.77	
	1822	31.91	
9-25	0819	32.72	
	1822	30.87	
9-26	0908	30.93	
	1819	30.99	
9-27	0735	31.00	
	1204	31.03	
	1335	31.01	
	1516	31.03	
	1826	31.03	
9-28	0031	31.04	
	0743	31.03	Water-level measurements discontinued, because not responsive to pumping

Table A12. -- Observation Well Data, Cypress Deep Observation Well

(Water-level measurements referenced to top of casing, which is at ground level elevation 81.8 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16		17.8	
9-17	1830	17.91	
9-18	1110	17.85	
9-19	0950	17.81	
9-20	1013	17.64	
	1115	17.75	
	1413	17.85	
	1833	18.04	
9-21	0040	17.94	
	1137	18.23	
	1820	18.20	
9-22	0659	18.29	
	1812	18.59	
9-23	0731	18.53	
	1846	18.77	
9-24	0755	18.75	
	1810	18.93	
9-25	0827	18.96	
	1827	19.03	
9-26	0912	19.12	
	1919	19.26	
9-27	0727	19,25	
	1208	19.02	
	1321	19.00	
	1505	18.97	
	1816	18.93	
9-28	0016	18.93	
	0728	18.82	
9-29	1111	18.79	
9-30	1121	18.72	
10-1	0927	18.66	
10-2	1143	18.67	
10-3	1011	18.45	
10-5	1003	18.55	
10-7	1142	18.38	
10-9	0852	18.18	
10-11	0927	18.32	
10-13	1504	18.29	Water-level measurements continued on this well for Cypress well pumping test.

PEARCE WELL PUMPING TEST

Table A13. -- Observation Well Data, Quail East Irrigation Well

(Water-level measurements referenced to top of casing, which is 0.6 feet above ground level elevation 72 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-16		17.2	
9-17	1740	17.14	
9-18	1000	17.12	
9-19	0845	17.22	
9-20	1002	17.60	
	1721	17.13	
9-21	1214		Adjacent well pumping.
	1827	18.17	do
9-22	0653	17.61	
	1805	17.89	Adjacent well pumping.
9-23	0737	17.53	
	1841	17.22	
9-24	0806	17.18	
	1806	17.08	
9-25	0720	17.03	
	1806	17.00	
9-26	0931	16.95	
	1805	17.00	
9-27	0717	17.00	
	1800	16.94	
9-28	0007	16.95	
	0747	16.94	

Water-level measurements resumed on this well for Cypress well pumping test.

The well adjacent to this observation well typically is pumped several hours daily for golf course irrigation.

Table A14. -- Observation Well Data, Quail Central Irrigation Well

(Water-level measurements referenced to top of casing, which is 1.1 feet above ground level elevation 72 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-20	1735	23.78	
9-21	1207	23.84	
	1831	23.85	
9-22	0647	23.90	
	1800	23.89	
9-23	0742	23.91	
	1835	23.85	
9-24	0810	23.81	
	1800	23.80	
9-25	0710	23.80	
	1801	23.78	
9-26	0935	23.75	
	1800	23.76	
9-27	0714	23.73	
	1755	23.70	
9-28	0002	23.92	
	0752	23.67	
9-29	1104	23.68	
9-30	1115	23.68	
10-1	0937	23.66	
10-2	0739	23.65	
10-3	0948	23.68	
10-5	0917	23.68	
10-7	1155	23.75	
10-9	0834	23.70	
10-11	0925	23.74	
10-13	1520	23.74	
10-15	1635	23.84	
10-16	1655	23.82	
10-17	1645	23.82	
10-18	1725	23.75	
10-19	1708	23.86	
10-20	1710	23.88	

Water-level measurements on this well appear also in tables of data for pumping tests of the Cypress and San Carlos wells.

CYPRESS WELL PUMPING TEST

Table B1. -- Pumping Well Data

(Water-level measurements referenced to lower edge of slant access tube, which is at ground level elevation 82.1 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Discharge (gpm)	Remarks
10-15	1035	19.02		Depth to water measured with steel tape.
	1100			Pumping started.
	1107	49	1104	Depths to water measured with air line.
	1122	52	2156	
	1139	52	2344	
	1151		1951	
	1159	52	2422	
	1221	52	2118	
	1312	52	2209	
	1515	54	2201	
	1800	54	2192	
	2356	54	2166	
10-16	0939	54	2162	
	1733	54½	2171	
	1745			Regional power outage.
	1805			Power restored; discharge to blowoff.
	1900			Discharge stabilized.
10-17	0710	54	1961	
	1536	55	2166	
10-18	0933		2142	
	1742	55	2192	
10-19	0938	55	2174	
	1724	55	1913	
10-20	0719	55	2147	
	1742	55	2152	
10-21	0754	55	2146	
	1651	55	2159	
10-22	0745	55	2142	
	1702	55	2184	
10-23	0856	55	2173	
	1707	55	2172	
10-24	0901	55	2159	
	1719		2182	
10-25	0750	57	2143	
	1000			Pumping stopped.
	1001	25.37		Depths to water measured with steel tape.
	1002	25.52		

Table B1. -- Pumping Well Data -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Discharge (gpm)	Remarks
10-25	1005	24.22		
	1010	24.07		
	1020	24.00		
	1030	23.96		
	1040	23.93		
	1050	23.87		
	1100	23.82		
	1339	23.52		
	1642	23.44		
	1815	23.36		
10-26	0034	23.09		
	1043	22.83		
	1611	22.78		
10-27	0820	22.59		
10-28	1102	22.07		
10-29	1019	21.82		
10-30	0930	21.60		
10-31	1135	21.88		
11-1	1008	20.78		
11-2	1016	20.70		
11-3	1027	20.62		
11-4	0925	20.50		
11-5	1044	20.52		
11-6	1035	20.48		
11-7	1137	20.46		
11-9	0923	20.28		
11-11	0900	20.06		
11-13	1217	19.77		
11-15	0910	19.65		

CYPRESS WELL PUMPING TEST

Table B2. -- Observation Well Data, Manor Production Well

(Water-level measurements referenced to upper edge of slant access tube, which is 3.8 feet above ground level elevation 104.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well resumed from Pearce well pumping test.
10-16	1057	23.95	
10-19	1045	23.98	
10-21	0942	24.14	
10-26	1152	23.84	
10-28	1021	24.72	
10-30	1030	24.93	
11-1	0925	24.98	
11-3	0930	25.07	
11-5	1010	23.05	
11-7	1111	21.97	
11-9	0944	22.14	
11-11	0840	22.17	
11-13	1240	22.29	
11-15	0850	18.03	

Table B3. -- Observation Well Data, Schulte Test Well

(Water-level measurements referenced to top of casing, which is 4.0 feet above ground level elevation 93.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1230	23.20	
10-19	1052	22.99	
10-21	0947	23.07	
10-24	0950	23.70	
10-26	1145	23.20	
10-28	1028	23.03	
10-30	1021	23.56	
11-1	0932	23.07	
11-3	0937	23.00	
11-5	1018	22.87	
11-9	0937	22.97	
11-11	0844	22.97	
11-13	1250	22.90	
11-15	0857	22.83	

Table B4. -- Observation Well Data, Pearce Production Well

(Water-level measurements referenced to lower edge of slant access tube, which is at ground level elevation 89.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1021	21.66	
	1208	21.67	
	1546	21.73	
	1829	21.62	
10-16	0915	21.69	
10-17	0739	21.82	
10-18	0901	21.96	
10-19	1104	22.14	
10-20	1035	22.42	
10-21	1001	22.37	
10-22	1012	22.56	
10-23	0952	22.70	
10-24	0938	23.00	
10-25	0733	23.14	
10-26	1130	22.89	
10-27	0855	22.88	
10-28	1047	22.62	
10-29	1005	22.70	
10-30	1010	22.67	
10-31	1116	22.72	
11-1	0949	22.93	
11-2	1001	22.27	
11-3	1002	22.00	
11-4	0940	22.01	
11-5	1032	21.96	
11-6	1020	21.82	
11-7	1128	21.82	
11-9	0930	21.40	
11-11	0854	20.80	
11-13	1230	21.52	
11-15	0905	21.50	

Table B5. -- Observation Well Data, Pearce Shallow Observation Well

(Water-level measurements referenced to top of casing, which is 0.4 feet above ground level elevation 89.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1210	21.65	
10-16	0912	21.78	
10-17	0737	21.83	
10-18	0904	21.92	
10-19	1105	22.06	
10-20	1033	22.17	
10-21	1000	22.24	
10-22	1011	22.38	
10-23	0951	22.55	
10-24	0936	22.66	
10-25	0731	22.69	
10-26	1135	22.76	
10-27	0849	22.77	
10-28	1045	22.65	
10-29	1007	22.55	
10-30	1012	22.52	
10-31	1114	22.57	
11-1	0948	22.42	
11-2	1000	22.32	

CYPRESS WELL PUMPING TEST

Table B6. -- Observation Well Data, Pearce Deep Observation Well

(Water-level measurements referenced to top of casing cover, which is 0.5 feet above ground level elevation 88.5 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1838	21.42	
10-16	0918	21.48	
10-17	0741	21.60	
10-18	0906	21.72	
10-19	1103	21.86	
10-20	1030	21.99	
10-21	0958	22.14	
10-22	1000	22.25	
10-23	0950	22.42	
10-24	0934	22.50	
10-25	0730	22.59	
	1806	22.53	
10-26	1125	22.56	
10-27	0847	22.55	
10-28	1043	22.28	
10-29	1004	22.28	
10-30	1007	22.70	
10-31	1111	22.78	
11-1	0947	22.07	
11-2	0959	21.90	
11-3	0958	21.87	
11-3	0936	21.86	
11-5	1030	21.82	
11-6	1017	21.77	
11-7	1127	21.72	

Table B7. -- Observation Well Data, Pearce Irrigation Well

(Water-level measurements referenced to top of casing cover, which is at ground level elevation 89.2 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1548	21.31	
	1835	21.33	
10-16	0921	21.45	
10-17	0745	21.56	
10-18	0907	21.70	
10-19	1102	21.82	
10-20	1027	22.02	
10-21	0957	22.09	
10-22	1008	22.32	
10-23	0950	22.60	
10-24	0932	22.75	
10-25	0729	22.74	
	1804	22.60	
10-26	1124	22.60	
10-27	0844	22.60	
10-28	1040	22.28	
10-29	1003	22.54	
10-30	1006	22.52	
10-31	1107	22.57	
11-1	0946	22.10	
11-2	0958	21.98	

CYPRESS WELL PUMPING TEST

Table B8. -- Observation Well Data, Pearce North Observation Well

(Water-level measurements referenced to top of casing, which is 0.3 feet above ground level elevation 89.9 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1843	22.39	
10-16	0924	22.46	
10-17	0748	22.49	
10-18	0910	22.62	
10-19	1901	22.72	
10-20	1025	22.80	
10-21	0955	22.94	
10-22	1005	23.07	
10-23	0944	23.25	
10-24	0929	23.34	
10-25	0727	23.40	
	1802	23.20	
10-26	1122	23.40	
10-27	0838	23.44	
10-28	1035	23.18	
10-29	1000	23.24	
10-30	1002	23.20	
10-31	1105	23.27	
11-1	0942	23.09	
11-2	0957	23.01	

Table B9. -- Observation Well Data, Clark Irrigation Well

(Water-level measurements referenced to top of casing, which is 0.7 feet above ground level elevation 101 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1019	35.25	
	1218	35.65	
	1541	35.77	
	1823	35.84	
	2337	35.86	
10-16	0909	35.84	
10-17	0732	36.13	
10-18	0913	36.20	
10-19	1100	36.43	
10-20	1020	36.38	
10-21	0953	36.75	
10-22	1004	37.14	
10-23	0939	37.80	
10-24	0926	38.29	
10-25	0725	37.29	
	1800	37.45	
10-26	1117	36.60	
10-27	0835	37.12	
10-28	1034	37.62	
10-29	0958	37.37	
10-30	1300	37.22	
10-31	1100	37.33	
11-1	0940	37.25	
11-2	0952	36.37	
11-3	0954	36.27	
11-4	0934	36.02	
11-4	1028	35.98	
11-6	1014	35.97	
11-7	1125	35.94	
11-9	0928	35.83	
11-11	0850	36.10	
11-13	1227	35.58	
11-15	0903	35.38	

CYPRESS WELL PUMPING TEST

Table B10. -- Observation Well Data, Williams East Irrigation Well

(Water-level measurements referenced to base of pump, which is at ground level elevation 93 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1050		Pumping
	1500		do
	1800		do
10-16	0900		do
	1700		do
10-17	0630		do
	1555	33.13	
10-18	0922	33.48	
10-19	0920		Pumping
10-20	0710	33.88	
10-21	0745	34.23	
10-22	0740	34.55	Pumped since last measurement.
10-23	0854		Pumping
10-24	0842	34.20	
10-25	0742	35.35	
	1130	34.34	
	1325	34.39	
	1635	34.32	
	1811	34.30	
10-26	1031	33.96	
10-27	0804	33.70	
10-28	1055	33.65	
10-29	1015	33.30	
10-30	0915	33.40	
10-31	1142	33.38	
11-1	0957	32.77	
11-2	1010	32.62	
11-3	1014	32.57	
11-4	0923	32.40	
11-5	1041	32.20	
11-6	1029	32.14	
11-7	1134	32.08	

CYPRESS WELL PUMPING TEST

Table B11. -- Observation Well Data, Williams West Irrigation Well #1

(Water-level measurements referenced to top of casing, which is 0.3 feet above ground level elevation 93 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1020	30.54	
	1204	30.46	
	1320	30.46	
	1535	30.54	
	1815	30.56	
	2348	30.59	
10-16	0929	30.63	
	1715	30.72	
10-17	0723	30.84	
	1600	30.97	
10-18	0927	31.21	
	1739	31.29	
10-19	0934	31.55	
	1717	31.74	
10-20	0705	31.94	
	1737	33.27	
10-21	0748	32.42	
	1647	32.58	
10-22	0742	32.79	
	1659	32.84	
10-23	0850	34.04	
	1701	33.34	
10-24	0836	33.49	
	1717	33.78	
10-25	0744	33.72	
	1135	34.94	
	1327	33.86	
	1638	33.95	
	1813	33.90	
10-26	1023	33.93	
	1603	33.95	
10-27	0757	34.00	
10-28	1059	33.93	
10-29	1017	33.95	
10-30	0917	34.41	
10-31	1145	34.09	
11-1	1000	33.44	
11-2	1012	33.24	

Table B12. -- Observation Well Data, Cypress Shallow Observation Well

(Water-level measurements referenced to top of casing, which is 0.7 feet above ground level elevation 82.1 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-2	1143	19.12	
10-3	1011	19.90	
10-5	1005	19.85	
10-7	1139	19.84	
10-9	0850	19.71	
10-11	0928	19.44	
10-13	1507	19.27	
10-15	1033	19.54	
	1104	19.55	
	1107	19.17	
	1108	19.54	
	1109	19.54	
	1112	19.56	
	1114	19.55	
	1115	19.55	
	1117	19.55	
	1119	19.55	
	1121	19.56	
	1124	19.57	
	1126	19.56	
	1130	19.56	
	1139	19.55	
	1152	19.58	
	1201	19.58	
	1221	19.60	
	1311	19.63	
	1512	19.71	
	1803	19.82	
	2358	19.97	
10-16	0941	20.48	
	1734	20.78	
10-17	0714	21.21	
	1542	21.48	
10-18	0923	22.50	
	1745	22.62	
10-19	0938	22.65	
	1720	22.67	
10-20	0717	22.91	
	1739	22.86	
10-21	0751	22.60	
	1649	22.64	
10-22	0744	22.60	
	1700	22.60	

Table B12. -- Observation Well Data, Cypress Shallow Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-23	0859	22.91	
	1720	22.93	
10-25	0747	22.65	
	1000	22.57	
	1001	22.56	
	1002	22.55	
	1005	22.56	
	1010	22.55	
	1020	22.55	
	1030	22.55	
	1040	22.55	
	1050	22.55	
	1100	22.55	
	1334	22.65	
	1640	22.65	
	1816	22.65	
10-26	0037	22.90	
	1045	22.60	
	1615	22.60	
10-27	0812	22.58	
10-28	1100	22.60	
10-29	1020	22.60	
10-30	0922	22.60	
10-31	1130	22.60	
11-1	1003	22.55	
11-2	1014	22.58	

CYPRESS WELL PUMPING TEST

Table B13. -- Observation Well Data, Cypress Deep Observation Well

(Water-level measurements referenced to top of casing, which is at ground level elevation 81.8 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from Pearce Well pumping test.
10-15	1031	18.17	
	1102	26.23	
	1106	26.19	
	1107	26.58	
	1109	26.98	
	1111	27.28	
	1113	27.46	
	1114	27.63	
	1116	27.17	
	1118	27.94	
	1120	28.02	
	1123	28.15	
	1125	28.22	
	1129	28.33	
	1138	28.65	
	1150	28.79	
	1200	28.88	
	1220	28.98	
	1310	29.19	
	1511	29.25	
	1806	29.43	
10-16	0002	29.61	
	0943	29.84	
	1736	30.29	
10-17	0716	30.33	
	1543	30.64	
10-18	0926	30.77	
	1746	31.54	
10-19	0940	31.50	
	1723	31.54	
10-20	0720	31.44	
	1741	31.61	
10-21	0753	31.33	
	1650	31.58	
10-22	0745	31.26	
	1701	31.89	
10-23	0902	31.70	
	1706	31.89	
10-24	0900	31.73	
	1720	31.87	

Table B13. -- Observation Well Data, Cypress Deep Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-25	0748	31.69	
	1000	31.74	
	1001	25.99	
	1002	24.90	
	1005	24.62	
	1010	24.15	
	1020	24.01	
	1030	23.85	
	1040	23.73	
	1050	23.65	
	1100	23.77	
	1332	23.23	
	1643	23.10	
	1820	23.07	
10-26	0041	22.72	
	1047	22.49	
	1613	22.49	
10-27	0815	22.08	
10-28	1104	21.63	
10-29	1022	21.57	
10-30	0924	21.12	
10-31	1127	21.55	
11-1	1007	20.67	
11-2	1015	20.47	

Table B14. -- Observation Well Data, Quail East Irrigation Well

(Water-level measurements referenced to top of casing, which is 0.6 feet above ground level elevation 72 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well resumed from Pearce Well pumping test.
10-15	1620	17.22	
10-16	1709	17.20	
10-17	1615	17.22	
10-18	1734	17.17	
10-19	1714	17.20	
10-20	1722	17.42	This well typically is pumped several hours daily for golf course irrigation.

Table B15. -- Observation Well Data, Quail Clubhouse Irrigation Well

(Water-level measurements referenced to top of casing, which is 1.0 feet above ground level elevation 71 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-15	1700	17.93	
10-16	1700	17.95	
10-17	1626	18.03	
10-18	1728	18.02	
10-19	1710	18.14	
10-20	1715	18.26	
10-21	1640	18.29	
10-22	1657	18.20	
10-23	1654	18.45	
10-24	1707	18.60	
10-25	1627	18.57	
10-26	1553	18.24	
10-27	1635	18.26	
10-28	1714	18.27	
10-29	1720	18.90	
10-30	1652	18.34	
10-31	1744	18.20	
11-1	1554	18.07	
11-2	1614	18.00	
11-3	1647	17.77	
11-4	1727	17.27	
11-5	1638	17.04	
11-7	1727	18.00	
11-8	1726	18.05	
11-9	1653	18.02	
11-10	1535	17.08	
11-11	1652	18.00	
11-13	1707	17.90	
11-15	1533	17.99	

CYPRESS WELL PUMPING TEST

Table B16. -- Observation Well Data, Quail Central Irrigation Well

(Water-level measurements referenced to top of casing, which is 1.1 feet above ground level elevation 72 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-20	1735	23.78	
9-21	1207	23.84	
	1831	23.85	
9-22	0647	23.90	
	1800	23.89	
9-23	0742	23.91	
	1835	23.85	
9-24	0810	23.81	
	1800	23.80	
9-25	0710	23.80	
	1801	23.78	
9-26	0935	23.75	
	1800	23.76	
9-27	0714	23.73	
	1755	23.70	
9-28	0002	23.92	
	0752	23.67	
9-29	1104	23.68	
9-30	1115	23.68	
10-1	0937	23.66	
10-2	0739	23.65	
10-3	0948	23.68	
10-5	0917	23.68	
10-7	1155	23.75	
10-9	0834	23.70	
10-11	0925	23.74	
10-13	1520	23.74	
10-15	1635	23.84	
10-16	1655	23.82	
10-17	1645	23.82	
10-18	1725	23.75	
10-19	1708	23.86	
10-20	1710	23.88	

Water-level measurements on this well appear also in tables of data for pumping tests of the Pearce and San Carlos wells.

SAN CARLOS WELL PUMPING TEST

Table C1. -- Pumping Well Data

(Water-level measurements referenced to top of air line bushing, which is 0.2 feet above ground level elevation 58.2 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Discharge (gpm)	Remarks
9-28	1743	12.54		Depths to water measured with steel tape.
9-29	1010	12.46		
9-30	0932	12.51		
10-1	1026	12.48		
10-2	0710	12.49		
	0808	12½		Depth to water measured with air line.
	0815			Pumping started.
	0830		878	Water level declined below bottom of air line.
	0840	45.4	1324	Depth to water measured with electric line.
	0857		1166	
	0918		1055	
	1020		1023	
	1238		1045	
	1754		1044	
	2353		1052	
10-3	0839		1029	
	1817		1052	
10-4	0745		1034	
	1710		1038	
10-5	0735		1015	
	1708		1020	
10-6	0742		1017	
	1714		951	
10-7	0742		1089	
	1714		1029	
10-8	0759		1019	
	1727		1031	
10-9	0739		1019	
	1732		984	
10-10	1014		1045	
	1727		1034	
10-11	0908		1024	
	1713		1040	
10-12	0805		1028	
	1030		1013	Pumping stopped.

SAN CARLOS WELL PUMPING TEST

Table C1. -- Pumping Well Data -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Discharge (gpm)	Remarks
10-12	1034	18.1		Depths to water measured with electric line.
	1037	17.9		
	1040	17.8		
	1044	17.7		
	1048	17.7		
	1051	17.7		
	1102	17.6		
	1110	17.6		
	1116	17.5		
	1124	17.5		
	1128	17.4		
	1130	17.4		
	1222	17.19		Depths to water measured with steel tape.
	1424	16.89		
	1601	16.64		
	1821	16.45		
10-13	0029	16.07		
	0727	15.87		
	1553	15.49		
10-14	0803	15.10		
	1728	15.09		
10-15	0739	14.74		
10-16	0831	14.54		
10-17	0828	14.41		
10-18	0858	14.10		
10-19	1130	13.94		
10-20	0917	13.90		

SAN CARLOS WELL PUMPING TEST

Table C2. -- Observation Well Data, Quail Central Irrigation Well

(Water-level measurements referenced to top of casing, which is 1.1 feet above ground level elevation 72 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-20	1735	23.78	
9-21	1207	23.84	
	1831	23.85	
9-22	0647	23.90	
	1800	23.89	
9-23	0742	23.91	
	1835	23.85	
9-24	0810	23.81	
	1800	23.80	
9-25	0710	23.80	
	1801	23.78	
9-26	0935	23.75	
	1800	23.76	
9-27	0714	23.73	
	1755	23.70	
9-28	0002	23.92	
	0752	23.67	
9-29	1104	23.68	
9-30	1115	23.68	
10-1	0937	23.66	
10-2	0739	23.65	
10-3	0948	23.68	
10-5	0917	23.68	
10-7	1155	23.75	
10-9	0834	23.70	
10-11	0925	23.74	
10-13	1520	23.74	
10-15	1635	23.84	
10-16	1655	23.82	
10-17	1645	23.82	
10-18	1725	23.75	
10-19	1708	23.86	
10-20	1710	23.88	

Water-level measurements on this well appear also in tables of data for pumping tests of the Pearce and Cypress wells.

SAN CARLOS WELL PUMPING TEST

Table C3. -- Observation well Data, Quail West Irrigation Well

(Water-level measurements referenced to top of casing, which is 0.9 feet above ground level elevation 64.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-28	0755	25.04	
9-29	1050	24.07	
9-30	1109	26.63	Adjacent well pumping.
10-1	0943	23.96	
10-2	0733	24.00	
	0908	23.96	
	1048	24.00	
	1333	23.95	
	1812		Adjacent well pumping.
10-3	0937	24.14	
	1736	24.06	
	1739		Pumping started at adjacent well.
10-4	1650	24.14	
10-5	1659	24.16	
10-6	1653	24.24	
10-7	1707	24.32	
10-8	1718	24.37	
10-9	1717	24.44	
10-10	1715	24.56	
10-11	1707	24.54	
10-12	1810	24.87	
10-13	1537	24.77	
10-14	1716	24.85	
10-15	1643	25.23	
10-16	1644	25.08	
10-17	1702	24.98	
10-18	1720	24.77	
10-19	1703	24.84	
10-20	1704	24.84	
10-22	1655	24.82	
10-24	1703	24.87	
10-26	1549	24.62	The well adjacent to this observation well typically is pumped daily for golf course irrigation. Pump starts by remote control. See data entry for 10-3.

SAN CARLOS WELL PUMPING TEST

Table C4. -- Observation Well Data, Valley Greens Observation Well

(Water-level measurements referenced to top of casing, which is 0.4 feet below ground level elevation 65.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-29	1100	23.54	
9-30	1111	23.63	
10-1	0940	23.46	
10-2	0736	23.48	
	0906	23.50	
	1047	23.49	
	1329	23.46	
	1810	23.54	
10-3	0933	23.63	
	1738	23.56	
10-4	1655	23.64	
10-5	1656	23.74	
10-6	1653	23.72	
10-7	1704	23.85	
10-8	1716	23.87	
10-9	1721	23.96	
10-10	1713	23.97	
10-11	1704	24.04	
10-12	1808	24.25	
10-13	1535	24.17	
10-14	1715	24.28	
10-15	1647	24.50	
10-16	1648	24.47	
10-17	1704	24.48	
10-18	1722	24.32	
10-19	1705	24.39	
10-20	1730	24.30	

SAN CARLOS WELL PUMPING TEST

Table C5. -- Observation Well Data, Brookdale Observation Well

(Water-level measurements referenced to top of casing, which is 0.5 feet below ground level elevation 58.3 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-29	1020	16.07	
9-30	1106	15.98	
10-1	1004	15.97	
10-2	0722	15.97	
	0903	15.97	
	1044	15.98	
	1319	16.02	
	1803	15.98	
10-3	0853	16.03	
	1837	16.08	
10-4	1720	16.11	
10-5	0910	16.18	
10-6	1707	16.28	
10-7	1029	16.34	
10-8	1720	16.49	
10-9	0805	16.66	
10-10	1007	16.68	
10-11	0902	16.80	
10-12	0756	16.90	
	1214	16.94	
	1414	16.95	
	1553	16.94	
	1814	16.97	
10-13	0022	17.02	
	0714	17.02	
	1540	17.03	
10-14	0756	17.00	
	1721	17.05	
10-15	0737	17.04	
10-16	0900	16.96	
10-17	0845	16.94	
10-18	0852	16.85	
10-19	1125	16.77	
10-20	0951	16.75	

SAN CARLOS WELL PUMPING TEST

Table C6. -- Observation Well Data, MWD Observation Well

(Water-level measurements referenced to top of casing, which is 0.7 feet above ground level elevation 52.3 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-29	1042	11.79	
9-30	1100	11.80	
10-1	0948	11.78	
10-2	0728	11.78	
	0912	11.77	
	1054	11.77	
	1349	11.81	
	1829	12.03	
10-3	0901	11.78	
	1755	11.81	
10-4	1657	11.80	
10-5	0738	11.85	
	1653	11.92	
10-6	0739	11.92	
	1647	11.99	
10-7	0748	12.07	
	1701	12.18	
10-8	0804	12.24	
	1707	12.25	
10-9	0800	12.43	
	1727	12.49	
10-10	0943	12.59	
	1718	12.64	
10-11	0857	12.73	
	1702	12.76	
10-12	0751	12.85	
	1207	12.90	
	1405	12.90	
	1550	12.93	
	1803	12.94	
10-13	0017	12.98	
	0710	13.00	
	1530	13.04	
10-14	0751	13.04	
	1710	13.14	
10-15	0730	13.08	
10-16	0844	13.08	
10-17	0807	13.09	
10-18	0842	13.09	
10-19	1120	13.08	
10-20	0939	12.90	

SAN CARLOS WELL PUMPING TEST

Table C7. -- Observation Well Data, Oppenheimer Irrigation Well

(Water-level measurements referenced to base of pump, which is 0.2 feet above ground level elevation 62 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-29	1034	18.55	This well will not be pumped until 10-12.
9-30	0928	18.58	
10-1	0950	18.55	
10-2	0725	18.73	
	0914	18.63	
	1051	18.63	
	1344	18.73	
	1819	18.72	
10-3	0908	18.75	
	1747	18.79	
10-3	0728	18.80	
10-5	0854	18.92	
10-6	1650	19.05	
10-7	1018	19.21	
10-8	1714	19.31	
10-10	1000	19.66	
10-11	0854	19.63	
10-12	0754	20.00	
	1210	20.07	
	1407		Pumping.
	1551		do
	1806	20.00	
10-13	0012	19.70	
	0714		Pumping.
	1531		do
10-14	0754	19.91	
	1714		Pumping.
10-15	0735		do
	1600		do
10-16	0850	19.62	
	1600		Pumping.
10-17	0800		do
10-18	0845	19.55	
10-19	0925		Pumping.
10-20	0730	19.97	
10-21	0738	20.01	

SAN CARLOS WELL PUMPING TEST

Table C8. -- Observation Well Data, San Carlos Deep Observation Well

(Water-level measurements referenced to top of casing, which is 0.2 feet above ground level elevation 58.2 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Construction of this well was completed 10-1-82.
10-2	0715	12.48	
	0815	12.50	
	0816	18.30	
	0820	18.33	
	0825	18.56	
	0835	18.60	
	0845	18.60	
	0855	18.62	
	0915	18.07	
	1019	18.57	
	1239	18.81	
	1753	19.37	
	2350	19.66	
10-3	0837	20.00	
	1816	19.77	
10-4	0744	20.65	
	1712	20.94	
10-5	0734	21.10	
	1707	21.34	
10-6	0743	21.51	
	1712	21.75	
10-7	0743	21.91	
	1714	22.05	
10-8	0758	22.16	
	1726	22.34	
10-9	0738	22.52	
	1737	22.61	
10-10	1013	22.71	
	1726	22.81	
10-11	0909	22.98	
	1712	22.95	
10-12	0804	23.19	
	1030	23.22	
	1035	18.31	
	1038	18.35	
	1042	18.30	
	1046	18.17	
	1050	18.12	
	1100	18.00	
	1109	18.00	
	1112	17.97	

Table C8. -- Observation Well Data, San Carlos Deep Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-12	1117	17.93	
	1123	17.91	
	1125	17.90	
	1127	17.88	
	1220	17.66	
	1423	17.30	
	1600	17.04	
	1820	16.79	
10-13	0028	16.30	
	0725	16.00	
	1550	15.63	
10-14	0802	15.26	
	1727	15.07	
10-15	0739	14.86	
10-16	0828	14.54	
10-17	0829	14.36	
10-18	0857	14.14	
10-19	1129	14.05	
10-20	0915	13.93	
10-21	1035	13.81	
10-22	1048	13.70	
10-23	0825	13.65	
10-24	0812	13.58	
10-25	1349	13.45	
10-26	1008	13.31	
10-27	0739	13.35	
10-28	1128	13.22	
10-29	1040	13.14	
10-30	0841	12.99	
10-31	1210	13.02	
11-1	0915	13.00	
11-2	1037	12.87	

SAN CARLOS WELL PUMPING TEST

Table C9. -- Observation Well Data, San Carlos West Shallow Observation Well

(Water-level measurements referenced to top of casing, which is 0.2 feet above ground level elevation 54.8 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Construction of this well was completed 9-30-82.
10-2	0728	11.28	
	0817	11.34	
	0820	11.37	
	0823	11.39	
	0826	11.40	
	0834	11.49	
	0844	11.51	
	0852	11.60	
	0909	11.63	
	1018	11.85	
	1258	12.23	
	1736	12.66	
	2333	13.08	
10-3	0831	13.49	
	1821	13.87	
10-4	0748	14.24	
	1706	14.51	
10-5	0730	14.77	
	1710	14.92	
10-6	0746	15.22	
	1709	15.36	
10-7	0739	15.63	
	1710	15.80	
10-8	0754	15.98	
	1723	16.12	
10-9	0734	16.28	
	1735	16.47	
10-10	1010	16.61	
	1723	16.69	
10-11	0907	16.89	
	1710	16.95	
10-12	0759	17.07	
	1030	17.10	
	1031	17.06	
	1032	17.03	
	1035	17.00	
	1040	16.99	
	1045	16.96	
	1050	16.96	
	1055	16.90	
	1100	16.92	

Table C9. -- Observation Well Data, San Carlos West Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-12	1105	16.88	
	1110	16.85	
	1115	16.84	
	1120	16.82	
	1125	16.78	
	1130	16.78	
	1217	16.40	
	1420	16.37	
	1556	16.14	
	1817	15.90	
10-13	0025	15.45	
	0720	15.02	
	1542	14.73	
10-14	0759	14.34	
	1723	14.14	
10-15	0740	13.89	
10-16	0818	13.59	
10-17	0834	13.38	
10-18	0854	13.18	
10-19	1126	13.00	
10-20	0912	12.90	

Table C10. -- Observation Well Data, San Carlos Deep Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-12	1100	17.43	
	1105	17.39	
	1110	17.35	
	1115	17.35	
	1120	17.33	
	1125	17.31	
	1130	17.29	
	1218	17.25	
	1421	16.90	
	1557	16.73	
	1818	16.51	
10-13	0026	16.14	
	0722	15.89	
	1545	15.52	
10-14	0800	15.12	
	1724	14.96	
10-14	0742	14.65	
10-16	0820	14.43	
10-17	0837	14.22	
10-18	0855	14.07	
10-19	1127	13.88	
10-20	0910	13.78	

SAN CARLOS WELL PUMPING TEST

Table C10. -- Observation Well Data, San Carlos West Deep Observation Well

(Water-level measurements referenced to top of casing, which is 1.2 feet above ground level elevation 56.35 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Construction of this well was completed 9-30-82
10-2	0734	12.21	
	0816	12.97	
	0819	13.15	
	0821	14.08	
	0824	14.14	
	0829	14.18	
	0832	14.21	
	0843	14.17	
	0853	14.22	
	0910	14.04	
	1020	14.28	
	1304	14.60	
	1739	14.99	
	2339	15.31	
10-3	0833	15.68	
	1827	16.06	
10-4	0752	16.40	
	1707	16.58	
10-5	0732	16.84	
	1711	17.04	
10-6	0748	17.22	
	1710	17.47	
10-7	0741	17.63	
	1712	17.78	
10-8	0755	17.98	
	1724	18.14	
10-9	0730	18.25	
	1740	18.41	
10-10	1010	18.52	
	1725	18.68	
10-11	0908	18.83	
	1711	18.95	
10-12	0801	19,07	
	1030	19.07	
	1031	18.00	
	1032	17.61	
	1035	17.58	
	1040	17.52	
	1045	17.49	
	1050	17.47	
	1055	17.43	

SAN CARLOS WELL PUMPING TEST

Table C11. -- Observation Well Data, Hacienda Carmel Irrigation Well

(Water-level measurements referenced to lower edge of hole in west side of casing, which is 0.4 feet above ground level elevation 51 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
9-30	1050	14.72	
10-1	1008	14,69	
10-2	0712	14.79	
	0918	14.77	
	1100	14.72	
	1401	14.77	
	1839	14.79	
10-3	0920	14.92	
	1727	15.20	
10-4	1700	15.10	
10-5	1650	15.27	
10-6	1644	15.41	
10-7	1700	15.60	
10-8	1700	15.85	
10-9	0820	15.91	
10-10	0935	16.10	
10-11	1658	16.22	
10-12	0747	16.37	
	1202	16.26	
	1359	16.25	
	1546	16.25	
	1800	16.25	
10-13	0003	16.21	
	0705	16.21	
	1525	16.23	
10-14	0746	16.20	
	1706	16.22	
10-15	0726	16.24	
10-16	1634	16.18	
10-18	1707	16.14	
10-19	1658	16.10	
10-20	1656	16.07	
10-22	1650	16.11	
10-24	1653	16.20	

This well typically is pumped daily for landscape irrigation.

Water-level measurements continued on this well for Rancho Canada Well pumping test.

RANCHO CANADA WELL PUMPING TEST

Table D1. -- Pumping Well Data

(Water-level measurements referenced to top of air line bushing, which is 0.7 feet above ground-level elevation 51.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Discharge (gpm)	Remarks
				Water level in this well is influenced by pumping at Golf Course Irrigation Well #1.
10-25	1603	18.39		Depths to water measured with steel tape.
10-26	1305	19.62		
10-27	0934	17.52		
	1100			Pumping started.
	1113		1318	
	1125		1963	
	1131		1995	
	1148		2006	
	1201		2043	
	1249	47		Depths to water measured with air line.
	1254		2075	
	1512	46½	2023	
	1742	46	2028	
	2341	46	2015	
10-28	0608	47	2022	
	1708	47	2057	
10-29	0657	47	2030	
	1655	47	2006	
10-30	0817	47	1984	
	1620	47	2032	
10-31	1014	47	2034	
	1727	47	2000	
11-1	0759	47	2035	
	1623	47	2002	
11-2	0844	47	2014	
	1557	47	2000	
11-3	0722	47	1982	
	1600	50	2014	
11-4	0730	50	2018	
	1700	50	2021	
11-5	0732	50	2002	
	1611	50	2016	
11-6	0958	50	1990	
	1800	50		
11-7	1010	50	1986	
	1702	50	1972	

Table D1. -- Pumping Well Data -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Discharge (gpm)	Remarks
11-8	0738	50	1954	
	1005			Pumping stopped.
	1006	30		
	1008	29		
	1013	27		
	1015	26½		
	1019	26		
	1026	26		
	1036	25½		
	1046	25		
	1056	25		
	1106	25		
	1304	24.52		Depths to water measured with steel tape.
	1540	23.53		
	1717	22.77		
11-9	0020	22.70		
	0759	22.40		
	1620	22.33		
11-10	0742	22.02		
	1550	21.98		
11-11	0837	21.72		
	1617	21.53		
11-12	0804	21.30		
	1607	22.20		
11-13	0830	21.60		
	1602	21.70		
11-14	0907	21.19		
	1620	21.10		
11-15	0729	21.97		
	1558	21.08		
11-16	0902	20.82		
11-17	0909	20.80		
11-19	1003	19.33		
11-20	1042	19.94		

RANCHO CANADA WELL PUMPING TEST

Table D2. -- Observation Well Data, Hacienda Carmel Irrigation Well

(Water-level measurements referenced to lower edge of hole in west side of casing, which is 0.4 feet above ground level elevation 51 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water-level measurements on this well carried forward from San Carlos Well pumping test.
10-26	1535	17.00	
10-27	1616	15.91	
10-28	1136	15.94	
10-29	1050	15.98	
10-30	1045	15.99	
10-31	1031	16.07	
11-1	1320	15.87	
11-2	1543	15.86	
11-3	1621	15.92	
11-4	0907	16.04	
11-5	1114	17.07	
11-6	1023	16.10	
11-7	1104	16.11	
11-8	1327	16.20	
11-9	0811	16.35	
	1647	16.14	
11-10	0759	16.09	
	1607	17.07	
11-11	0800	16.10	
	1637	16.20	
11-12	0825	16.45	
	1617	16.37	
11-13	0852	16.33	
	1617	16.17	
11-14	0928	16.05	
	1653	16.10	
11-15	0738		Pumping.
	1539	16.09	
11-16	0839	16.06	
			This well typically is pumped daily for landscape irrigation.

Table D3. -- Observation Well Data, Rancho Canada North Shallow Observation Well

(Water-level measurements referenced to top of casing, which is at ground level elevation 50.1 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-25	1615	16.66	
10-27	0948	16.70	
	1052	16.67	
	1100	16.67	
	1101	16.65	
	1102	16.67	
	1105	16.67	
	1110	16.66	
	1120	16.69	
	1130	16.69	
	1140	16.71	
	1150	16.75	
	1200	16.75	
	1306	16.82	
	1519	16.97	
10-28	0638	17.86	
	1703	18.24	
10-29	0647	18.77	
	1649	19.22	
10-30	0800	19.66	
	1611	19.82	
10-31	1011	20.07	
	1717	20.50	
11-1	0754	20.79	
	1609	21.12	
11-2	0839	21.37	
	1552	21.49	
11-3	0718	21.79	
	1550	21.76	
11-4	0726	21.97	
	1655	21.53	
11-5	0727	22.70	
	1606	22.82	
11-6	0942	22.87	
	1748	22.92	
11-7	1056	22.97	
	1654	23.66	
11-8	0729	23.77	
	1255	23.64	
	1532	23.57	
	1701	23.40	
11-9	0008	23.01	

RANCHO CANADA WELL PUMPING TEST

Table D4. -- Observation Well Data, Rancho Canada North Deep Observation Well

(Water-level measurements referenced to top of casing, which is 1.8 feet above ground level elevation 50.1 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			Water level in this well is influenced by pumping at Golf Course Irrigation Well #1.
9-29	0940	17.72	
9-30	1020	17.74	
10-1	1015	18.70	
10-2	1118	17.99	
10-3	1718	17.83	
10-4	1646	18.04	
10-5	1645	17.87	
10-6	1636	18.14	
10-7	1653	18.08	
10-8	1658	18.14	
10-9	1655	18.20	
10-10	1708	18.15	
10-11	1655	18.22	
10-12	1756	18.28	
10-13	1600	18.38	
10-14	1702	18.36	
10-16	1628	18.49	
10-17	1716	18.36	
10-18	1700	18.51	
10-19	1654	18.51	
10-20	1650	18.51	
10-21	1635	18.55	
10-22	1647	18.48	
10-23	1647	18.74	
10-24	1642	18.63	
10-25	1609	18.55	
10-26	1311	19.32	
10-27	1000	18.65	
	1050	18.52	
	1100	18.54	
	1101	19.35	
	1102	20.12	
	1105	20.90	
	1110	20.49	
	1120	20.66	
	1130	20.79	
	1140	20.83	

Table D4. -- Observation Well Data, Rancho Canada North Deep Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-27	1150	20.90	
	1200	20.94	
	1305	22.02	
	1517	22.16	
	1714	21.26	
	2322	21.57	
10-28	0633	21.75	
	1702	22.20	
10-29	0646	22.52	
	0918	23.12	
	1136	23.20	
	1645	23.39	
10-30	0803	23.18	
	1609	23.40	
10-31	1010	23.92	
	1716	23.98	
11-1	0750	24.07	
	1608	24.55	
11-2	0838	24.71	
	1551	25.29	
11-3	0717	26.52	
	1549	25.35	
11-4	0725	25.98	
	1654	25.75	
11-5	0725	25.84	
	1605	26.00	
11-6	0940	26.14	
	1747	26.30	
11-7	1052	26.50	
	1653	26.56	
11-8	0727	27.11	
	1008	26.93	
	1018	25.76	
	1028	25.38	
	1038	25.23	
	1048	25.12	
	1058	25.05	
	1108	24.98	
	1254	24.92	
	1530	24.68	
	1700	24.36	
11-9	0007	24.06	
	0750	23.70	
	1609	23.24	

Table D4. -- Observation Well Data, Rancho Canada North Deep Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
11-10	0730	22.98	
	1543	22.82	
11-11	0827	22.47	
	1610	22.10	
11-12	0753	21.87	
	1556	22.90	
11-13	0820	22.50	
	1548	22.62	
11-14	0850	21.66	
	1607	21.52	
11-15	0716	21.92	
	1549	21.44	
11-16	0850	21.28	
11-17	0902	21.10	
11-19	1015	18.21	
11-20	1036	18.75	

RANCHO CANADA WELL PUMPING TEST

Table D5. -- Observation Well Data, Golf Course Irrigation Well #1

Part 1. -- Water-level Measurements

(Water-level measurements referenced to lower edge of slant access tube, which is 1.5 feet above ground level elevation 51.4 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
			This well was pumped intermittently before, during and after the pumping test of the Rancho Canada production well. Data on discharge and times of pumping are provided in Part 2 of this table.
10-25	1552	19.72	
10-27	0929	19.82	
	1032	19.77	
	1104	23.25	
	1114	23.51	
	1123	23.75	
	1129	23.80	
	1135	23.84	
	1147	23.97	
	1200	24.02	
	1254	24.13	
	1411	24.30	
	1600	24.38	
	1733	24.33	
	2335	24.64	
10-28	0618	24.72	
	1659	25.45	
10-29	0651	25.60	
	0924	43	Pumping.
	1148	43	do
	1652	43	do
10-30	0807	26.02	
	1618	26.75	
10-31	1012	26.90	
	1719	26.99	
11-1	0757		Pumping.
	1612	27.82	
11-2	0841	27.79	
	1553		Pumping.
11-3	0720		do
	1553	28.52	
11-4	0727		Pumping.
	1657	28.80	

Table D5. -- Observation Well Data, Golf Course Irrigation Well #1 -- continued

Part 1. -- Water-level Measurements -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
11-5	0729	28.92	
	1608	28.99	
11-6	0945		Pumping.
	1750	29.58	
11-7	1040	29.63	
	1658	30.20	
11-8	0731		Pumping.
	1000		do
	1257		do
	1534		do
	1702	25.60	
11-9	0009	24.97	
	0852	24.61	
	1614	24.15	
11-10	0735	23.83	
	1546	23.75	
11-11	0833	23.38	
	1613	23.20	
11-12	0756	23.14	
	1600		Pumping.
11-13	0824	23.19	
	1552		Pumping.
11-14	0857	22.62	
	1613	22.42	
11-15	0720		Pumping.
	1552	22.42	
11-16	0853	22.25	

Table D6. -- Observation Well Data, Rancho Canada Shallow Observation Well

(Water-level measurements referenced to top of casing, which is 0.5 feet above ground level elevation 51.0 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-27	1032	17.86	
	1044	18.02	
	1056	18.07	
	1100:05	18.07	
	1100:40	18.21	
	1101:30	17.96	
	1102:05	17.96	
	1102:40	17.95	
	1103:40	17.96	
	1104:20	17.96	
	1105	17.98	
	1106	18.00	
	1107	17.98	
	1108	17.97	
	1109	17.96	
	1110	17.97	
	1112	17.96	
	1113	17.97	
	1114	17.99	
	1115	18.00	
	1116	17.99	
	1117	17.99	
	1118	17.99	
	1119	18.02	
	1120	18.01	
	1121	18.01	
	1122	18.00	
	1123	18.03	
	1124	18.02	
	1125	18.06	
	1126	18.03	
	1127	18.05	
	1128	18.05	
	1129	18.05	
	1130	18.06	
	1131	18.06	
	1132	18.05	
	1136	18.09	
	1142	18.10	
	1522	18.50	
10-28	0611	19.58	
	1707	20.18	
10-29	0700	20.70	
	1705	21.20	

Table D6. -- Observation Well Data, Rancho Canada Shallow Observation Well --continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
11-30	0816	21.25	
	1623	21.28	
10-31	1020	21.33	
	1725	21.50	
11-1	0805	21.77	
	1618		Dry.
11-7	1037	24.98	Well deepened. Water-level measurements referenced to original reference point.
	1714	25.28	
11-8	0735	25.45	
	1111	25.21	
	1306	25.00	
	1543	24.73	
	1712	24.52	
11-9	0014	23.82	
	0801	23.33	
	1625	22.82	
11-10	0748	22.36	
	1553	22.14	
11-11	0843	21.74	
	1624	21.07	
11-12	0810	20.47	
	1607	21.70	
11-13	0834	20.98	
	1607	21.07	
11-14	0914	20.90	
	1530	20.77	
11-15	0725	20.85	
	1555	20.40	
10-16	0858	20.55	

Table D7. -- Observation Well Data, Rancho Canada Deep Observation Well

(Water-level measurements referenced to top of casing, which is 0.2 feet above ground level elevation 51.2 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-25	1600	17.50	Water level in this well is
10-26	1307	18.36	influenced by pumping at Golf
10-27	0931	17.55	Course Irrigation Well #1.
	1050	17.50	
	1103	29.51	
	1111	28.44	
	1121	28.63	
	1128	28.74	
	1133	28.78	
	1149	29.10	
	1202	29.18	
	1258	29.30	
	1515	29.36	
	1745	29.47	
	2339	29.66	
10-28	0605	29.84	
	1709	30.50	
10-29	0703	30.54	
	0920	30.54	
	1140	30.50	
	1700	30.51	
10-10	0809	30.50	
	1622	30.56	
10-31	1015	30.60	
	1728	30.62	
11-1	0800	30.80	
	1624	31.30	
11-2	0845	31.53	
	1600	32.10	
11-3	0723	32.29	
	1558	32.03	
11-4	0732	31.98	
	1702	32.08	
11-5	0734	32.02	
	1613	32.10	
11-6	0954	32.14	
	1802	32.20	
11-7	1023	32.35	
	1704	32.48	
11-8	0736	32.90	
	1005	32.19	
	1007	31.00	
	1012	25.27	
	1014	24.98	

Table D7. -- Observation Well Data, Rancho Canada Deep Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
11-8	1018	24.80	
	1025	24.51	
	1035	24.33	
	1045	24.25	
	1055	24.16	
	1105	24.15	
	1305	23.92	
	1542	23.47	
	1715	22.95	
11-9	0017	22.68	
	0800	22.28	
	1622	21.90	
11-10	0745	21.60	
	1552	21.46	
11-11	0840	21.32	
	1619	21.17	
11-12	0806	20.91	
	1606	21.90	
11-13	0832	21.20	
	1604	21.70	
11-14	0911	20.30	
	1624	20.17	
11-15	0827	20.73	
	1557	20.27	
11-16	0900	20.14	

RANCHO CANADA WELL PUMPING TEST

Table D8. -- Observation Well Data, Golf Course Irrigation Well #5 Old

(Water-level measurements referenced to top of coupling, which is 0.2 feet above ground level elevation 51.2 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-25	1558	17.78	
10-26	1301	18.10	
10-27	0930	17.90	
	1045	17.77	
	1101	18.18	
	1106	18.41	
	1118	18.54	
	1205	18.82	
10-28	1706	19.94	
10-30	0813	21.54	
11-1	1620	23.50	
11-3	1557	23.97	
11-5	1614	24.94	
11-7	1024	25.60	
11-8	1110	25.38	
	1713	24.52	
11-10	0747	22.64	
11-12	0808	21.60	
11-14	0913	20.00	
11-16	0859	20.62	

Table D9. -- Observation Well Data, Rancho Canada South Observation Well

(Water-level measurements referenced to top of casing, which is 1.6 feet above ground level elevation 51 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-26	1305	19.40	Water level in this well is influenced by pumping at Golf Course Irrigation Well #1.
10-27	0926	19.04	
	1101	19.33	
	1102	19.77	
	1105	20.29	
	1110	20.68	
	1130	22.00	
	1140	22.16	
	1150	22.31	
	1200	22.37	
	1300	22.50	
	1511	22.65	
	1720	22.69	
	2312	22.88	
10-28	0650	23.05	
	1654	23.32	
10-29	0709	23.54	
	0930	23.97	
	1130	23.99	
	1711	24.12	
10-30	0839	24.19	
	1642	24.40	
10-31	1033	24.80	
	1733	24.72	
11-1	0830	24.77	
	1602	25.44	
11-2	0904	25.20	
	1546	25.64	
11-3	0729	25.85	
	1627	25.92	
11-4	0739	26.14	
	1714	26.27	
11-5	1120	26.07	
	1629	26.26	
11-6	1005	26.30	
	1738	26.52	
11-7	1100	26.71	
	1720	26.77	
11-8	0740	26.89	
	1005	27.17	
	1006	27.13	
	1007	27.08	
	1010	26.77	

Table D9. -- Observation Well Data, Rancho Canada South Observation Well -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
11-8	1015	26.00	
	1025	25.13	
	1035	24.77	
	1045	24.58	
	1055	24.40	
	1105	24.33	
	1330	23.99	
	1520	23.82	
	1721	23.52	
11-9	0027	23.33	
	0807	23.11	
	1607	22.97	
11-10	0755	22.67	
	1557	22.58	
11-11	0820	22.49	
	1630	22.23	
11-12	0820	22.14	
	1614	22.89	
11-13	0845	22.60	
	1614	22.76	
11-14	0920	21.80	
	1642	21.72	
11-15	0736	21.95	
	1544	21.62	
11-16	0845	21.48	

Table D10. -- Observation Well Data, Golf Course Irrigation Well #5 New

(Water-level measurements referenced to lower edge of slant access tube, which is 0.4 feet above ground level elevation 48.8 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-25	1429	17.22	Water level in this well is
10-26	1258	17.32	influenced by pumping at Golf
10-27	1005	17.28	Course Irrigation Well #1.
	1100	17.28	
	1101	17.28	
	1102	17.30	
	1105	17.32	
	1110	17.41	
	1120	17.47	
	1130	17.52	
	1140	17.56	
	1150	17.58	
	1200	17.61	
	1255	17.70	
	1508	17.82	
	1731	17.95	
	2353	18.12	
10-28	0626	18.38	
	1651	18.69	
10-29	0654	18.84	
	0912	18.90	
	1138	18.90	
	1810	18.90	
10-30	0825	19.89	
10-31	1024	20.09	
	1721	20.50	
11-1	0814	20.63	
	1615	20.65	
11-2	0843	20.87	
	1550	20.90	
11-3	0721	20.92	
	1555	20.98	
11-4	0729	21.56	
	1659	21.78	
11-5	0731	21.90	
	1610	22.00	
11-6	0948	22.07	
	1757	22.33	
11-7	1041	22.52	
	1700	22.56	
11-8	0732	22.76	
	1013	22.71	
	1023	22.59	
	1033	22.43	

Table D10. -- Observation Well Data, Golf Course Irrigation Well #5 New -- continued

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
11-8	1043	22.37	
	1053	22.31	
	1103	22.25	
	1113	22.17	
	1300	22.35	
	1536	22.19	
	1710	22.11	
11-9	0012	21.42	
	0757	21.80	
	1617	21.53	
11-10	0739	21.35	
	1547	21.22	
11-11	0835	21.00	
	1614	20.07	
11-12	0801	20.80	
11-13	0827	20.60	
	1557	20.17	
11-14	0905	19.97	
	1617	19.80	
11-15	0723	20.18	
	1554	20.10	
11-16	0856	20.00	
11-17	0906	19.87	
11-19	1010	15.20	
11-20	1021	15.18	
11-21	1041	14.54	

RANCHO CANADA WELL PUMPING TEST

Table D11. -- Observation Well Data, Golf Course Irrigation Well #4

(Water-level measurements referenced to upper edge of hole in casing, which is 0.2 feet above ground level elevation 48 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-25	1445	21.10	
10-27	1014	21.10	Pumped since last measurement.
11-8			Unable to measure depth to water.

Table D12. -- Observation Well Data, Golf Course Irrigation Well #3

(Water-level measurements referenced to base of pump, which is 0.8 feet above ground level elevation 31 ft.)

Date (1982)	Time (PDT)	Depth to Water (ft.)	Remarks
10-24	1545	14.92	
10-27	1442	15.05	Pumped since last measurement.
11-8	0940		Pumping.
11-12	0950	15.45	