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BEFORE THE ARIZONA CORPORATION COMMISSION

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WILLIAM A. MUNDELL
JEFF HATCH-MILLER
KRISTIN K. MAYES
GARY PIERCE

IN THE MATTER OF THE APPLICATION OF ARIZONA WATER COMPANY, AN ARIZONA CORPORATION, TO EXTEND ITS EXISTING CERTIFICATE OF CONVENIENCE AND NECESSITY FOR ITS SUPERSTITION SYSTEM, PINAL COUNTY, ARIZONA	DOCKET NO. W-01445A-05-0701 REQUEST FOR ADDITIONAL TIME TO COMPLY WITH FILING REQUIREMENT

On August 29, 2006, the Commission entered Decision No. 70527 in the above-captioned docket, extending Arizona Water Company's (the "Company") time to comply with certain conditions included in Decision No. 68919 (the "Decision") to August 29, 2010. The Decision approved the Company's application for an extension of its certificate of convenience and necessity for its Superstition system. It also contained the following ordering paragraphs, at page 8, lines 1-16 of the Decision:

> IT IS FURTHER ORDERED that Arizona Water Company shall file with Docket Control, as a compliance item in this docket, a Notice of Filing indicating that it has submitted for Staff's review and approval, a copy of the fully executed main extension agreements for water facilities for the extension area within two years of the Decision in this matter.

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IT IS FURTHER ORDERED that Arizona Water Company shall file with Docket Control, as a compliance item in this docket, a copy of the Arizona Department of Environmental Quality Certificate of Approval to Construct for facilities needed to serve the extension area within two years of the effective date of this Decision.

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IT IS FURTHER ORDERED that that Arizona Water Company shall file with Docket Control, as a compliance item in this docket, a copy of the developers' Certificate of Assured Water Supply, where applicable or when required by statute within two years of the effective date of this Decision.

The Company is requesting that the current compliance deadline, August 29, 2010, be extended for an additional two (2) year period, until August 29, 2012. In support of its request, the Company respectfully submits and provides as follows:

1. In mid to late 2006, the housing market in Arizona began its current decline.

2. Before a developer can plat any subdivision within an Active Management Area, the Arizona Department of Water Resources ("ADWR") must have issued a CAWS.

3. The ADWR requires proof of water supplies physically available to serve a planned subdivision for a minimum of one hundred years and will not issue a CAWS without such proof.

4. The Company contracted with Clear Creek Associates, a highly respected professional hydrologic engineering firm to prepare a regional groundwater model for the

Company's Apache Junction Service Area ("AJSA"), which includes the extension area, demonstrating sufficient physically available groundwater supplies to serve the AJSA.

5. On November 22, 2000, on the Company's behalf, Clear Creek Associates filed a Physical Availability Demonstration ("PAD") application with ADWR demonstrating more than sufficient groundwater supplies to serve the subject extension area and more for over one hundred years (Exhibit "B") and was approved by ADWR on July 19, 2001 (Exhibit "C").

6. Most major economists declared the beginning of a deep recession, affecting the entire country and further depressing the housing market.

7. Most economists believe that the current recession ended on or about July-August 2009 (see Attachment "D", hereto).

8. Housing permits for single family residences issued in Pinal County, Arizona, where the parcel in the extension area is located, dropped from an annual peak of 11,371 in 2005 to 3,104 in 2008. The numbers of new housing permits continued to drop into 2009 which shows 1,507 permits issued through August 2009, however, over the past couple of months, housing permits have increased in Pinal County with the month of August 2009 showing 258 new permits compared with 205 permits in August 2008 (see Exhibit "E" hereto).

Due to the foregoing factors, the Company is now requesting additional time to file the required compliance items for the transfer areas in compliance with the Decision. In support of its request, the Company respectfully further provides as follows:

1. A map of the extension area is attached hereto as Exhibit A.

2. With respect to the applicable CCN extension area, the Company is requesting that the current compliance deadline, August 29, 2010, be extended for an additional two (2) year period, until August 29, 2012. In support of this request the Company further submits the following:

3. While the PAD is not a certificate of assured water supply, it is a precursor to, and a necessary requirement for obtaining a certificate. Therefore, the Company submits that the PAD, as documented by Exhibits "B" and "C", constitutes substantial compliance with the Decision's requirement of this post-decision condition, particularly in view of the other matters presented herein in support of the Company's request.

4. As discussed above, and as the Commission knows, the development and home-building industries in Pinal County essentially bottomed out in late 2008 bringing development to a near halt (see Exhibit "F" hereto, an Economic Synopsis prepped by the Federal Reserve Bank of St. Louis), a fact over which the Company (and many other water and sewer utilities who have compliance obligations and have had to request CCN compliance extension deadlines) and the Commission obviously have no control, but one which did not exist when the Decision was entered; the Company submits that this economic reality should be an important determinant in the Commission acting favorably on the Company's request, as the continued existence of the Company's CCN for the extension area will help to support the now improving development market; conversely, the withdrawal of the CCN would be, the Company submits harmful to the development recovery

In view of the foregoing, the Company respectfully requests that the compliance deadline under the Decision for the extension area be extended until August 29, 2012.

RESPECTFULLY SUBMITTED this 6th day of January 2010.

ARIZONA WATER COMPANY

By: _____

Robert W. Geake
Vice President and General Counsel
ARIZONA WATER COMPANY
Post Office Box 29006
Phoenix, Arizona 85038-9006

Original and thirteen (13) copies of the foregoing filed this 6th day of January 2010 with:

Docket Control Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

A copy of the foregoing was mailed this 6th day of January 2010 to:

Janice Alward, Chief Counsel
Legal Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Ernest G. Johnson
Director, Utilities Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

By: _____

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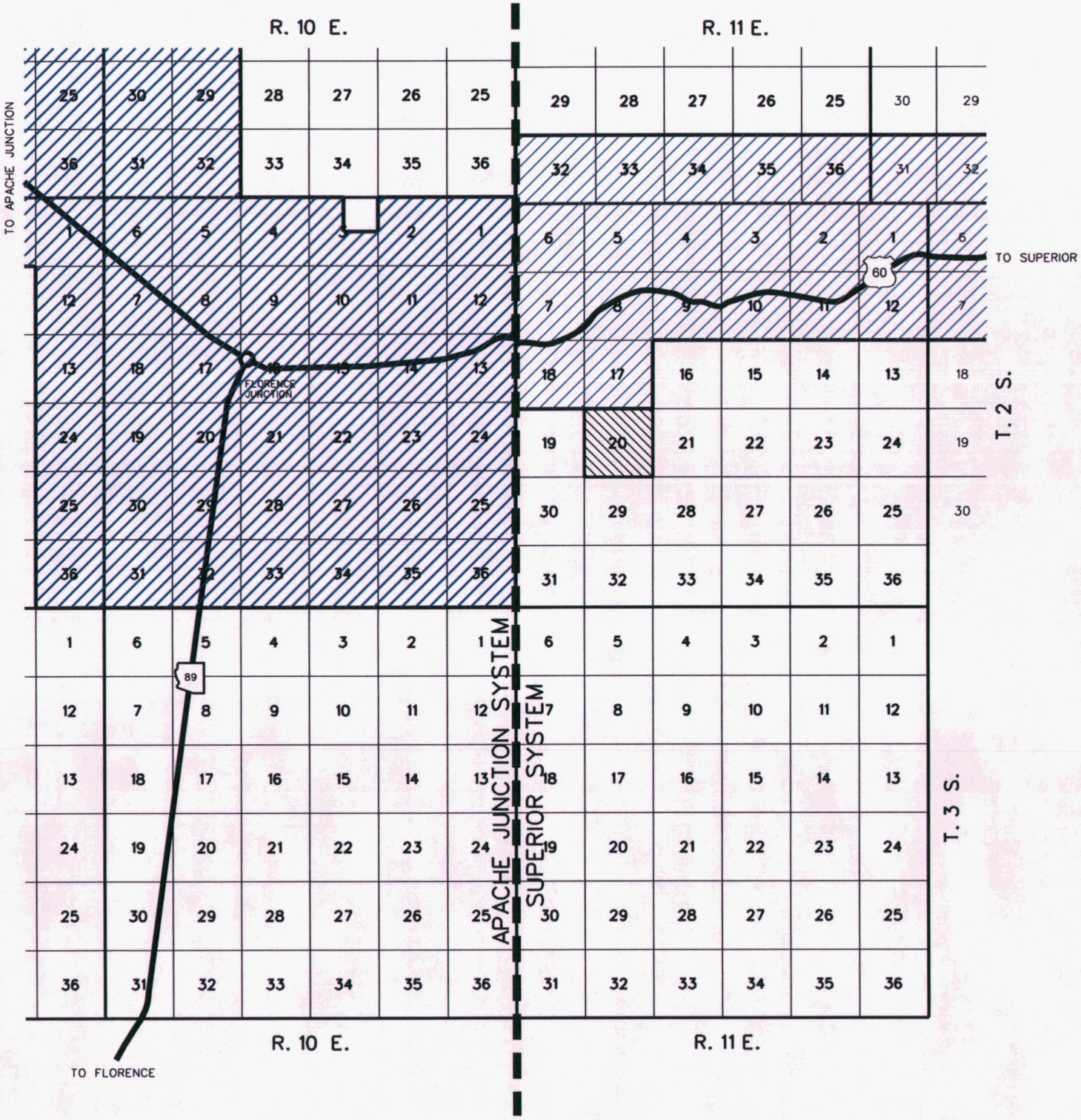
EXHIBIT "A"



CC&N This Application

A Portion Of Arizona Water Company CC&N

ARIZONA WATER COMPANY

DESCRIPTION: Application for CC&N to include Section 20, Township 2 South, Range 11 East of the Gila and Salt River Base and Meridian, Pinal County, Arizona

LOCATION: SUPERSTITION WATER SYSTEM

DATE:	SCALE:	DRAWN BY:
05.02.2005	1"=2 Miles	CB

EXHIBIT "B"

HYDROLOGY STUDY REPORT
APACHE JUNCTION GROUNDWATER FLOW MODEL

REGISTERED GEOLOGIST
CERTIFICATE
30990
STEVE W.
CORELL
Date Signed 11.22.00
ARIZONA U.S.A.

Prepared For:

Arizona Water Company
3805 North Black Canyon Highway
Phoenix, Arizona 85015

Prepared By:

Clear Creek Associates
5125 North 16th Street, Suite A-201
Phoenix, Arizona 85016

November 22, 2000

EXHIBIT "B"

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EXECUTIVE SUMMARY

This hydrology study report summarizes the groundwater flow model development, basic data, model calibration, and sensitivity analysis of the Apache Junction Groundwater Flow Modeling Study. Following the calibration of the transient model, a predictive model simulation was run to address the physical availability of the groundwater resources within Arizona Water Company's Apache Junction service area.

Clear Creek Associates' groundwater modeling results indicate a groundwater resource of at least 19,255 acre-feet per year is available to meet current, committed and projected demands. Model-calculated water table depths for Arizona Water Company wells range from 570 feet to 857 feet below land surface after 100 years of continuous groundwater withdrawal. Therefore, the withdrawal of 19,255 acre-feet per year of groundwater from the Arizona Water Company Apache Junction service area will not result in a depth to water exceeding 1,000 feet below land surface after 100 years of continuous groundwater withdrawal. This quantity of available groundwater resource exceeds Arizona Water Company's 1998 groundwater withdrawals by 15,295 acre-feet per year.

INTRODUCTION

This report is submitted to Arizona Water Company by Clear Creek Associates to summarize the results of the Apache Junction Groundwater Modeling Study. Groundwater has been identified as the potential water source for meeting Arizona Water Company's current and future water demands for the Apache Junction service area. Clear Creek Associates conducted this groundwater modeling study to address the physical availability of the groundwater resources within Arizona Water Company's Apache Junction service area.

Purpose and Scope of Work

The purpose of this report is to summarize the geologic and hydrogeologic factors that control groundwater flow in Arizona Water Company's Apache Junction service area, and to demonstrate the quantity of local groundwater resources that will be available to meet the demands of Arizona Water Company. To demonstrate the physical availability of a groundwater supply within the Phoenix Active Management Area (AMA), ADWR requires that the current, committed, and projected groundwater production will not result in a depth to water exceeding 1,000 feet below land surface, after a groundwater withdrawal period of 100 years. In addition, the groundwater must be of acceptable quality for potable use.

The scope of this groundwater modeling study included evaluations of geologic and hydrologic conditions in the East Salt River Valley, particularly in the Apache Junction area. Clear Creek Associates recently conducted the following tasks in support of the groundwater modeling study:

- Compiled and reviewed existing data including pumpage data and well construction data from ADWR databases and Arizona Water Company, published water level maps and geologic maps from ADWR and the U.S. Geological Survey. In addition, electronic copies of model datasets of ADWR's Salt River Valley groundwater flow model were obtained from ADWR.

- Compiled an inventory of all wells of record in ADWR databases within the Apache Junction groundwater flow model study area. The data were tabulated, and plotted on a well inventory map.

- Prepared a groundwater elevation map based on recent (December 1997) static groundwater level data for wells located within the model study area. Water level data were obtained from ADWR's GWSI database.

- Developed a site conceptual model that presents the hydrogeologic understanding of the area of interest in anticipation of numerical model development.

- Constructed a numerical groundwater flow model to assist in the evaluation of groundwater resources in Arizona Water Company's Apache Junction service area.

- Calibrated the numerical groundwater flow model to published water level data and water levels over time in selected wells to achieve a 'transient calibration'.

- Prepared a predictive model simulation based on information obtained from ADWR and projected demands from Arizona Water Company. The predictive model simulation was run 100 years into the future to assess long- term groundwater drawdown.

- Conducted a model sensitivity analysis in which input assumptions are varied over reasonable hydrogeologic ranges. The results are used to rank input parameters by their effect on model predictions.

Background

Arizona Water Company requested that Clear Creek Associates evaluate the groundwater resources in and around Apache Junction, Arizona. The groundwater resources study consisted of developing a 3-dimensional groundwater model to support the demonstration of physical groundwater availability to enable developers to obtain Certificates of Assured Water Supply (CAWS) for their developments within Arizona Water Company's Apache Junction service area. The groundwater model will also serve as a planning tool for Arizona Water Company to blueprint its future water resources needs, as the Apache Junction/Florence Junction corridor is developed in future years.

Model Area

The Apache Junction groundwater flow model study area is located within the East Salt River Valley sub-basin of the Salt River Valley, located in Central Arizona. Figure 1 illustrates the location of the model study area. The model study area is also located within the Phoenix Active Management Area (AMA). AMAs are areas in which intensive groundwater management is required to address severe impacts on groundwater supplies due to extensive groundwater withdrawals. The active model area of the Apache Junction groundwater flow model encompasses approximately 420 square miles.

The model domain encompasses Apache Junction, Florence Junction, Queen Creek, and portions of Mesa and Chandler. Although a large geographic area, the principal area of

interest occupies only a portion of the model domain in the immediate vicinity of the Arizona Water Company Apache Junction service area. The eastern model boundary is bounded by the Usery Mountains and the Superstition Mountains. The southwestern model boundary is bounded by the Santan Mountains. The large model study area provides several advantages:

1) Model boundaries can be tied to impermeable mountain ranges flanking the basin.

2) Model boundaries located some distance from the primary area of interest assist in making model predictions more reliable by preventing the boundaries from influencing the model predictions.

3) The model can be used in the future for other physical availability demonstrations between Apache Junction and Florence Junction.

The climate within the model study area is semi-arid and is characterized by hot summers, mild winters, and an average annual precipitation of 7 to 8 inches (ADWR, 1991). The model study area is drained by Queen Creek (Figure 1), an ephemeral stream flowing only in response to major precipitation events.

HYDROGEOLOGY

The hydrogeologic setting of the Eastern Salt River Valley (ESRV) is described in a report by Laney and Hahn (1986). The ESRV is an alluvial groundwater basin defined and surrounded by predominantly north to northwest trending fault-block mountain ranges. The ESRV alluvial basin and a majority of the surrounding mountains characteristic of the present Basin and Range physiography were formed during a period of high-angle block faulting occurring approximately 15 to 8 million years ago (Shafiquallah et. al., 1980).

The surrounding mountain ranges are composed primarily of crystalline rocks of Precambrian to middle Tertiary age and extrusive rocks of middle Tertiary to Quaternary age (Brown and Pool, 1989). The crystalline and extrusive rocks form nearly impermeable barriers to groundwater flow and are referred to as the Hydrologic Bedrock Unit (Corell and Corkhill, 1994).

The crystalline rocks of the Hydrologic Bedrock Unit (HBU), are composed of various metamorphic and granitic rocks including; schist, gneiss, metavolcanics, quartzite, granite, and other granitic rocks of Precambrian and middle Tertiary age (Corell and

Corkhill, 1994). The extrusive rocks include middle to late Tertiary volcanic rocks of rhyolitic to basaltic composition and basalt flows of middle Tertiary to Quaternary age.

Mountain ranges surrounding the sub-basin also include sedimentary rocks of late Tertiary age referred to as the Red Unit (Arteaga and others, 1968). The Red Unit consists of reddish colored, well-cemented breccia, conglomerate, sandstone, and siltstone (Laney and Hahn, 1986). The upper part of the unit locally contains interbedded volcanic flows and pyroclastic rocks. The Red Unit was deposited primarily as alluvial fan deposits.

The Red Unit was deposited prior to high-angle normal faulting that formed the alluvial basins. The age of the Red Unit may range from 17.5 to 22 million years, based on radiometric dating of volcanic rocks within the unit (Laney and Hahn, 1986). Because the Red Unit is limited in areal extent it has been included with the basin-fill deposits for modeling purposes.

Basin-Fill Deposits and Hydrogeologic Units Defined for the Model

The ESRV sub-basin consists of thick basin-fill deposits of unconsolidated to semi-consolidated clastic sediments of Late Tertiary to Quaternary age that overly the Red Unit. Radiometric dating of volcanic rocks within the basin-fill indicated deposition between 3.3 to 15.8 million years ago (Laney and Hahn, 1986). Basin-fill deposits east of Gilbert may be greater than 9,000 feet in thickness as indicated by geothermal exploration drilling.

Basin-fill deposits are made up of interbedded sequences of conglomerate, gravel, sand, silt, clay, and evaporates. Sediments are weakly consolidated to unconsolidated alluvial fan, playa, and fluvial deposits. The basin-fill sediments generally are finer grained toward the basin center and coarsen upward. The lithologic relationships are interpreted as alluvial fan and playa deposits formed in closed basins during the early and middle stages of basin development, followed by fluvial and alluvial fan deposits formed during late stages of basin development after the through flowing drainages were established (Brown and Pool, 1989). The basin-fill deposits comprise the regional aquifer in the ESRV sub-basin. The basin-fill deposits are sub-divided into three hydrogeologic units for modeling purposes.

Upper Alluvial Unit

The Upper Alluvial Unit (UAU) overlies the Middle Alluvial Unit (MAU) and consists of silt, sand, and gravel. The UAU is dominated by sand and gravel near the present Salt and Gila Rivers and near an earlier course of the Salt River to the east and south of South Mountain, and near sub-basin margins. The UAU is generally dominated by silt and sand in other areas.

The UAU was deposited during the later stages of basin development. The relatively uniform thickness of the unit and association of coarser-grained sediments along major drainages indicate that the unit was probably deposited by ancestral Salt and Gila River drainages after establishment of through-flowing drainages. The UAU is also comprised of alluvial fans along the mountain fronts. The UAU consists of alluvial channel, terrace, floodplain, and alluvial fan deposits. UAU sediments were derived from the ancestral Salt and Gila Rivers and other drainages, and from surrounding mountains. The unit is generally 200 to 300 feet thick in the ESRV and thins toward the sub-basin margins. Figure 2 illustrates the bottom elevation contours of the UAU.

Middle Alluvial Unit

The MAU overlies the Lower Alluvial Unit (LAU) consisting mainly of clay, silt, mudstone, gypsiferous mudstone, with interbedded sand and gravel. Near sub-basin margins the unit is primarily sand and gravel and is difficult to distinguish from other units. The MAU consists of alluvial fan deposits at the mountain fronts grading to fluvial, playa, and evaporite deposits in the central sub-basin. The predominance of silt and clay suggests the unit was primarily a playa deposit with sediments derived from the surrounding mountains.

The MAU thickens toward the central sub-basin and in the ESRV is thickest southeast of Gilbert. The increasing thickness and decreasing particle size of the MAU away from the basin margins suggest that the alluvial basin was still closed and subsiding during deposition of the unit. Figure 3 illustrates the bottom elevation contours of the MAU.

Lower Alluvial Unit

The LAU overlies or is in fault contact with the Hydrologic Bedrock Unit (HBU) and the Red Unit and is primarily conglomerate and gravel near basin margins, grading to

mudstone, gypsiferous and anhydritic mudstone, and anhydrite in the central basin. The unit contains interbedded volcanics locally. The LAU consists of alluvial fan deposits at the mountain fronts grading to fluvial, playa, and evaporite deposits in the central basin. LAU sediments were likely derived from surrounding mountains.

The LAU ranges from 0 feet in thickness at basin margins, to several thousands of feet in thickness in the central basin area. Due to its great thickness, for modeling purposes the LAU was not modeled to a depth of more than 3,000 feet below land surface.

The LAU was deposited during early stages of alluvial basin development. Similar to the MAU, the increasing thickness and decreasing particle size of the LAU basin-ward suggest that the alluvial basin was closed during deposition. Figure 4 illustrates the bottom elevation contours of the LAU. Figures 5 and 6 present generalized hydrogeologic cross sections across the model domain.

Hawk Rock Formation

As requested by the ADWR, the model geology in the vicinity of Apache Junction has been updated to include Hawk Rock, an up-lifted fault block of volcanic rocks. Hawk Rock outcrops in Township 1 North Range 8 East Section 6. Raymond (1985) and Laney and Hahn (1986) previously mapped the up-lifted fault block. Data from these maps were then used to update the bottoms of model layers 1 and 2 in the Apache Junction area. Figure 7 illustrates the bedrock elevation in the vicinity of Arizona Water Company's Apache Junction service area.

Aquifer Testing

Specific capacity data were tabulated from ADWR's GWSI database for wells within the model study area in which specific capacity data were available. Transmissivity values were then calculated from the available specific capacity data. The resulting transmissivity values were utilized as a check of final model-calibrated transmissivity values. Table 1 presents the specific capacity data and transmissivity values for the Apache Junction study area.

Arizona Water Company's Apache Junction service area is currently supplied by five water supply wells. The wells are designated by Arizona Water Company as follows:

Well # 11	A-01-07 26AAC
Well # 12	A-01-08 30DCC
Well # 13	A-01-07 26ADB
Well # 14	A-01-08 31DCB
Well # 15	A-01-08 29CDC

Table 2 presents aquifer test results from Arizona Water Company wells numbers 12 through 15. The resulting hydraulic conductivity values were incorporated into the model to calibrate the model locally within the Apache Junction service area.

Well Inventory

A well inventory map was prepared (Figure 8) to illustrate the locations of existing wells simulated in the groundwater flow model. Data were obtained from ADWR's 55 well registry database. The location and other pertinent information from the database query are presented in Appendix A.

HYDROLOGIC SYSTEM – 1983 TO 1998

The hydrologic system of the ESRV sub-basin is dominated by regional pumping centers and recharge from agricultural return flows, canal leakage, mountain front recharge, and occasional flood events. The hydrologic system adjusts to stresses of groundwater pumpage and recharge by changes in the volume of groundwater in storage. Groundwater overdraft has reduced the volume of groundwater in storage resulting in groundwater depressions, notably in the East Mesa and Queen Creek areas within the model study area.

Within the Arizona Water Company model study area the UAU is generally de-watered from historical groundwater pumping. The hydrologic system between 1983 and 1998 was used as the time frame for the transient model calibration period. This time period was selected due to availability of water level and pumping data from ADWR. The various components of the hydrologic system simulated included groundwater underflow, sources of recharge, groundwater pumpage, and changes in groundwater storage.

Groundwater Flow and Underflow

Within the Arizona Water Company model study area groundwater flow entering the sub-basin is directed toward two regional pumping centers. Historical groundwater pumping for agricultural irrigation has resulted in groundwater depressions in the East Mesa-Gilbert and Chandler Heights areas. Groundwater underflow exits the model along the northwestern and western model boundaries. A small amount of groundwater underflow

enters the model study area near Florence (approximately 3,000 ac-ft/yr); this small groundwater flux was not simulated in the model.

Figure 9 illustrates 1983 groundwater level contours (Reeter and Remick, 1986) and Figure 10 illustrates 1991 groundwater level contours (Hammett and Herther, 1995). The 1997 groundwater level map presented in Figure 11 was constructed from water level data obtained from ADWR's GWSI database. A comparison of the groundwater level maps indicates that water levels have generally risen throughout much of the East Salt River Valley due to decreases in groundwater pumping.

Groundwater Recharge

Recharge is the primary inflow to the Arizona Water Company model study area. Estimates of groundwater recharge were obtained from ADWR's Salt River Valley groundwater flow model (Corell and Corkhill, 1994) and served as recharge inputs for the Arizona Water Company model. The components of groundwater recharge within the model study area include, agricultural irrigation, urban irrigation, canal leakage, artificial lake seepage, ephemeral stream infiltration (along Queen Creek), and mountain front recharge.

Groundwater Pumpage

Groundwater pumping represents the major outflow from the groundwater system within the model study area. Groundwater pumping data were obtained from ADWR's "55" well database. These pumping data were then input into the Visual MODFLOW model. Figure 12 presents 1984 to 1998 groundwater pumping within the model study area. Figure 12 illustrates an historical pumping high of about 200,000 acre-feet in 1990 declining to less than 100,000 acre-feet in 1998 within the model study area. The decreased pumping rate is due to decreases in agricultural pumping and increased use of CAP water.

GROUNDWATER MODEL DEVELOPMENT

The groundwater flow model was calibrated to historic groundwater levels using data available from ADWR's GWSI database and published groundwater level maps from ADWR. The pattern of drawdown in the basin is complex. The intent of the calibration was to simulate changes in water levels over the past 14 years specifically in the area of Arizona Water Company's Apache Junction service area. The large distances to the model boundaries extending away from the Apache Junction service area helped to assure that the boundary conditions did not influence the model predictions around the Apache Junction service area. Model boundaries, if chosen too close to the area of interest, can have the effect of forcing the model prediction, rather than letting the model predict the best solution.

The groundwater modeling study required a review of all existing hydrogeologic data and development of a three-dimensional groundwater flow model. The modeling analysis and results are presented in this summary report. These tasks are described in more detail in the following paragraphs.

Careful consideration has been given to the limits of the model area needed for this analysis. Several factors were considered:

1) The site is located near the eastern edge of the East Salt River Valley sub-basin, the Arizona Water Company well field is approximately five miles southwest of the Usery Mountains, which form the northeast model boundary.

2) Groundwater pumping is prevalent both historically and currently from various production wells located around the Apache Junction service area. As urbanization has spread throughout the East Salt River Valley, groundwater pumping for agricultural purposes has declined. Further pumping declines are likely in the future.

3) Recharge occurs from ephemeral streams (Queen Creek), canal leakage, and agricultural irrigation, and as mountain front recharge along the Usery Mountains and Superstition Mountains.

Given these observations, a conceptual groundwater model was developed. The USGS model code "MODFLOW" was selected as it is widely accepted and has well-developed

pre- and post-processor software (Visual MODFLOW) allowing easy input of data and development of graphics.

Once the groundwater flow model was constructed it was then calibrated to measured groundwater level data and estimates of various water budget components. A sensitivity analysis of the transient-state groundwater flow model was conducted to determine which model input parameters the model was most sensitive to. Upon completion of the transient-state groundwater model calibration, a predictive model simulation was run to evaluate the impacts of additional Arizona Water Company wells on the regional aquifer system wells. The following sections provide a brief synopsis of the groundwater model and parameters used.

Groundwater Model Code and Limitations

The groundwater model code selected to simulate groundwater flow was Visual MODFLOW (Guiger and Franz, 1995), which combines the U.S. Geological Survey's MODFLOW-96 (Harbaugh and McDonald, 1996) with an advanced graphical interface. Visual MODFLOW allows the user to graphically assign input parameters, run the analysis, calibrate the model, and visualize the results in plan view and full-screen cross-section. MODFLOW is widely accepted in the hydrogeologic professional community as a valid numerical model to simulate groundwater flow.

The Apache Junction Valley groundwater flow model and numerical models in general have limitations and assumptions that need to be considered. The solution of the numerical model is a non-unique solution. Model calibration by trial and error produces a non-unique solution for the numerical model. The trial and error calibration method involves changing one parameter at a time until a satisfactory match is achieved between model-calculated and observed heads (water levels). Several different combinations of aquifer properties and/or boundary conditions could result in the same or similar solutions. The problem is particularly evident in areas of limited aquifer data, resulting in several unknown parameters. The problem of non-uniqueness in the model solution was

addressed in the sensitivity analysis by examining the degree to which selected model parameters affect the model solution.

Model Simulation Period

The transient groundwater flow model was constructed to represent the post-development time period from 1984 to 1998. The transient model incorporates yearly hydrologic stress periods and 20 time steps per stress period with a time step multiplier of 1.1. MODFLOW allows the use of a time step multiplier to increase the time step as the simulation progresses. Increasing the time step is recommended when simulating a stress, such as pumping, that is applied to the aquifer at the beginning of the simulation (Anderson and Woessner, 1992). Table 3 illustrates the transient model stress periods.

Groundwater Model Characteristics

MODFLOW Packages

The model was constructed using six MODFLOW packages:

1. The Basic package handles the administrative tasks of modeling. It reads the model grid, model layers, and stress periods. It also allocates computer memory, reads the location of model input files, and identifies boundary conditions. The Basic package also allocates time discretization, reads initial heads, and calculates the overall water budget.

2. The Block Centered Flow (BCF) package simulates the hydrogeologic framework of the model. The BCF package contains the basic hydrogeologic inputs to the model and computes the conductance components of the finite-difference equation, which determines flow between adjacent cells. It also computes the terms that determine the rate of movement of water to and from storage.

3. The WELL package simulates groundwater pumpage from the aquifer at specified volumetric rates during specified stress periods. The WELL package was also used to simulate constant flux across some of the model boundaries.

4. The Recharge package simulates the areal distribution of recharge. Recharge simulated in the model included agricultural recharge, ephemeral stream recharge, mountain front recharge, and canal leakage.

5. The WHS solver package was used to solve the system of simultaneous equations produced by the model. The WHS solver approaches the solution iteratively through an approximation scheme.

Model Grid

The Arizona Water Company model study area is located within the ESRV sub-basin with the active model domain encompassing approximately 420 square miles. The model grid is oriented from northwest to southeast parallel to the Superstition Mountain front. The model grid has been refined in the area of Arizona Water Company's well field to more accurately simulate drawdown in the area of most interest. The model grid has variable model cell sizes and is 74 rows by 104 columns. The model grid extends approximately 31 miles in a northwest to southeast direction, and approximately 21 miles in a northeast to southwest direction. Model cell sizes in the area of Arizona Water Company's well field are 330 feet by 330 feet, or 2.5 acres in size. Model cells extending away from the area of interest are as much as 0.5 mile by 1 mile, or 320 acres in size. The variable grid size allows for finer resolution in areas of steep hydraulic gradients such as near pumping wells. Figure 13 illustrates the Arizona Water Company model grid.

Model Layers

As stated earlier in this report, the basin-fill sediments of the East Salt River Valley are sub-divided into three hydrogeologic units for modeling purposes; the UAU, MAU, and LAU. Two model layers represented the hydrogeologic system of the Apache Junction groundwater flow model. Model layer 1 represents the basin-fill sediments from the land surface to the bottom of the MAU. Model layer 1 was simulated as an unconfined aquifer, where the water table is exposed to and fluctuates with atmospheric pressure changes. The basin-fill sediments of the UAU were not independently simulated because the UAU is unsaturated throughout most of the model domain. Model Layer 2 represents

the basin-fill sediments of the LAU. Model Layer 2 is simulated as a confined/unconfined aquifer, confined when the overlying model layer is saturated, and unconfined when the overlying model layer is unsaturated. At the sub-basin margins, the bottom of model layer 2 corresponds to the geologic contact of the basin-fill sediments with the Hydrologic Bedrock Unit. Toward the sub-basin center where the basin-fill sediments become very thick, the bottom of model layer 2 parallels the land surface to a maximum-modeled depth of 3,000 feet below land surface.

The bottom surface elevation of each model layer was obtained from ADWR's Salt River Valley groundwater flow model (Corell and Corkhill, 1994). The bottom of model layer 2 was modified in the area of Hawk Rock to include this up-lifted fault block structure. Hawk Rock is located in Township 1 South Range 8 East Section 6. To incorporate this structure into the model, data were obtained from Raymond (1985) and Laney and Hahn (1986).

Boundary Conditions

Boundary cells define the hydrologic conditions along the edges of the model. The Apache Junction groundwater flow model incorporates two types of boundary conditions; specified head and specified flux boundaries. In the post-development model, specified head cells represent groundwater underflow out of the basin along the northwest and southeast model boundaries. The model incorporates time-varying constant head cells; input data for the time-varying constant head cells were obtained from the ADWR GWSI database.

A specified flux boundary is where groundwater flow entering or exiting the groundwater system can be defined. The model uses no-flow cells to represent the hard rock boundaries surrounding the basin. Specified flux boundaries were also used to represent mountain front recharge along the Usery Mountains and Superstition Mountains. Figure 14 illustrates the groundwater flow model boundary conditions.

Basic Data Requirements

The model requires the user to input values for certain aquifer parameters. These values were derived from a combination of published literature and site-specific data collection. Sources of data included ADWR, USGS, and Arizona Water Company records. The main aquifer parameters include hydraulic conductivity and storage. Other parameters include recharge, groundwater pumping, and water levels. The following provides a summary of model values.

Hydraulic Conductivity

Initial estimates of hydraulic conductivity for model layers 1 and 2 were obtained from ADWR's Salt River Valley groundwater flow model (Corell and Corkhill, 1994). Initial estimates of hydraulic conductivity for the Salt River Valley model were developed from aquifer test data, specific capacity data from GWSI, recovery test data from Salt River Project wells, and particle size data from the USGS. These values were then adjusted during the transient model calibration. In addition, hydraulic conductivity values calculated from pumping tests conducted on Arizona Water Company's wells were incorporated into the model. Model layer 1 had hydraulic conductivity values that ranged from 2 to 25 feet/day with higher conductivity values corresponding to the basin margins where sediments grade into coarser-grained sand and gravel. Model layer 2 had hydraulic conductivity values that ranged from 0.1 to 30 feet/day with lower values corresponding to central basin areas where finer-grained sediments are located. Calibrated vertical anisotropy ratios for model layers 1 and 2 were equal to 10:1. Figures 15 and 16 present the final model calibrated values of hydraulic conductivity for model layers 1 and 2 respectively.

Storage

Model layer 1 was modeled as unconfined with calibrated values of specific yield ranging from 10 to 15 percent. Model layer 2 was modeled as a fully convertible unconfined/confined aquifer with calibrated values of specific yield ranging from 9 to 10 percent and a uniform storage coefficient of $10^{-7}ft^{-1}$. Figures 17 and 18 present the final model calibrated values of specific yield conductivity for model layers 1 and 2, respectively.

Agricultural Recharge

MODFLOW's Recharge package was used to simulate recharge within the basin. The areal distribution of recharge for the Apache Junction groundwater flow model was obtained from the ADWR Salt River Valley groundwater flow model (Corell and Corkhill, 1994). The recharge values input into the model consist of the 1991 ADWR estimates. Recharge simulated in the model includes incidental recharge from agricultural and urban irrigation, and canal seepage. The areally distributed recharge within the model study area was approximately 178,000 acre-feet per year. Recharge values were held constant for the entire transient calibration period of 1984 to 1998. Recharge values for the predictive model simulation were reduced by 25 percent to about 134,000 acre-feet per year. This value corresponds to the recharge value of ADWR's Assured Water Supply model run 30_7 (ADWR, November 12, 1997) for the year 2010. The MODFLOW datasets for this model run were obtained from ADWR and recharge values were totaled for the Apache Junction model study area.

Mountain Front Recharge

Recharge along the Superstition Mountain front was simulated in MODFLOW's Well package as a specified-flux. Mountain front recharge for the Apache Junction model study area totals 10,500 acre-feet per year, which is similar to what was simulated in ADWR's SRV model (Corell and Corkhill, 1994).

Groundwater Pumping

The MODFLOW WELL package was used to simulate pumping wells within the sub-basin in the transient model. Groundwater pumping data for the period 1984 to 1998 were obtained from the ADWR Wells 55-database. Existing production wells are simulated in the model with screened intervals consistent with the actual construction of the wells when construction data were available. When well construction data was unavailable, it was assumed that wells were screened similar to neighboring wells. Model pumpage rates for 1999 were assumed to be similar to the 1998 rates. Groundwater pumping within the model study area ranges from approximately 70,000 acre-feet in 1992 and 1993 to 200,000 acre-feet in 1984 and 1990. Annual groundwater pumping totals are illustrated in Figure 12. Groundwater pumping totals for the predictive model simulation totaled approximately 164,000 acre-feet per year. This value corresponds to the pumpage value of ADWR's Assured Water Supply model run 30_7 (ADWR, November 12, 1997) for the year 2010. The MODFLOW datasets for this model run were obtained from ADWR and pumpage values were totaled for the Apache

Junction model study area. The predictive model simulation utilized the 1991 groundwater pumping stress for the 100-year stress period, as this pumping rate was similar.

Water Levels

The starting heads for the transient model were calculated from an initial conditions model run. The initial conditions model consisted of a simulation in which a flat-water table was input as the initial condition and the model was run for 100 years and solved for water levels. The initial conditions model results were compared with a 1983 groundwater elevation contour map (Reeter and Remick, 1986). The final initial conditions model, calibrated to the 1983 water level surface, became the initial heads for the transient model. Measured water level data at discrete well points, obtained from ADWR's GWSI database, were input into the model to serve as observation points aiding in the calibration of the transient model. The 1983, 1991, and 1997 groundwater elevation maps (Figures 9,10, & 11) were used to qualitatively check model results to ensure that the model-calculated reasonable directions of groundwater flow. Table 4 illustrates some of the general model characteristics.

Transient Model Calibration Summary

The model was calibrated to the transient groundwater flow conditions of 1984 to 1998. The calculated heads from the initial conditions model run served as the initial heads for the transient model. The main purpose of the transient calibration was to adjust aquifer parameters and to demonstrate that the model could reasonably simulate the effects of changing hydrologic stresses. Model stress periods are 1-year in length with 20 time-steps per stress period and a time-step multiplier of 1.1. The transient model includes pumpage and recharge discussed earlier.

The transient calibration process involved making adjustments to storage terms and hydraulic conductivity values to obtain an acceptable match between model-calculated water levels and measured water levels. Figure 19 presents the final model-calibrated transmissivity values. Figures 20 and 21 present model-calculated versus measured water level contours for 1984 for model layers 1 and 2. Figures 22 and 23 present model-calculated versus measured water level contours for 1991 for model layers 1 and 2. Figures 24 and 25 illustrate the model-calculated versus measured water level contours

for 1997 for model layers 1 and 2. The location of observation wells used to assess the model calibration is illustrated on Figure 26.

1984 Scatterplot Results

A transient state scatterplot of model-calculated versus observed heads for 1984 is presented in Figure 27. The mean error is 1.87 feet, which is the mean difference between the observed water levels and the model calculated water levels. The mean absolute error was calculated to be 28.4 feet, which is the mean of the absolute value of the differences in observed and model-calculated water levels. The normalized root mean squared (RMS) error was calculated at 6.99%, which is the RMS error divided by the difference between the highest and lowest observed water levels. A normalized RMS error of 10% or less is considered acceptable.

1991 Scatterplot Results

A transient state scatterplot of model-calculated versus observed heads for 1991 is presented in Figure 28. The mean error is 9.37 feet, the mean absolute error was calculated to be 28.4 feet, and the normalized root mean squared (RMS) error was calculated at 9.32%.

1997 Scatterplot Results

A transient state scatterplot of model-calculated versus observed heads for 1997 is presented in Figure 29. The mean error is –3.7 feet, the mean absolute error was calculated to be 18.0 feet, and the normalized root mean squared (RMS) error was calculated at 9.86%.

Hydrographs

The final calibrated transient model run was also evaluated by a series of hydrographs of observed water levels versus model-calculated water levels for selected Arizona Water Company wells. The hydrographs presented in Figures 30, 31, and 32 are for Arizona Water Company well number 12, 13, and 14. The hydrographs indicate a reasonable match between observed and model calculated water levels for wells in the area of greatest interest, Arizona Water Company's well field.

Model Calculated Water Budgets

A comparison of volumetric water budgets also served as a check of model calibration. The volumetric water budget serves as an independent check of the overall acceptability of the model solution (Harbaugh and McDonald, 1996). An acceptable transient model solution should have small differences between total inflows and total outflows with changes in storage included (the percent discrepancy).

A model configuration that closely matches actual hydrogeologic conditions will have a small percent error term. The model calculated volumetric water budgets for 1984, 1991, 1997, and 1984 to 1998 all had a percent discrepancy of 0.0 feet. Tables 5 through 8 present the volumetric water budgets.

Transient Model Calibration Summary

Overall, the transient model calibration was successful. This has been demonstrated qualitatively and quantitatively; qualitatively by comparison of observed versus model calculated groundwater level contours, and quantitatively by volumetric water budgets, statistical analysis, and hydrographs. The model reasonably simulates groundwater flow directions, hydraulic gradients, and rising groundwater levels due to decreases in groundwater pumping. The statistical analysis presented in Figures 27 through 29 indicates acceptable levels of error for a regional model. Overall, model errors are small for a regional model, and are within professional standards for numerical groundwater flow modeling.

Sensitivity Analysis

A sensitivity analysis was performed on the Apache Junction Groundwater Flow Model to evaluate the effect of varying model input parameters on model-predicted heads and flow. The sensitivity analysis consisted of varying select model input parameters and recording the effect on the model-calculated heads and the model-calculated cumulative water budget relative to the calibrated transient model. The results of the Apache Junction Groundwater Model sensitivity analysis were used to identify the model input parameters that have the largest affect on predicted heads and groundwater flow.

Introduction

The sensitivity analysis was conducted on the calibrated transient model. The following hydraulic parameters were tested within reasonable ranges: Hydraulic conductivity, storage, agricultural recharge, and boundary conditions along the Superstition Mountains. The change in 1997 model-predicted heads and the model-wide cumulative mass water budget were calculated for each of the 10 sensitivity runs. Due to Arizona Water Company's proposed production well locations, particular attention in head changes is focused across the "project area", although model-wide changes are also noted. The "projectarea" is defined as Arizona Water Company's Certificate of Convenience and Necessity ("CC&N") for its Apache Junction water system issued to Arizona Water Company by the Arizona Corporation Commission (Figure 1).

The cumulative volumetric water deficit or surplus (in acre-feet) was calculated for each sensitivity run by taking the numerical difference between the cumulative water budgets of the sensitivity run and the calibrated model for the stress period representing the end of the calendar year 1997. The change-in-storage (expressed as a percentage) is the ratio of the model-calculated cumulative water budget and the calibrated model cumulative water budget. Sensitivity ranks for change-in-storage were calculated by taking the absolute value of percent change-in-storage. Sensitivity integers from 1-10 were then assigned to the corresponding ascending absolute values of percent change-in-storage calculations, with "1" being the most sensitive and "10" the least sensitive. Results of the sensitivity analysis are presented in Table 9.

The percent RMS error was calculated for each sensitivity run and compared to the percent RMS error of the calibrated transient model for the corresponding stress period. The difference between the percent RMS errors of the sensitivity runs and the calibrated model was then calculated. The higher the difference in percent RMS error, the more sensitive the calibrated model heads were to that particular input parameter. The absolute values of the percent RMS differences were normalized to the maximum residual RMS errors for each stress period calculated, and are the basis for designation of the sensitivity ranks for observed heads. The 10 sensitivity runs were assigned a sensitivity integer

from 1-10, with "1" corresponding to the most sensitive (or having the greatest effect on the model results) input parameter, ascending to the least sensitive (or having the smallest effect on the model results) input parameter "10".

The absolute change in heads across the project area for the calendar year 1997 were calculated for each sensitivity run by taking the difference in the model-calculated and the calibrated model heads for the corresponding stress period. The reported water levels (calculated heads) for each sensitivity run represent the approximate model-predicted groundwater level elevations (in feet above mean sea level) across the project area. It should be noted however, that the sensitivity rankings for observed heads (and hence the normalized RMS errors) indicate head changes across the entire model area, and do not always coincide with the calculated head changes across the project area or other areas of interest within the model-wide domain.

The values in the "In-Out" column in Table 9 represent the cumulative volumetric water budget (in acre-feet), which are surpluses (represented by positive values) in all cases (outflow>inflow). The "Difference in In-Out" column is the net cumulative volumetric change-in-storage (in acre-feet) of the model-calculated cumulative water budget from the calibrated model (or base case) cumulative water budget, resulting from a change in a particular input parameter value. A negative value in this column indicates a reduced surplus in the model-calculated cumulative water budget, while a positive value indicates an increased surplus in the model calculated cumulative water budget.

Storage Coefficient

The storage coefficient, or specific storage (S_s), is an essential hydraulic parameter in any transient groundwater model. The S_s coefficient represents the amount of water released from storage or stored per unit volume in an aquifer, per unit of change in head. Due to its importance in the calibrated transient model, both model layers 1 and 2 were varied by ±1 order of magnitude to assess the model's sensitivity to this parameter.

Increasing S_s by one order of magnitude resulted in a 28,900 acre-feet increase in the calibrated model's cumulative water budget surplus. This equates to a 5.1 percent increase in the model-calculated cumulative water budget surplus with respect to the calibrated model. This is a relatively moderate volumetric inflow to the calibrated model cumulative water budget, accounting for the fifth largest change-in-storage of all 10 sensitivity analyses. The RMS error for this sensitivity run was 10.4 percent, resulting in a 0.5 percent RMS difference between the calculated heads and the calibrated model heads. This corresponds to a sensitivity rank of 5 based on the normalized RMS value. There was no observed change in the calculated model heads across the project area with respect to the calibrated model heads, while model-wide heads decreased approximately 10 feet.

Decreasing S_s by one order of magnitude resulted in a 2,950 acre-feet decrease in the calibrated model's cumulative water budget surplus. This equates to a 0.5 percent decrease in the model-calculated cumulative water budget surplus with respect to the calibrated model. This is a relatively small volumetric outflow to the calibrated model cumulative water budget, accounting for the eighth largest change-in-storage of all 10 sensitivity analyses. The RMS error for this sensitivity run was 9.8 percent, resulting in a 0.05 percent RMS difference between the calculated heads and the calibrated model heads. This corresponds to a sensitivity rank of 6 based on the normalized RMS value. There was no observed change in the calculated model heads across the model-wide domain with respect to the calibrated model heads.

The results of the S_s sensitivity analyses demonstrate that the calibrated model is low to moderately sensitive to an order of magnitude increase in S_s, but far less sensitive to a one-order magnitude decrease. According to the normalized RMS errors, the calibrated model is slightly less sensitive to a one order of magnitude decrease in S_s by approximately 3 percent. In terms of change-in-storage, increasing S_s by an order of magnitude resulted in an eight times greater impact on the calibrated model water budget than did decreasing S_s by one order of magnitude. Increasing and decreasing S_s by one

order of magnitude had no observable effect on the calibrated model heads across the project area.

Specific Yield

Specific yield (S_y) is another fundamental hydrologic input parameter of the groundwater model. The magnitude and distribution of S_y defines the storage properties of the water table aquifer throughout the model-wide domain. Because of its importance, both model layers 1 and 2 were varied by ±25 percent to assess the calibrated model's sensitivity to S_y.

Increasing S_y by 25 percent resulted in a 38,650 acre-feet increase in the calibrated model's cumulative water budget deficit. This equates to a 6.9 percent increase in the model-calculated cumulative water budget surplus with respect to the calibrated model. The 6.9 percent change-in-storage is a relatively moderate volumetric inflow to the calibrated model cumulative water budget, accounting for the fourth largest change-in-storage of all 10 sensitivity analyses. The RMS error for this sensitivity run was 10.6 percent, resulting in a 0.7 percent RMS difference between the calculated heads and the calibrated model heads. This corresponds to a sensitivity rank of 4 based on the normalized RMS value. The calculated model heads for 1997 were approximately 5 feet higher across the project area with respect to the calibrated model heads for the respective year, while model-wide heads increased approximately 10 feet.

Decreasing S_y by 25 percent resulted in a 47,650 acre-foot decrease in the calibrated model's cumulative water budget surplus. This equates to an 8.5 percent decrease in the model-calculated cumulative water budget surplus with respect to the calibrated model. The 8.5 percent change-in-storage is a low to moderate volumetric outflow to the calibrated model cumulative water budget, accounting for the third largest change-in-storage of all 10 sensitivity analyses. The RMS error for this sensitivity run was 10.2 percent, resulting in a 0.3 percent RMS difference between the calculated heads and the

calibrated model heads. This corresponds to a sensitivity rank of 6 based on the normalized RMS value. The calculated model heads were approximately 10 feet lower along the base of the Usery Mountains with respect to the calibrated model heads. However, there was no observed change in heads from the calibrated model across the rest of the project area. In contrast, model-wide heads increased approximately 10 feet.

The results of the S_s sensitivity analyses demonstrate that the calibrated model is low to moderately sensitive to a 25 percent increase or decrease in S_y. According to the normalized RMS errors, the calibrated model is slightly less sensitive to a 25 percent decrease in S_y by approximately 3 percent. In terms of change-in-storage, the calibrated model is slightly less sensitive to a 25 percent increase in S_y by approximately 1.6 percent. Increasing and decreasing S_y by 25 percent had a minimal effect on the calibrated model heads across the project area.

Hydraulic Conductivity

Hydraulic conductivity is a fundamental hydrologic input parameter in any groundwater model. The flow of groundwater in an aquifer system is largely controlled by the magnitude and distribution of hydraulic conductivities of the surrounding soil or rock materials. Due to its importance, the hydraulic conductivity values for both model layers 1 and 2 were varied by ±25 percent to assess the calibrated model's sensitivity to this parameter.

Increasing hydraulic conductivity by 25 percent resulted in a 21,700 acre-feet decrease in the calibrated model's cumulative water budget surplus. This equates to a 3.9 percent decrease in the model-calculated cumulative water budget deficit surplus with respect to the calibrated model. The 3.9 percent change-in-storage is a relatively low volumetric outflow to the calibrated model cumulative water budget, making it the sixth largest change-in-storage of all 10 sensitivity analyses. The RMS error for this sensitivity run was 9.7 percent, resulting in a 0.1 percent RMS difference between the calculated heads and the calibrated model heads. This corresponds to the lowest sensitivity rank of 10 based on the normalized RMS value. The calculated model heads were approximately 10

feet lower along the base of the Usery Mountains with respect to the calibrated model heads. However, there was no observed change in heads from the calibrated model across the rest of the project area. Localized variations in model-wide heads of approximately ±10 feet occurred throughout the model domain. Generally speaking, heads increased in the area between Gilbert and Apache Junction, and decreased elsewhere, with the exception of the project area as previously mentioned.

Decreasing hydraulic conductivity by 25 percent had approximately an equal and opposite effect on the calibrated model as the 25 percent increase. The 25 percent decrease in hydraulic conductivity resulted in a 20,750 acre-feet increase in the calibrated model's cumulative water budget surplus. This equates to a 3.7 percent increase in the model-calculated cumulative water budget deficit surplus with respect to the calibrated model. The 3.7 percent change-in-storage is a relatively low volumetric inflow to the calibrated model cumulative water budget, making it the seventh largest change-in-storage of all 10 sensitivity analyses. The RMS error for this sensitivity run was 11.0 percent, resulting in a 1.2 percent RMS difference between the calculated heads and the calibrated model heads. This corresponds to a sensitivity rank of 3 based on the normalized RMS value. The calculated model heads were approximately 10 feet higher along the base of the Usery Mountains, and 5 feet lower throughout the rest of the project area. Localized variations in model-wide heads of approximately ±10 feet occurred throughout the model domain. Generally speaking, heads increased in the area between Gilbert and Apache Junction, and decreased elsewhere.

The results of the hydraulic conductivity sensitivity analyses demonstrate that the calibrated model is low to moderately sensitive to 25 percent increase or decrease in hydraulic conductivity. As anticipated, the effects on the calibrated model heads and the change-in-storage were approximately equal (within 0.2 percent) and opposite in the two sensitivity runs. The model-wide variations in calculated heads demonstrates that the model is more sensitive on a local level than a regional one. These variations are indicative of localized recharge/pumping rate ratios (i.e., pumpage>recharge, or recharge>pumpage).

Agricultural Recharge

Although a substantial amount of data has been collected to derive estimates of agricultural recharge in the model-wide area, the data are nevertheless incomplete. It, therefore, seemed reasonable to vary agricultural recharge rates in layer 1 of the calibrated model by ±25 percent to test the sensitivity of the calibrated model to this input parameter.

Increasing agricultural recharge by 25 percent produced the second largest head and storage changes of all other modified parameters. The 25 percent increase in agricultural recharge resulted in a 429,300 acre-feet increase in the calibrated model's cumulative water budget surplus. This equates to a 76.8 percent increase in the model-calculated cumulative water budget surplus with respect to the calibrated model. The 76.8 percent change-in-storage is a significant volumetric outflow to the calibrated model cumulative water budget, increasing the 1997 water surplus budget from 559,300 acre-feet to 988,600 acre-feet. The RMS error for this sensitivity run was 12.9 percent, resulting in a 3.0 difference between the sensitivity run and the calibrated model. This corresponds to a sensitivity rank of 2 based on the normalized RMS value. The calculated model heads for 1997 were approximately 10 feet higher across the project area with respect to the calibrated model heads for the respective year, while model-wide heads increased approximately 10-30 feet. The largest increase in heads (30 feet) occurred in the Gilbert area.

Decreasing agricultural recharge by 25 percent had approximately an equal and opposite effect on the calibrated model as the 25 percent increase, producing the largest head and storage changes of all other modified parameters. The 25 percent decrease in agricultural recharge resulted in a 430,900 acre-feet decrease in the calibrated model's cumulative water budget surplus. This equates to a 77.0 percent decrease in the model-calculated cumulative water budget surplus with respect to the calibrated model. The 77.0 percent change-in-storage is a significant volumetric outflow to the calibrated model cumulative water budget, decreasing the 1997 water surplus budget from 559,300 acre-feet to 128,400 acre-feet. The RMS error for this sensitivity run was 14.7 percent, resulting in a

4.8 percent difference between the sensitivity run and the calibrated model. This corresponds to a sensitivity rank of 1 (most sensitive) based on the normalized RMS value. The calculated model heads for 1997 were approximately 10 feet lower across the project area with respect to the calibrated model heads for the respective year, while model-wide heads decreased approximately 10-20 feet. The largest decrease in heads (20 feet) occurred in the area between Gilbert and Apache Junction.

Boundary Conditions – Mountain Front Recharge

Selecting appropriate boundary conditions are essential components of an accurate groundwater model. As discussed earlier in the report, specified fluxes were assigned in the calibrated transient model to simulate mountain front recharge, and ephemeral stream channel infiltration based on the annual consistency of these fluxes. In order to test the appropriateness of using constant flux boundaries, selected sensitivity runs were conducted to determine the impact of on varying constant flux boundaries to constant head cells. This was accomplished by varying mountain front recharge rates by ±25 percent along the Superstition Mountains constant flux boundary (Figure 14). The increase and decrease in mountain front recharge rates were simulated by adjusting the injection rates in the specified flux cells located along the base of the Superstition Mountains/basin interface. The results of these sensitivity runs are presented below.

The RMS errors and change-in-storage volumes for both sensitivity runs were within 0.5% of the calibrated model. These results indicate that regionally there was little to no change in heads or the cumulative water budget. However, it is noteworthy to point out that on a local level model heads were affected along areas of the Superstition Mountains/basin interface. In general, water levels rose and declined approximately 10 feet in response to the 25 percent increase and decrease in mountain front recharge rates along the Superstition Mountains constant flux boundary, respectively. Water levels remained unaffected elsewhere throughout the model-domain.

In general, model heads were only slightly affected locally by change in boundary conditions and the cumulative water budget remained relatively unchanged. In light of

these results, the model-assigned boundary conditions for the Superstition Mountains appears reasonable.

Sensitivity Analysis Summary

The sensitivity analysis has provided valuable information concerning the calibrated transient model's response to changes in various hydraulic parameters. A ranking system was developed to gauge the calibrated model's sensitivity to these varying parameters for the calendar year ending 1997. The rankings for head changes were based on the numerical difference between the calibrated model's RMS error and the RMS error of a particular sensitivity run. The RMS error is the summation of statistical derivations of calculated versus observed head residuals. These rankings indicate that the model-wide calibrated heads are most sensitive to changes in agricultural recharge and least sensitive to changes in specific storage. Head changes across the project area (approximately ±10 feet) were equally affected by changes in agricultural recharge, hydraulic conductivity, specific yield, and mountain front recharge. There were no observed changes in heads across the project area due to varying specific storage. All calculated head residuals were within 5 percent of the calibrated model residual heads.

The sensitivity rankings for change-in-storage were based upon absolute values of volumetric changes in the cumulative water budget, as of the calendar year ending 1997. The results indicate that the calibrated model's water budget is most sensitive to changes in agricultural recharge and least sensitive to changes in mountain front recharge. The calibrated model was low to moderately sensitive to changes in hydraulic conductivity, specific yield, specific storage, and mountain front recharge.

The sensitivity analysis has demonstrated that the calibrated transient model solution is acceptably stable over a reasonable range of input parameter variation. The results have also indicated the degree to which different input parameters influence the model solution.

PREDICTIVE MODEL SIMULATION – EVALUATION OF GROUNDWATER SUPPLY

Following the completion of the transient groundwater flow model calibration; a predictive model simulation was run to simulate a total groundwater supply of 19,255 acre-feet per year for use by Arizona Water Company in meeting its current, committed and projected water demands. An additional 100-year stress period was added to the model, to the year 2099. Nine "new" Arizona Water Company wells were located within the Apache Junction Service area each pumping at a rate of 1,080 to 1745 acre-feet per year. The "new" wells were located based on greatest available saturated thickness. To do this, 1997 model-calculated water levels were subtracted from the model bottom elevations and a 1997 saturated thickness overlay was prepared and imported into the model.

Agricultural Recharge for the Predictive Model Simulation

Values of agricultural recharge for the 100-year predictive simulation were obtained from ADWR's Phoenix Active Management Area's Assured Water Supply model run 30_7 (ADWR, November 1997). The MODFLOW datasets were obtained from ADWR and recharge values were then totaled for agricultural recharge within the model study area. Total agricultural recharge within the model study area totals approximately 134,000 acre-feet per year. The predictive model simulates 128,000 acre-feet per year agricultural recharge (including canal seepage).

Groundwater Pumpage for the Predictive Model Simulation

Values of groundwater pumpage for the 100-year predictive simulation were obtained from ADWR's Assured Water Supply model run 30_7 (ADWR, November 1997). The MODFLOW datasets were obtained from ADWR and groundwater pumpage values were then totaled for pumping within the model study area. Groundwater pumpage within the model study area totals approximately 164,000 acre-feet per year. The year 1991 most closely approximates this value (Figure 12) and thus 1991 pumping stresses were utilized as the pumping stress for the 100-year stress period. The predictive model simulates 164,000 acre-feet per year groundwater pumping, of which 19,255 acre-feet per year is groundwater pumping by Arizona Water Company. The discrepancy may be due in part to groundwater pumping located near boundary conditions and not simulated in the model, and possibly in wells located in model cells that become dry during the 100-year simulation.

Predictive Model Simulation Results

In the predictive model simulation, Arizona Water Company Wells Nos. 11 through 14 were simulated using 1998 pumping rates (total 3,960 acre-feet per year). Arizona Water Company Well No. 15 was simulated at a rate of 1,170 acre-feet per year, the permitted annual allotment. Arizona Water Company Well No. 16 (recently completed but not yet on line) was simulated at a rate of 1,745 acre-feet per year. Four of the nine "new" wells, Well Nos. 17 through 20, were simulated at a pumping rate of 1,745 acre-feet per year, or an additional groundwater supply of 8,725 acre-feet per year. The remaining five "new" wells, Well Nos. 21 through 25, were simulated at a pumping rate of 1,080 acre-feet per year, or an additional groundwater supply of 5,400 acre-feet per year. This equates to a total groundwater supply of 19,255 acre-feet per year.

Figures 33 and 34 illustrate the groundwater elevation contours at the end of the 100-year predictive model simulation for model layers 1 and 2 respectively. Figure 35 illustrates the depth to water at the end of the 100-year predictive model simulation. Table 10 summarizes the results of the predictive model simulation for all Arizona Water Company wells located within the Apache Junction service area. Depths to water for the 100-year simulation for Arizona Water Company's wells range from 570 feet to 857 feet below land surface (Table 10). Model-calculated drawdowns for Arizona Water Company wells range from 218 feet to 359 feet (Table 10) for the 1999 to 2099 time-period. Our groundwater modeling results indicate that at least 19,255 acre-feet per year of groundwater may be withdrawn continuously for a period of 100 years and will not result in a depth to water exceeding 1,000 feet below land surface. 19,255 acre-feet per year of groundwater supplies should be considered physically available to Arizona Water Company's Apache Junction service area..

CONCLUSIONS

Clear Creek Associates' groundwater modeling results indicate a groundwater resource of at least 19,255 acre-feet per year that will result in a projected water table depth ranging from 570 to 857 feet below land surface (Table 10), after 100 years of continuous groundwater withdrawal. Model-calculated drawdowns for Arizona Water Company's wells range from 218 feet to 359 feet (Table 10) for the 1999 to 2099 time-period. Therefore, the total withdrawal of up to 19,255 acre-feet per year of groundwater from the Arizona Water Company Apache Junction service area will not result in a depth to water exceeding 1,000 feet below land surface after a groundwater withdrawal period of 100 years.

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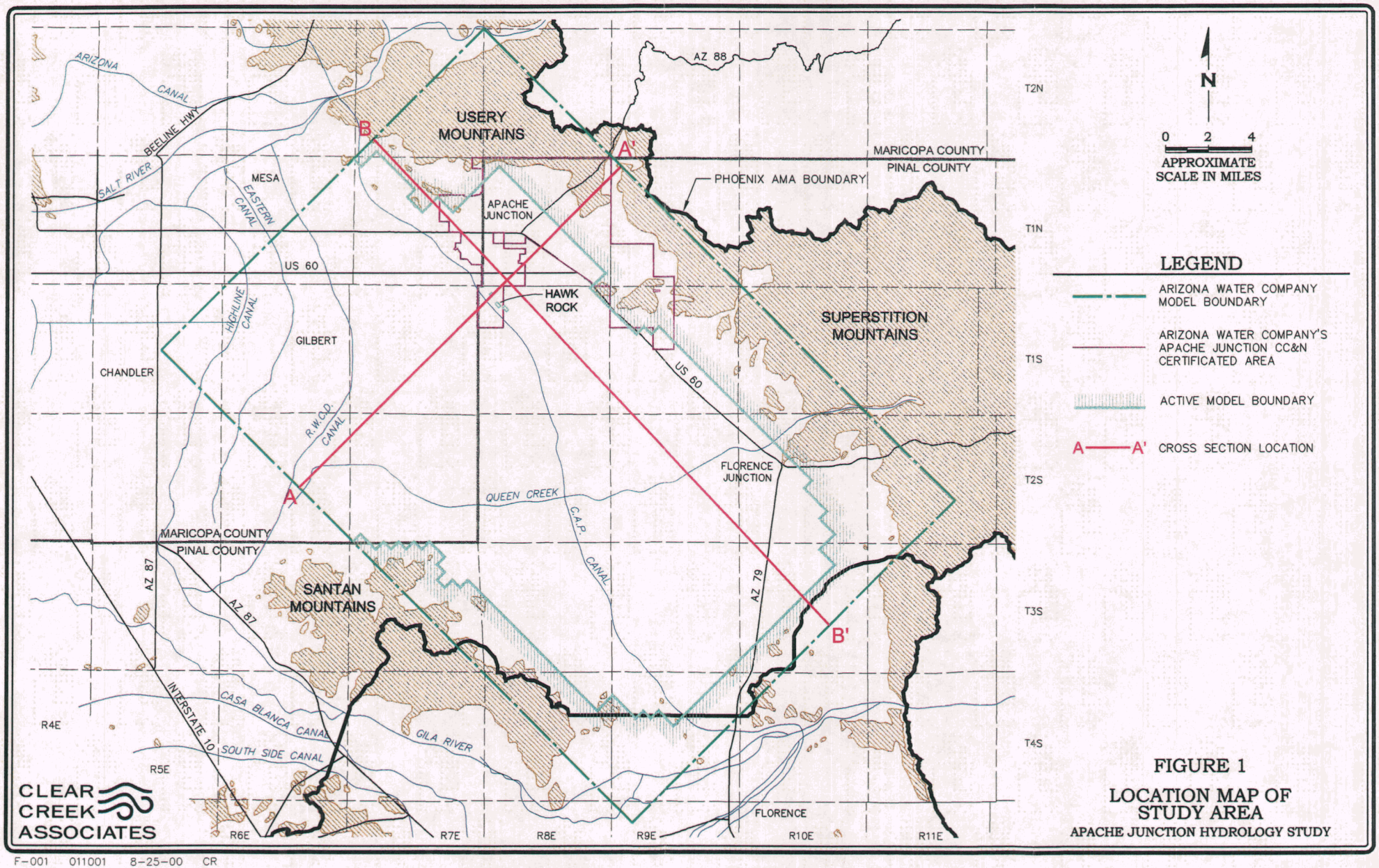


FIGURE 1

LOCATION MAP OF STUDY AREA

APACHE JUNCTION HYDROLOGY STUDY

F-001 011001 8-25-00 CR

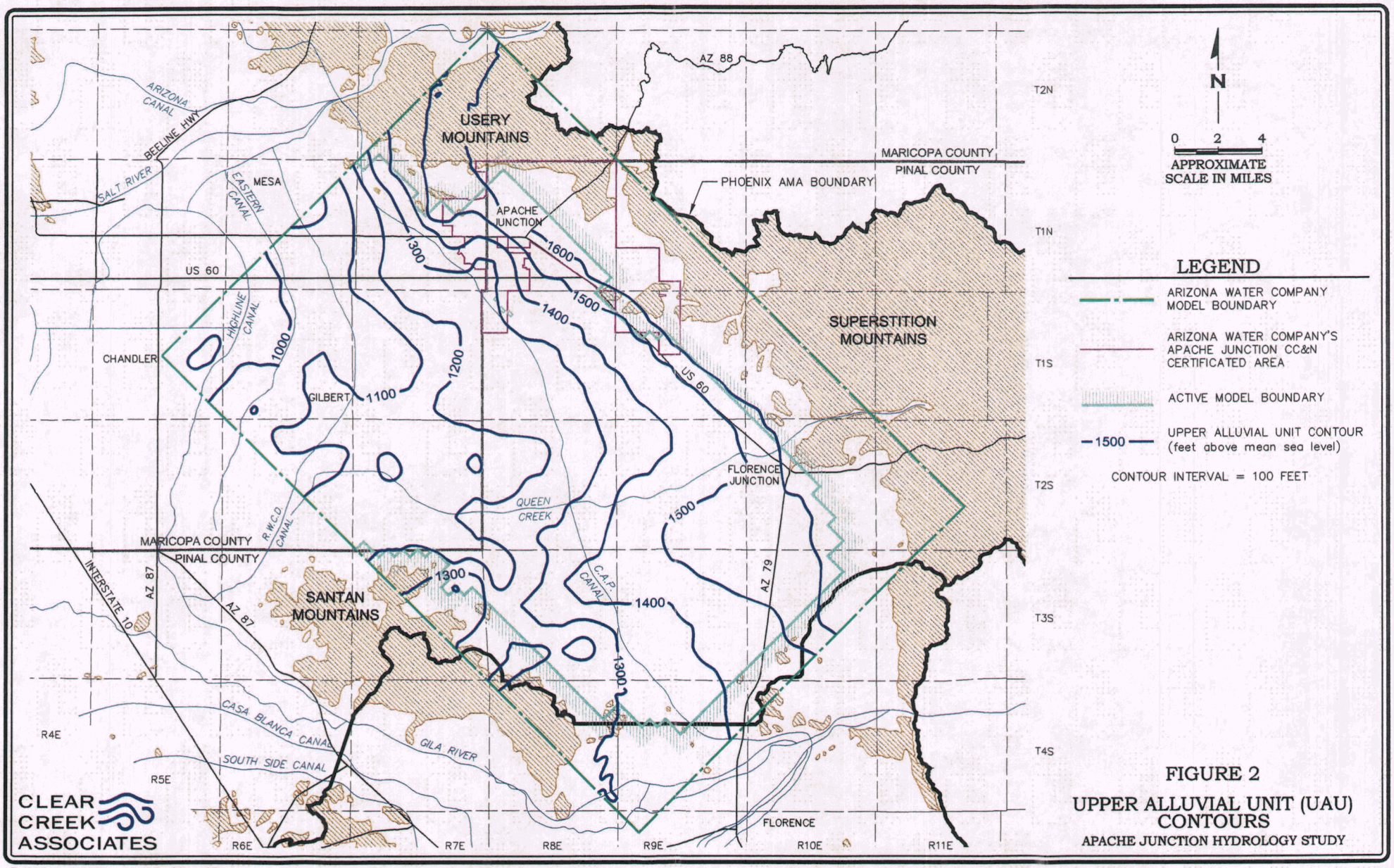


FIGURE 2

UPPER ALLUVIAL UNIT (UAU) CONTOURS

APACHE JUNCTION HYDROLOGY STUDY

F-005 011001 8-25-00 CR

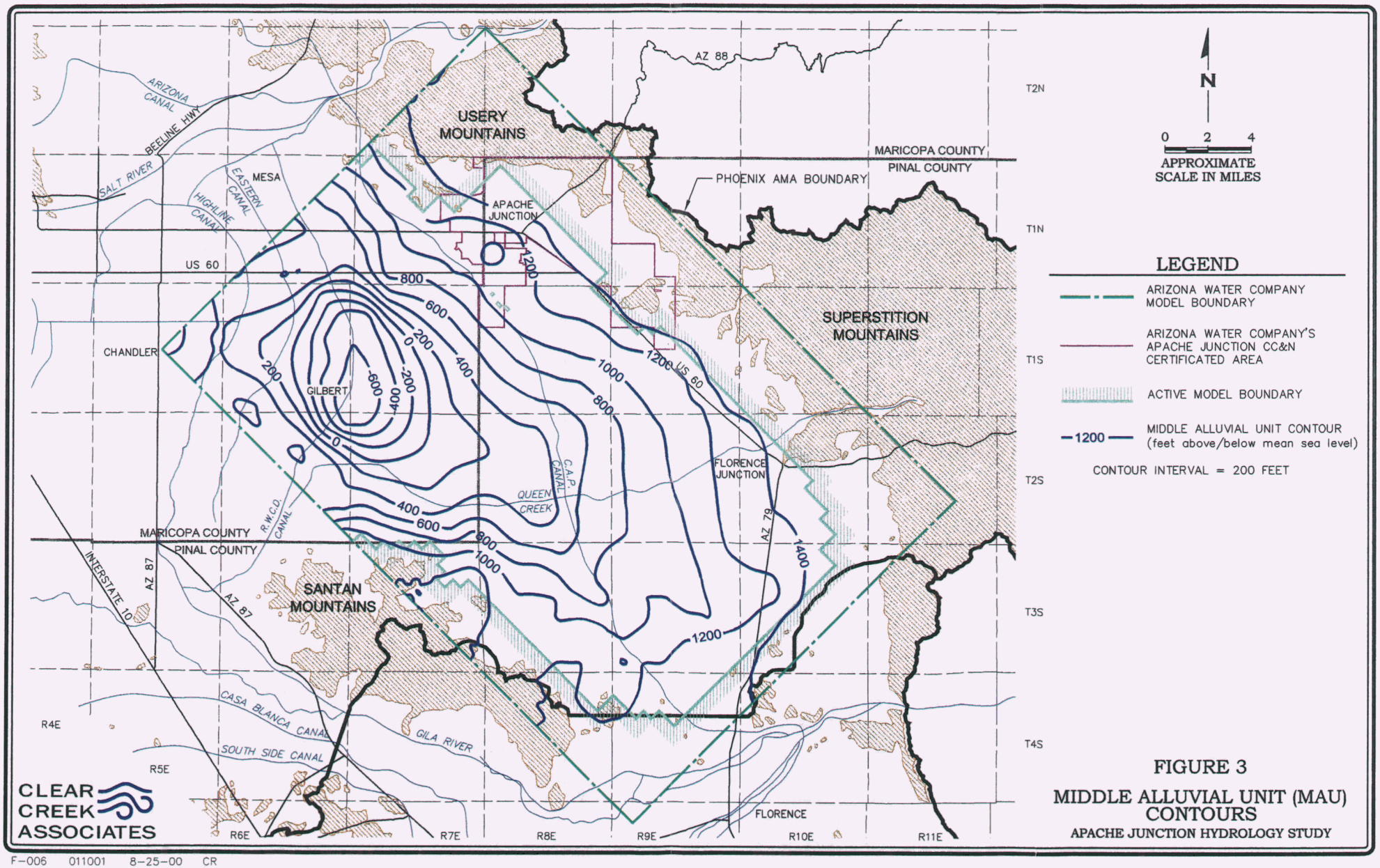


FIGURE 3

MIDDLE ALLUVIAL UNIT (MAU) CONTOURS

APACHE JUNCTION HYDROLOGY STUDY

F-006 011001 8-25-00 CR

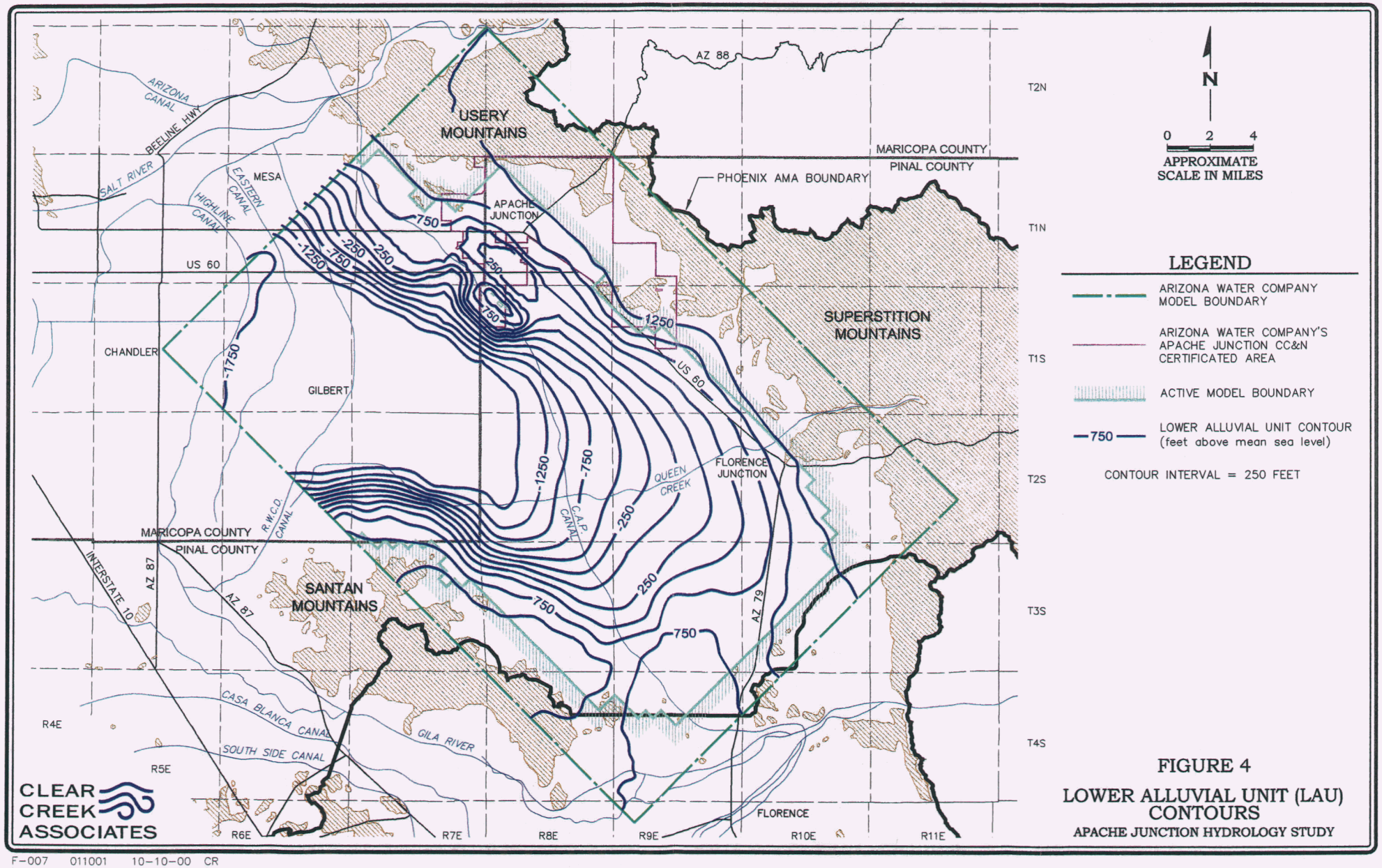
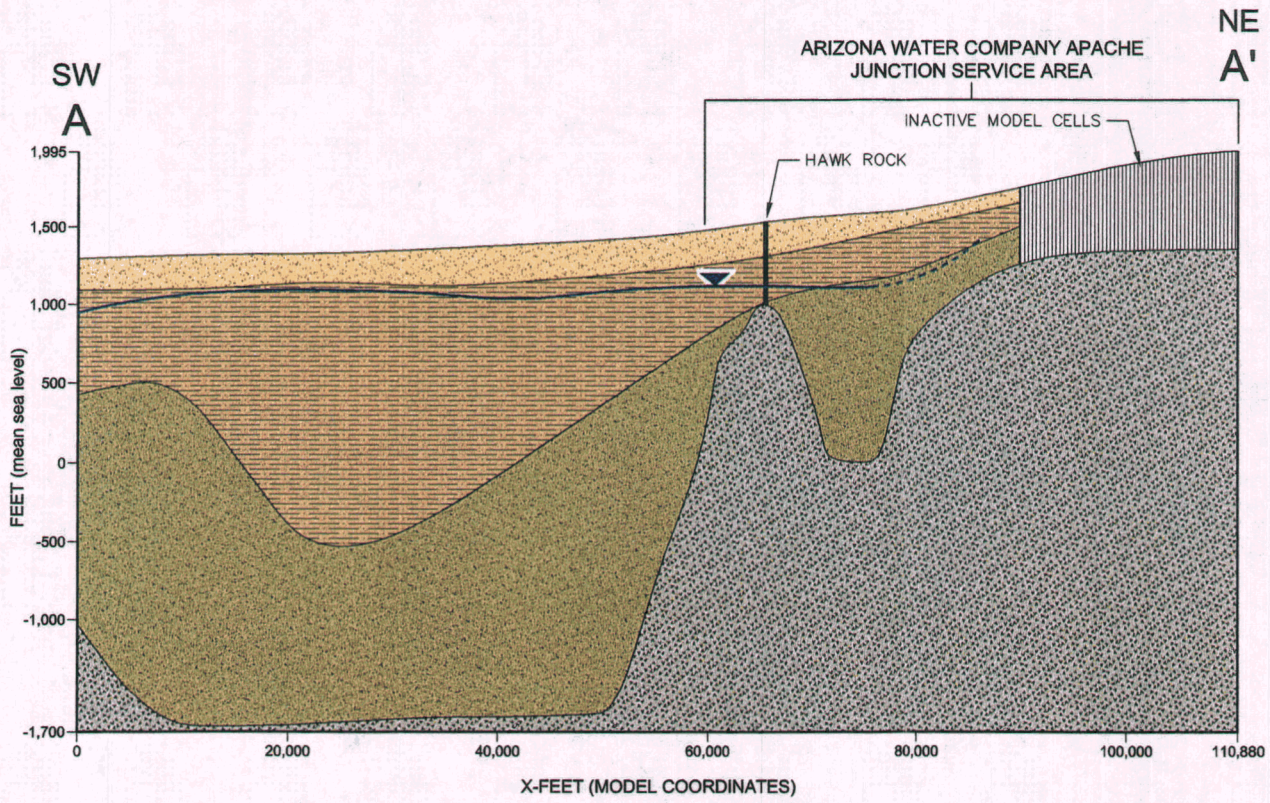


FIGURE 4

LOWER ALLUVIAL UNIT (LAU) CONTOURS

APACHE JUNCTION HYDROLOGY STUDY

F-007 011001 10-10-00 CR



LEGEND

- UPPER ALLUVIAL UNIT
- MIDDLE ALLUVIAL UNIT
- LOWER ALLUVIAL UNIT
- HYDROLOGIC BEDROCK UNIT
- DECEMBER 1991 WATER LEVEL (HAMMETT & HERTHER, 1995)

SOURCES: CORELL, S.W., AND CORKHILL, E.F., 1994. A REGIONAL GROUNDWATER FLOW MODEL OF THE SALT RIVER VALLEY–PHASE II, PHOENIX ACTIVE MANAGEMENT AREA, NUMERICAL MODEL, CALIBRATION AND RECOMMENDATIONS.

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RAYMOND, 1985

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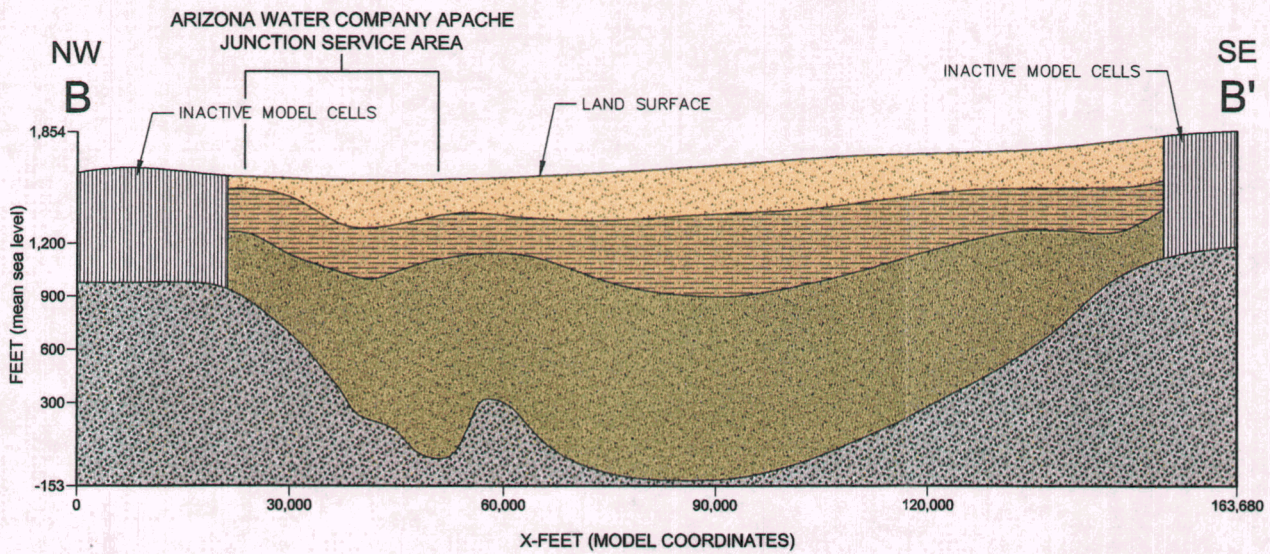
FIGURE 5

GENERALIZED HYDROGEOLOGIC CROSS SECTION A-A'

APACHE JUNCTION HYDROLOGY STUDY

F–020 011001 10–10–00 CR



LEGEND

- UPPER ALLUVIAL UNIT
- MIDDLE ALLUVIAL UNIT
- LOWER ALLUVIAL UNIT
- HYDROLOGIC BEDROCK UNIT

SOURCES: CORELL, S.W., AND CORKHILL, E.F., 1994. A REGIONAL GROUNDWATER FLOW MODEL OF THE SALT RIVER VALLEY–PHASE II, PHOENIX ACTIVE MANAGEMENT AREA, NUMERICAL MODEL, CALIBRATION AND RECOMMENDATIONS.

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FIGURE 6

GENERALIZED HYDROGEOLOGIC CROSS SECTION B-B'

APACHE JUNCTION HYDROLOGY STUDY

F–021 011001 10–10–00 CR

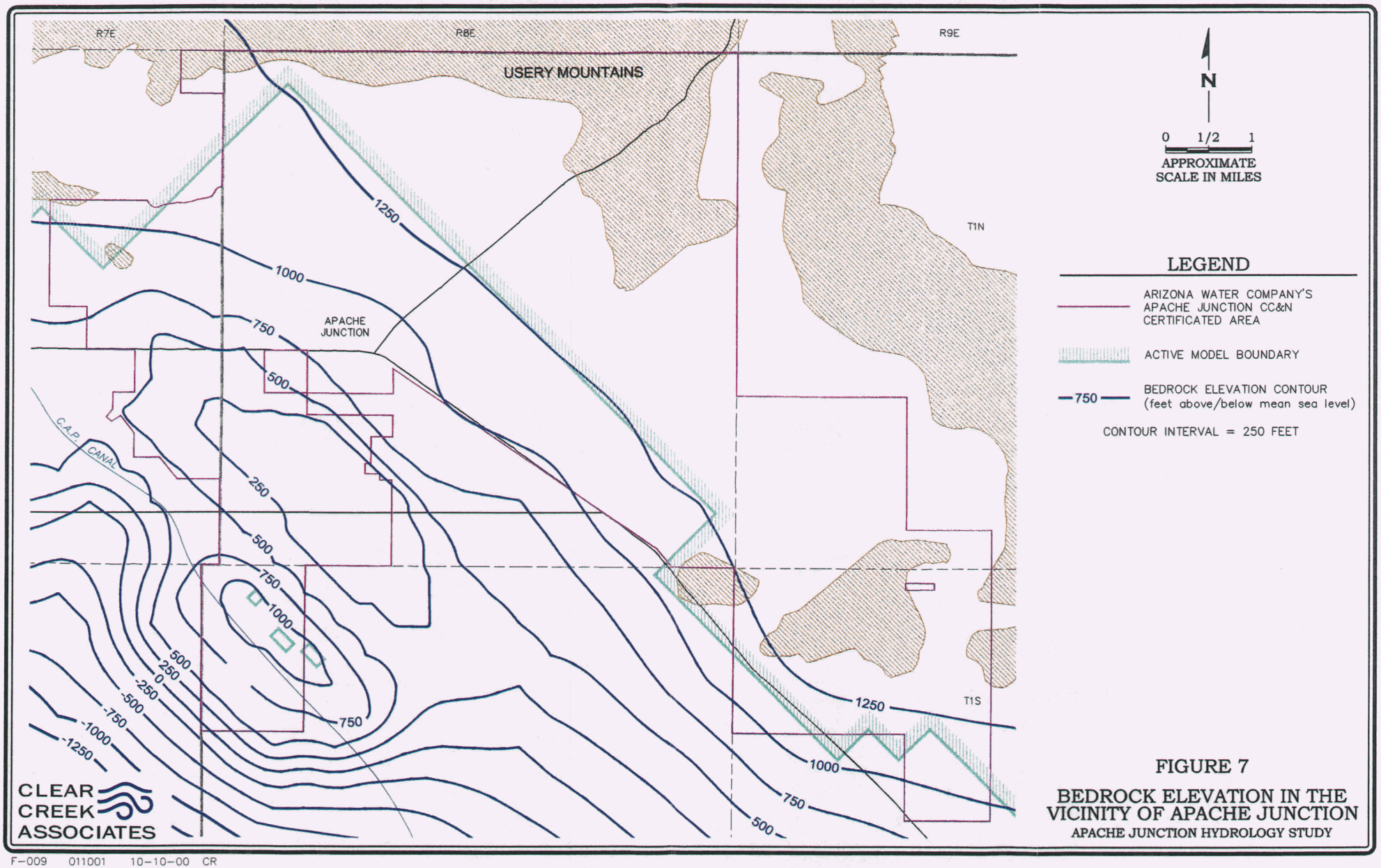

FIGURE 7

BEDROCK ELEVATION IN THE VICINITY OF APACHE JUNCTION

APACHE JUNCTION HYDROLOGY STUDY

F-009 011001 10-10-00 CR

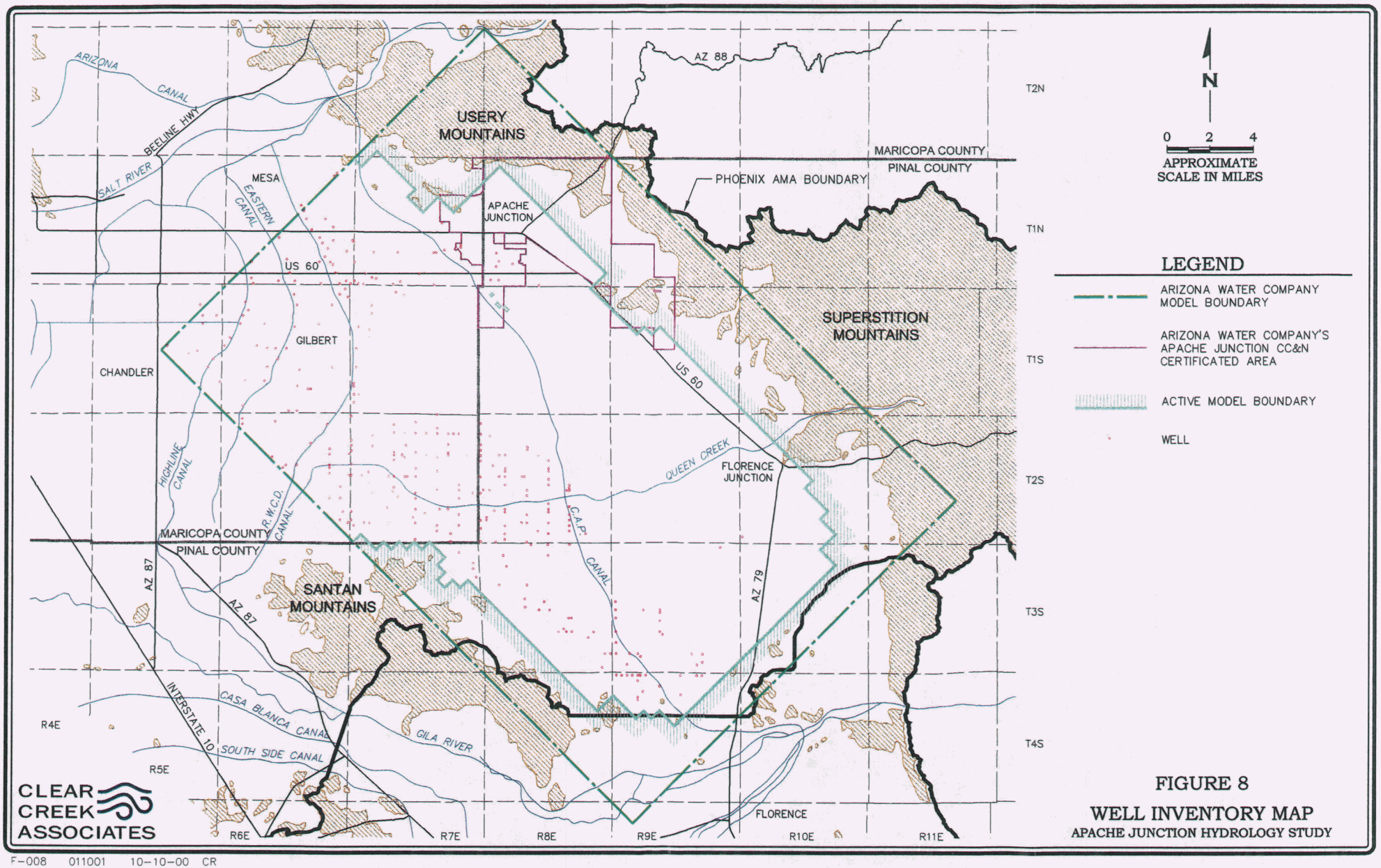

FIGURE 8

WELL INVENTORY MAP

APACHE JUNCTION HYDROLOGY STUDY

F-008 011001 10-10-00 CR

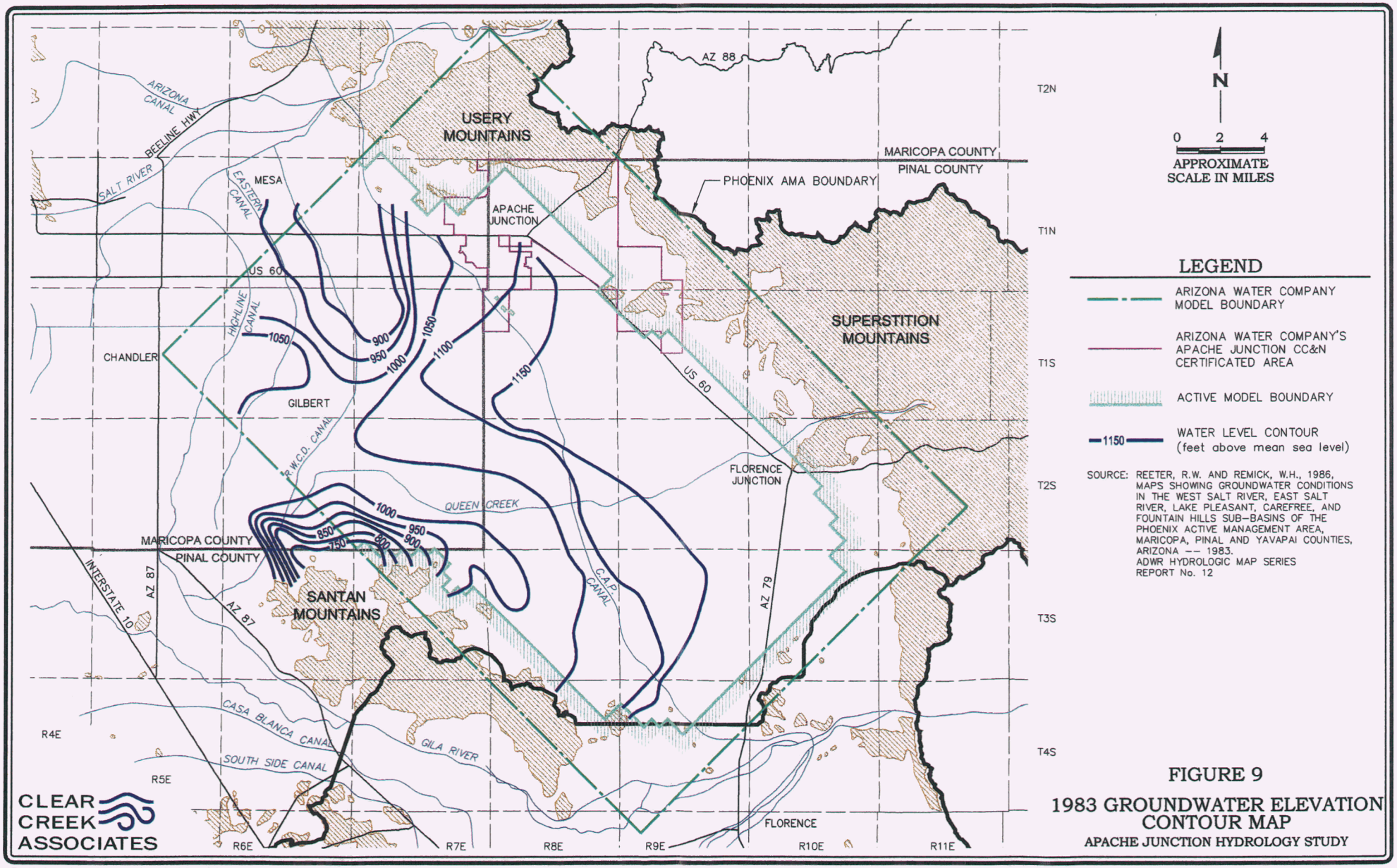

FIGURE 9

1983 GROUNDWATER ELEVATION CONTOUR MAP

APACHE JUNCTION HYDROLOGY STUDY

F-003 011001 10-10-00 CR

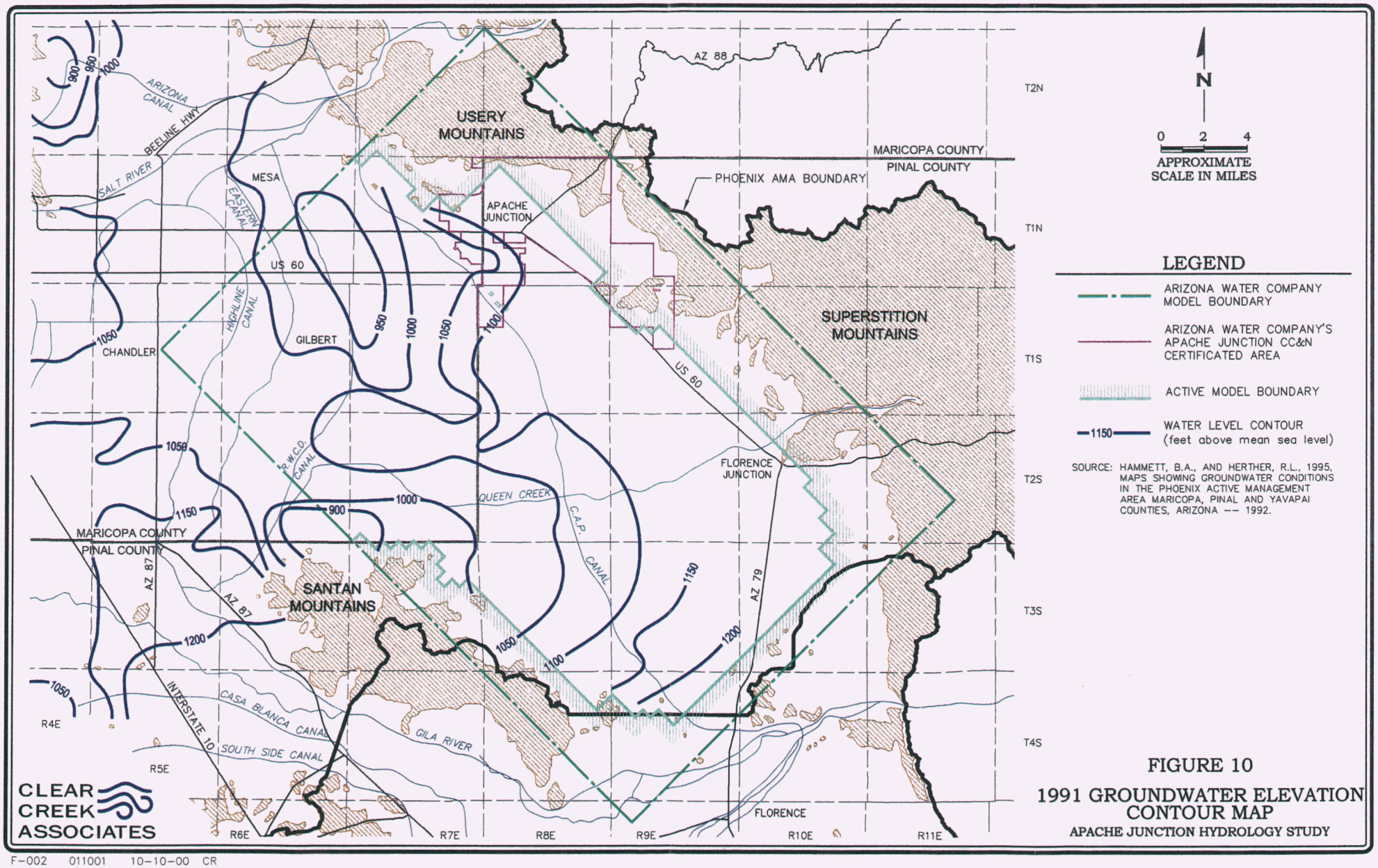

FIGURE 10

1991 GROUNDWATER ELEVATION CONTOUR MAP

APACHE JUNCTION HYDROLOGY STUDY

F-002 011001 10-10-00 CR

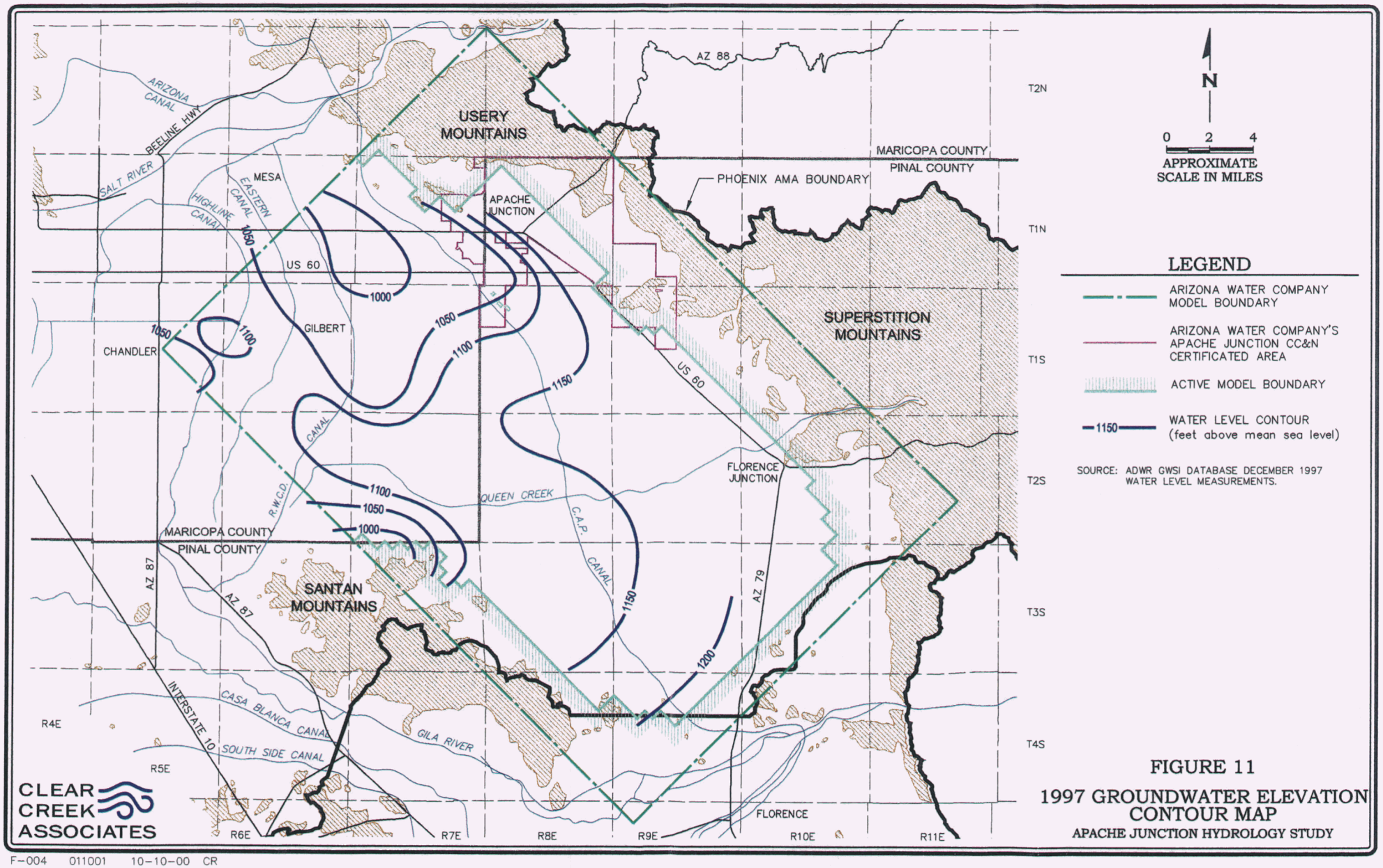

FIGURE 11

1997 GROUNDWATER ELEVATION CONTOUR MAP

APACHE JUNCTION HYDROLOGY STUDY

F-004 011001 10-10-00 CR

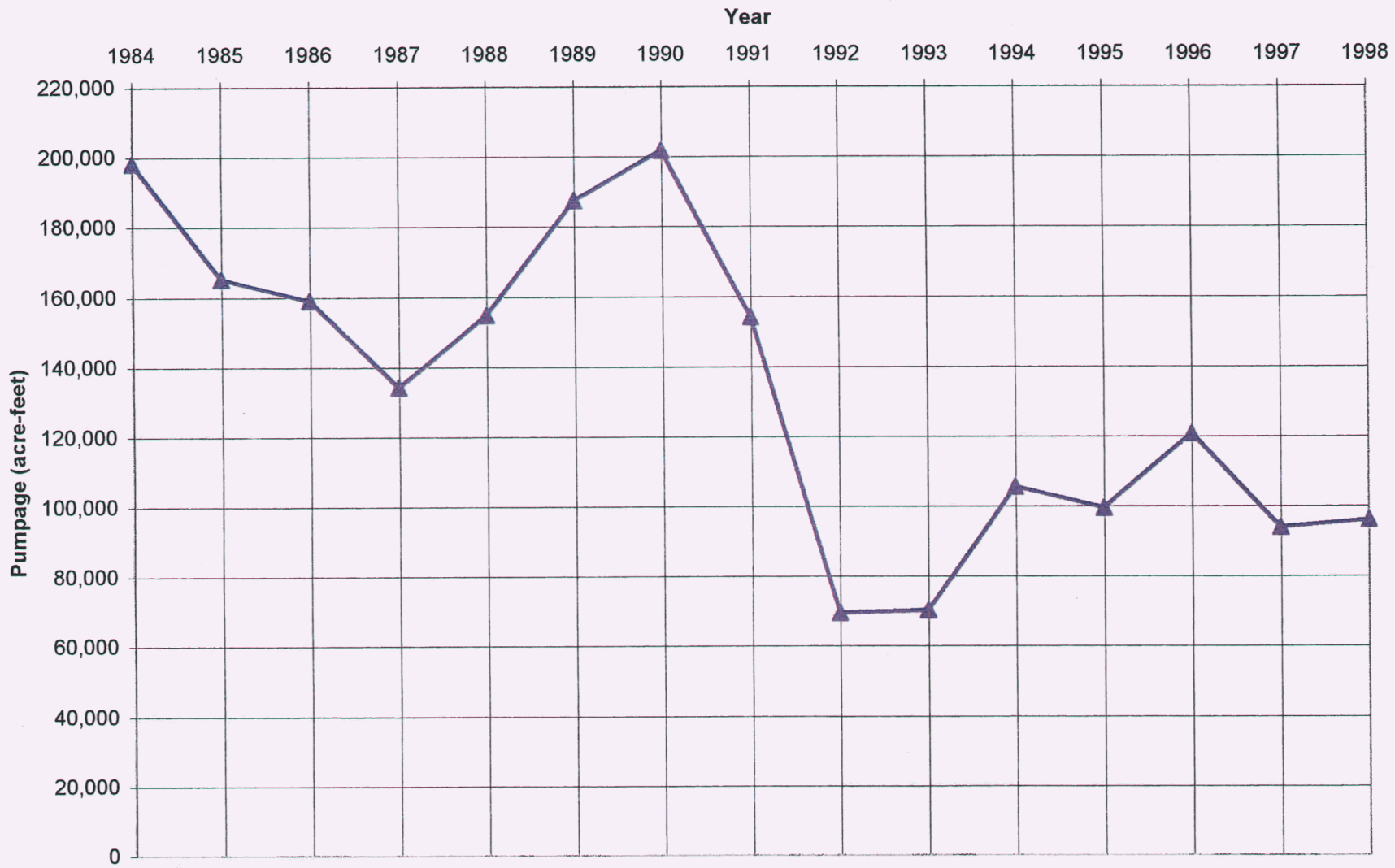

Figure 12

PUMPAGE WITHIN STUDY AREA 1984 to 1998

APACHE JUNCTION HYDROLOGY STUDY

CLEAR CREEK ASSOCIATES

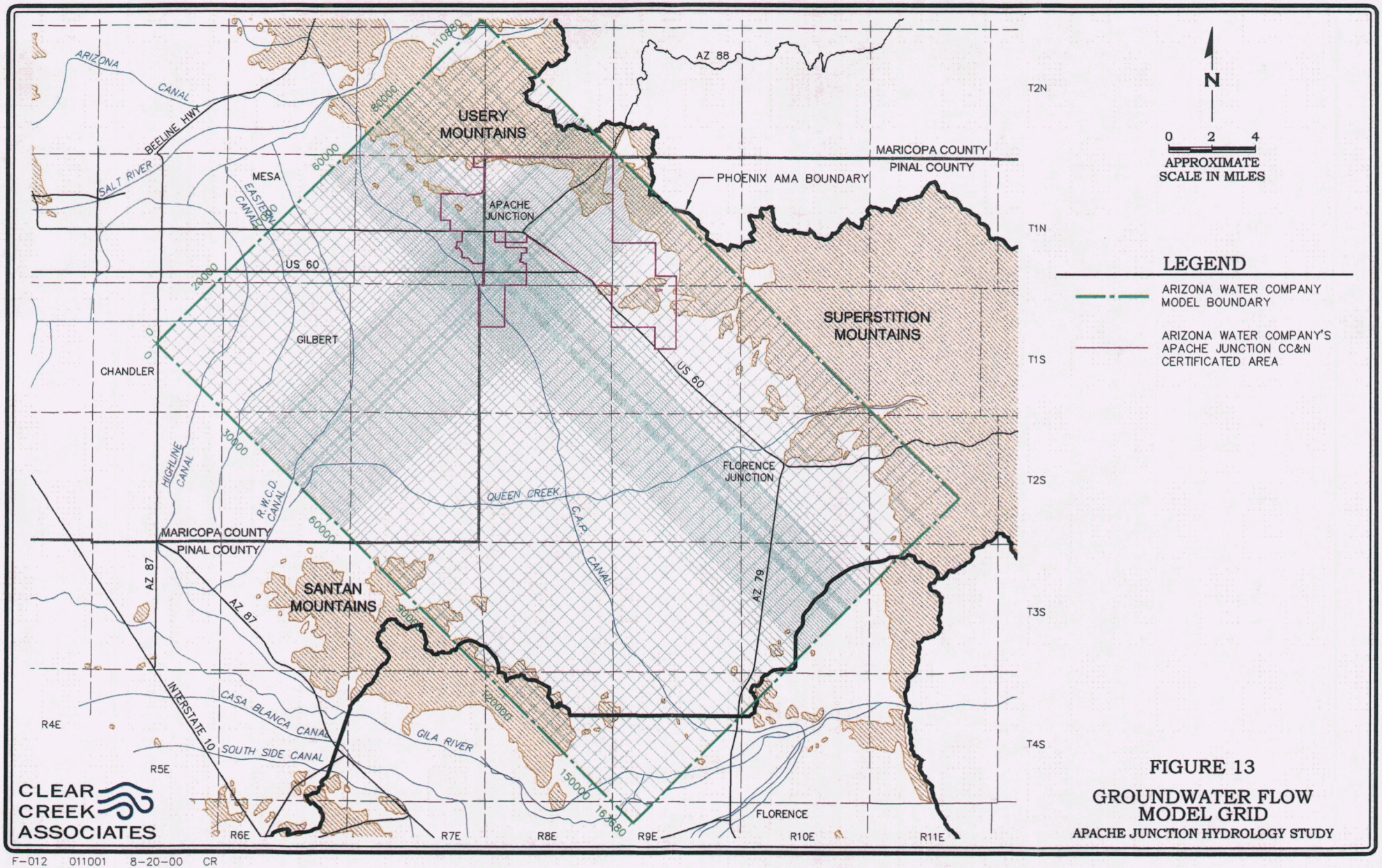

FIGURE 13

GROUNDWATER FLOW MODEL GRID

APACHE JUNCTION HYDROLOGY STUDY

F-012 011001 8-20-00 CR

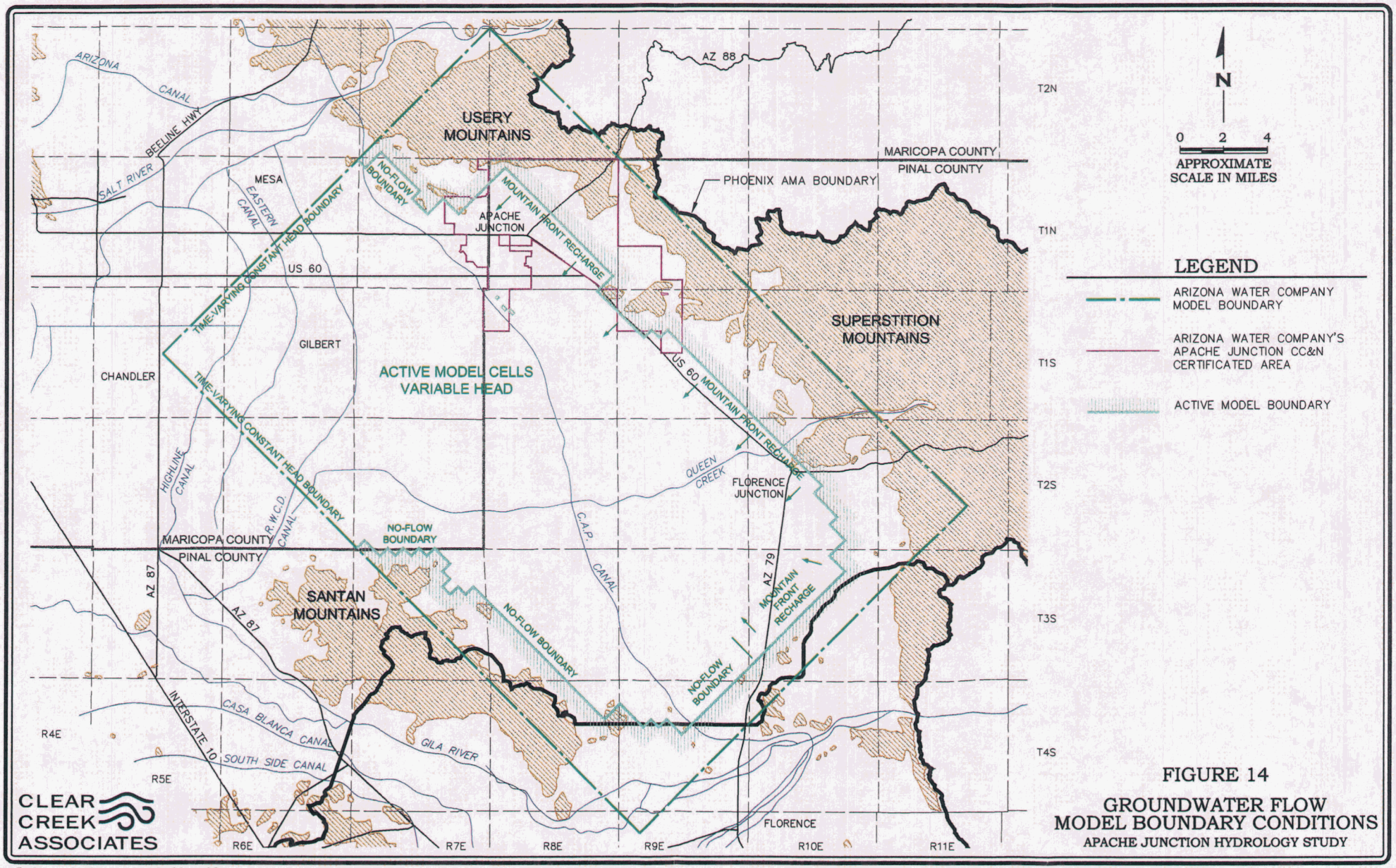

FIGURE 14

GROUNDWATER FLOW MODEL BOUNDARY CONDITIONS

APACHE JUNCTION HYDROLOGY STUDY

F-011 011001 8-25-00 CR

Explanation

Kx [ft/d]	Ky [ft/d]	Kz [ft/d]	Color
15	15	1.5	
7	7	0.7	
4	4	0.4	
3	3	0.3	
2	2	0.2	
0.7	0.7	0.07	
12	12	1.2	
4	4	0.4	
15	15	1.5	
7	7	0.7	
0.1	0.1	0.01	
2	2	0.2	
0.3	0.3	0.03	
25	25	2.5	
10	10	1	
10	10	1	
8	8	0.8	
10	10	1	
2	2	0.2	
30	30	3	
1	1	0.1	

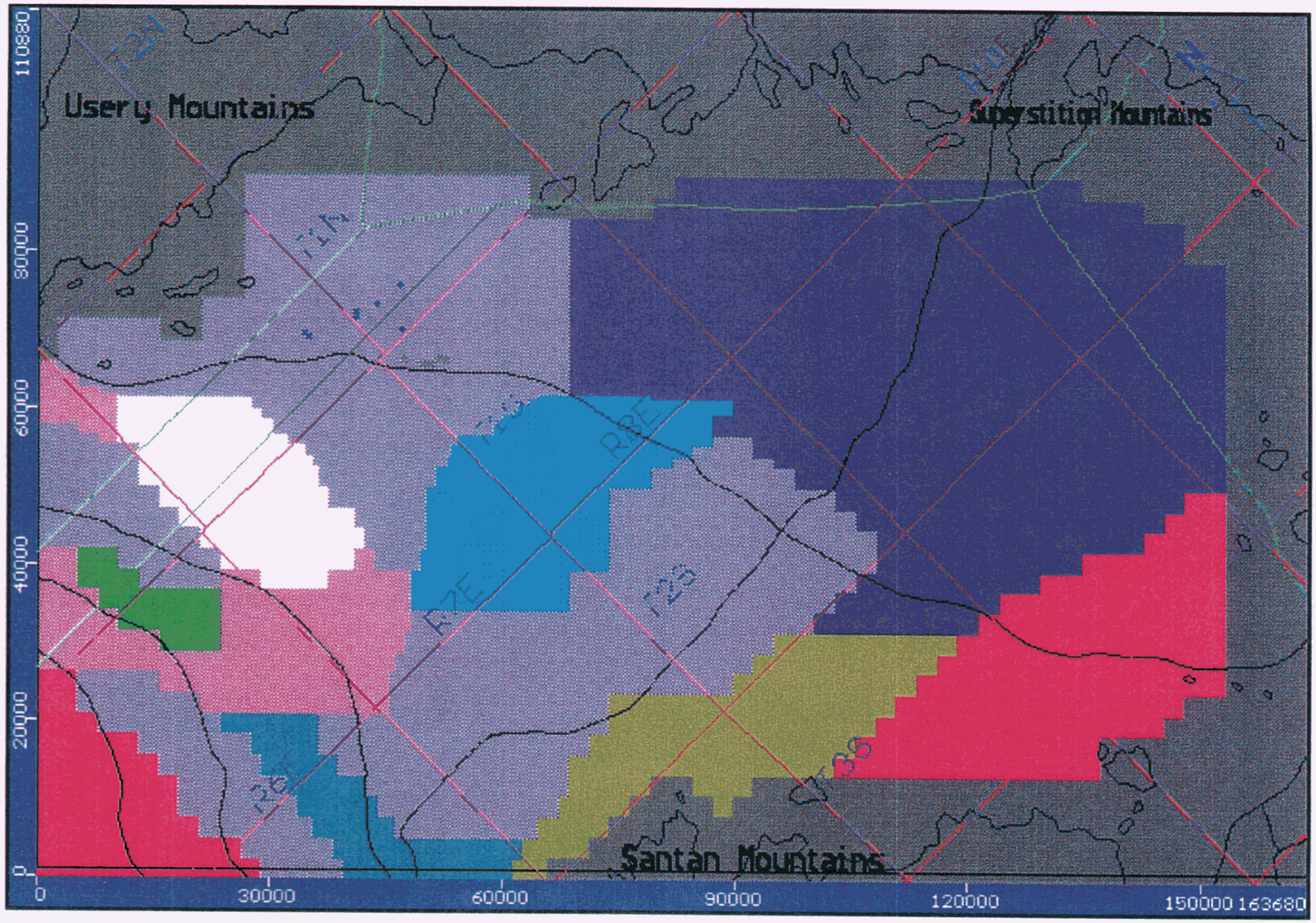

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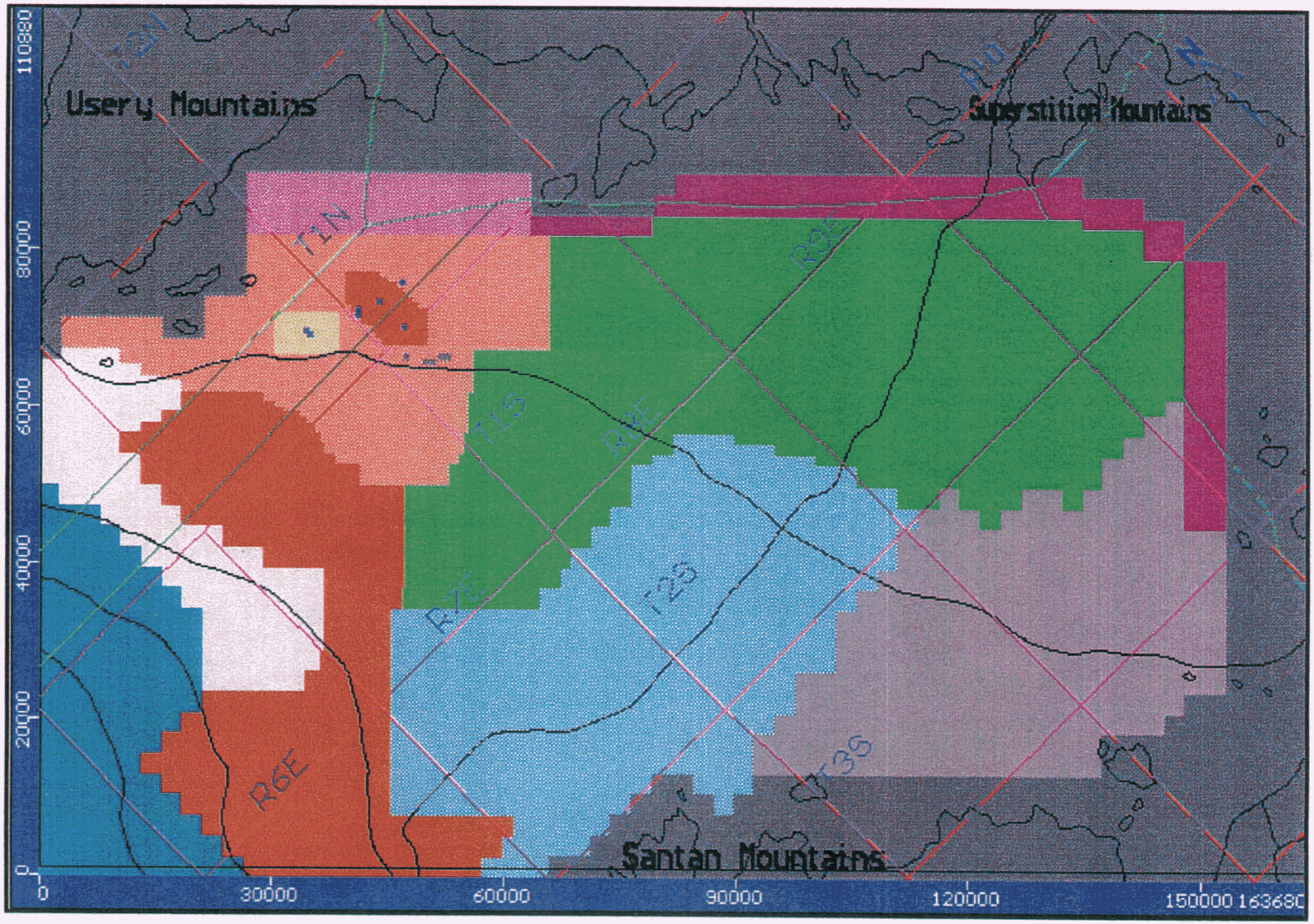
Figure 15
Hydraulic Conductivity Values
Model Layer 1 (feet/day)
Arizona Water Company Project

Explanation

Kx [ft/d]	Ky [ft/d]	Kz [ft/d]	Color
15	15	1.5	
7	7	0.7	
4	4	0.4	
3	3	0.3	
2	2	0.2	
0.7	0.7	0.07	
12	12	1.2	
4	4	0.4	
15	15	1.5	
7	7	0.7	
0.1	0.1	0.01	
2	2	0.2	
0.3	0.3	0.03	
25	25	2.5	
10	10	1	
10	10	1	
8	8	0.8	
10	10	1	
2	2	0.2	
30	30	3	
1	1	0.1	

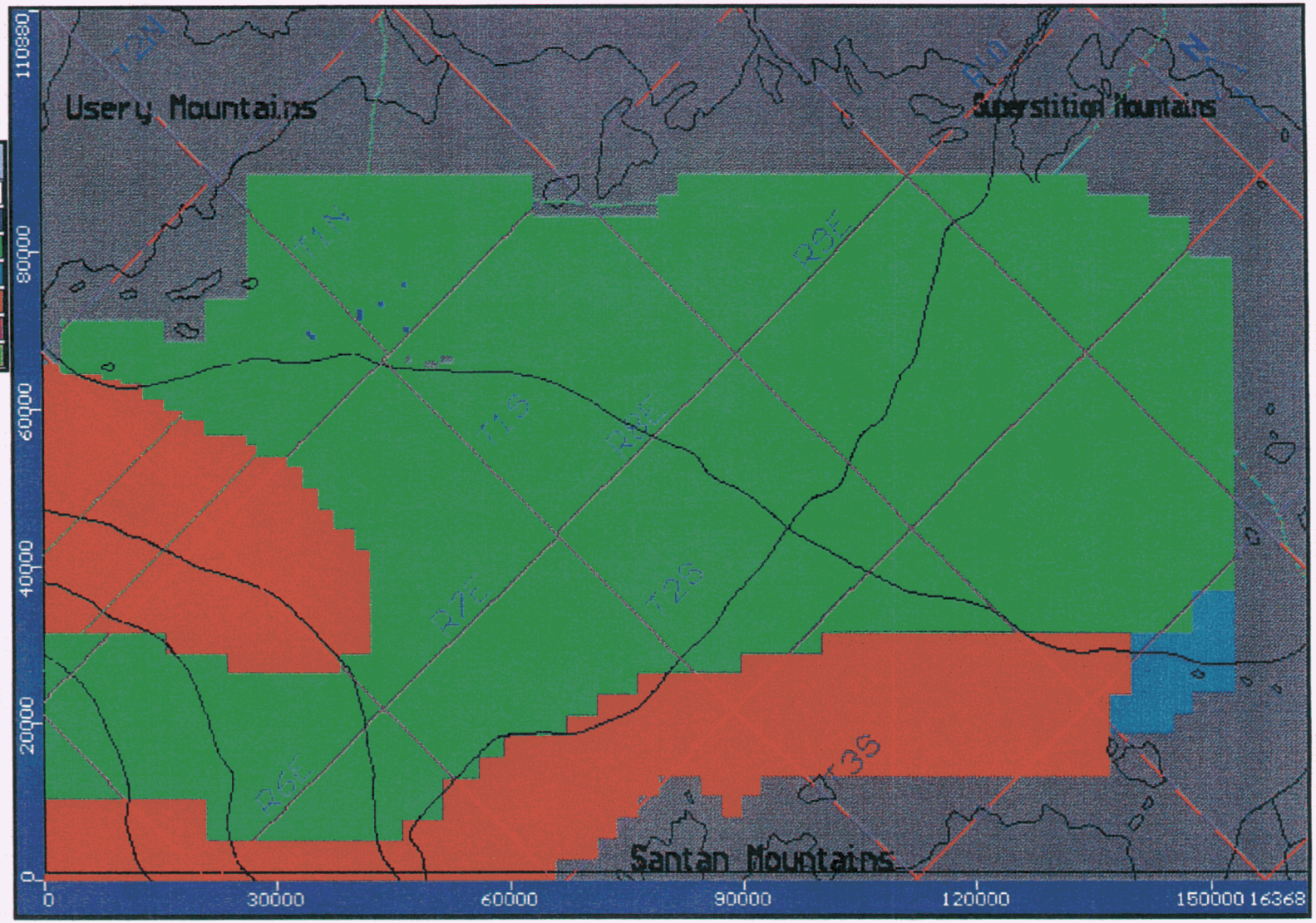


CLEAR CREEK ASSOCIATES

Figure 16
Hydraulic Conductivity Values
Model Layer 2 (feet/day)
Arizona Water Company Project

Explanation

Ss [1/ft]	Sy [-]	Eff.Por[-]	Tot.Por[-]	Color
0.1	0.1	0.2	0.2	
1E-6	0.1	0.2	0.2	
1E-6	0.1	0.2	0.2	
1E-6	0.15	0.2	0.2	
1E-6	0.1	0.2	0.2	
1E-6	0.09	0.2	0.2	
1E-6	0.1	0.2	0.2	

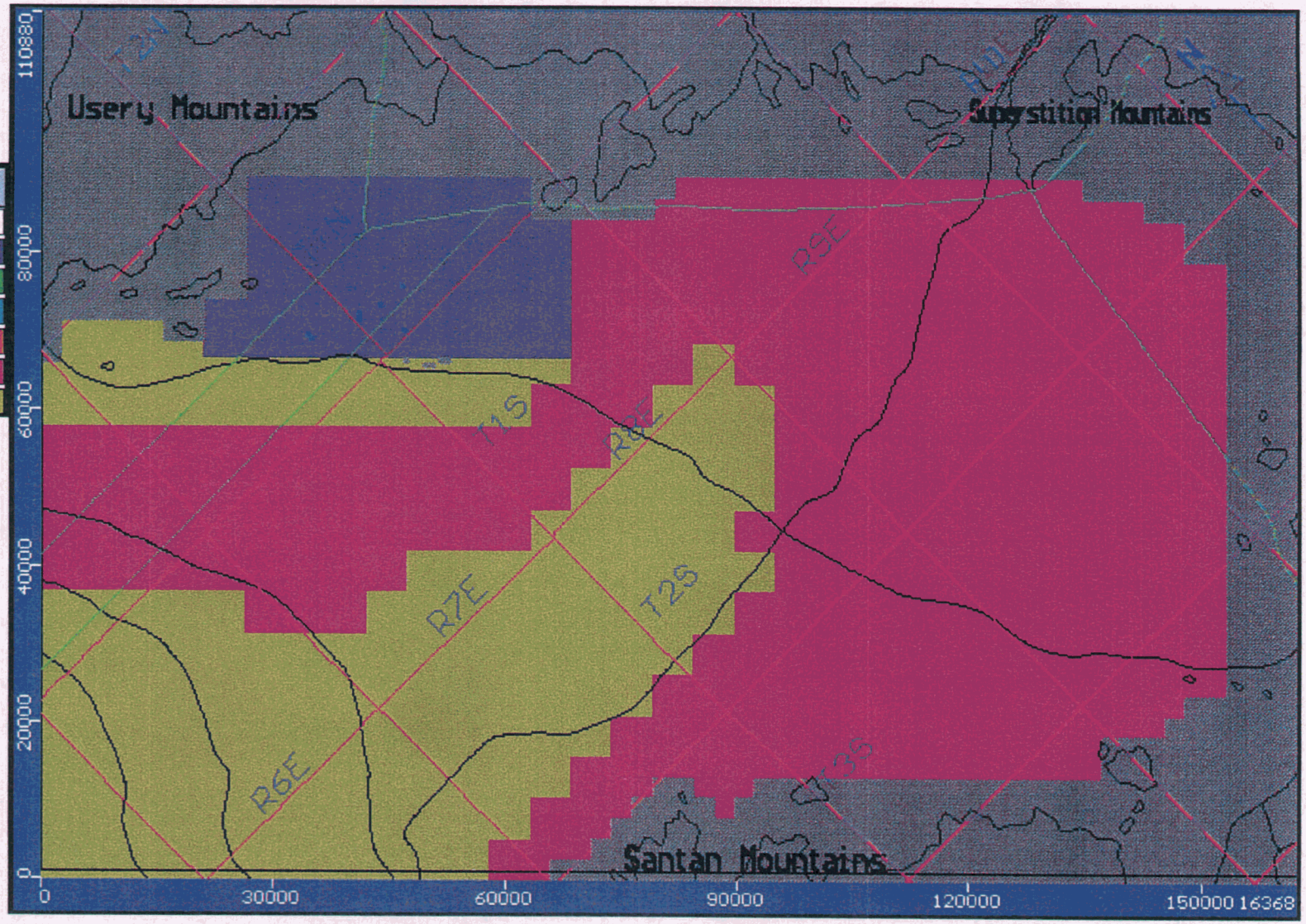


CLEAR CREEK ASSOCIATES

Figure 17
Specific Yield Values
Model Layer 1 (dimensionless)
Arizona Water Company Project

Explanation

Ss [1/ft]	Sy [-]	Eff.Por[-]	Tot.Por[-]	Color
0.1	0.1	0.2	0.2	
1E-6	0.1	0.2	0.2	
1E-6	0.1	0.2	0.2	
1E-6	0.15	0.2	0.2	
1E-6	0.1	0.2	0.2	
1E-6	0.09	0.2	0.2	
1E-6	0.1	0.2	0.2	



CLEAR CREEK ASSOCIATES

Figure 18
Specific Yield Values
Model Layer 2 (dimensionless)
Arizona Water Company Project

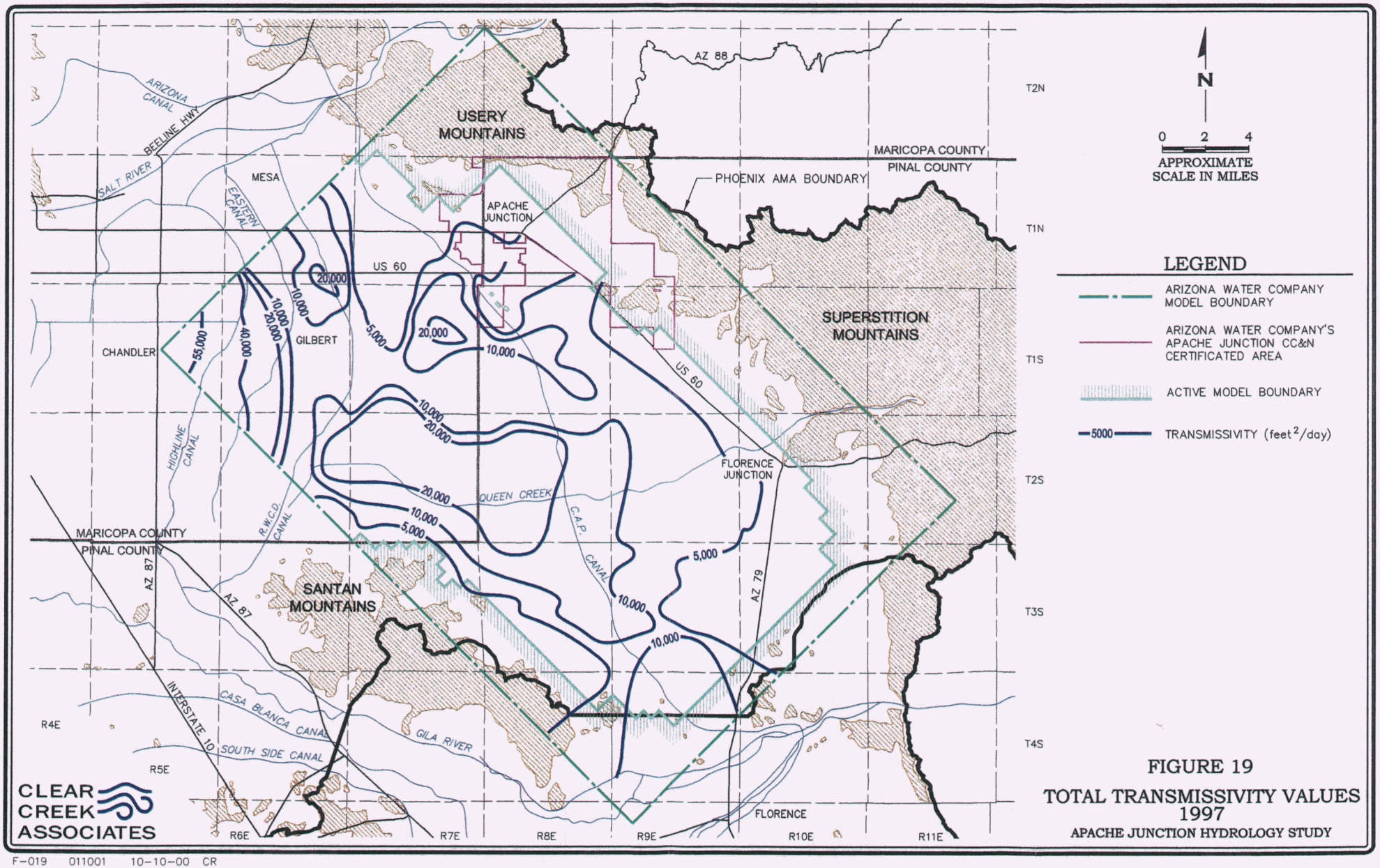


FIGURE 19

TOTAL TRANSMISSIVITY VALUES 1997

APACHE JUNCTION HYDROLOGY STUDY

F-019 011001 10-10-00 CR

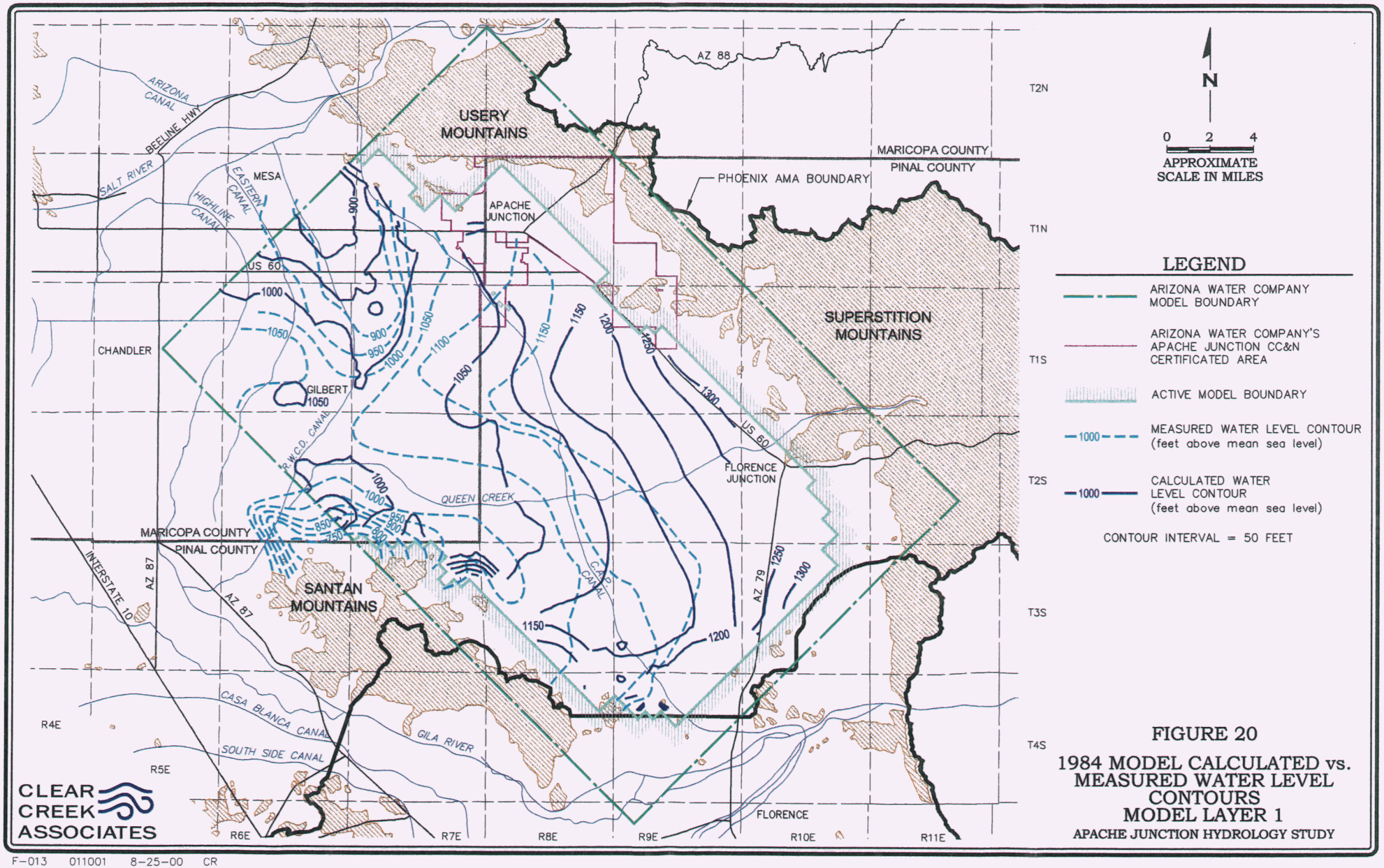


FIGURE 20

1984 MODEL CALCULATED vs. MEASURED WATER LEVEL CONTOURS MODEL LAYER 1

APACHE JUNCTION HYDROLOGY STUDY

F-013 011001 8-25-00 CR

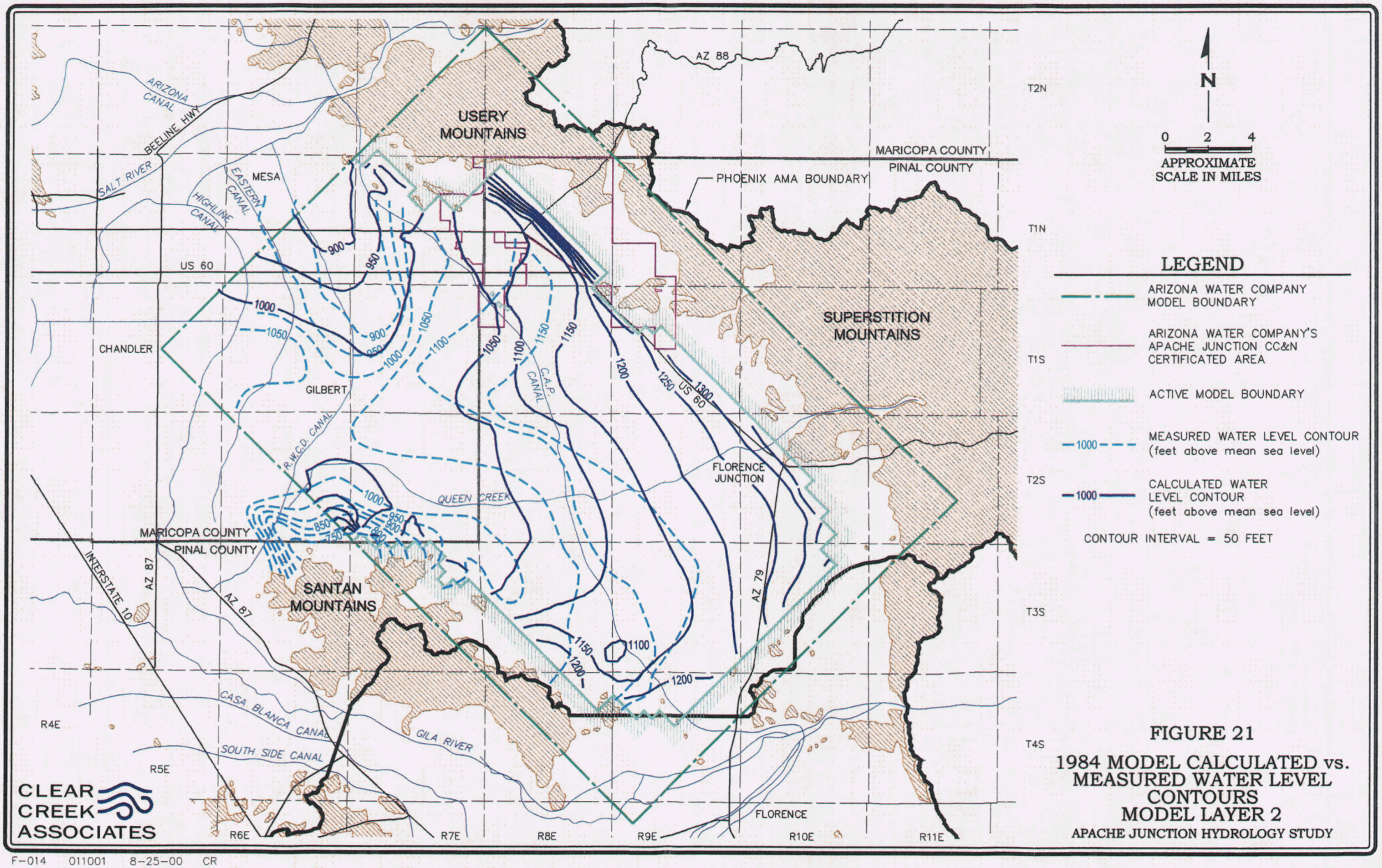


FIGURE 21

1984 MODEL CALCULATED vs. MEASURED WATER LEVEL CONTOURS MODEL LAYER 2

APACHE JUNCTION HYDROLOGY STUDY

F-014 011001 8-25-00 CR

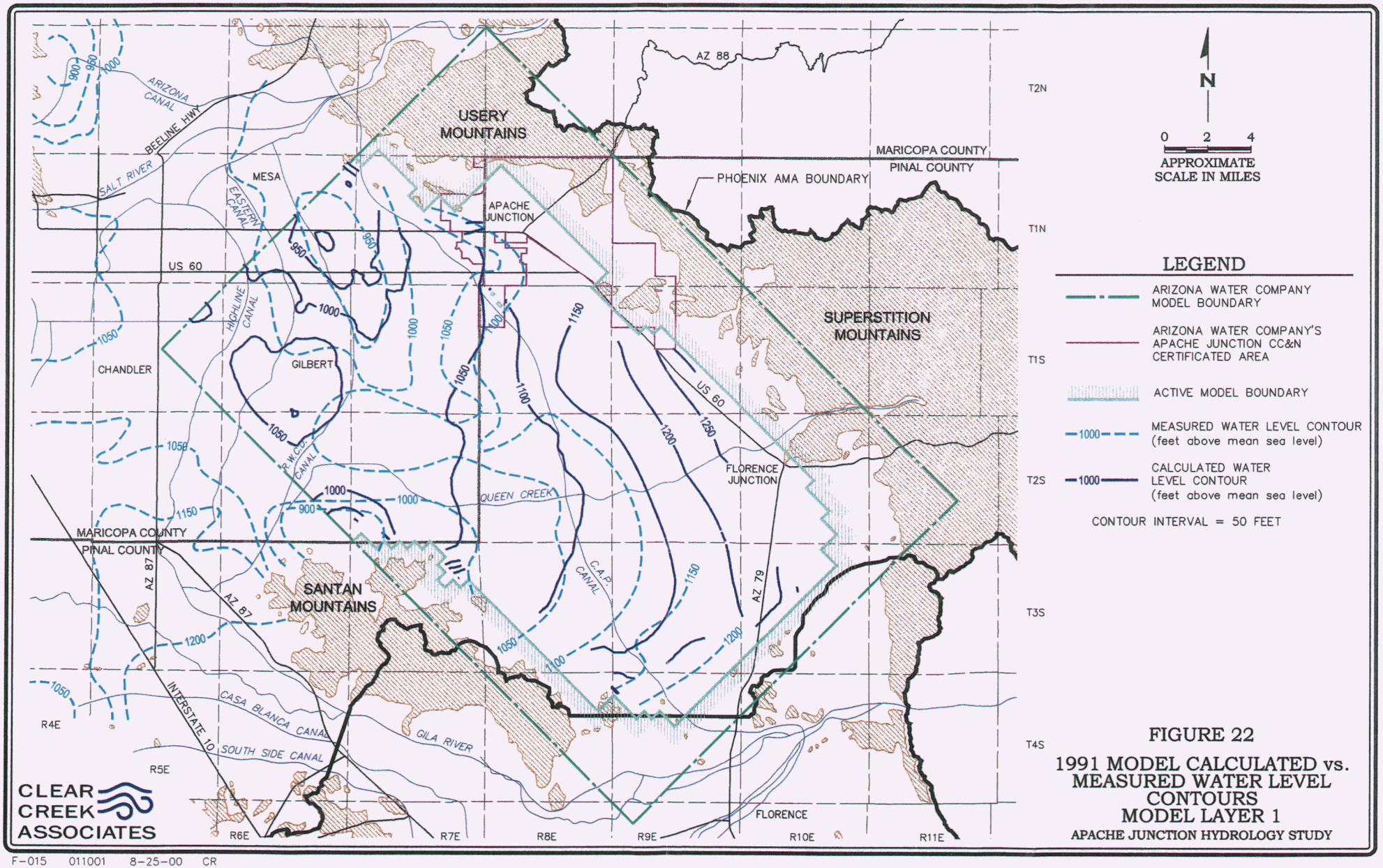


FIGURE 22

1991 MODEL CALCULATED vs. MEASURED WATER LEVEL CONTOURS MODEL LAYER 1

APACHE JUNCTION HYDROLOGY STUDY

F-015 011001 8-25-00 CR

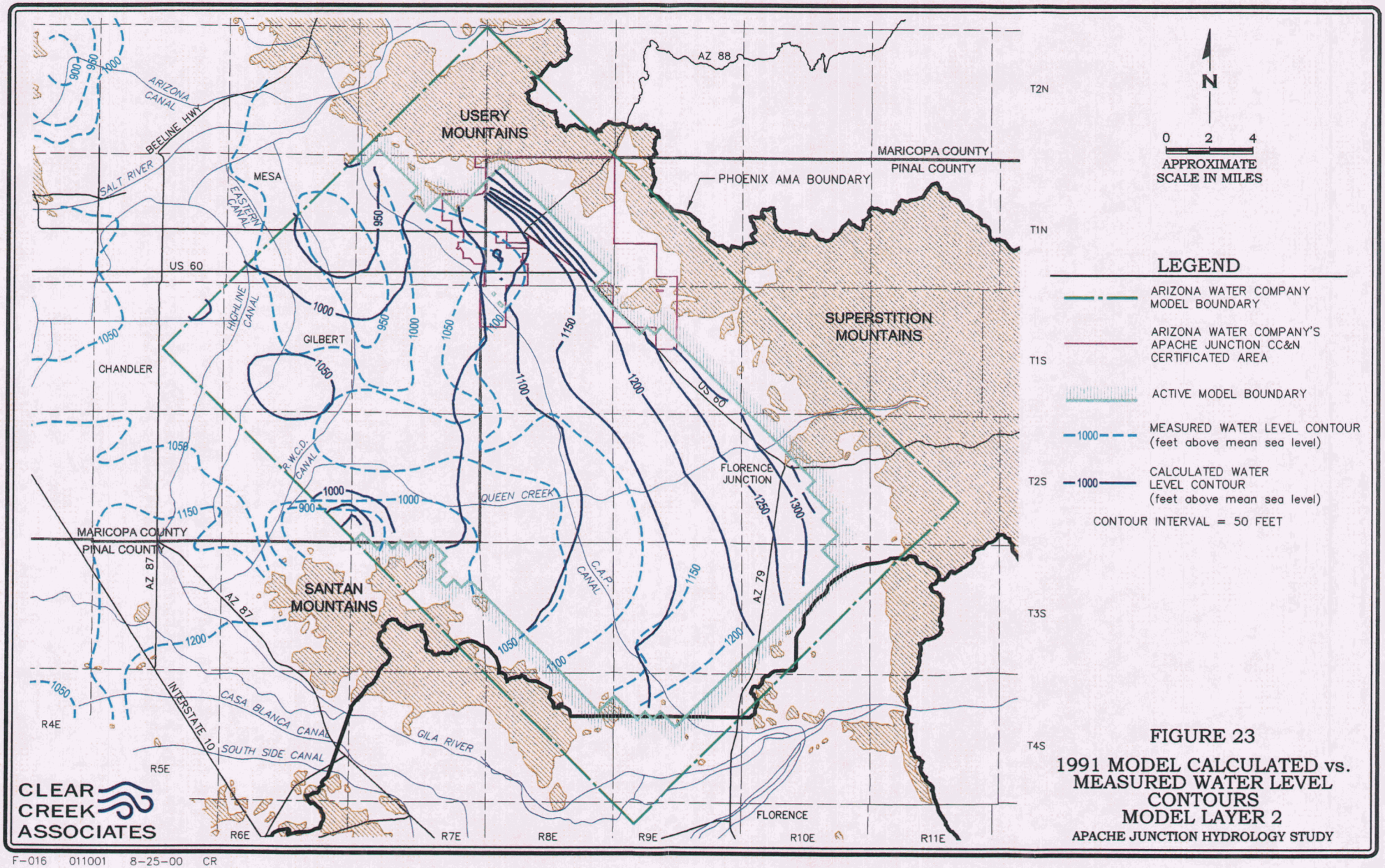


FIGURE 23

1991 MODEL CALCULATED vs. MEASURED WATER LEVEL CONTOURS MODEL LAYER 2

APACHE JUNCTION HYDROLOGY STUDY

F-016 011001 8-25-00 CR

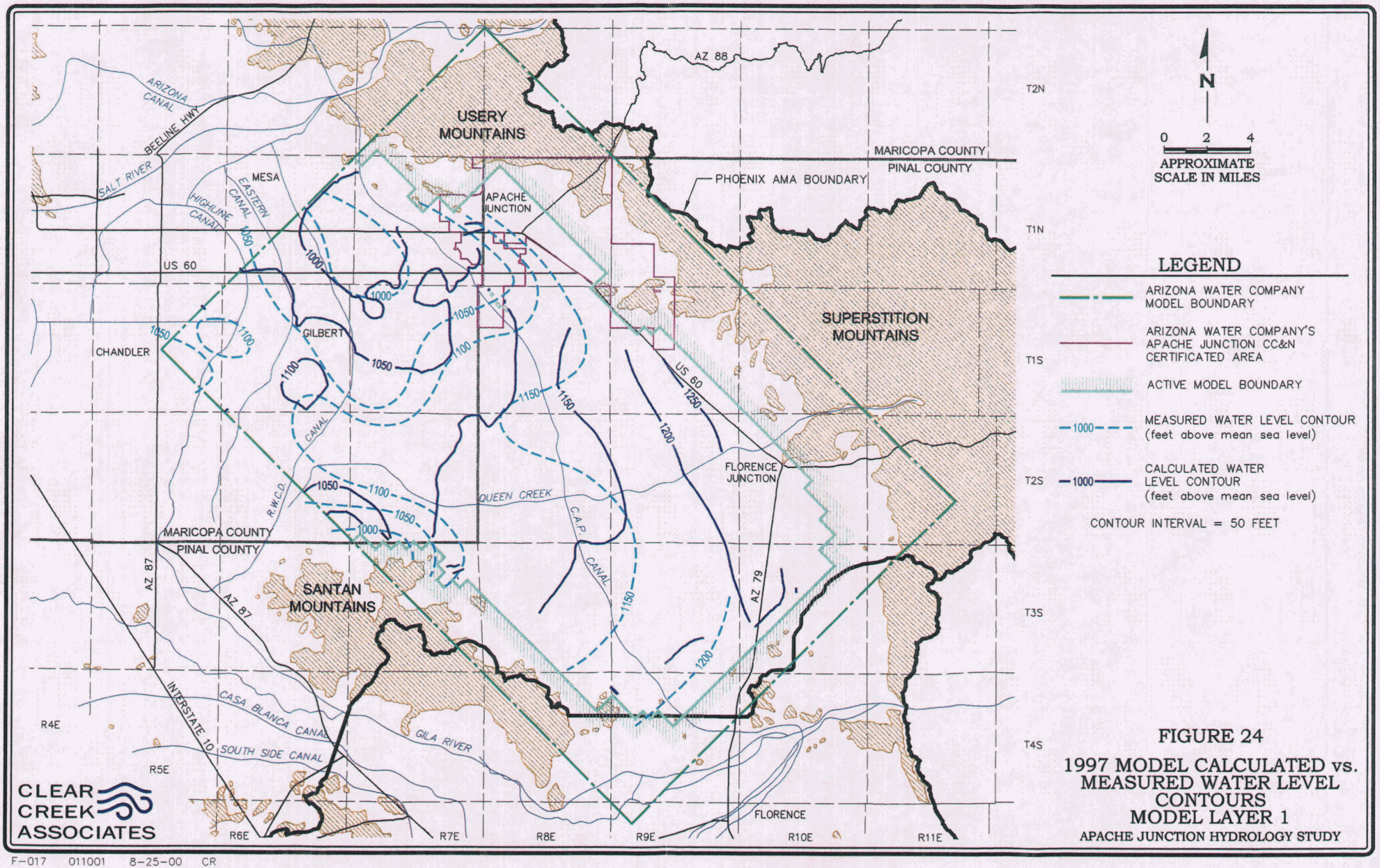


FIGURE 24

1997 MODEL CALCULATED vs. MEASURED WATER LEVEL CONTOURS MODEL LAYER 1

APACHE JUNCTION HYDROLOGY STUDY

F-017 011001 8-25-00 CR

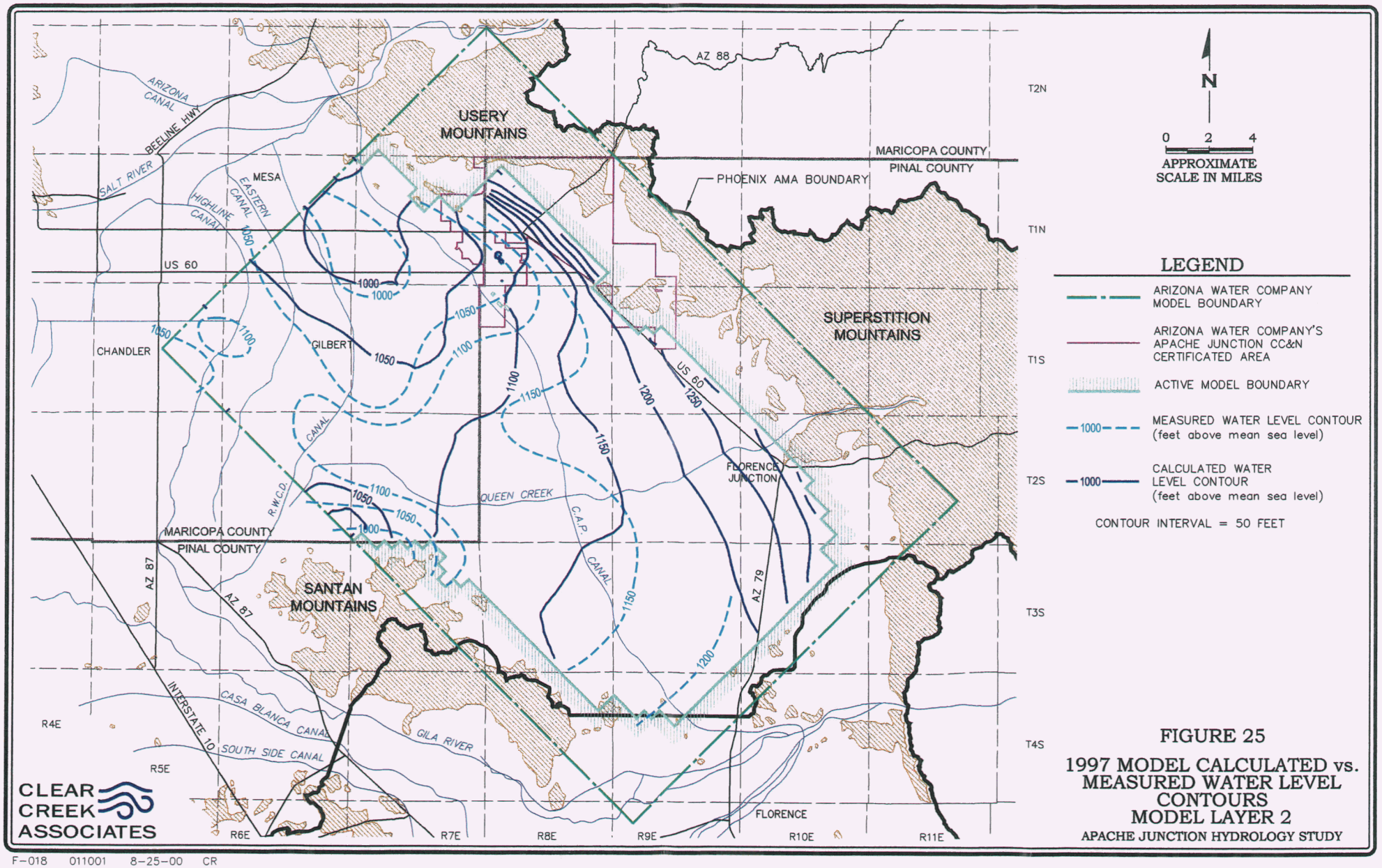


FIGURE 25

1997 MODEL CALCULATED vs. MEASURED WATER LEVEL CONTOURS MODEL LAYER 2

APACHE JUNCTION HYDROLOGY STUDY

F-018 011001 8-25-00 CR

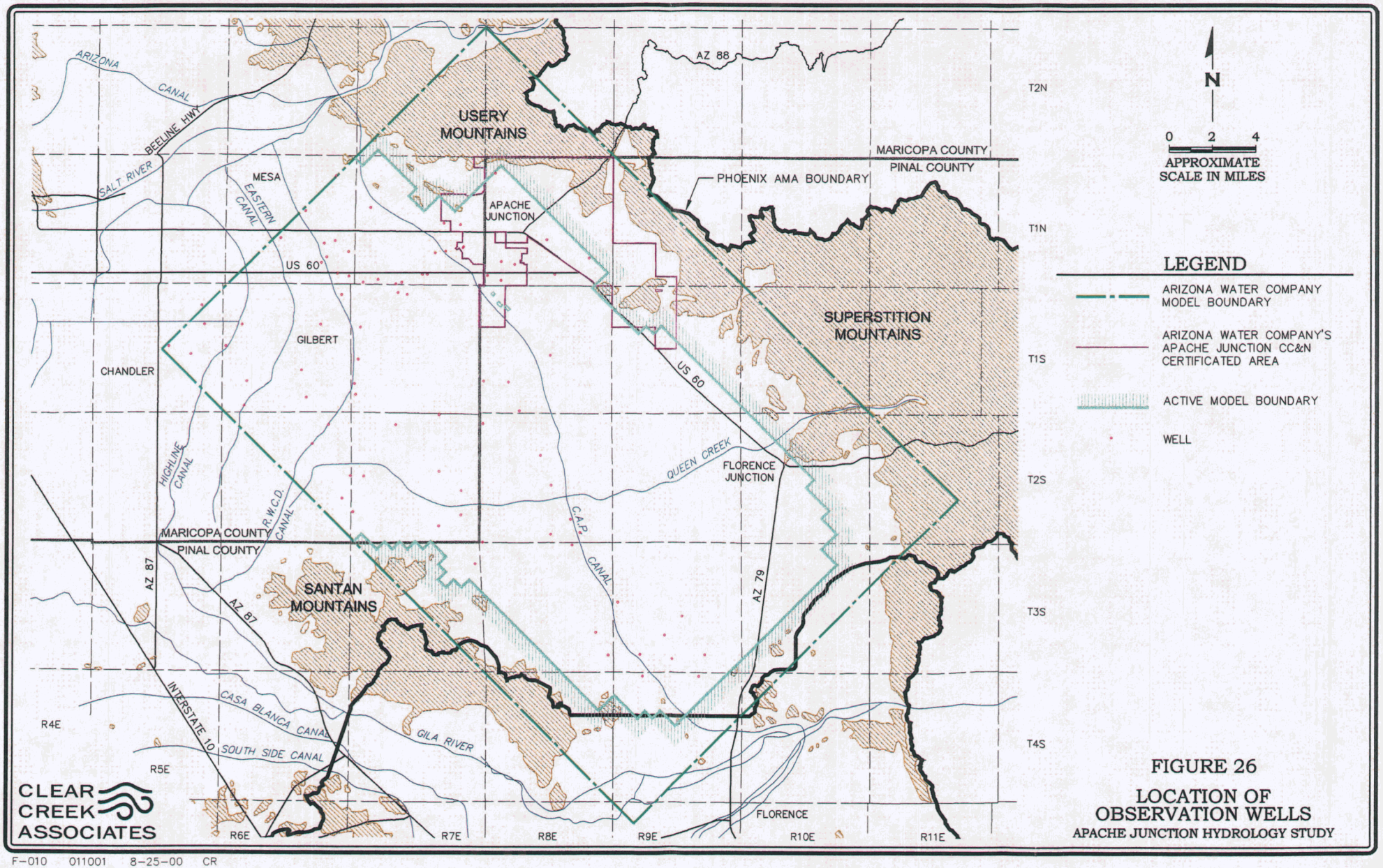


FIGURE 26

LOCATION OF OBSERVATION WELLS

APACHE JUNCTION HYDROLOGY STUDY

F-010 011001 8-25-00 CR

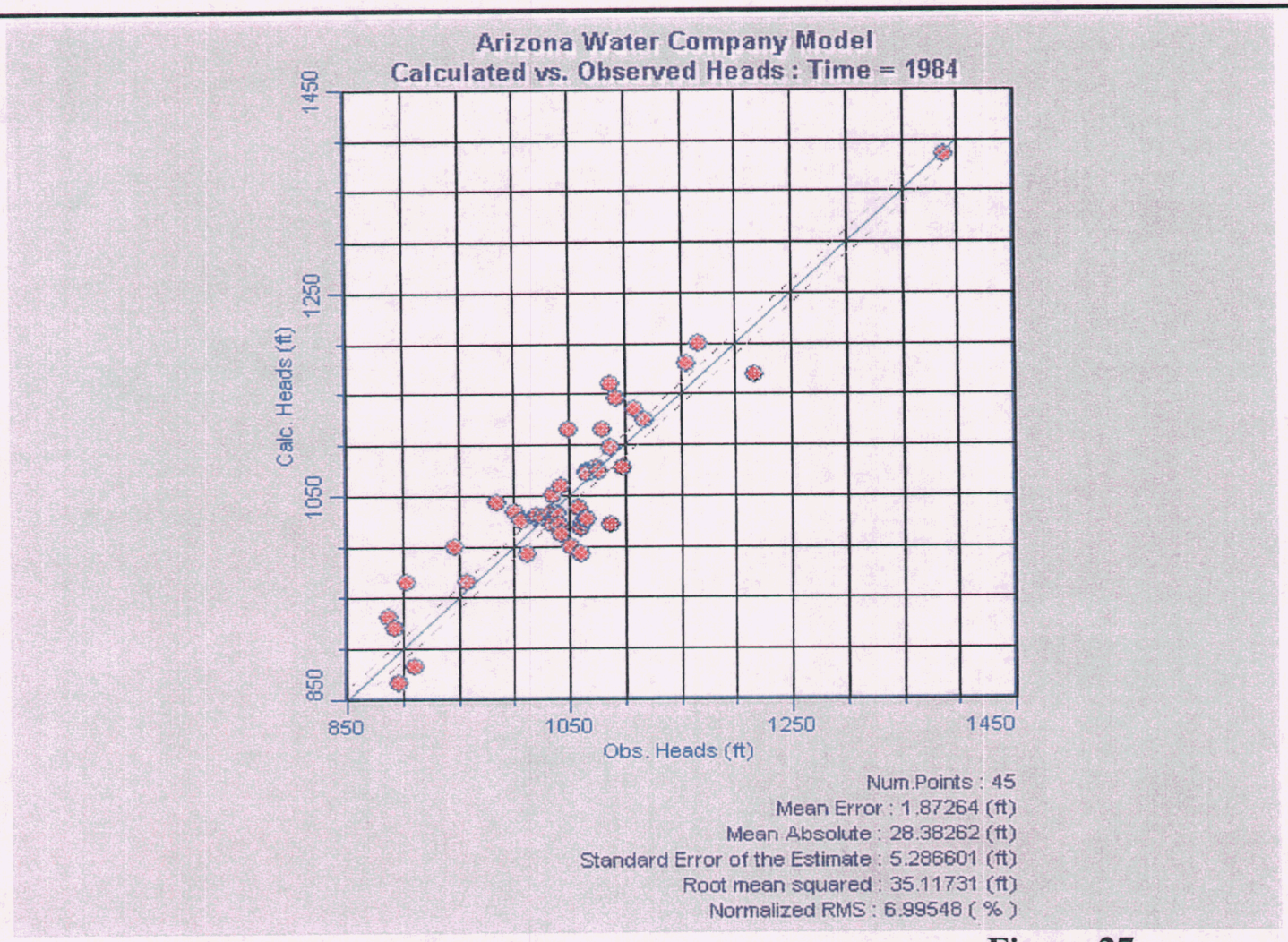


Figure 27

1984 MODEL CALCULATED vs OBSERVED WATER LEVELS

APACHE JUNCTION HYDROLOGY STUDY

CLEAR CREEK ASSOCIATES

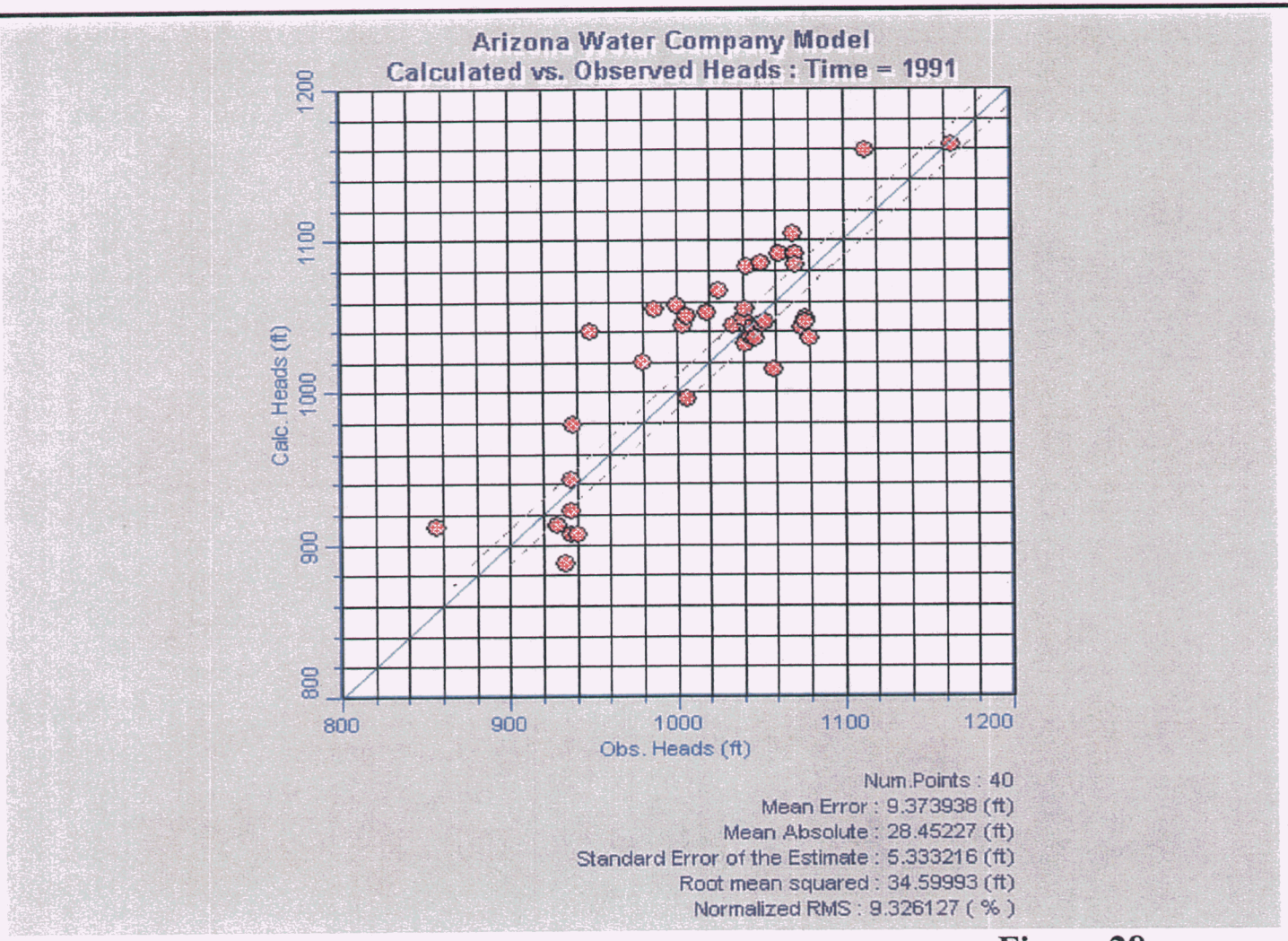


Figure 28

1991 MODEL CALCULATED vs OBSERVED WATER LEVELS

APACHE JUNCTION HYDROLOGY STUDY

CLEAR CREEK ASSOCIATES

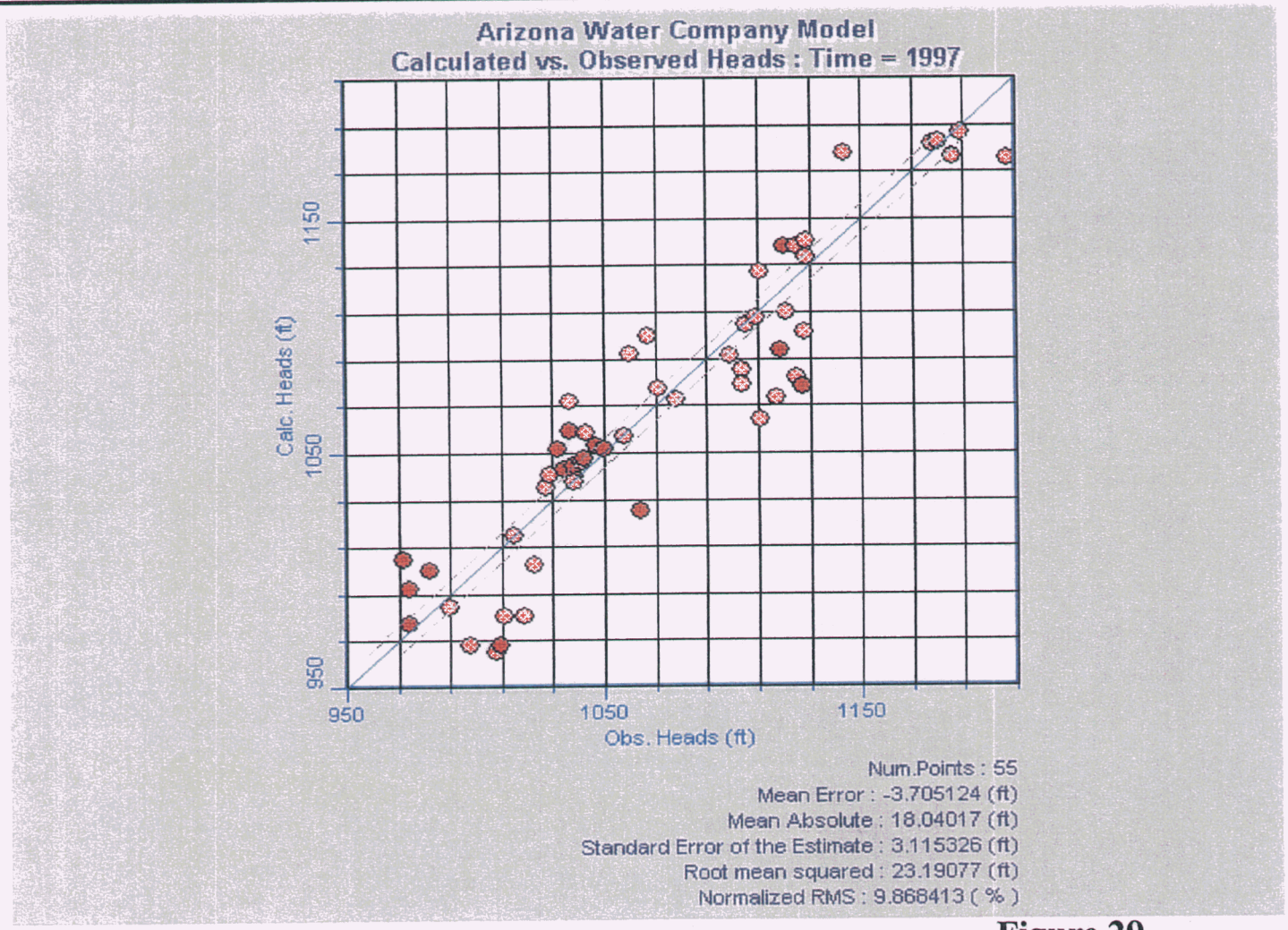


Figure 29

1997 MODEL CALCULATED vs OBSERVED WATER LEVELS

APACHE JUNCTION HYDROLOGY STUDY

CLEAR CREEK ASSOCIATES

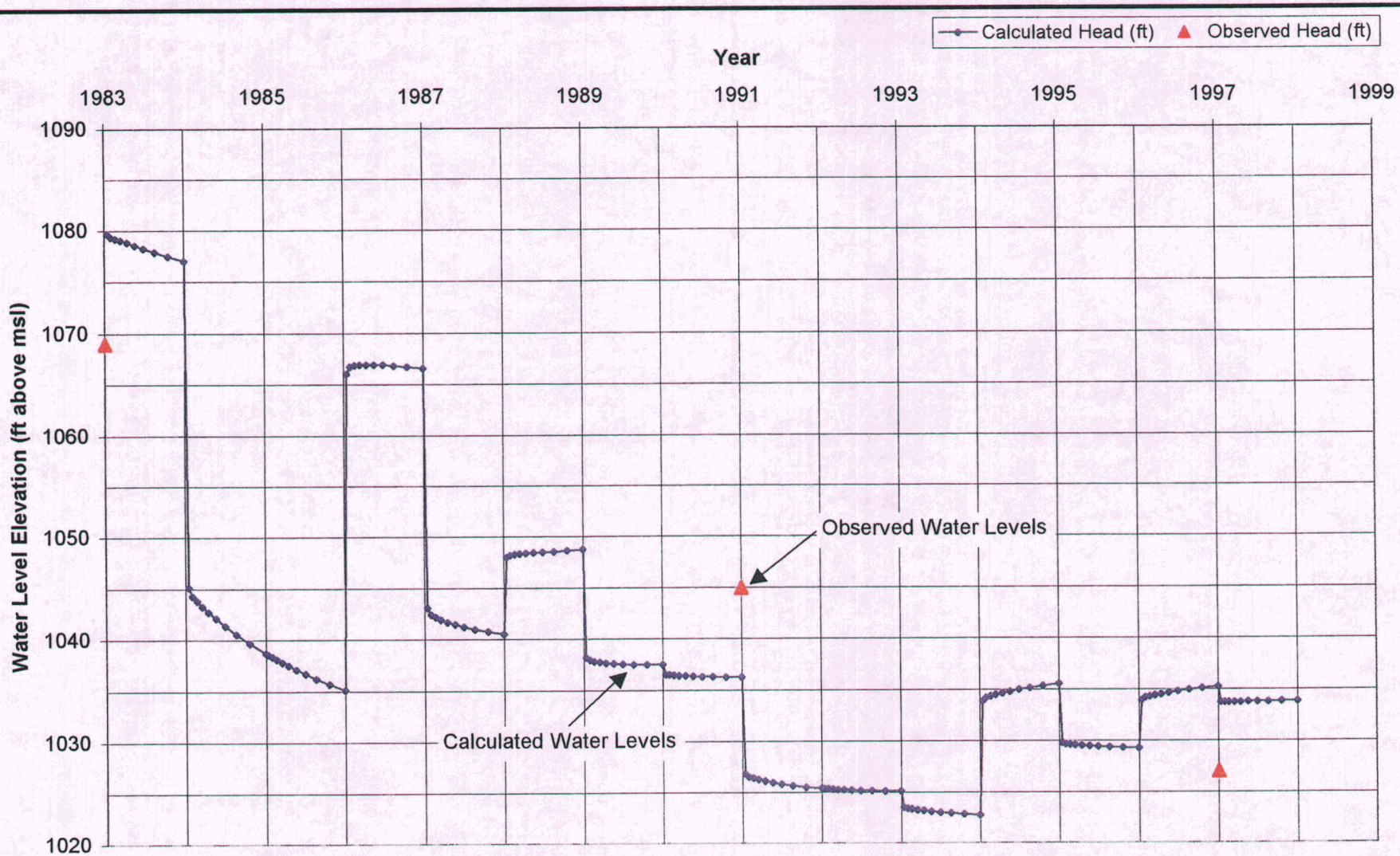


Figure 30

WELL No. 12 (A(01-08)30DCC) CALCULATED vs OBSERVED WATER LEVELS

APACHE JUNCTION HYDROLOGY STUDY

CLEAR CREEK ASSOCIATES

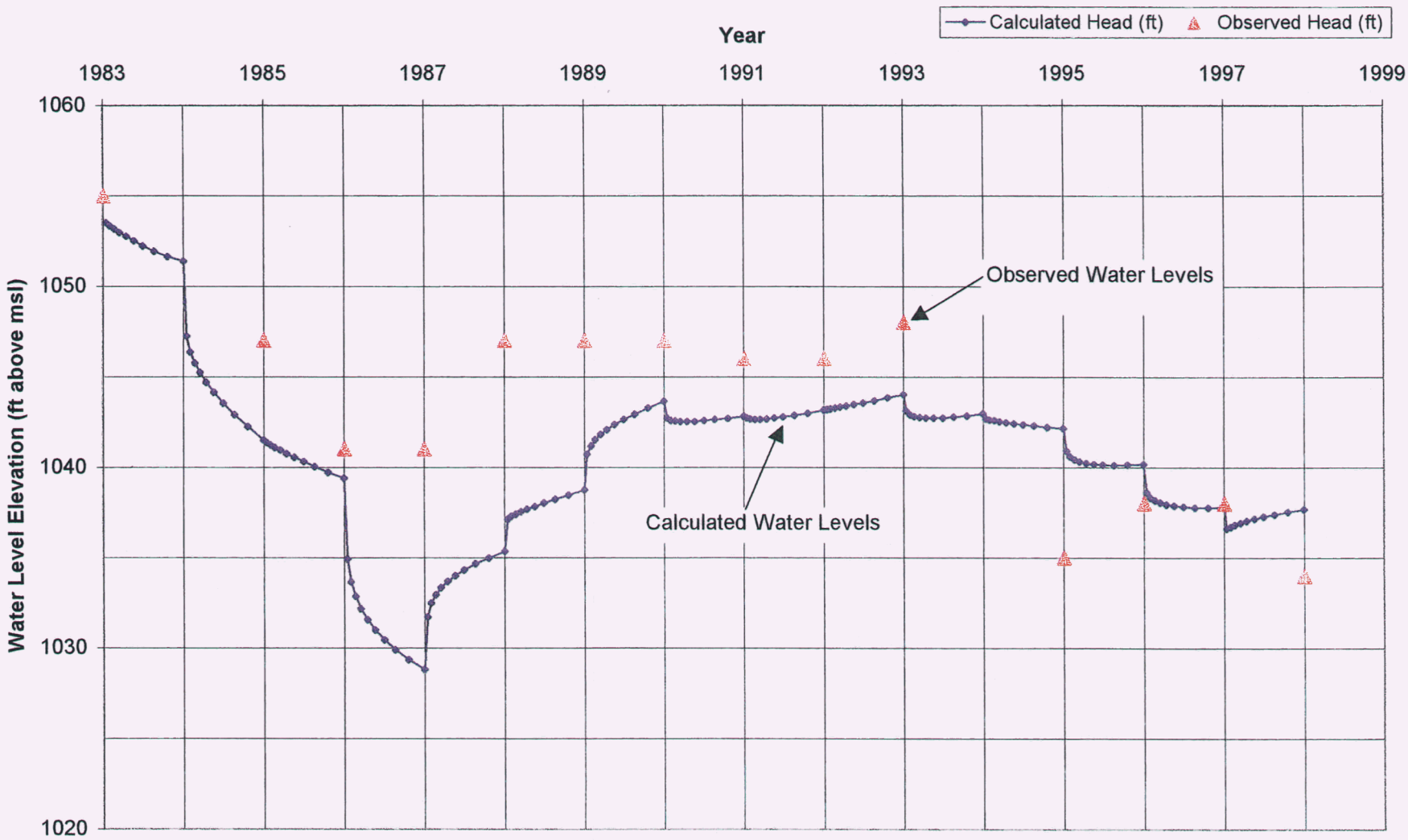


Figure 31

WELL No. 13 (A(01-07)26ADB) CALCULATED vs OBSERVED WATER LEVELS

APACHE JUNCTION HYDROLOGY STUDY

CLEAR CREEK ASSOCIATES

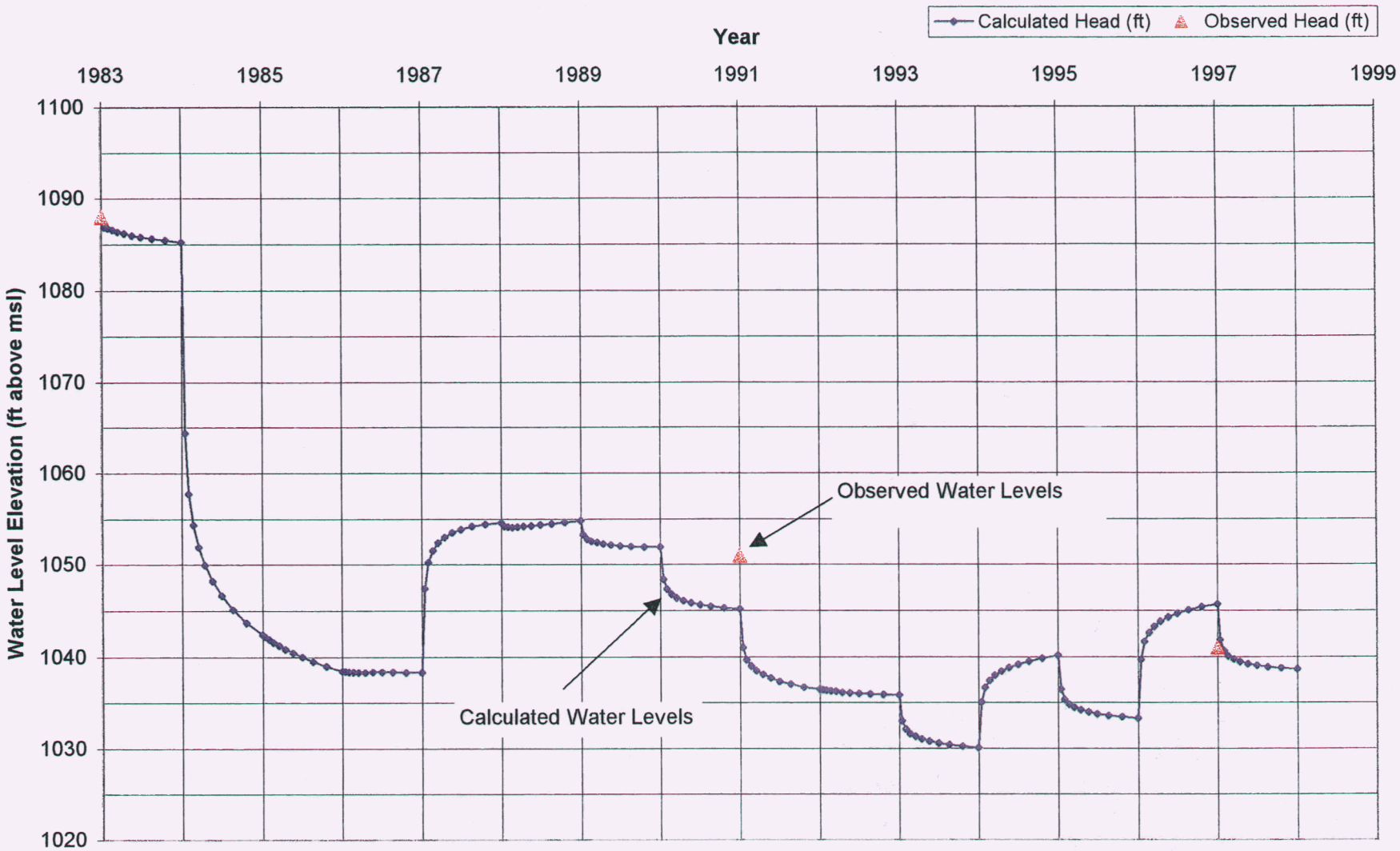


Figure 32

WELL No. 14 (A(01-08)31DCB) CALCULATED vs OBSERVED WATER LEVELS

APACHE JUNCTION HYDROLOGY STUDY

CLEAR CREEK ASSOCIATES

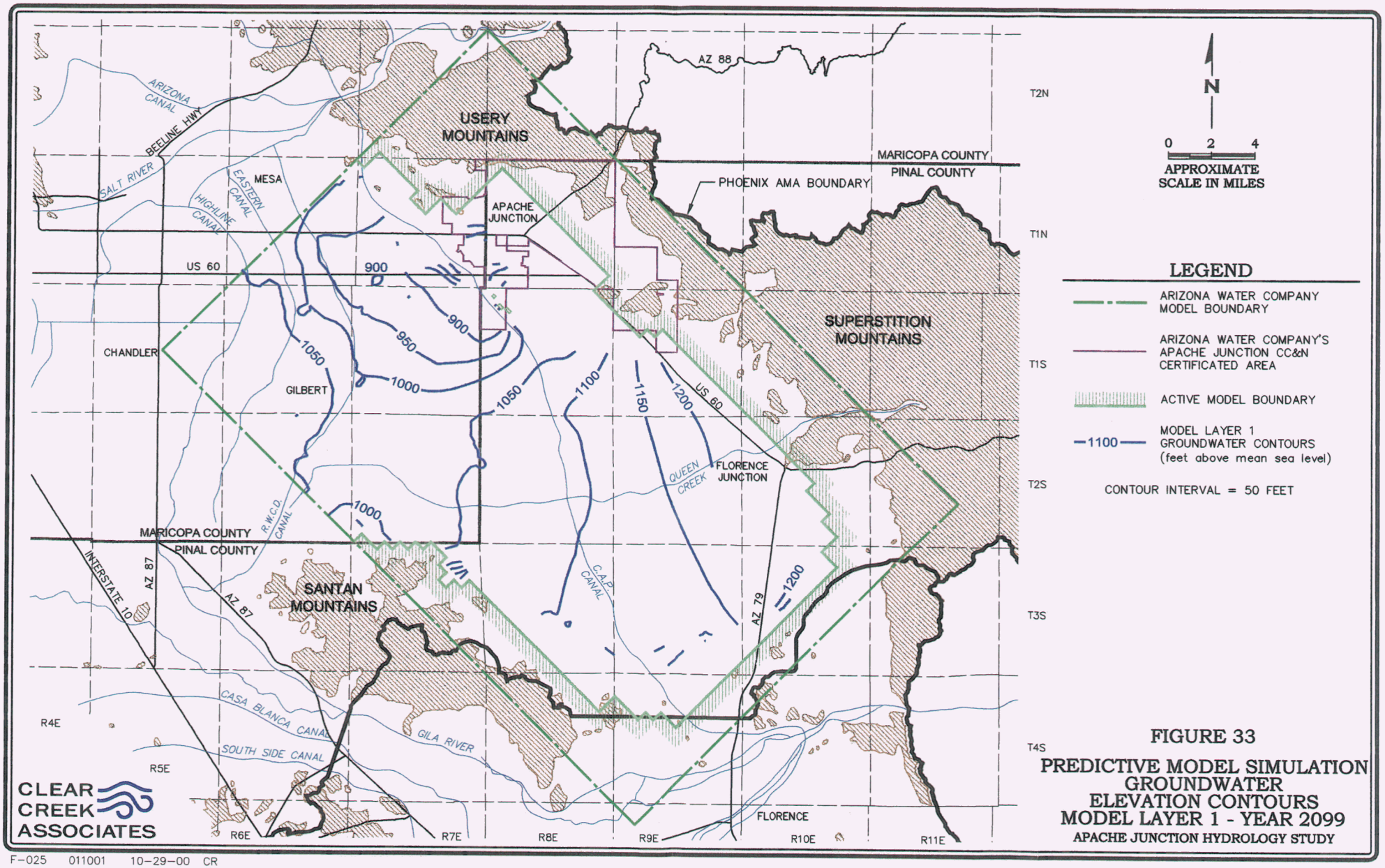


FIGURE 33

PREDICTIVE MODEL SIMULATION GROUNDWATER ELEVATION CONTOURS MODEL LAYER 1 - YEAR 2099

APACHE JUNCTION HYDROLOGY STUDY

F-025 011001 10-29-00 CR

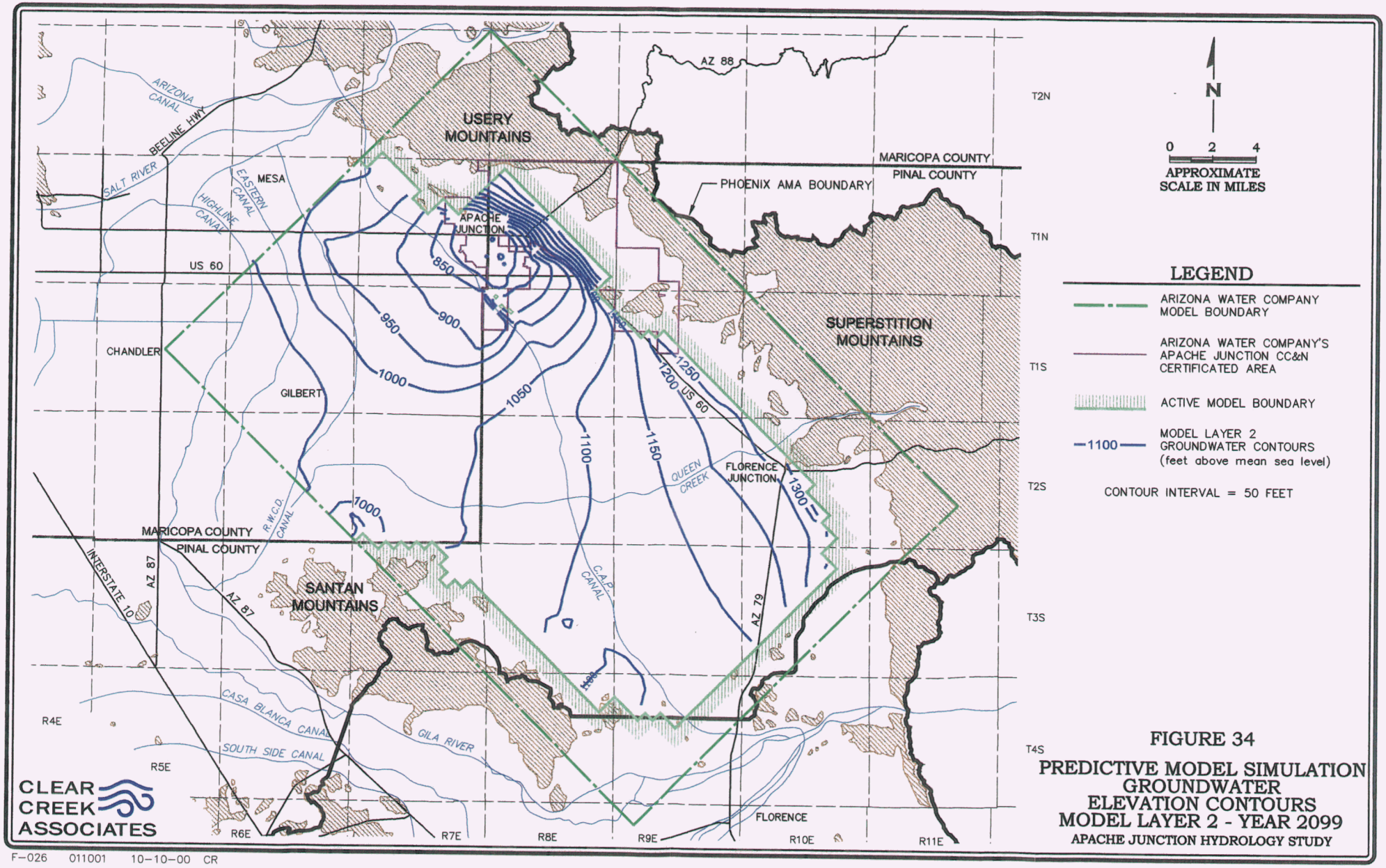


FIGURE 34

PREDICTIVE MODEL SIMULATION GROUNDWATER ELEVATION CONTOURS MODEL LAYER 2 - YEAR 2099

APACHE JUNCTION HYDROLOGY STUDY

F-026 011001 10-10-00 CR

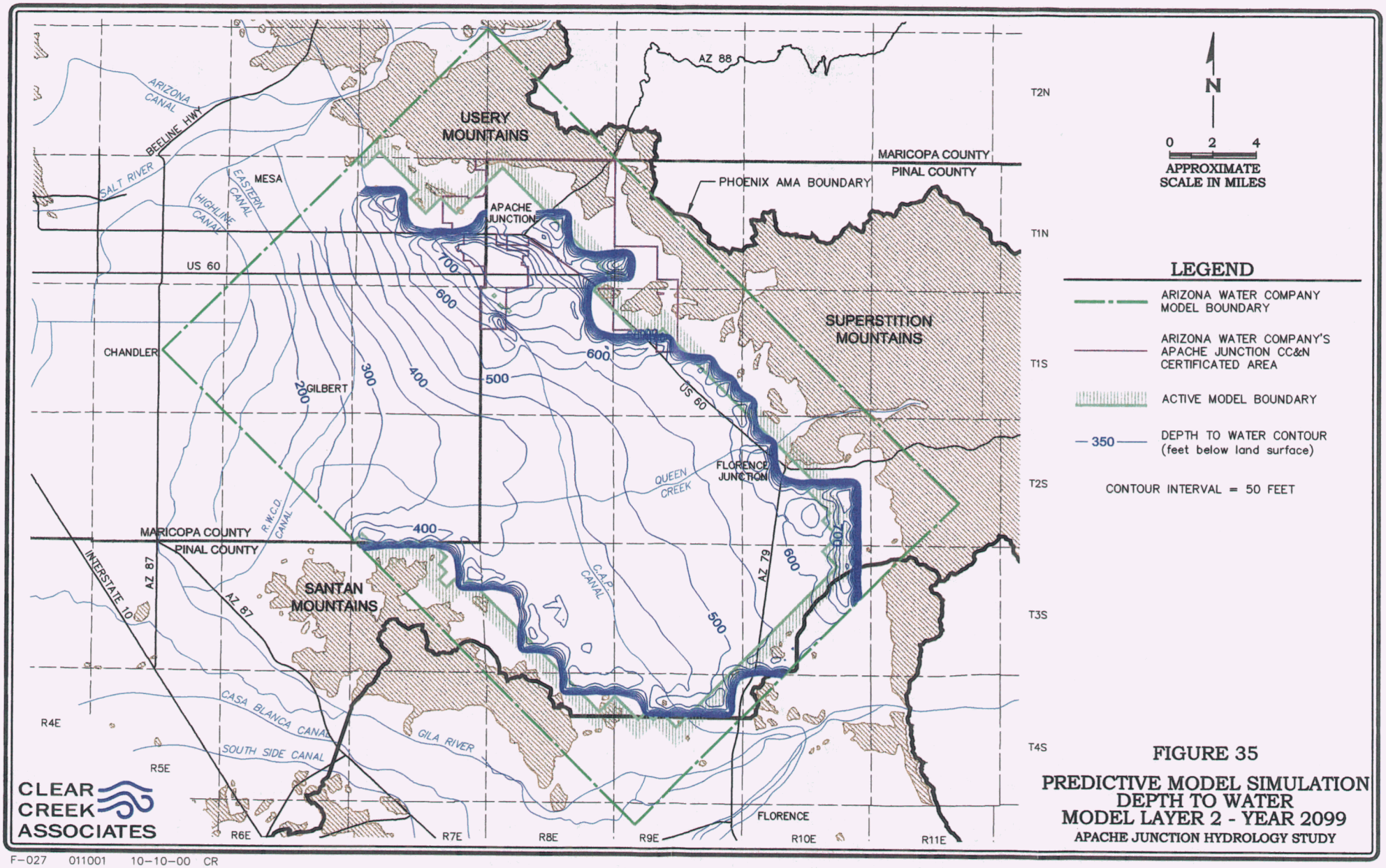


FIGURE 35

PREDICTIVE MODEL SIMULATION
DEPTH TO WATER
MODEL LAYER 2 - YEAR 2099

APACHE JUNCTION HYDROLOGY STUDY

F-027 011001 10-10-00 CR

TABLE 1
SPECIFIC CAPACITY DATA AND TRANSMISSIVITY VALUES
APACHE JUNCTION MODEL STUDY AREA

Location	Well Elevation (Ft. amsl)	Well Depth (Feet)	Discharge Date	Discharge Rate (GPM)	Production Level (Feet)	Static Level (Feet)	Specific Capacity (GPM/Ft)	Drawdown (Feet)	Transmissivity (GPD/Ft)	Transmissivity (Ft2/D)
A-01-06 01CCC2	1456	814		1500	385	365	75	20	150,000	20,013
A-01-06 06BBB	1256.3	200		3385	182	51	25.8	131	51,679	6,895
A-01-06 07BCC	1279	997	04-Aug-80	2514	325.9	296.2	84.6	29.7	169,293	22,587
A-01-06 22BCD	1317	1004	19-Jun-97	2626	375	305.7	37.9	69.3	75,786	10,112
A-01-06 23DAA	1375.7	600		22	230	229	22	1	44,000	5,871
A-01-06 30ABA1	1251.9	196		3035	162	49	26.9	113	53,717	7,167
A-01-07 26AAC2	1570	1000	05-Aug-77	1200	499	481	66.7	18	133,333	17,790
A-01-07 36DAA5	1560	1275	30-Apr-79	550	678.8	468.5	2.6	210.3	5,231	698
A-01-08 31DCB	1580	1000		1027	575	454	8.5	121	16,975	2,265
D-01-05 11AAA1	1221	154		1500	118	9	13.8	109	27,523	3,672
D-01-05 13DCD	1237	350		3800	125	90	108.6	35	217,143	28,972
D-01-06 04DAA	1276	800	03-Mar-64	2200	434	329	21	105	41,905	5,591
D-01-06 05CCC1	1248	200		2074	171	45	16.5	126	32,921	4,392
D-01-06 13BBA	1305	724	05-Jan-49	4490	193	173	224.5	20	449,000	59,907
D-01-06 15BAA	1277	418		4171	254	116	30.2	138	60,449	8,065
D-01-06 19DAA	1254	900		3800	166	134	118.8	32	237,500	31,688
D-01-06 21CCC2	1268	1070	04-Feb-80	3000	325	283	71.4	42	142,857	19,060
D-01-06 32BAA	1269	1000		3000	182	142	75	40	150,000	20,013
D-01-07 05BBB	1388	735		2245	266	246	112.3	20	224,500	29,953
D-01-07 06ABB1	1370	496		2500	269	249	125	20	250,000	33,356
D-01-07 06ABB3	1369	930	04-Sep-97	1851	459.8	395.3	28.7	64.5	57,395	7,658
D-01-07 07AAA1	1360	700	01-Apr-46	3500	237	217	175	20	350,000	46,698
D-02-06 07CDD2	1258	800		2250	257	124	16.9	133	33,835	4,514
D-02-06 09DCC2	1294	800		2531	322	160	15.6	162	31,247	4,169
D-02-06 11DDD	1333	400	23-Feb-50	1400	225	170	25.5	55	50,909	6,792
D-02-06 16AAD	1304	610	01-Jul-48	3000	368	142	13.3	226	26,549	3,542
D-02-07 03CDD	1408	520		2000	167	132	57.1	35	114,286	15,248
D-02-07 04ADD	1390	1524	17-Jan-52	2400	462	182	8.6	280	17,143	2,287
D-02-07 04ADD	1390	1524	20-Jun-85	1020	502.2	311.9	5.4	190.3	10,720	1,430
D-02-07 16DDD1	1407	420		1750	156	145	159.1	11	318,182	42,453
D-02-07 17ADA	1383	601		2800	250	180	40	70	80,000	10,674
D-02-08 33AAA1	1528	674		2500	213	198	166.7	15	333,333	44,474
D-03-08 36AAA1	1537	507		2400	190	180	240	10	480,000	64,043
D-03-09 20AAA1	1594	781	31-May-42	2000	235	225	200	10	400,000	53,369
D-03-09 31AAA1	1552	740	01-Apr-60	2185	375.5	350	85.7	25.5	171,373	22,865
D-04-09 05AAB1	1555	403	07-Jul-55	2150	225	207	119.4	18	238,889	31,873

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Table 2.
Aquifer Test Results for Selected Arizona Water Company Wells

Well ID.	Transmissivity (from analysis of pumping tests or specific capacity)		Hydraulic Conductivity (based on perforated interval)	Hydraulic Conductivity (based on total aquifer thickness)	Hydraulic Conductivity (average)
	gpd/ft	sq ft/day	ft/day	ft/day	ft/day
Arizona Water Co. Well No. 12	4,140	553	2	0.7	1.4
Arizona Water Co. Well No. 13	167,200	22,353	117	29.8	73.4
Arizona Water Co. Well No. 14	8,507	1,137	3	1.5	2.3
Arizona Water Co. Well No. 15	198,000	26,471	39	35.3	37.1

Notes: Estimates based on pumping and recovery tests

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Table 3.

1984 to 1998 Transient Model Stress Periods

Stress Period No.	Year	Cumulative Days
1	1984	365
2	1985	730
3	1986	1095
4	1987	1460
5	1988	1825
6	1989	2190
7	1990	2555
8	1991	2920
9	1992	3285
10	1993	3650
11	1994	4015
12	1995	4380
13	1996	4745
14	1997	5110
15	1998	5475

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TABLE 4

APACHE JUNCTION MODEL CHARACTERISTICS

Model Characteristic	Description	Units
Transient Calibration Period	December 1983 to December 1998	time = days
Predictive Model Simulation	December 1999 to December 2099	time = days
Model Grid	73 rows by 104 columns	length = feet
Model Cell Size	½ mile by 1 mile (320 ac.) to 330 feet by 330 feet (2.5 ac.)	length = feet
Model Layer 1 (UAU & MAU)	unconfined aquifer	length = feet
Model Layer 2 (LAU)	confined/unconfined aquifer	length = feet
Horizontal Hydraulic Conductivity	no horizontal anisotropy	feet/day
Vertical Hydraulic Conductivity	ratio of vertical: horizontal conductivity = 1:10	1/day
Specific Yield	volume of water yielded per unit area per unit change in water level	dimensionless
Storage Coefficient	volume of water yielded per unit area per unit change in confined aquifer potentiometric elevation	dimensionless
Recharge	applied to uppermost active model cell	feet/day
Pumpage	distributed to all model layers	$feet^3$/day
Model Cell Types	No-flow, constant head, variable head	
Boundary Conditions	No-flow, time-varying constant head, constant flux	
Numerical Solution Technique	Preconjugate gradient	Closure criteria = 0.01 ft.

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Table 5
MODEL CALCULATED WATER BUDGET - 1984

IN	Acre-feet	Description
Constant Head	6,010	NW & W Model Boundary
Wells 1	1,872	Queen Creek
Wells 2	10,504	Mountain Front Recharge
Recharge	160,788	Agricultural Recharge
Total In	**179,174**	
OUT		
Constant Head	30,892	NW & W Model Boundary
Wells	186,364	Agric & Muni Wells
Total Out	**217,256**	
(In - Out)	-38,081	
% Discrepancy	0.00	

Note: Agricultural Recharge value includes canal leakage.

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Table 6
MODEL CALCULATED WATER BUDGET - 1991

IN	Acre-Feet	Description
Constant Head	12,296	NW & W Model Boundary
Wells 1	1,872	Queen Creek
Wells 2	10,504	Mountain Front Recharge
Recharge	178,618	Agricultural Recharge
Total In	**203,290**	
OUT		
Constant Head	9,710	NW & W Model Boundary
Wells	146,714	Agric & Muni Wells
Total Out	**156,424**	
(In - Out)	46,866	
% Discrepancy	0.00	

Note: Agricultural Recharge value includes canal leakage.

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Table 7

MODEL CALCULATED WATER BUDGET - 1997

IN	Acre-Feet	Description
Constant Head	15,761	NW & W Model Boundary
Wells 1	1,872	Queen Creek
Wells 2	9,859	Mountain Front Recharge
Recharge	178,618	Agricultural Recharge
Total In	**206,110**	
OUT		
Constant Head	18,362	NW & W Model Boundary
Wells	89,687	Agric & Muni Wells
Total Out	**108,048**	
(In - Out)	98,062	
% Discrepancy	0.00	

Note: Agricultural Recharge value includes canal leakage.

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TABLE 8
MODEL CALCULATED WATER BUDGET 1984 TO 1998

Model Calculated Water Budget 1984 to 1998		
IN	***Acre-Feet***	**Description**
Constant Head	155,109	NW & W Model Boundary
Wells	182,419	Queen Creek
Recharge	2,643,613	Mountain Front Recharge
Total In	**2,981,141**	Agricultural Recharge
OUT		
Constant Head	263,570	
Wells	1,907,953	*Agric & Muni Wells*
Total Out	**2,171,524**	
(In - Out)	*809,618*	
% Discrepancy	0.00	

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Table 9.
Summary of Sensitivity Analysis

Model Input Parameter	In-Out (ac-ft)	Difference in In-Out (ac-ft)	% Change In Storage[1]	Sensitivity Rank-Change In Storage[2]	RMS % Error	Difference in RMS % Error[3]	Normalized[4]	Approximate Water Level in project area (feet above mean sea level)	Approximate Head Change Across Project Area (feet)	Sensitivity Rank-Heads[5]
Model Calculated - 1984 to 1997	**559,314**				**9.868**			**1035' to 1350'**		
Agricultural Recharge -25%	128,394	-430,920	-77.04	1	14.656	4.788	1.000	1025' to 1350'	▼ 10'	1
Agricultural Recharge +25%	988,617	429,303	76.76	2	12.898	3.030	0.880	1040' to 1350'	▲10'	2
Hydraulic Conductivity -25%	580,070	20,756	3.71	7	11.030	1.162	0.753	1030' to 1360'	▲▼10'	3
Specific Yield +25%	597,950	38,636	6.91	4	10.621	0.753	0.725	1030' to 1350'	▼ 5'	4
Specific Storage +1 order magnitude	588,158	28,844	5.16	5	10.381	0.513	0.708	1035' to 1350'	No Change	5
Specific Yield -25%	511,688	-47,626	-8.52	3	10.189	0.321	0.695	1035' to 1340'	▼ 10'	6
Mountain Front Recharge +25%	561,744	2,430	0.43	9	9.909	0.041	0.676	1035' to 1360'	▲ 10'	7
Mountain Front Recharge -25%	556,884	-2,430	-0.43	10	9.836	-0.032	0.671	1035' to 1340'	▼ 10'	8
Specific Storage -1 order magnitude	556,358	-2,956	-0.53	8	9.822	-0.046	0.670	1035' to 1350'	No Change	9
Hydraulic Conductivity +25%	537,608	-21,706	-3.88	6	9.723	-0.145	0.663	1035' to 1340'	▲▼ 10'	10

[1]Calculated as the percent change in the water budget from the transient calibrated model (- values indicate defecit from transient model water budget)

[2]Rank based upon absolute value of % Change In Storage

[3]Calculated as the numerical difference between the transient model and the sensitivity run Normalized RMS % errors

[4]Normalized to the maximum percent change in RMS of 14.656%

[5]Sensitivity rank assigned from Normalized RMS values of calculated vs. observed heads. Most sensitive =1; Least Sensitive =10

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Table 10
Summary of Predictive Model Simulation

Arizona Water Co. Well No.	Land Surface Elev. (ft amsl)	WL Elev. Year 1999 (ft amsl)	WL Elev. Year 2099 (ft amsl)	DTW - Year 1999 (ft bls)	DTW - Year 2099 (ft bls)	Model Calc. Drawdown 1999 to 2099 (ft)	Model Depth to Bedrock (ft bls)	Saturated Thickness –Year 2099 (ft)	1999 to 2099 Pumping Rate (acre-feet/year)	Remarks
11	1,529	1,082	765	447	764	317	1,026	262	423	1998 rate
12	1,587	1,075	735	512	852	340	1,587	735	878	1998 rate
13	1,521	1,080	765	441	756	315	1,028	272	1,917	1998 rate
14	1,556	1,080	750	476	806	330	1,150	344	742	1998 rate
15	1,607	1,118	810	489	797	308	1,607	810	1,170	Permitted allotment
16	1,568	1,092	750	476	818	342	1,368	550	1,745	
17 (New Well)	1,455	1,193	885	262	570	308	1,638	1,068	1,745	
18 (New Well)	1,477	1,098	880	379	597	218	1,270	673	1,745	
19 (New Well)	1,578	1,143	855	435	723	288	1,578	855	1,745	
20 (New Well)	1,591	1,138	835	453	756	303	1,591	835	1,745	
21 (New Well)	1,506	1,080	780	426	726	300	996	270	1,080	
22 (New Well)	1,534	1,087	773	447	761	314	1,018	257	1,080	
23 (New Well)	1,576	1,097	755	479	821	342	1,107	286	1,080	
24 (New Well)	1,602	1,104	745	498	857	359	1,173	316	1,080	
25 (New Well)	1,543	1,093	760	450	783	333	1,045	262	1,080	

Annual Pumpage for Wells Nos. 11-15 (acre-feet/yr)	**5,130**
Additional Pumpage for New Wells Nos. 16-25 (acre-feet/yr)	**14,125**
Total Annual Pumpage for Wells Nos. 11-25 (acre-feet/yr)	**19,255**

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Note:
DTW = Depth to Water
WL = Water Level
Ft amsl = Feet Above Mean Sea Level
1999 2099 water level elevations are model calculated.

APPENDIX A
ADWR Registry of Groundwater Rights (ROGR) Database

Regno	Location	Well Depth (ft)	Casing Depth (ft)	Pump Rate (gpm)	Test Rate (gpm)	Draw-down (ft)	Owners Name	Annual Pumpage (acre-feet) 1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
610679	T1N R6E 11AAA	700	700	1,350	1,350	0	US LIFE TITLE CO,	4.0	36.8	449.6	134.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
610677	T1N R6E 11BAA	1,497	1,464	1,500	1,600	0	AMCC, INC.,	5.7	743.0	73.6	970.4	943.9	725.0	0.0	743.0	794.5	895.0	869.0	875.6	1,020.0	1,043.0	732.7
610676	T1N R6E 14AAA	500	0	1,600	0	0	US LIFE TITLE CO,	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	2.0	0.0	0.0	0.0
605618	T1N R6E 15BAA	915	907	900	900	0	IGLEHART,F L	117.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
620495	T1N R6E 15BDB	1,200	1,200	190	190	0	ROOSEVELT WTR DIST,	1,680.0	793.0	1,570.1	33.5	1,453.3	2,001.6	2,033.1	2,116.1	805.2	1,039.6	1,852.9	1,506.2	2,223.5	1,868.1	2,092.2
620496	T1N R6E 15BDD	1,000	1,000	165	165	0	ROOSEVELT WTR DIST,	1,174.0	665.0	1,054.9	31.2	1,115.4	1,470.6	1,462.1	1,380.9	643.7	737.6	1,327.5	1,008.5	204.4	1,054.0	1,296.1
620497	T1N R6E 15DBC	1,200	1,000	210	210	0	ROOSEVELT WTR DIST,	2,205.0	1,300.0	1,773.8	1,717.4	2,018.7	2,089.8	1,887.4	1,921.5	643.1	826.4	1,729.5	881.2	2,113.7	1,451.1	1,047.3
800719	T1N R6E 1CCC	800	750	800	800	0	GATES	648.8	644.0	650.1	642.2	660.0	704.7	650.8	624.9	661.0	748.3	787.9	747.5	744.0	904.6	749.0
617831	T1N R6E 21BCC	1,006	1,006	3,344	3,344	0	SALT RIVER PROJECT,	1,107.7	13.8	21.5	12.7	27.2	52.0	2,303.4	55.5	26.9	18.0	128.3	26.6	67.6	1,122.9	346.1
607711	T1N R6E 21CDD	1,160	1,140	2,050	1,988	59	SALT RIVER PROJECT,	475.0	9.7	9.3	23.2	10.3	21.5	1,785.1	247.7	10.0	17.6	1.2	0.0	0.0	11.0	8.8
620498	T1N R6E 22ABA	1,000	1,000	170	170	0	ROOSEVELT WTR DIST,	1,773.0	765.0	792.8	1,477.8	1,636.4	2,105.9	2,164.0	1,217.4	0.0	247.9	1,277.7	822.8	1,343.9	812.9	1,080.6
620499	T1N R6E 22DAA	1,000	1,000	192	192	0	ROOSEVELT WTR DIST,	1,911.0	957.0	1,299.8	155.9	1,400.4	1,646.1	1,945.2	1,925.7	727.8	1,032.6	1,569.2	929.0	2,300.2	1,859.9	1,878.3
617955	T1N R6E 23ABB	0	0	0	0	0	FARNSWORTH GOLF CO,	0.0	150.0	137.9	146.6	158.0	151.1	142.8	145.0	125.2	134.2	144.8	139.6	140.0	146.0	142.4
621658	T1N R6E 23ADD	1,100	1,100	100	100	0	SLIGER,T W	1.0	1.0	0.9	3.8	3.8	4.0	0.0	0.0	0.0	0.0	0.0	42.0	0.0	37.8	36.2
621659	T1N R6E 23ADD	800	800	100	100	0	SLIGER,T W	18.5	18.8	15.3	28.9	26.6	31.0	43.4	37.7	46.2	41.9	54.6	0.0	40.2	0.0	0.0
620500	T1N R6E 23CDC	1,200	1,200	198	198	0	ROOSEVELT WTR DIST,	2,168.0	1,148.0	1,880.4	1,771.3	1,837.7	1,933.6	2,340.0	1,865.0	680.4	752.9	1,767.4	1,127.6	1,919.6	1,241.7	1,438.0
800546	T1N R6E 25AA	1,100	1,000	1,200	1,200	0	LAKE DEVELPMT GROUP,	481.9	506.0	498.0	522.0	495.0	571.6	589.0	435.0	426.0	434.5	460.2	432.4	0.0	554.5	471.9
621103	T1N R6E 25AAB	1,000	1,000	1,600	1,600	0	TURNER RANCHES,	758.3	308.3	131.7	69.1	27.2	0.0	0.0	0.0	0.0	0.0	39.8	0.0	0.0	0.0	0.0
621104	T1N R6E 25DBB	1,040	1,040	1,025	1,025	0	TURNER RANCHES,	301.1	494.3	652.4	726.2	436.6	510.9	0.0	545.8	310.7	257.9	513.9	427.5	509.4	517.3	0.0
621102	T1N R6E 26AAA	800	800	1,600	1,600	0	TURNER RANCHES,	353.2	365.7	308.8	764.3	276.2	0.0	0.0	34.2	0.0	94.3	25.6	44.3	16.5	139.4	0.0
620501	T1N R6E 26ACD	750	750	188	188	0	ROOSEVELT WTR DIST,	1,859.0	1,317.0	1,836.0	833.7	2,147.5	2,371.9	2,464.1	2,075.8	316.1	187.3	1,641.8	1,553.7	2,413.3	1,748.7	1,990.8
502203	T1N R6E 26BAD	1,200	1,190	2,500	2,500	59	ROOSEVELT WTR DIST,	2,276.0	1,079.0	1,934.4	108.9	1,769.8	2,005.1	2,168.5	1,888.6	759.6	846.3	1,940.0	1,414.5	2,171.2	1,174.7	1,628.2
502202	T1N R6E 26DCB	1,200	1,190	2,988	2,988	49	ROOSEVELT WTR DIST,	2,140.0	1,193.0	1,846.9	102.3	1,817.2	2,039.1	2,005.6	1,639.2	773.0	836.6	1,779.1	1,208.0	1,574.6	1,330.7	1,863.3
626787	T1N R6E 27CBC	0	0	100	0	0	ANDERSON-CLAYTON CO,	0.0	1.3	0.0	0.0	0.0	1.3	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
607722	T1N R6E 28DDC	1,000	1,000	2,229	2,229	0	SALT RIVER PROJECT,	696.3	10.3	9.5	22.3	12.3	32.4	1,820.6	414.6	41.8	14.9	231.2	273.4	969.0	1,816.4	92.9
617868	T1N R6E 32BBA	1,000	1,000	2,460	2,460	0	SALT RIVER PROJECT,	1,292.1	8.4	10.9	9.4	10.6	10.4	1,941.2	327.2	26.2	65.0	26.5	10.7	39.8	489.8	28.8
617864	T1N R6E 32CCA	460	460	2,091	2,091	0	SALT RIVER PROJECT,	737.4	3.0	5.6	7.4	10.2	10.0	1,500.1	669.3	13.6	0.0	20.2	0.4	2.9	38.4	22.9
618126	T1N R6E 32DAD	600	575	10	0	0	DANA RANCH PNTER-2,	36.0	3.2	2.0	4.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
607721	T1N R6E 33CDD	1,000	1,000	2,138	2,138	0	SALT RIVER PROJECT,	1,034.1	6.0	20.4	0.0	31.2	23.2	2,240.6	2.7	35.1	17.9	27.4	52.8	1,854.2	744.3	845.5
628096	T1N R6E 33DAA	693	600	2,250	2,250	0	ADOT,	0.0	72.0	0.0	0.0	65.6	57.7	99.9	100.0	0.0	63.0	0.0	0.0	0.0	0.0	0.0
607723	T1N R6E 34CCD	1,000	1,000	2,827	2,827	0	SALT RIVER PROJECT,	748.0	23.7	21.0	174.6	70.9	20.9	1,492.4	289.7	55.4	12.1	127.6	28.8	370.8	307.2	57.1
620503	T1N R6E 35AAB	1,000	1,000	158	158	0	ROOSEVELT WTR DIST,	1,560.0	898.0	1,300.0	0.0	1,432.5	1,511.3	1,927.3	1,383.5	597.5	405.4	1,604.7	1,141.7	1,790.2	993.8	1,375.4
620504	T1N R6E 35AAD	1,316	1,316	245	245	0	ROOSEVELT WTR DIST,	2,501.0	1,551.0	2,183.8	2,026.5	2,657.4	3,130.4	2,488.4	2,144.8	982.3	924.6	2,023.4	1,028.3	1,987.6	1,057.3	1,350.0
620502	T1N R6E 35BAB	1,000	1,000	130	130	0	ROOSEVELT WTR DIST,	671.0	520.0	316.4	0.0	217.4	117.4	669.9	1,213.3	398.1	294.5	748.6	373.5	363.2	0.0	0.0
621100	T1N R6E 36AAA	690	690	1,300	1,300	0	MESA, CITY OF,	46.4	0.5	0.0	0.0	97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
505014	T1N R6E 36CBB	1,215	1,200	3,705	3,705	36	ROOSEVELT WTR DIST,	2,360.0	1,742.0	2,371.6	156.2	1,965.6	2,342.5	2,305.9	2,028.6	1,035.0	1,183.8	2,251.1	1,746.0	2,983.3	1,363.8	2,297.5
621105	T1N R6E 36DCC	1,000	1,000	1,050	1,050	0	MESA, CITY OF,	367.5	431.2	486.0	485.6	12.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
621101	T1N R6E 36DDD	675	675	1,300	1,300	0	MESA, CITY OF,	38.5	3.7	70.0	313.9	532.0	515.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
608945	T1N R7E 22AAD	617	600	100	100	0	DESERT SAGE WATER CO,	63.0	29.0	0.0	63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
608944	T1N R7E 23BBC	600	600	70	70	0	DESERT SAGE WATER CO,	0.0	0.0	22.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
804597	T1N R7E 23CBA	750	730	90	0	0	ARCTIC ICE & WATER,	0.0	0.0	0.0	6.6	8.1	13.9	14.6	13.6	14.5	15.6	15.4	17.3	19.3	17.6	18.9
517992	T1N R7E 26AAC	790	689	1,050	1,170	0	AZ WATER COMPANY,	0.0	0.0	0.0	857.8	264.3	798.9	679.0	719.7	718.2	796.6	1,029.9	967.5	1,207.3	1,149.0	422.5
616592	T1N R7E 26AAC	700	700	400	40,000	0	AZ WATER COMPANY,	0.0	131.5	310.0	219.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
616590	T1N R7E 26ADB	1,000	900	950	950	0	AZ WATER COMPANY,	0.0	982.3	1,837.1	1,768.5	1,292.0	714.7	269.3	500.0	329.9	501.7	870.3	754.1	1,000.3	1,409.0	1,916.8
529939	T1N R7E 26BCC	1,005	900	2,000	0	0	MESA, CITY OF,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	298.1	186.4	0.0	185.7	0.0	85.6	24.4
608949	T1N R7E 27DBA	775	740	1,250	2,300	0	MESA, CITY OF,	0.0	1,175.0	1,118.6	1,001.0	42.0	0.0	29.0	431.6	0.0	0.0	0.0	475.6	52.2	102.6	0.0
608948	T1N R7E 27DBB	865	865	2,300	2,300	0	DESERT SAGE WATER CO,	1,318.0	1,303.0	1,612.3	416.0	35.0	0.0	4.0	2.9	0.0	0.0	0.0	0.1	0.0	0.0	0.0
518028	T1N R7E 29DAA	1,010	710	1,500	1,500	579	FOUNTAIN OF THE SUN,	0.0	0.0	0.0	266.0	469.0	505.0	390.3	445.6	411.9	431.6	459.5	449.4	506.3	474.2	512.4
613970	T1N R7E 29DAA	698	696	0	0	0	UNIVERSAL DEVELMNT,	417.4	457.0	499.5	97.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
629613	T1N R7E 30DAB	922	922	588	588	0	MESA, CITY OF,	80.0	117.0	121.0	127.0	0.0	133.7	120.0	119.0	95.0	115.4	121.6	125.0	0.0	109.7	106.0
518151	T1N R7E 31CAA	1,520	1,500	500	500	11	TURNER RANCHES	0.0	0.0	0.0	0.0	169.3	145.4	0.0	112.0	103.0	109.6	120.0	113.6	102.0	116.5	0.0
602750	T1N R7E 31D	900	900	1,800	1,800	0	MESA, CITY OF	0.0	0.0	393.1	130.0	19.0	281.0	1,249.0	946.3	0.9	0.0	0.0	6.6	9.3	1.0	1.2
609699	T1N R7E 31DDA	1,005	1,006	1,150	1,150	0	DESERT SANDS OF ARIZ,	0.0	241.3	220.9	230.0	240.0	270.0	250.0	234.0	224.5	240.7	269.4	270.9	291.5	282.6	272.7
505767	T1N R7E 33CCC	874	870	850	850	116	MESA, CITY OF,	0.0	0.0	953.0	37.0	2.0	471.0	16.0	94.3	621.9	680.6	0.0	206.4	31.1	1.6	2.3
623798	T1N R7E 33DAA	702	0	0	0	0	A. R. DEVELOPMENT, L. L.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	266.0
617022	T1N R7E 36DAA	1,252	1,233	550	550	0	BUREAU OF RECLAM,	9.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
501155	T1N R8E 1ABB	0	0	92	60	8	HAND SR,D G	96.8	60.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
546608	T1N R8E 1C	0	0	0	0	0	WORST, CLAY,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0	0.0	0.0
501156	T1N R8E 1CAB	0	0	213	190	12	HAND SR,D G	96.8	101.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
514179	T1N R8E 29AAA	760	760	35	34	2	ROAD HAVEN HOMEOWNER,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	39.0	0.0
625085	T1N R8E 30CAA	965	965	750	750	0	PALM SPRINGS WTR CO,	533.0	499.1	720.5	787.6	825.1	772.6	760.6	781.6	826.5	826.5	982.1	915.5	951.3	737.2	752.7
616591	T1N R8E 30DCC	878	852	850	850	0	AZ WATER COMPANY,	0.0	942.3	673.4	0.0	677.0	463.7	774.2	800.5	748.5	1,073.3	1,101.9	783.0	948.0	835.4	878.4
611887	T1N R8E 31BAD	740	740	1,100	0	0	FORTUNE TRAVEL INC,	204.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
624383	T1N R8E 31CCA	700	0	110	110	0	PIONEER CONCRETE OF AZ I	26.0	41.2	34.1	26.9	18.6	16.0	14.6	12.6	17.0	18.4	23.1	28.1	43.1	45.6	45.1
085759	T1N R8E 31CCC	760	760	0	0	0	JOHNSON STEWART CO,	0.4	2.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
616589	T1N R8E 31DCB	1,000	1,000	920	920	0	AZ WATER COMPANY,	0.0	753.8	671.9	750.6	431.1	445.9	500.5	624.8	535.8	770.4	867.9	693.8	823.8	602.7	742.1
800843	T1N R8E 32BBA	651	640	270	600	600	APACHE JCT UNIF SCHL,	45.2	51.1	60.2	63.8	72.0	0.0	37.0	59.0	6.8	18.7	0.0	9.1	6.5	4.1	0.0
628139	T1S R10E 34CDA	385	44	140	140	0	QUEEN VALLEY DOM WTR,	36.0	57.9	25.8	36.6	41.7	74.1	21.7	65.6	66.6	22.2	36.9	64.3	80.8	61.1	59.4

Regno	Location	Well Depth (ft)	Casing Depth (ft)	Pump Rate (gpm)	Test Rate (gpm)	Draw-down (ft)	Owners Name	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
								Annual Pumpage (acre-feet)														
628140	T1S R10E 35DBA	440	55	140	140	0	QUEEN VALLEY GOLF,	40.0	63.2	45.0	22.1	44.9	23.7	67.9	42.9	0.1	20.6	6.8	0.0	0.0	16.4	8.3
628138	T1S R10E 35DBB	500	0	145	145	0	QUEEN VALLEY DOM WTR,	47.0	63.4	22.6	46.9	41.9	53.8	64.8	43.0	71.0	98.8	127.2	85.2	62.8	73.1	73.5
628137	T1S R10E 35DBC	550	0	100	100	0	QUEEN VALLEY DOM WTR,	62.0	41.8	25.4	34.3	26.8	21.2	36.8	2.1	14.7	29.4	5.1	0.0	0.0	5.9	40.1
542431	T1S R5E 11AAA	1,107	970	0	0	0	SALT RIVER PROJECT,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,304.2	1,469.5	1,240.8	936.8	723.3
617106	T1S R5E 11AAA	710	710	2,737	2,737	0	SALT RIVER PROJECT,	1,075.3	4.7	51.9	13.9	14.0	22.9	1,541.3	77.9	53.3	23.0	0.0	0.0	0.0	0.0	0.0
617105	T1S R5E 12CBB	615	596	2,114	2,114	0	SALT RIVER PROJECT,	630.1	10.4	15.5	15.4	36.4	11.6	1,481.2	49.4	21.9	95.7	275.3	3.5	230.4	319.4	19.9
617104	T1S R5E 12CCC	400	400	3,489	3,489	0	SALT RIVER PROJECT,	1,736.4	20.7	19.8	250.2	22.4	26.1	3,229.0	174.8	146.6	82.7	588.5	13.0	34.6	28.4	15.3
626322	T1S R5E 12DAA	460	460	400	400	0	GILBERT, TOWN OF,	284.0	242.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
534889	T1S R5E 12DBA	910	880	1,800	1,514	103	GILBERT, TOWN OF,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	131.0	1,646.0	1,883.0	1,264.0	1,843.0	1,476.0	1,256.7
624352	T1S R5E 14CDD	385	360	2,000	2,000	0	LAYTON, L.R. LTD,	258.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
617082	T1S R5E 15BBA	700	700	2,125	2,125	0	SALT RIVER PROJECT,	940.1	10.2	25.8	25.0	14.7	18.9	1,145.6	64.1	22.8	4.2	248.3	13.4	82.3	475.0	12.0
585549	T1S R5E 15CDA	835	820	0	0	0	SALT RIVER PROJECT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	123.2
617083	T1S R5E 15CDD	660	618	2,447	2,447	0	SALT RIVER PROJECT,	332.1	699.4	2,029.8	2,914.0	2,995.1	2,172.1	1,347.2	611.6	336.5	226.6	449.7	345.8	322.0	154.5	3.3
617087	T1S R5E 18AB	1,000	1,000	2,441	2,441	0	SALT RIVER PROJECT,	483.2	687.8	811.2	1,337.0	1,281.4	1,022.8	559.4	388.3	2.6	2.7	13.4	0.8	12.5	0.0	14.4
617833	T1S R5E 22CCC	800	800	2,702	2,702	0	SALT RIVER PROJECT,	1,045.4	73.2	85.5	88.2	0.0	25.5	1,182.4	68.5	181.4	62.6	9.9	13.2	137.7	72.2	0.5
510941	T1S R5E 23AAC	952	952	0	0	0	GILBERT, TOWN OF	0.0	0.0	0.0	226.6	292.1	804.6	1,021.4	1,600.0	1,255.0	796.0	1,290.0	1,389.0	1,789.0	1,636.0	1,447.0
617090	T1S R5E 23BDA	1,004	1,002	2,950	2,950	0	SALT RIVER PROJECT,	162.1	0.0	14.8	37.1	16.6	23.1	197.1	66.3	3.8	7.1	11.6	501.8	122.5	109.7	663.3
629671	T1S R5E 23CBD	400	400	35	35	0	SHUMWAY FARMS,	126.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
617086	T1S R5E 24CDC	425	425	2,391	2,391	0	SALT RIVER PROJECT,	1,477.6	52.7	9.3	65.5	53.7	31.3	1,883.6	540.1	18.6	176.1	18.6	82.0	18.0	179.1	9.1
617085	T1S R5E 24DBB	520	520	3,045	3,045	0	SALT RIVER PROJECT,	1,348.6	0.0	0.0	41.4	40.0	45.8	1,433.2	532.7	16.6	10.7	73.6	26.7	142.1	252.0	16.3
608477	T1S R5E 25DA	684	680	2,210	2,210	0	DOBSON	294.0	0.0	0.0	0.0	0.0	368.6	981.0	112.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627365	T1S R5E 26DDD	350	350	3,010	3,010	0	DOBSON JOINT VENTURE	524.7	0.0	0.0	0.0	325.1	361.0	704.5	43.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
620665	T1S R5E 36DDD	0	0	1,860	1,860	0	PECOS RD PROP LTD,	309.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
521875	T1S R6E 10BAA	880	880	2,490	2,490	167	GILBERT, TOWN OF,	0.0	0.0	0.0	0.0	0.0	1,122.2	2,227.6	2,533.0	1,970.0	2,413.0	2,266.0	2,328.0	2,327.0	1,859.7	1,178.4
620513	T1S R6E 11CDD	1,000	1,000	230	230	0	ROOSEVELT WTR DIST,	1,006.0	457.0	217.6	0.0	441.6	439.8	1,276.3	818.2	0.5	415.0	864.2	582.8	811.9	154.4	334.9
606258	T1S R6E 12AB	700	700	45	45	0	LDS CHURCH R E DIV,	0.0	4.7	0.0	0.0	0.0	5.0	5.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0
620511	T1S R6E 12BBB	1,000	1,000	180	180	0	ROOSEVELT WTR DIST,	1,598.0	945.0	1,479.4	273.8	1,284.1	1,066.2	1,709.1	1,250.7	579.6	173.7	1,739.0	1,620.0	2,125.2	825.4	1,184.0
613065	T1S R6E 14BBA	300	300	100	100	0	MBR LAND II,	0.0	0.0	0.0	0.0	2.0	3.0	3.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0
613064	T1S R6E 14CBA	720	694	60	60	0	J & M-B & K LAND INV,	30.0	30.0	30.0	23.0	30.0	24.0	22.0	22.0	22.0	23.0	37.0	37.0	40.0	37.0	33.0
617108	T1S R6E 15BAB	1,000	1,000	2,310	2,310	0	SALT RIVER PROJECT,	1,010.9	1,362.0	1,948.0	2,003.0	2,663.7	2,912.6	2,640.1	1,979.7	2,568.1	2,597.1	3,042.7	3,302.0	3,238.8	1,560.0	113.2
617822	T1S R6E 17DCC	1,020	1,020	2,482	2,482	0	SALT RIVER PROJECT,	907.2	44.5	16.0	12.1	25.9	64.3	1,814.6	15.0	140.3	747.3	21.9	17.3	64.3	90.6	12.7
617115	T1S R6E 18CAB	1,480	1,466	2,000	2,000	0	SALT RIVER PROJECT,	1,233.2	1,125.0	1,300.6	716.0	1,577.0	1,577.4	1,624.2	1,352.9	1,319.7	1,411.4	1,557.6	1,227.4	1,968.3	1,590.9	1,972.5
617084	T1S R6E 18CCC	425	425	1,772	1,772	0	SALT RIVER PROJECT,	940.4	7.4	9.3	8.3	11.8	37.9	891.5	225.2	17.4	14.6	74.0	27.8	229.7	142.8	8.9
610824	T1S R6E 1AAA	1,200	1,100	1,500	1,500	0	TURNER RANCHES WTR,	0.0	104.3	781.7	956.3	843.6	906.4	0.0	260.0	251.0	379.9	270.8	298.8	216.8	109.0	0.0
620509	T1S R6E 1ACA	1,296	1,296	170	170	0	ROOSEVELT WTR DIST,	1,167.0	742.0	1,089.8	117.1	996.0	779.9	1,494.8	1,263.6	670.8	655.1	1,178.0	785.7	877.4	718.9	1,313.0
620507	T1S R6E 1BAA	1,004	1,004	180	180	0	ROOSEVELT WTR DIST,	1,925.0	1,042.0	1,584.9	215.5	1,315.0	1,651.3	1,835.8	1,748.6	819.8	1,007.9	1,747.4	1,515.6	1,979.0	1,078.4	1,944.7
620508	T1S R6E 1CAA	735	735	172	172	0	ROOSEVELT WTR DIST,	1,804.0	902.0	1,012.2	1,485.7	1,647.7	2,302.7	1,967.7	701.0	528.5	730.9	1,347.2	963.8	1,333.3	518.2	2,220.2
620510	T1S R6E 1DAC	1,000	1,000	90	90	0	ROOSEVELT WTR DIST,	558.0	440.0	768.2	67.8	660.2	1,196.6	1,257.5	914.9	494.3	527.2	1,018.3	719.0	1,096.0	484.9	736.7
607720	T1S R6E 21AAA	452	452	4,130	4,130	0	SALT RIVER PROJECT,	2,146.4	17.3	16.9	76.0	77.4	76.7	1,401.5	500.5	353.2	312.9	864.6	157.8	1,097.0	567.2	572.1
607690	T1S R6E 21BAA	1,000	1,000	2,206	0	0	SALT RIVER PROJECT,	0.0	0.0	2,739.2	3,198.7	3,302.7	4,249.9	2,796.0	2,280.4	0.0	4,913.0	6,863.5	3,413.3	0.0	2,067.7	7,079.0
607693	T1S R6E 21BBB	928	998	2,273	0	0	SALT RIVER PROJECT,	0.0	0.0	213.9	0.0	81.1	596.5	322.0	77.7	0.0	0.0	3.7	3.6	0.0	0.4	0.8
606366	T1S R6E 21CCC	1,000	1,000	2,000	2,000	0	SALT RIVER PROJECT,	711.9	50.3	68.4	119.0	0.0	115.1	1,990.5	324.9	316.0	0.0	0.0	40.7	504.8	531.5	0.0
617110	T1S R6E 21DBB	1,005	1,005	2,500	2,500	0	SALT RIVER PROJECT,	967.7	9.2	25.5	87.9	17.3	23.6	876.0	12.1	131.7	171.8	344.8	76.2	471.7	533.2	274.4
514399	T1S R6E 23DDB	430	20	0	0	0	LINDBLOM, JIM JR.,	0.0	0.0	0.5	1.1	1.0	5.0	4.5	0.0	5.8	5.1	0.0	0.0	0.0	0.0	0.0
620517	T1S R6E 24CCC	1,000	1,000	75	0	0	ROOSEVELT WTR DIST,	367.0	94.0	47.4	41.0	388.1	512.9	668.2	555.1	214.5	216.3	707.3	418.8	587.0	185.7	207.1
622892	T1S R6E 26CCC	1,000	1,000	50	50	0	LOVING,G	658.0	9.0	0.0	4.5	0.0	9.0	0.0	0.0	0.0	0.0	9.0	0.0	10.0	0.0	0.0
620521	T1S R6E 27ABB	1,000	1,000	120	120	0	ROOSEVELT WTR DIST,	885.0	296.0	222.6	139.3	520.2	813.6	693.6	329.7	112.1	89.9	65.3	0.0	0.0	0.0	0.0
618966	T1S R6E 27CDA	820	820	100	100	0	*RAYO BLANCO TRUST,*	*138.0*	*138.0*	*130.0*	*85.7*	*142.0*	*0.0*	*101.0*	*0.0*	*35.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
620520	T1S R6E 27DDD	300	300	50	50	0	ROOSEVELT WTR DIST,	368.0	168.0	149.9	35.8	251.5	312.2	471.0	415.3	120.9	89.2	192.5	0.0	98.2	24.2	10.9
608367	T1S R6E 29CBB	1,000	1,000	1,860	1,860	0	SALT RIVER PROJECT,	891.0	72.8	60.2	128.4	63.7	38.5	1,318.7	5.0	1.2	25.8	16.2	19.5	14.7	56.4	0.0
606753	T1S R6E 29DAA	965	965	1,500	1,500	0	SUPERSTITION 2 JOINT,	460.2	279.6	332.0	271.3	566.9	885.1	508.5	377.4	358.1	206.9	259.6	279.1	297.8	364.3	74.0
620506	T1S R6E 2ABB	950	950	175	175	0	ROOSEVELT WTR DIST,	873.0	417.0	799.3	167.5	421.9	914.3	1,273.4	1,109.2	336.5	80.9	1,389.1	703.8	982.1	325.8	474.8
607549	T1S R6E 31DAD	650	650	1,100	1,100	0	MURPHREE,A P	321.5	0.0	0.0	0.0	0.0	203.0	369.5	45.4	0.0	0.0	326.6	131.0	310.6	332.8	0.0
501999	T1S R6E 32BAA	1,000	1,000	900	900	206	MODESITT,B	325.6	325.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	120.0	60.0	0.0
611239	T1S R6E 32CDD	900	900	125	125	0	CITIBANK,	57.3	0.0	60.3	18.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
600711	T1S R6E 33BA	890	890	215	0	0	DAIRYLAND WATER,	116.2	84.1	84.6	60.4	83.9	108.9	99.9	75.4	60.3	84.2	103.4	144.3	82.5	153.0	161.0
620523	T1S R6E 34CCC	1,010	1,010	90	90	0	ROOSEVELT WTR DIST,	621.0	201.0	203.1	17.2	24.5	0.0	711.8	822.4	261.0	253.6	686.0	622.3	942.8	563.7	328.3
620522	T1S R6E 34CDD	1,200	1,200	130	130	0	TRANSAMERICAN TITLE,	752.0	90.0	376.7	45.1	550.8	1,067.1	1,188.0	1,079.3	177.7	126.0	455.4	442.1	1,092.0	680.5	633.1
617107	T1S R6E 3CAB	1,002	1,002	2,500	2,500	0	SALT RIVER PROJECT,	357.9	11.9	12.8	27.7	24.6	28.8	1,874.5	215.6	64.3	42.6	191.8	300.2	310.8	138.3	98.9
617111	T1S R6E 5BAA	408	210	1,328	1,328	0	SALT RIVER PROJECT,	601.1	6.3	10.8	5.8	16.4	24.2	1,221.4	501.5	23.9	25.8	5.7	1.5	3.3	35.7	7.7
617116	T1S R6E 5CCC	700	700	2,679	2,679	0	SALT RIVER PROJECT,	1,261.6	10.6	9.3	12.1	36.2	21.4	2,069.6	49.9	53.4	887.9	22.1	20.0	6.6	28.7	55.3
617117	T1S R6E 7DAA	700	666	2,482	2,482	0	SALT RIVER PROJECT,	988.0	11.5	200.7	1,579.0	711.9	642.1	171.2	1.7	1,123.3	0.0	23.4	0.1	54.3	862.6	82.3
617866	T1S R6E 7DDC	400	204	1,986	1,986	0	SALT RIVER PROJECT,	852.0	14.7	8.5	15.6	39.5	40.0	1,661.8	300.2	10.1	20.8	1.4	7.7	6.6	92.2	17.3
529938	T1S R6E 8BCA	1,220	900	1,500	1,357	84	GILBERT, TOWN OF,	0.0	0.0	0.0	0.0	0.0	0.0	761.0	1,695.0	1,636.0	1,336.0	1,331.0	1,221.0	1,157.0	1,312.3	1,847.0
547844	T1S R6E 8DDD	1,010	850	0	0	0	SALT RIVER PROJECT,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1,364.6
617113	T1S R6E 8DDD	440	440	2,298	2,296	0	SALT RIVER PROJECT,	1,202.9	10.6	19.6	0.0	37.9	25.0	1,347.5	50.6	6.2	0.0	6.4	1,388.3	2,307.4	1,264.2	0.0
529833	T1S R7E 16CCC	1,002	666	120	120	30	VAN RIJN DAIRY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	92.6	87.7	115.9	152.9	117.3	109.0	111.0	105.6
607053	T1S R7E 16CCC	970	954	90	90	0	VAN RIJN DAIRY	20.8	14.1	16.8	17.4	18.7	20.5	18.1	19.3	32.6	46.3	0.0	39.1	41.4	38.4	0.0

Regno	Location	Well Depth (ft)	Casing Depth (ft)	Pump Rate (gpm)	Test Rate (gpm)	Draw-down (ft)	Owners Name	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
								Annual Pumpage (acre-feet)														
621443	T1S R7E 17A	776	750	70	70	0	FEENSTRA,C L	304.3	182.0	227.0	79.1	132.7	0.0	119.3	126.2	191.8	76.7	156.4	72.5	114.7	99.8	112.4
635451	T1S R7E 17A	900	0	100	100	0	BOYLE	62.5	76.4	74.0	72.7	90.3	88.2	72.7	56.1	87.3	88.7	0.0	87.4	0.0	88.3	87.6
606660	T1S R7E 17BAB	380	380	40	40	0	CHILCOTT, ROBERT C,	18.8	112.7	6.5	16.0	19.2	59.1	60.8	69.8	60.8	58.6	56.4	54.8	61.4	61.5	56.6
606661	T1S R7E 17BAB	750	750	55	55	0	CHILCOTT RANCHES,	0.0	0.0	4.5	6.9	4.4	10.3	11.1	12.6	12.1	11.5	11.2	9.8	7.8	7.5	7.2
623409	T1S R7E 17BBB	575	0	0	0	0	ELLIOTT & SOSSAMAN,	72.0	72.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
613066	T1S R7E 18AAC	1,000	1,000	565	565	0	J & M-B & K LAND INV,	454.0	423.0	492.0	633.5	606.0	390.0	438.0	350.0	405.0	405.0	133.0	348.0	347.0	200.0	218.0
620514	T1S R7E 18BAB	1,000	1,000	110	110	0	ROOSEVELT WTR DIST,	972.0	651.0	915.4	807.6	1,071.6	1,129.3	1,260.5	1,153.8	590.3	535.2	1,195.4	783.7	1,180.5	676.0	974.8
613067	T1S R7E 18DAB	1,000	1,000	1,500	1,500	0	J & M-B & K LAND INV,	432.0	493.0	536.0	374.0	311.0	539.0	473.0	417.0	420.0	389.0	430.0	522.0	337.0	451.0	380.0
620516	T1S R7E 19BBA	1,020	1,020	118	118	0	ROOSEVELT WTR DIST,	1,336.0	764.0	940.4	174.2	903.3	1,320.3	1,167.7	1,074.3	576.9	473.5	1,132.9	774.7	1,106.7	480.5	646.8
620518	T1S R7E 19CCD	602	602	62	62	0	ROOSEVELT WTR DIST,	659.0	406.0	649.6	46.4	444.5	576.1	781.7	862.7	425.3	437.2	934.1	522.7	710.0	202.8	475.6
554077	T1S R7E 1BBA	1,200	680	1,500	1,500	49	FARNSWORTH DEV CO,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.7	346.3	337.8
611655	T1S R7E 20AAA	930	893	65	65	0	MAYNARD,B W	27.0	27.4	9.6	15.4	12.9	12.3	11.9	9.5	24.4	41.2	66.9	62.5	47.4	66.6	18.5
610152	T1S R7E 22CBA	1,000	1,000	250	250	0	GM DESERT PROVING GR,	46.0	38.2	44.8	41.5	90.1	49.8	74.2	41.3	29.7	51.3	41.8	61.1	62.9	58.1	55.3
610153	T1S R7E 22CBB	500	500	150	150	0	GM DESERT PROVING GR,	10.2	0.4	0.0	0.0	0.0	42.7	75.7	58.4	51.7	46.8	56.3	0.4	0.2	2.2	0.2
610154	T1S R7E 22CBB	390	390	180	180	0	GM DESERT PROVING GR,	9.6	29.7	34.2	30.1	15.9	5.1	0.7	1.8	0.1	0.3	1.7	0.0	0.0	0.0	0.0
802009	T1S R7E 25CDA	550	550	132	132	0	GROHET AL,J E	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
610151	T1S R7E 26AAB	1,040	1,007	700	400	0	GEN MOTORS DESERT,	6.6	22.9	29.5	36.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	46.9	54.1	61.8	50.5
618438	T1S R7E 28DCB	500	500	37	0	0	WILLIAMS AFB,	1.1	0.9	2.9	0.2	0.1	1.5	2.0	1.7	2.2	0.0	0.0	0.0	0.1	0.0	0.0
620519	T1S R7E 30CBC	1,200	1,200	135	135	0	ROOSEVELT WTR DIST,	1,807.0	1,163.0	1,819.3	1,528.9	1,966.7	2,131.4	2,242.9	1,763.6	759.1	979.7	1,917.1	0.0	1,380.6	826.9	892.3
618435	T1S R7E 30CCB	848	680	1,700	1,700	0	WILLIAMS AFB,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.6
618437	T1S R7E 31BAC	1,000	1,000	1,500	1,500	0	WILLIAMS AFB,	223.4	185.6	27.6	70.0	6.2	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0
618436	T1S R7E 31BBC	1,000	1,000	1,725	1,725	0	WILLIAMS AFB,	1,294.3	1,390.7	774.0	347.5	747.7	629.7	307.0	380.7	304.4	215.0	158.4	300.2	436.4	269.3	193.8
508689	T1S R7E 31CBB	1,509	960	2,000	2,000	60	WILLIAMS AFB,	0.0	17.3	758.3	1,258.3	922.2	1,209.5	1,103.7	1,090.0	902.4	622.4	524.3	537.7	600.9	803.4	627.1
640304	T1S R7E 35ADA	440	440	24	24	0	LIBBEY, ARETTA,	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
625089	T1S R7E 3AAA	595	595	1,467	1,467	0	MESA, CITY OF,	0.0	0.0	0.0	194.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
511595	T1S R7E 3AAB	820	820	1,500	1,500	73	MESA, CITY OF,	0.0	0.0	0.0	0.0	394.0	519.0	675.0	660.3	7.0	0.1	0.0	805.3	157.4	101.6	598.3
629614	T1S R7E 4BCC	1,000	1,000	612	612	0	MESA, CITY OF,	368.0	527.0	185.8	22.0	3.0	5.0	5.0	33.3	6.2	25.3	0.0	112.5	0.0	226.1	461.6
629615	T1S R7E 4BCC	1,000	1,000	492	492	0	MESA, CITY OF,	134.0	321.0	152.7	18.0	2.0	4.0	5.0	14.7	10.8	18.7	0.0	2,107.7	32.8	330.2	252.0
801266	T1S R7E 4BDC	800	800	72	72	0	MANGUM,T F	0.0	0.0	1.0	1.0	0.5	1.0	1.3	1.3	1.1	1.4	0.0	0.0	0.0	0.0	0.0
621005	T1S R7E 4CAA	1,005	640	1,000	1,000	0	LESUEUR,W W	0.0	0.0	0.0	0.0	0.0	0.0	626.0	456.0	0.0	119.0	347.0	473.0	347.0	0.0	0.0
626922	T1S R7E 5AAA	2,234	929	1,150	1,150	0	SUPER SPRINGS INC,	122.0	524.0	249.6	461.4	459.0	412.6	553.3	374.1	356.1	394.5	429.7	433.3	458.9	461.5	280.6
621107	T1S R7E 5BAB	0	0	1,050	0	0	MESA, CITY OF,	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
621106	T1S R7E 5BBB	0	0	1,250	0	0	MESA, CITY OF,	0.0	0.9	107.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
629616	T1S R7E 8ABB	870	660	1,237	0	0	MESA, CITY OF,	2,000.0	1,788.0	1,804.1	14.0	4.0	0.0	0.0	568.1	15.0	213.5	0.0	563.6	146.2	0.0	0.0
522924	T1S R7E 6BAB	930	930	1,791	1,965	51	MESA, CITY OF,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	443.0	61.7
613062	T1S R7E 7AAA	1,330	1,330	1,680	1,680	0	J & M-B & K LAND INV,	1,782.0	1,134.0	1,530.0	1,549.0	1,207.0	1,050.0	907.0	525.0	721.0	1,232.0	1,193.0	1,056.0	1,151.0	1,186.0	564.0
613068	T1S R7E 7ADD	909	909	1,250	1,250	0	J & M-B & K LAND INV,	994.0	858.0	1,083.0	892.0	824.0	845.0	0.0	133.0	574.0	25.0	59.0	430.0	758.0	803.0	516.0
620512	T1S R7E 7BCD	1,300	1,300	70	70	0	ROOSEVELT WTR DIST,	749.0	579.0	812.0	61.7	620.7	825.6	878.1	586.3	284.3	366.1	713.7	478.4	784.2	326.5	727.0
805633	T1S R7E 8CAC	200	0	0	0	0	BEALS, ARTHUR,R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	9.2	6.6	0.0	0.0	0.0	0.0	0.0
621524	T1S R7E 8CDA	400	400	45	45	0	TLC ENTERPRISES,	0.0	0.0	2.8	0.0	0.0	2.8	0.0	1.0	75.4	2.8	2.8	2.8	2.8	2.0	0.0
621525	T1S R7E 8CDA	400	400	260	260	0	MAO, THERESE,	169.2	0.0	195.0	171.2	145.4	124.3	114.9	133.1	0.0	64.7	93.9	72.4	63.3	59.9	0.0
632877	T1S R7E 8CDA	490	490	180	180	0	LLOYD,M	0.0	0.0	0.0	45.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
613665	T1S R7E 8DAD	900	900	75	0	0	RIJLAARSDAM,J	61.1	36.0	93.3	95.6	95.2	95.6	95.8	102.4	113.0	118.0	0.0	116.4	118.1	119.1	0.0
629012	T1S R7E 8DDA	740	740	100	100	0	STECHNIJ,H	32.3	90.0	282.0	90.1	58.4	83.2	73.4	93.3	70.9	64.3	53.6	0.0	0.0	59.5	54.2
554006	T1S R8E 4BAA	1,315	1,315	625	650	169	WUCFD,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	394.4	510.6
522742	T1S R9E 21DDD	960	960	35	35	640	AZ STATE LAND DEPT,	0.0	0.0	0.0	0.0	0.0	33.3	1.3	0.3	1.0	1.2	2.1	3.0	22.6	19.0	21.8
610435	T2S R10E 16BCB	428	268	0	0	0	SUPERSTITION VILLAGE,	1.3	0.7	1.1	1.1	1.1	1.1	0.9	0.4	0.4	0.8	0.8	0.0	0.0	0.0	0.0
624606	T2S R10E 31ABB	780	780	280	280	0	AZ WATER COMPANY,	219.8	66.8	131.8	88.0	153.0	153.9	185.1	179.4	138.5	117.6	155.2	149.3	237.1	144.2	165.8
624607	T2S R10E 31ABD	780	780	600	600	0	AZ WATER COMPANY,	94.4	33.7	3.9	189.3	266.3	274.5	240.0	272.8	202.9	189.7	167.8	265.6	142.6	195.5	244.7
510410	T2S R10E 5DDC	650	650	0	0	0	ARIZONA CRUSHING CO	0.0	0.0	52.7	60.7	52.8	33.1	26.7	25.9	19.3	31.6	40.9	45.6	0.0	0.0	0.0
550345	T2S R10E 5DDC	940	940	500	904	56	PIONEER CONCRETE OF AZ,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	52.7	77.3	88.0
620595	T2S R6E 10BBA	1,000	1,000	100	100	0	ZINKE INVESTMENTS	62.9	78.0	74.0	81.3	33.0	33.7	30.7	24.1	26.0	21.2	21.2	18.4	23.9	22.1	24.9
620596	T2S R6E 10BBB	750	650	60	60	0	ZINKE INVESTMENTS	64.5	80.4	80.0	84.2	73.3	60.6	63.5	54.5	23.8	48.6	51.7	54.6	49.3	46.7	59.7
634914	T2S R6E 10BCD	600	600	7	7	0	LOPEZ,J M	0.0	26.5	0.0	0.0	23.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
620531	T2S R6E 10DCD	2,000	2,000	66	66	0	ROOSEVELT WTR DIST,	290.0	283.0	232.9	0.0	0.0	3.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
618953	T2S R6E 10DDC	800	0	55	55	0	T & K INVESTMENTS,	55.6	69.2	58.6	70.6	63.1	57.0	67.0	68.9	86.4	83.0	117.5	88.4	104.1	111.0	85.0
618954	T2S R6E 10DDC	605	605	100	0	0	T & K INVESTMENTS,	2.2	2.1	22.9	13.4	14.4	14.6	17.6	0.0	17.0	14.6	12.7	14.2	21.5	15.9	27.8
620529	T2S R6E 11BCC	1,015	1,015	98	98	0	ROOSEVELT WTR DIST,	944.0	762.0	1,099.8	1,004.9	1,298.1	1,419.5	1,871.5	1,453.1	541.2	545.2	1,017.1	743.5	576.4	737.5	926.8
618554	T2S R6E 11DAD	734	734	1,200	1,200	0	BILTMORE INV BANK,	776.5	68.2	68.8	774.8	610.1	829.9	547.3	0.0	381.5	0.0	372.2	679.2	972.3	277.0	158.0
618553	T2S R6E 11DDD	1,000	1,000	1,200	1,200	0	BILTMORE INV BANK,	776.5	62.5	0.0	0.0	688.6	688.1	734.0	0.0	350.3	74.0	500.2	676.5	1,126.0	236.0	0.0
607296	T2S R6E 12ADA	800	0	830	830	0	SUNPOWER PROPERTIES,	322.2	317.0	147.0	199.0	137.0	137.0	115.0	247.0	66.8	193.0	136.0	670.0	710.0	573.0	695.0
607297	T2S R6E 12DAA	800	0	800	800	0	SUNPOWER PROPERTIES,	164.9	269.0	168.0	194.0	112.0	212.0	230.0	206.0	130.0	178.0	152.0	175.0	196.0	212.0	121.0
607298	T2S R6E 12DDA	1,200	0	1,320	1,320	0	SUNPOWER PROPERTIES, LLC	728.8	596.0	505.0	479.0	459.0	594.0	189.6	313.0	11.5	702.0	0.0	0.0	0.0	0.0	0.0
607299	T2S R6E 12DDC	1,200	0	1,250	1,250	0	UDC/SUNPOWER LLC	781.7	675.0	627.0	611.0	585.0	640.0	613.1	630.0	372.0	0.0	667.0	936.0	872.0	750.0	0.0
607293	T2S R6E 13ADD	800	0	1,010	1,010	0	UDC/SUNPOWER LLC	481.0	517.0	65.0	239.0	557.0	385.0	269.3	423.0	215.0	166.0	227.0	446.0	526.0	514.0	239.0
607294	T2S R6E 13DDC	1,200	0	915	915	0	UDC/SUNPOWER LLC	226.9	587.0	220.0	89.0	190.0	246.0	542.1	520.0	196.5	136.0	6.0	557.0	399.0	624.0	297.0
607292	T2S R6E 13DDD	1,300	0	1,210	1,210	0	UDC/SUNPOWER LLC	740.8	787.0	231.0	363.0	500.0	509.0	628.6	550.0	395.0	228.0	429.0	456.0	612.0	598.0	439.0

Regno	Location	Well Depth (ft)	Casing Depth (ft)	Pump Rate (gpm)	Test Rate (gpm)	Draw-down (ft)	Owners Name	Annual Pumpage (acre-feet) 1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
612273	T2S R6E 14ADD	1,700	1,700	1,500	1,500	0	SUN STATE SAVINGS,	733.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612275	T2S R6E 14DAA	650	650	1,000	1,000	0	CITY OF MESA	240.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612274	T2S R6E 14DDA	1,300	1,300	1,100	1,100	0	CITY OF MESA	351.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	256.6	463.7	225.7
620533	T2S R6E 15BDD	855	855	165	165	0	ROOSEVELT WATER CONSERVA	1,662.0	1,069.0	1,528.7	829.7	947.7	1,258.2	1,486.5	1,134.0	1,134.0	1,052.9	1,498.5	1,015.9	1,208.8	591.9	1,545.9
626948	T2S R6E 16ADD	1,500	1,500	165	165	0	TANKERSLEY WTR CO,J	20.9	14.0	44.1	48.2	54.7	135.2	131.3	128.2	125.2	138.4	163.9	164.3	31.9	0.0	0.0
086951	T2S R6E 16BAB	800	796	90	90	0	DE JONG,T	0.0	95.8	100.9	132.9	98.1	7.9	111.0	111.0	61.6	70.7	58.7	0.0	0.0	52.7	0.0
520547	T2S R6E 16BAB	805	805	225	0	0	MILKY WAY DAIRY,	0.0	0.0	0.0	0.0	36.5	112.5	0.0	0.0	89.0	89.0	89.0	89.0	0.0	92.9	0.0
620534	T2S R6E 16DAB	750	750	126	126	0	ROOSEVELT WTR DIST,	839.0	431.0	904.4	842.6	768.7	980.9	1,314.2	1,011.6	291.9	2.2	0.0	0.0	0.0	0.0	0.0
607295	T2S R6E 1AAD	800	800	1,445	1,445	0	POWER ENTERPRISES,	601.8	460.0	350.0	540.0	642.0	585.0	480.9	797.0	416.0	373.0	868.0	1,048.0	703.0	395.0	765.0
620547	T2S R6E 1BBC	900	900	35	35	0	ROOSEVELT WTR DIST,	40.0	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
623411	T2S R6E 22BA	778	0	2,000	2,000	0	FREEMAN,A A	9.0	22.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
609477	T2S R6E 22CDD	730	730	900	900	0	ROBINSON FARMS INC,	0.0	0.0	465.9	565.4	400.5	679.7	0.0	439.8	172.7	72.5	0.0	269.5	0.0	0.0	177.7
603553	T2S R6E 22DCA	1,600	1,593	400	400	0	SHAMROCK FARMS CO,	140.9	182.7	217.4	0.0	490.3	448.7	444.0	317.0	336.7	246.2	281.6	625.1	875.9	238.9	0.0
529563	T2S R6E 22DDC	815	40	600	600	50	SHAMROCK FARMS CO,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	281.1	298.5	325.1	307.9	0.0	0.0	463.4	686.8
647066	T2S R6E 23DDD	1,120	1,120	1,631	1,631	0	SAN TAN IRRIG DIST,	520.5	584.2	741.7	841.0	705.8	909.2	451.2	689.9	619.9	13.5	461.0	911.8	1,126.2	1,106.9	680.3
647064	T2S R6E 24BDD	1,313	1,300	956	956	0	SAN TAN IRRIG DIST,	390.3	522.6	372.3	452.4	361.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	126.0
626945	T2S R6E 24CBB	625	600	165	165	0	TANKERSLEY WTR CO,J	6.2	14.0	13.5	17.1	22.7	19.8	15.2	14.5	17.3	18.2	21.7	21.4	5.9	0.0	0.0
647065	T2S R6E 24CDD	1,533	1,533	1,250	1,250	0	SAN TAN IRRIG DIST,	564.3	786.4	838.4	897.7	559.8	330.6	504.8	467.4	296.3	424.6	599.2	947.4	1,162.8	899.8	833.7
609475	T2S R6E 24DDA	890	810	100	100	0	QUEEN CREEK WATER CO,	222.8	208.3	189.8	224.1	248.8	135.0	49.0	26.3	7.1	52.2	6.9	0.0	0.0	0.0	8.3
609476	T2S R6E 24DDA	850	830	400	400	0	QUEEN CREEK WATER CO,	114.9	116.3	153.7	171.4	201.7	256.0	309.0	184.7	20.1	39.0	88.3	144.3	0.0	0.0	81.0
608827	T2S R6E 25CDD	792	792	1,800	1,800	0	C/A INVESTMENTS XIV, XII	969.1	1,034.0	969.9	474.9	420.2	509.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	440.0
647067	T2S R6E 25DAA	1,360	1,360	1,631	0	0	SAN TAN IRRIG DIST,	1,322.4	991.3	825.9	1,444.1	853.5	1,144.8	897.4	883.9	716.4	151.0	458.9	610.8	658.7	604.0	509.8
505650	T2S R6E 25DBB	1,510	690	2,100	2,100	34	SAN TAN IRRIG DIST,	431.8	1,098.9	1,237.7	1,086.6	994.1	1,507.6	1,497.0	1,146.0	438.9	133.8	823.1	588.6	869.3	767.3	445.7
647068	T2S R6E 25DDD	1,190	1,190	1,740	1,740	0	SAN TAN IRRIG DIST,	1,318.6	1,185.2	1,831.1	2,098.8	1,480.2	885.1	1,358.5	1,431.6	695.8	952.7	1,105.4	1,327.3	1,503.7	713.8	814.1
647146	T2S R6E 26CDD	1,197	1,197	913	913	0	SAN TAN IRRIG DIST,	558.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
647144	T2S R6E 26DDC	0	1,200	1,600	1,600	0	SAN TAN IRRIG DIST,	1,417.1	1,092.0	870.3	807.9	890.4	603.8	281.7	516.0	550.5	327.8	658.0	1,209.9	1,350.9	765.9	452.6
620525	T2S R6E 2DAB	1,000	1,000	100	100	0	ROOSEVELT WATER CONSERVA	979.0	546.0	866.9	861.7	1,125.4	1,234.6	885.0	600.8	21.6	0.0	0.0	0.0	0.0	0.0	0.0
608811	T2S R6E 36AAB	975	800	1,200	1,200	0	CHANDLER HEIGHTS IRRIGAT	0.0	0.0	1,132.3	1,226.1	1,236.0	1,158.6	1,155.1	1,089.5	897.0	0.0	0.0	578.0	913.0	1,028.0	723.0
626461	T2S R6E 3DDC	0	0	189	0	0	BOYLE	17.7	82.2	22.0	30.7	32.1	32.1	19.6	45.5	22.1	211.0	186.5	222.9	0.0	0.0	39.2
623901	T2S R6E 4BDD	0	0	0	0	0	CANYON OAKS VAL VISTA LL	0.0	861.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
621535	T2S R6E 4CAC	472	0	75	75	0	CRANDALL WTR ASSOC,	68.7	34.1	37.0	41.0	42.7	48.2	33.7	35.4	31.6	35.3	40.1	39.0	40.2	40.3	34.6
620526	T2S R6E 4CCC	500	500	75	75	0	ROOSEVELT WTR DIST,	455.0	239.0	270.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
609589	T2S R6E 4CDA	1,120	904	90	90	0	C & B DAIRY,	70.1	71.5	95.5	71.5	36.0	41.0	46.0	93.3	94.6	96.4	108.1	88.9	0.0	106.0	108.1
609590	T2S R6E 4CDA	904	672	45	45	0	C & B DAIRY,	34.9	35.7	92.6	33.5	44.9	51.6	51.6	7.4	8.7	18.8	13.2	28.0	0.0	25.7	17.6
626948	T2S R6E 4DAA	806	806	200	200	0	GILBERT, TOWN OF,	26.0	14.0	51.5	60.9	65.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627862	T2S R6E 5BD	560	560	42	42	0	KUHNEN,J	0.0	14.3	15.6	18.3	15.9	17.4	10.9	10.9	11.7	13.5	14.9	15.3	11.7	10.8	10.2
620524	T2S R6E 6ADA	745	745	170	170	0	ROOSEVELT WTR DIST,	1,663.0	853.0	1,391.3	106.4	1,062.7	2,035.0	2,001.7	1,853.5	736.1	861.4	1,700.0	1,487.3	991.3	0.0	1,477.7
620526	T2S R6E 6DAA	1,200	1,200	2,200	2,200	0	ROOSEVELT WTR DIST,	1,657.0	755.0	1,285.0	40.6	1,031.7	1,477.2	1,327.0	658.5	373.1	434.1	1,133.1	834.9	1,181.6	145.2	865.8
600664	T2S R6E 6DCC	725	725	250	0	0	BOYLE, JAMES,H	157.0	134.0	133.5	134.7	103.5	109.3	108.9	85.2	111.7	74.7	0.0	113.6	136.2	0.0	0.0
620527	T2S R6E 6DDD	1,230	1,230	220	220	0	ROOSEVELT WTR DIST,	1,994.0	936.0	1,424.9	65.5	1,361.4	1,396.1	1,554.3	1,363.4	523.1	78.4	0.0	0.0	0.0	0.0	0.0
620532	T2S R6E 8CDD	1,000	1,000	115	115	0	ROOSEVELT WTR DIST,	1,007.0	485.0	327.0	0.0	929.5	803.7	1,220.0	1,251.4	268.0	259.3	432.2	876.9	1,404.2	889.8	387.3
607840	T2S R7E 10CAD	1,583	1,583	1,400	1,400	0	SANTA ROSA RANCH CO,	20.9	17.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
607838	T2S R7E 10CDD	0	0	900	900	0	SANTA ROSA RANCH CO,	372.7	550.9	650.6	286.7	405.4	529.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	719.5
607839	T2S R7E 10CDD	912	912	900	0	0	SANTA ROSA RANCH CO,	522.5	606.1	683.8	353.2	65.6	79.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
539935	T2S R7E 11BDA	703	0	30	200	2	MCK PROPERTIES,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	18.1	0.0
625011	T2S R7E 11BDD	0	0	0	0	0	MCK PROPERTIES INC,	494.7	457.7	452.1	211.3	0.0	269.3	383.5	500.0	99.9	156.8	265.6	264.8	764.1	371.4	117.3
625013	T2S R7E 11CDA	0	0	0	0	0	JORDE FARMS INC,	431.6	474.5	396.7	545.6	0.0	541.7	656.1	648.3	351.4	366.3	550.5	660.7	621.1	377.0	513.3
625014	T2S R7E 11CDD	0	0	0	0	0	JORDE FARMS INC,	569.8	709.2	654.5	555.1	0.0	501.6	584.4	354.5	2.4	0.0	83.2	525.5	1,112.6	481.1	134.5
607980	T2S R7E 12ADD	1,302	1,302	1,600	1,600	0	BARNEY FARMS,	895.4	796.5	758.9	0.0	714.3	735.2	596.7	486.5	66.4	31.6	137.3	32.1	115.8	128.4	63.3
607981	T2S R7E 12CDC	1,005	1,005	1,450	1,450	0	BARNEY FARMS,	719.7	516.3	864.3	0.0	345.1	173.1	1,110.8	102.0	72.9	0.0	0.0	0.0	0.0	0.0	0.0
607982	T2S R7E 12DAD	2,986	2,986	1,500	1,500	0	BARNEY FARMS,	603.1	753.8	847.2	0.0	605.3	494.8	429.1	506.8	71.9	0.0	10.7	0.0	33.1	0.0	0.0
607979	T2S R7E 12DDD	1,200	1,200	1,840	1,840	0	BARNEY FARMS,	974.0	1,022.3	783.0	0.0	1,244.0	2,173.6	959.5	740.6	150.8	10.4	37.3	0.0	23.7	0.0	0.0
625028	T2S R7E 13AAD	0	0	0	0	0	ANDERSEN, ZOLA,	534.4	570.1	462.2	586.9	383.5	932.9	780.3	916.4	281.7	51.0	309.8	232.1	121.4	379.6	71.4
625029	T2S R7E 13DDD	800	0	0	0	0	ANDERSEN, ZOLA,	582.1	701.2	674.7	266.9	586.7	839.9	735.8	637.8	385.9	266.0	311.8	737.5	847.8	1,066.3	839.2
085994	T2S R7E 14AB	985	985	55	55	30	ANGLIN,A	0.0	24.8	24.6	0.0	45.6	45.7	47.3	47.2	55.0	56.5	0.0	59.2	45.5	73.7	78.0
621356	T2S R7E 14BAD	1,000	1,000	1,843	1,843	0	BARNES, ESTATE OF,P L	209.0	148.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
621358	T2S R7E 14CDA	1,000	1,000	2,513	2,513	0	BARNES	394.3	329.0	210.6	209.8	395.0	187.9	124.0	92.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
628855	T2S R7E 15AAA	1,000	0	0	0	0	BARNES, ETAL	0.0	0.0	232.6	236.0	300.0	422.2	355.0	261.2	71.6	45.3	144.8	108.8	0.0	0.0	0.0
628856	T2S R7E 15AAA	1,000	20	0	0	0	BARNES, ETAL	0.0	0.0	211.0	218.0	388.0	513.5	454.0	385.8	107.0	0.0	0.0	0.0	0.0	0.0	0.0
600236	T2S R7E 15BBA	728	540	0	0	0	QUEEN CREEK SCHOOL DISTR	0.0	3.1	2.4	0.3	7.9	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
619361	T2S R7E 15DAD	1,000	1,000	1,100	1,100	0	ALBA/ATLANTIC DEV INC	1,067.2	562.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
619362	T2S R7E 15DAD	750	750	50	50	0	ALBA/ATLANTIC DEV INC	0.0	4.0	0.0	3.0	3.0	0.0	4.0	2.0	4.0	0.0	0.0	3.0	4.0	3.0	4.0
803069	T2S R7E 16BAA	875	875	900	0	0	AZ BOYS RANCH,	0.0	389.2	184.2	513.9	362.9	456.9	335.9	271.6	3.8	24.3	12.0	0.0	0.0	0.0	0.0
609474	T2S R7E 16CDD	750	742	450	450	0	QUEEN CREEK WATER CO,	84.2	65.4	155.1	196.4	147.4	258.0	311.0	189.0	40.4	54.2	83.1	168.3	0.0	0.0	0.0
627063	T2S R7E 16DAA	700	700	1,400	1,400	0	GLOBE CORP,	529.6	389.0	393.6	479.7	477.0	425.2	524.4	647.6	92.1	60.7	111.1	212.0	170.6	187.2	8.0

Regno	Location	Well Depth (ft)	Casing Depth (ft)	Pump Rate (gpm)	Test Rate (gpm)	Draw-down (ft)	Owners Name	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
								Annual Pumpage (acre-feet)														
626051	T2S R7E 16DCC	1,000	1,000	1,200	1,200	0	JOBE, EMMETT,S	325.0	358.0	440.0	762.0	421.2	305.6	248.2	378.0	244.2	265.1	211.5	183.0	157.2	162.1	0.0
626052	T2S R7E 16DDD	1,000	1,000	1,000	1,000	0	JOBE, EMMETT,S	429.0	480.0	522.0	653.0	447.4	437.5	385.6	477.6	404.4	35.7	0.0	0.0	0.0	0.0	0.0
612284	T2S R7E 17AAD	1,205	1,205	1,300	0	0	QUEEN CREEK INV. ASS,	460.7	616.0	478.5	752.0	389.6	444.0	378.0	332.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
801577	T2S R7E 17DCD	1,110	1,110	1,200	0	0	PUTRUS, MIKHAIL,	0.0	1,066.0	631.6	676.1	1,005.8	325.9	434.0	342.6	25.5	410.9	345.3	184.4	80.7	288.5	164.3
801578	T2S R7E 17DDD	660	660	1,520	1,520	0	PUTRUS, MIKHAIL,	0.0	367.0	487.4	523.1	594.1	701.7	796.6	784.7	310.4	306.7	144.3	443.2	399.8	68.8	4.3
613582	T2S R7E 18CDD	470	0	0	0	0	ANDERSEN, ZOLA,	126.0	238.0	219.0	376.0	324.0	182.0	117.0	129.0	31.0	0.0	0.0	64.0	0.0	26.5	70.0
613583	T2S R7E 18CDD	1,650	0	0	0	0	ANDERSEN, ZOLA,	258.0	396.0	396.0	345.0	367.0	337.0	407.0	268.0	106.0	0.0	0.0	249.2	0.0	0.0	0.0
602786	T2S R7E 18D	1,100	1,075	1,400	1,400	0	SOSSAMAN,J J	643.0	1,019.0	677.0	1,060.0	1,002.0	1,110.0	332.0	614.0	263.0	17.0	60.0	409.0	312.0	87.0	137.0
602785	T2S R7E 19A	930	930	1,000	1,000	0	SOSSAMAN LAND CO,	513.0	716.0	296.0	254.0	546.0	184.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
602787	T2S R7E 19A	1,200	1,200	1,410	1,410	0	SOSSAMAN LAND CO,	93.0	197.0	262.0	495.0	420.0	370.0	407.0	396.0	246.0	230.0	236.0	409.0	188.0	197.0	116.0
531230	T2S R7E 19DAD	1,110	1,110	800	1,809	251	RANCHOS JARDINES IRG,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	334.0	51.0	26.0	563.0	618.0	711.0
606285	T2S R7E 1ADD	1,200	1,180	1,450	0	0	CITY OF MESA	673.4	799.0	612.0	459.0	808.0	814.3	83.2	0.0	0.0	0.7	0.0	154.3	330.1	360.3	0.0
606286	T2S R7E 1CCD	848	833	1,300	1,300	0	HOLSUM BAKERY INC,	249.7	384.0	319.0	326.0	312.0	146.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
606287	T2S R7E 1DDD	782	782	1,400	1,400	0	MESA, CITY OF	840.1	904.0	501.0	828.0	323.0	954.7	198.4	18.8	29.8	21.3	0.0	0.0	0.0	0.0	0.0
608339	T2S R7E 20ADD	730	730	0	0	0	ALLRED, J HARVEY,	442.0	75.5	0.0	176.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	0.0
628274	T2S R7E 20DA	0	0	0	0	0	PJM PARTNERSHIP	228.3	180.0	193.0	474.0	171.0	302.7	216.0	246.3	33.6	0.0	0.0	0.0	0.0	0.0	0.0
628275	T2S R7E 21CC	0	0	0	0	0	QUEEN CREEK WATER CO,	0.0	21.2	0.0	0.0	0.0	0.0	0.0	264.0	536.9	553.0	646.3	707.2	0.0	0.0	603.1
627085	T2S R7E 21DAD	900	600	1,380	1,380	0	ELLSWORTH LND-LIVEST,	240.2	395.0	358.1	417.6	340.7	400.4	313.2	388.6	175.5	194.5	0.0	27.0	75.2	191.2	0.0
627084	T2S R7E 21DDD	1,165	1,165	1,400	1,400	0	ELLSWORTH LND-LIVEST,	437.8	493.0	510.8	301.0	468.1	433.7	307.8	322.3	324.2	324.4	1.5	203.0	596.2	444.5	324.1
609473	T2S R7E 22BCC	1,000	1,000	500	500	0	QUEEN CREEK WATER CO,	34.4	117.6	53.2	10.5	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
613584	T2S R7E 22DAA	887	0	0	0	0	GNP HOLDINGS, LLC	141.0	255.0	306.0	249.7	353.6	354.2	389.8	325.0	415.0	275.0	31.0	0.0	0.0	434.9	565.2
621357	T2S R7E 23ADA	1,000	1,000	2,500	2,500	0	MILLER,J A	304.8	259.0	156.0	328.2	212.0	261.7	190.8	0.0	0.0	0.0	0.0	0.0	57.5	402.5	100.5
621359	T2S R7E 23DAA	1,000	1,000	2,500	2,500	0	WESTERN FARM CREDIT,	129.8	148.0	55.0	73.9	223.9	246.3	47.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
613585	T2S R7E 23DDD	1,132	0	0	0	0	GNP HOLDINGS, LLC	219.0	292.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	18.0	0.0	0.0	0.0	0.0	549.2
619743	T2S R7E 24DAD	1,700	1,700	1,800	1,800	0	L D S,	553.9	550.4	573.8	0.0	325.5	351.5	193.0	470.1	117.4	230.0	132.2	63.0	417.9	0.0	48.2
627087	T2S R7E 24DAD	1,215	1,000	1,400	1,400	0	WHITE, SID L & LINDA,M	57.5	57.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
804111	T2S R7E 24DBC	1,215	1,000	1,100	0	0	C.P. FINANCIAL INC,	0.0	0.0	332.0	233.0	280.0	64.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	56.1	0.0
612289	T2S R7E 25DDD	750	750	150	0	0	CLOUD RANCHES LP,	30.3	31.7	16.1	181.9	13.5	14.5	18.0	15.6	18.6	24.3	22.5	21.9	0.0	0.0	0.0
612290	T2S R7E 25DDD	1,000	1,000	1,400	0	0	CLOUD RANCHES LP,	807.6	700.1	326.8	652.5	676.7	850.9	592.1	571.3	512.4	210.4	109.9	101.1	0.0	0.0	0.0
600448	T2S R7E 26BCC	1,000	999	1,160	1,160	0	HASTING & SKOUSEN,	1,001.4	733.0	757.0	606.0	581.0	444.3	325.8	351.7	301.4	779.3	345.6	478.0	720.8	300.4	33.5
600449	T2S R7E 26BDD	1,250	1,240	685	685	0	HASTINGS ET AL,	1,084.4	721.0	713.1	743.0	615.0	355.2	546.9	489.9	307.7	139.1	266.3	254.0	111.9	88.9	202.3
600450	T2S R7E 26BDD	420	420	30	30	0	HASTINGS ET AL,	0.0	238.0	438.1	303.4	260.7	358.4	396.2	127.5	165.9	0.0	0.0	0.0	0.0	519.0	262.2
625024	T2S R7E 26DAD	900	0	0	0	0	CALL, ANSON,L	172.0	6.1	0.0	0.0	410.3	590.7	399.8	300.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
628456	T2S R7E 27CA	0	0	0	0	0	BARNES & WILLIS,	319.0	249.0	278.0	519.0	269.0	344.6	123.0	236.5	73.3	124.4	124.7	0.0	171.4	0.0	0.0
628457	T2S R7E 27CA	0	0	0	0	0	BARNES & WILLIS,	136.0	121.0	211.0	664.0	199.0	534.0	88.0	290.2	59.2	51.9	204.2	563.9	347.5	0.0	0.0
615228	T2S R7E 27DDA	600	600	0	0	0	AZ STATE LAND DEPT,	0.0	121.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	263.9	78.2
514326	T2S R7E 28AAD	0	0	0	0	0	EARNHARDT, III	0.0	0.0	0.0	93.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
625195	T2S R7E 28ADD	1,000	1,000	1,150	1,150	0	QUEEN CREEK HEIGHTS,	446.5	445.5	1,357.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
625818	T2S R7E 28DDB	1,658	1,658	850	850	0	QUEEN CREEK HEIGHTS,	863.5	863.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
618958	T2S R7E 29AC	0	0	0	0	0	RANCHO JARDINES IRRI,	541.5	524.2	483.1	650.0	721.0	792.8	549.0	604.0	534.0	337.0	732.0	806.0	353.0	350.0	651.0
607983	T2S R7E 2CDD	1,005	1,005	1,400	1,400	0	BARNEY FARMS,	512.8	506.5	502.4	0.0	716.6	740.7	623.2	586.3	209.4	106.6	266.9	139.2	136.5	40.6	54.3
615226	T2S R7E 2DCD	1,300	1,200	1,000	1,000	0	AZ STATE LAND DEPT,	603.0	417.3	237.2	277.0	555.5	849.1	771.9	1,115.5	784.6	497.1	449.5	360.2	922.0	806.7	857.0
615227	T2S R7E 2DDD	1,010	990	1,530	1,530	0	AZ STATE LAND DEPT,	628.2	481.7	170.8	201.0	510.2	557.8	269.5	581.6	271.8	463.4	243.4	373.8	397.0	429.1	334.0
608810	T2S R7E 31AAB	1,200	800	1,250	1,250	0	CHANDLER HEIGHTS IRRIGAT	0.0	0.0	947.0	940.6	802.2	592.9	441.5	615.0	228.0	0.0	0.0	397.0	450.0	586.0	84.0
608809	T2S R7E 31ABB	1,200	800	1,200	1,200	0	CHANDLER HEIGHTS IRRIGAT	0.0	0.0	1,203.0	1,491.0	1,356.5	1,097.9	1,095.8	1,155.9	941.0	0.0	0.0	735.0	842.0	896.0	676.0
608808	T2S R7E 31BBC	1,220	1,000	1,150	1,150	0	CHANDLER HEIGHTS IRRIGAT	0.0	0.0	1,284.6	1,106.4	1,402.1	1,423.5	628.9	884.7	461.0	0.0	0.0	359.0	361.0	365.0	301.0
605482	T2S R7E 33AAA	1,190	1,190	1,000	1,000	0	BARNES,E L	318.7	0.0	3.2	0.0	298.3	363.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
605483	T2S R7E 33DDA	1,125	957	1,000	1,000	0	MILLER,M P	251.1	0.0	260.2	820.3	509.8	415.2	436.6	462.1	48.8	51.2	0.0	6.8	0.0	0.0	0.0
606642	T2S R7E 34AAD	1,068	1,068	800	800	0	QUEEN CREEK INVEST,	333.8	1,025.5	808.2	938.3	1,243.2	1,079.6	812.6	0.0	468.9	0.0	0.0	0.0	0.0	0.0	0.0
606643	T2S R7E 34ADD	1,139	1,139	600	600	0	QUEEN CREEK INVEST,	563.4	628.9	560.9	386.5	671.5	688.4	503.5	0.0	310.9	466.1	117.2	722.0	966.0	617.0	977.0
625023	T2S R7E 35AAD	0	0	0	0	0	QUEEN CREEK TEN, INC	845.3	835.2	619.9	643.4	569.6	775.1	724.2	669.5	477.2	294.3	0.0	488.9	617.8	1,131.4	628.6
625022	T2S R7E 35DBB	1,400	0	0	0	0	QUEEN CREEK TEN, INC	1,179.4	1,232.2	858.4	874.3	1,076.4	1,140.8	850.2	910.4	696.9	318.7	0.0	672.3	720.3	384.4	306.4
625021	T2S R7E 35DCC	970	0	0	0	0	JORDE FARMS INC,	1,043.6	1,032.4	541.7	835.2	703.0	852.8	760.3	754.6	609.3	327.3	0.0	0.0	0.0	121.7	0.0
610889	T2S R7E 36ADA	1,500	1,500	0	0	0	CENTURY PLAZA INVEST,	718.4	397.9	521.7	1,008.1	548.2	896.8	533.4	711.1	5.7	11.4	0.0	0.0	0.0	0.0	0.0
508779	T2S R7E 36CCC	800	800	119	119	17	EMPIRE INVESTMENTS,	0.0	0.0	8.0	8.0	6.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	0.0	0.0	0.0
605074	T2S R7E 36CCC	1,007	0	2,000	2,000	0	THE CARDON FAMILY,	71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
603150	T2S R7E 36DDD	1,500	1,200	1,200	1,200	0	AZ THOROUGHBRED,	997.5	456.0	60.7	496.5	377.3	303.0	458.1	507.9	0.0	0.2	0.0	0.0	0.0	0.0	0.0
613588	T2S R7E 3AAA	2,000	1,383	0	0	0	HARRIS CATTLE CO,	579.0	757.0	907.0	695.0	713.0	593.0	654.0	694.0	97.0	780.0	368.0	326.0	463.0	126.0	194.0
625010	T2S R7E 3CDD	690	690	0	0	0	JORDE FARMS INC,	540.7	332.7	486.5	447.0	0.0	544.3	337.6	574.1	271.8	461.4	414.5	698.7	824.4	357.4	0.0
613587	T2S R7E 3DAD	0	0	0	0	0	HARRIS CATTLE CO,	147.0	131.0	22.0	66.0	960.0	87.0	54.0	71.0	27.0	90.0	92.0	61.0	101.0	140.0	101.0
613586	T2S R7E 3DDD	0	0	0	0	0	HARRIS CATTLE CO,	290.0	268.0	316.0	293.0	152.0	41.0	183.0	373.0	147.0	973.0	385.0	370.0	517.0	535.0	293.0
613581	T2S R7E 4ADD	1,524	1,514	0	0	0	HARRIS CATTLE CO,	337.0	522.0	482.0	427.0	248.0	327.0	447.0	248.0	258.0	0.0	326.0	173.0	367.0	245.0	375.0
629594	T2S R7E 4CDD	1,000	0	1,500	0	0	SOUTH RITTENHOUSE RD,	400.0	450.0	157.5	696.0	376.5	470.6	453.4	354.7	69.9	0.0	52.2	0.0	0.0	0.0	0.0
625008	T2S R7E 4DDD	0	0	0	0	0	E G 160 GEN PTRSHP,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	213.0
613580	T2S R7E 5DAA	533	0	0	0	0	PECOS SOSSAMAN PRTSP,	151.5	185.0	183.0	246.0	256.0	238.0	195.0	295.0	147.0	0.0	450.0	88.0	277.0	129.0	0.0
613579	T2S R7E 5DDD	624	0	0	0	0	PECOS SOSSAMAN PRTSP,	296.9	452.0	365.0	399.0	406.0	390.0	364.0	331.0	46.0	44.0	473.0	54.0	316.0	105.0	10.0
613292	T2S R7E 7AAA	1,300	1,300	1,200	1,200	0	OLYMPUS HOTELS INC,	252.9	302.6	228.8	379.5	817.1	744.1	473.0	313.0	188.7	0.0	0.0	0.0	342.4	46.8	12.0
509958	T2S R7E 7CBC	1,204	1,204	400	805	160	QUEEN CREEK POTOATO,	0.0	0.0	2.7	24.1	25.5	34.1	29.7	33.2	31.8	37.1	32.1	32.6	31.6	34.6	0.0

Regno	Location	Well Depth (ft)	Casing Depth (ft)	Pump Rate (gpm)	Test Rate (gpm)	Draw-down (ft)	Owners Name	Annual Pumpage (acre-feet) 1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
613293	T2S R7E 7DAA	1,608	1,498	1,500	1,500	0	OLYMPUS HOTELS INC,	497.4	847.6	265.6	814.7	570.9	656.1	282.9	362.4	95.4	0.0	18.2	231.5	342.5	47.1	101.1
612286	T2S R7E 8DDA	1,208	1,208	1,400	0	0	QUEEN CREEK INV. ASS,	302.9	994.3	310.7	579.0	901.1	541.0	247.0	384.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612285	T2S R7E 8DDD	928	928	1,400	0	0	CLOUD RANCHES LTD,	515.6	666.0	512.0	240.9	418.9	600.0	233.0	165.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
620865	T2S R7E 9	860	860	1,150	1,150	0	RAYBURN, LEO,G	207.5	206.3	252.7	253.4	327.6	236.5	100.3	67.2	31.7	68.0	65.0	0.0	156.8	185.1	224.1
803070	T2S R7E 9CDC	1,025	650	140	0	0	AZ BOYS RANCH,	0.0	70.5	75.2	32.0	331.0	422.0	343.0	423.7	383.6	0.0	0.0	0.0	0.0	0.0	0.0
628854	T2S R7E 9DDA	1,000	0	0	0	0	BARNES, ETAL	0.0	0.0	218.0	224.0	362.0	466.4	477.0	436.6	155.3	10.1	0.0	0.0	23.5	0.0	0.0
605834	T2S R8E 16AAD	1,205	1,205	2,000	2,000	0	H2O INC,	0.0	0.0	0.0	297.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
605835	T2S R8E 16DAA	1,205	1,205	1,500	1,500	0	H2O INC,	205.2	234.6	264.2	0.0	298.8	302.4	267.2	294.9	258.2	270.5	294.4	318.0	343.9	134.2	394.3
605837	T2S R8E 18DAD	1,005	1,005	1,000	1,000	0	SCHNEPF,J M	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.1	1.3	1.8	0.0	9.0	0.8	239.6	2.0
606715	T2S R8E 17DCD	1,000	1,000	1,500	1,500	0	SUN VALLEY FARMS,	399.5	695.0	345.9	840.9	928.6	692.2	1,306.2	892.7	452.8	534.3	380.2	146.5	326.1	389.7	242.0
606714	T2S R8E 17DDC	1,000	1,000	1,500	1,500	0	SUN VALLEY FARMS,	460.5	560.3	558.8	451.7	470.7	335.4	12.3	68.7	0.0	0.6	0.0	0.0	0.0	0.0	0.0
625027	T2S R8E 18BDD	0	0	0	0	0	ANDERSEN, ZOLA,	497.9	821.2	699.8	469.3	617.8	631.5	635.3	696.7	78.9	16.1	468.9	556.6	1,259.1	891.4	613.1
630352	T2S R8E 18DAA	945	904	1,000	1,000	0	BARNES,E M	181.4	341.1	322.0	342.0	344.1	332.6	179.0	253.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
630351	T2S R8E 18DAD	1,000	1,000	900	900	0	BARNES,E M	63.3	162.2	325.0	314.0	314.5	744.0	524.0	560.0	0.0	0.0	0.0	0.0	0.0	47.7	61.3
630353	T2S R8E 18DCD	700	700	800	800	0	BARNES,E M	255.4	525.2	242.0	312.0	310.7	242.0	276.0	0.0	0.0	0.0	0.0	0.0	0.0	347.5	370.2
630354	T2S R8E 18DDD	1,000	1,000	1,000	1,000	0	BARNES ET AL,E M	408.1	399.3	205.0	522.0	522.4	414.0	42.0	196.0	0.0	0.0	0.0	0.0	0.0	100.5	70.9
603092	T2S R8E 19ADA	930	925	1,350	1,350	0	CTRY FARMS IRR &MGMT,	363.8	385.4	363.1	393.6	398.3	416.6	377.1	326.1	38.0	20.5	374.4	446.0	495.0	486.0	521.0
619740	T2S R8E 19CAB	1,000	1,000	1,400	1,400	0	L D S,	732.9	883.3	330.4	482.3	565.5	674.4	554.4	116.9	77.2	46.3	8.5	8.5	0.0	71.7	51.1
604110	T2S R8E 19CBB	1,000	1,000	1,100	0	0	C.P. FINANCIAL INC.,	0.0	0.0	35.0	159.0	122.9	443.0	338.5	149.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
628276	T2S R8E 20DAA	0	0	0	0	0	LINKS AT QUEEN CREEK,	567.9	567.0	116.6	417.0	343.0	457.0	722.0	670.0	313.0	0.0	225.5	340.5	468.1	342.2	412.4
628277	T2S R8E 20DAA	0	0	0	0	0	LINKS AT QUEEN CREEK,	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	0.0	0.0	0.0	0.0	0.0
609158	T2S R8E 20DDA	973	973	1,500	1,500	0	PECAN GROVES ASSOC'S,	0.0	759.0	35.9	624.8	681.6	817.9	733.5	496.3	194.4	34.7	585.7	794.6	349.0	198.7	146.2
601387	T2S R8E 21AAA	960	0	1,400	1,400	0	GORMLEY, THOMAS,M	376.0	704.0	614.6	808.5	594.4	408.2	335.2	560.3	120.6	205.4	210.0	64.0	129.8	0.0	0.0
601386	T2S R8E 21ADA	1,100	0	1,400	1,400	0	GORMLEY, THOMAS,M	668.0	498.0	358.0	270.6	439.9	501.4	477.2	346.8	155.0	178.7	22.0	202.0	153.7	149.0	0.0
625005	T2S R8E 22ADA	0	0	0	0	0	JORDE FARMS INC,	248.2	413.6	0.0	0.0	0.0	0.0	0.0	0.0	286.0	70.9	123.0	99.0	0.0	0.4	0.0
625004	T2S R8E 22ADD	0	0	0	0	0	JORDE FARMS INC,	0.0	0.0	131.3	207.0	439.2	368.8	169.9	514.2	397.0	553.2	208.0	324.5	269.7	147.6	36.7
625007	T2S R8E 22DAA	0	0	0	0	0	JORDE FARMS INC,	541.3	622.5	342.4	389.0	0.0	529.4	602.9	531.2	0.0	0.0	273.5	0.0	609.0	452.0	465.2
625006	T2S R8E 22DAB	0	0	0	0	0	JORDE FARMS INC,	571.0	987.6	614.1	691.6	0.0	591.4	499.9	438.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627092	T2S R8E 27ADA	1,008	1,003	1,500	1,500	0	ORMSBY, LOREE LEE,	704.6	1,525.4	4.0	331.0	579.0	710.0	515.0	310.3	0.0	35.8	785.1	18.9	718.0	208.2	99.5
627091	T2S R8E 27DAD	1,008	1,008	2,000	2,000	0	ORMSBY, LOREE LEE,	669.8	385.9	74.2	379.0	543.0	1,268.0	716.0	530.2	41.6	0.0	686.3	113.1	963.5	56.8	0.0
627090	T2S R8E 27DDD	1,516	1,500	2,300	2,300	0	ORMSBY, LOREE LEE,	933.3	504.8	47.0	409.0	741.0	840.0	930.0	585.3	0.0	0.0	0.0	0.0	127.3	0.0	0.0
606357	T2S R8E 28AAD	1,010	1,010	1,200	1,200	0	WALES RANCHES,	282.4	286.0	240.6	575.0	551.6	490.3	573.8	336.1	181.6	7.6	0.0	0.0	0.0	0.0	0.0
606369	T2S R8E 28ADD	1,440	1,440	1,600	1,600	0	WALES RANCHES	91.7	110.7	0.0	325.0	375.5	629.2	588.3	982.6	9.0	18.9	0.0	0.0	0.0	0.0	0.0
606368	T2S R8E 28DAA	1,050	1,050	1,400	1,400	0	WALES RANCHES,	289.7	292.7	0.0	660.0	761.8	649.3	951.7	531.3	5.9	7.2	21.6	31.9	333.8	0.0	478.0
609159	T2S R8E 29DAD	884	884	1,500	1,500	0	PECAN GROVES ASSOC'S,	0.0	678.0	242.4	1,114.0	1,188.9	1,012.4	1,039.5	755.6	352.9	24.7	176.1	0.0	0.0	97.2	90.0
604112	T2S R8E 30	660	660	900	0	0	C.P. FINANCIAL INC,	0.0	0.0	0.0	0.0	97.2	176.0	192.4	121.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
609298	T2S R8E 30ADD	1,125	1,125	1,320	1,320	0	SUN VLY FARMS ASSOC,	542.2	607.0	488.7	284.6	528.6	271.0	310.6	341.5	62.0	46.4	28.2	93.0	130.3	72.4	1.2
612287	T2S R8E 30CCA	1,005	1,005	1,100	0	0	R & T INVESTMENTS LL,C	372.1	556.0	308.2	463.7	532.6	483.6	244.3	567.2	405.1	1,257.6	932.3	260.1	0.0	141.5	0.0
612288	T2S R8E 30CCD	1,953	1,953	2,000	0	0	R & T INVESTMENTS LL,C	553.7	1,008.8	859.2	529.1	727.1	716.7	732.0	454.7	0.0	0.0	609.2	287.7	0.0	0.0	48.5
609297	T2S R8E 30DAA	640	640	1,000	1,000	0	SUN VLY FARMS ASSOC,	904.4	421.0	636.8	648.2	262.7	477.8	619.9	576.7	423.5	551.9	289.6	381.0	309.0	346.9	157.1
618026	T2S R8E 31AAD	1,185	1,185	1,600	1,600	0	GANTZEL RANCH,	465.0	361.0	86.0	400.0	893.0	784.6	446.0	569.3	147.0	49.0	132.5	140.0	634.7	308.5	149.2
618025	T2S R8E 31DAA	1,136	1,136	1,600	1,600	0	GANTZEL RANCH,	635.0	674.0	675.0	675.0	588.0	674.5	592.0	491.5	316.0	156.0	50.0	201.5	179.4	71.9	223.3
625916	T2S R8E 31DCC	1,156	1,150	1,000	1,000	0	FIRST AM TITLE INS,	465.0	363.0	290.0	335.0	297.3	364.3	315.0	309.0	663.0	291.0	198.0	259.0	0.0	266.0	194.0
625918	T2S R8E 31DDA	1,150	1,042	1,300	1,300	0	FIRST AM TITLEINS,	277.0	1,004.4	539.0	890.2	1,265.7	944.7	1,234.0	521.9	217.0	116.0	205.0	47.0	0.0	245.6	99.4
600771	T2S R8E 32AAA	720	720	890	890	0	JOHNSON, ETAL	735.3	779.1	728.8	1.1	0.0	930.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
802278	T2S R8E 32ABA	1,100	1,100	1,100	1,100	0	JOHNSON, ETAL	0.0	375.7	401.4	0.0	0.0	869.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
601852	T2S R8E 32BBB	1,200	1,200	450	450	0	COMBS SCHOOL DIST#44,J O	30.3	37.4	26.5	29.5	22.0	24.7	21.4	20.0	12.4	9.2	7.5	2.6	4.8	8.1	5.0
086441	T2S R8E 32DDD	1,287	1,285	3,000	3,000	0	JOHNSON, ETAL	1,454.2	888.1	438.5	0.0	0.0	2,831.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
608532	T2S R8E 33AAA	700	700	200	200	0	COMBS,G D	111.6	111.6	177.5	0.0	19.8	33.6	22.0	20.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
608533	T2S R8E 33AAA	1,300	1,300	1,490	1,490	0	COMBS, MICHAEL,R	672.1	690.1	389.9	247.8	408.3	298.2	559.2	539.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
608534	T2S R8E 33BDD	1,000	1,000	1,000	1,000	0	ENCHANTED FARMS,	638.2	492.3	822.1	0.0	284.8	96.1	589.0	293.4	0.0	59.0	29.2	0.0	0.0	0.0	0.0
608535	T2S R8E 33DAA	1,270	1,270	2,000	2,000	0	PANTANO DEVELOPMENT,	1,198.6	1,001.9	0.0	0.0	0.0	0.0	782.3	729.6	0.0	0.0	38.4	86.7	0.0	0.0	0.0
627093	T2S R8E 34AAD	1,000	1,000	1,400	1,400	0	RUSSELL, BRANDT,E	101.9	0.0	76.0	159.0	267.0	356.0	238.0	96.8	26.0	0.0	0.0	0.0	237.8	140.1	63.1
601451	T2S R8E 34ADD	965	965	1,800	1,800	0	SUN VALLEY FARMS,	1,615.9	1,264.0	1,085.7	858.5	867.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615233	T2S R8E 35DBA	1,026	1,003	1,900	1,900	0	AZ STATE LAND DEPT,	477.3	420.1	34.5	159.1	548.0	802.0	654.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
508033	T2S R8E 7BAB	1,005	1,002	70	70	614	ZIMMERMAN DAIRY LTD,	4.7	89.0	99.0	97.2	103.0	67.6	67.5	70.7	71.1	74.6	56.0	100.3	76.3	84.8	88.0
619771	T2S R8E 7BAB	800	800	35	35	0	ZIMMERMAN DAIRY LTD,	821.6	839.7	1,246.0	622.4	429.3	384.4	425.4	426.1	195.2	132.0	176.6	98.4	335.6	279.9	249.8
619741	T2S R8E 7DCD	1,210	1,203	1,700	1,700	0	LDS-CORP OF PRESID,	571.2	640.1	427.8	334.7	299.0	400.8	279.0	267.8	73.0	20.7	52.2	25.8	155.5	0.0	0.0
619742	T2S R8E 7DDD	1,012	1,012	1,800	1,800	0	LDS-CORP OF PRESID,	0.0	0.0	0.0	289.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	55.3	54.4
802279	T2S R8E 8DAA	1,000	1,000	1,100	1,100	0	COMMODITIES OF ARIZ,	0.0	394.5	754.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
618933	T2S R8E 8DAD	1,500	1,500	1,200	1,200	0	BARONE JR., ROBERT,G	165.0	175.4	185.2	202.5	175.1	329.1	273.6	248.5	140.0	173.0	212.3	237.7	224.3	227.0	204.4
615230	T2S R8E 9BAA	1,002	1,002	0	0	0	AZ STATE LAND DEPT,	0.0	0.0	0.0	0.0	0.0	0.0	24.1	21.8	21.9	0.0	0.0	0.0	0.0	0.0	0.0
615231	T2S R8E 9CDD	1,140	1,140	1,130	1,130	0	AZ STATE LAND DEPT,	250.6	520.0	0.0	0.0	0.0	504.0	634.4	462.6	240.9	142.6	0.0	717.2	636.6	1,254.4	1,326.5
605836	T2S R8E 9DAA	1,207	1,207	1,500	1,500	0	H2O INC,	0.0	360.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
624608	T2S R9E 36DAC	840	840	240	240	0	BHP COPPER INC,	52.6	35.4	25.2	44.6	49.4	27.4	8.8	81.0	22.2	92.0	132.4	79.9	350.0	156.4	73.5
615235	T2S R9E 36DBD	840	840	0	0	0	AZ STATE LAND DEPT,	26.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
629470	T3S R7E 12ABC	0	0	1,360	1,360	0	FARMERS HOME,	0.0	1,568.0	1,087.1	732.1	991.1	1,006.0	840.5	811.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
625025	T3S R7E 12DBA	1,000	0	0	0	0	TRINITY FARMS OF PHX,	319.0	359.6	449.4	447.1	0.0	424.1	170.3	533.6	343.7	61.5	95.3	144.9	91.3	83.2	636.5

Regno	Location	Well Depth (ft)	Casing Depth (ft)	Pump Rate (gpm)	Test Rate (gpm)	Draw-down (ft)	Owners Name	Annual Pumpage (acre-feet) 1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
629469	T3S R7E 1DCC	0	0	980	0	0	FARMERS HOME,	0.0	771.8	180.1	727.2	494.3	347.0	678.8	329.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
625020	T3S R7E 2ADD	980	0	0	0	0	JORDE FARMS INC,	600.1	612.9	758.3	706.2	0.0	440.2	726.8	651.1	0.0	205.8	119.2	0.0	0.0	0.0	0.0
603380	T3S R8E 13DAD	1,200	1,200	0	0	0	BELLAVISTA FARMS #4,	0.0	0.0	0.0	0.0	0.0	958.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
603386	T3S R8E 15ADD	724	697	0	0	0	BELLAVISTA FARMS #2,	0.0	0.0	0.0	0.0	0.0	330.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615283	T3S R8E 16DBD	1,010	1,000	0	0	0	AZ STATE LAND DEPT,	1,173.3	593.4	107.4	355.4	423.7	714.1	535.9	587.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627098	T3S R8E 17DAB	920	918	1,400	1,400	0	ELLSWORTH LND-LIVEST,	834.0	845.4	520.6	771.7	642.4	187.7	692.5	690.0	0.0	0.0	284.0	0.0	0.0	0.0	0.0
627099	T3S R8E 17DDC	866	866	1,450	1,450	0	ELLSWORTH LND-LIVEST,	1,214.0	1,185.1	1,091.8	1,270.4	655.0	1,012.4	609.4	701.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627103	T3S R8E 21AAA	720	720	900	900	0	ELLSWORTH LAND & LIVESTO	384.4	391.7	32.6	319.4	0.0	169.9	62.0	207.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627104	T3S R8E 21BAA	804	804	1,400	1,400	0	ELLSWORTH LAND & LIVESTO	919.6	1,013.1	742.3	798.2	428.3	352.3	181.0	153.0	220.8	0.0	0.0	0.0	0.0	0.0	0.0
615289	T3S R8E 22ADC	600	600	3,000	3,000	0	AZ STATE LAND DEPT,	359.4	529.7	325.0	551.0	562.6	588.6	461.0	511.2	438.5	513.6	567.0	615.2	641.7	623.7	551.0
615290	T3S R8E 22ADD	1,000	1,000	2,535	2,535	0	AZ STATE LAND DEPT,	1,020.0	766.2	505.0	730.0	695.4	925.4	475.8	551.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615291	T3S R8E 22DCC	1,000	600	1,840	1,840	0	AZ STATE LAND DEPT,	1,061.7	1,046.0	637.0	1,152.9	1,259.6	1,248.6	1,039.0	1,058.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
633857	T3S R8E 24AAA	773	773	1,520	1,520	0	NEVITT FARMS LP,	384.0	1,146.5	1,471.2	731.4	308.1	694.0	691.4	791.0	62.2	40.8	85.2	0.0	5.5	5.5	0.0
633858	T3S R8E 24ADD	1,001	1,001	1,750	1,750	0	NEVITT FARMS LP,	700.0	714.6	428.0	392.9	128.5	545.0	584.7	515.6	0.0	20.9	29.0	0.0	0.0	0.0	0.0
615292	T3S R8E 25AAA	748	748	2,200	2,200	0	AZ STATE LAND DEPT,	437.0	266.7	606.0	4.0	498.2	729.1	645.8	574.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615293	T3S R8E 25DAA	721	664	3,275	3,275	0	AZ STATE LAND DEPT,	773.5	582.6	685.4	338.0	646.0	731.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615294	T3S R8E 26AAA	900	900	2,000	2,000	0	AZ STATE LAND DEPT,	614.0	937.7	619.0	0.0	264.3	709.1	514.3	907.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615295	T3S R8E 26ACA	816	816	2,100	2,100	0	AZ STATE LAND DEPT,	493.0	857.0	664.0	0.0	604.3	857.3	202.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627111	T3S R8E 27AAA	811	738	1,300	1,300	0	SPIKE H. ENTERPRISES,	206.0	502.0	205.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627112	T3S R8E 27ABA	914	914	1,100	1,100	0	SPIKE H. ENTERPRISES,	343.5	556.0	611.0	576.6	480.8	307.7	250.0	381.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627113	T3S R8E 27BAB	680	673	350	350	0	SPIKE H. ENTEPRISES,	146.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627114	T3S R8E 27BDB	600	530	600	600	0	SPIKE H, ENTERPRISES,	0.0	0.0	0.0	0.0	0.0	235.9	22.0	75.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
609350	T3S R8E 2DDD	1,000	1,000	50	50	0	ELLSWORTH LND-LIVEST,	0.0	0.0	0.0	0.0	0.0	13.3	10.9	12.3	7.7	0.0	0.0	13.7	0.0	17.0	23.4
610615	T3S R8E 36AAA	700	700	35	2,400	0	NALBANDIAN FARMS INC,	0.0	7.8	4.7	2.6	418.7	1,824.8	786.3	680.3	0.0	0.0	11.2	0.0	7.8	0.0	0.0
610616	T3S R8E 36AAA	700	700	2,000	2,000	0	NALBANDIAN FARMS INC,	1,245.5	1,243.3	473.0	0.0	40.5	1,058.6	932.1	339.1	0.0	0.0	0.0	491.3	296.5	0.0	0.0
610618	T3S R8E 36ABA	700	700	1,995	1,995	56	NALBANDIAN FARMS INC,	1,556.9	991.1	103.0	0.0	0.0	1,412.5	0.0	668.5	0.0	0.0	0.0	447.5	399.8	391.4	0.0
610617	T3S R8E 36BAA	630	830	2,000	2,000	95	NALBANDIAN FARMS INC,	996.1	1,661.3	444.0	0.0	435.4	1,247.3	1,845.2	757.5	0.0	0.0	585.3	518.5	279.2	0.0	0.0
610619	T3S R8E 36CAC	760	760	2,006	2,006	45	NALBANDIAN FARMS INC,	1,179.0	722.5	655.3	0.0	250.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
801450	T3S R8E 3AAA	671	0	1,200	1,200	0	SUN VALLEY FARMS,	572.6	470.0	528.0	472.0	424.0	0.0	0.0	866.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615274	T3S R8E 4AAA	1,015	1,015	910	910	0	AZ STATE LAND DEPT,	726.2	1,318.8	854.8	0.0	0.0	0.0	634.3	307.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615275	T3S R8E 4BBA	1,000	1,000	0	0	0	AZ STATE LAND DEPT,	904.7	1,318.8	922.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615276	T3S R8E 4DAA	955	955	1,275	1,275	0	AZ STATE LAND DEPT,	808.5	1,544.7	769.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
625917	T3S R8E 6DAA	2,422	2,422	3,000	3,000	0	FIRST AM TITLEINS,	1,021.0	485.0	739.0	1,551.5	1,193.2	1,809.4	1,266.0	1,171.5	292.0	147.0	475.0	155.0	149.1	32.0	2.0
615277	T3S R8E 7DCD	0	0	0	2,000	28	AZ STATE LAND DEPT,	579.2	462.3	575.1	550.9	215.0	478.6	319.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
615278	T3S R8E 8BBB	825	825	1,300	1,300	50	AZ STATE LAND DEPT,	460.9	842.9	733.3	850.3	205.2	37.3	41.9	546.0	0.0	0.0	11.6	0.0	0.0	0.0	0.0
615279	T3S R8E 8DDD	975	970	1,160	1,160	25	AZ STATE LAND DEPT,	55.5	202.8	352.6	186.5	0.0	0.0	23.6	16.9	16.8	18.5	152.4	0.0	0.0	0.0	0.0
500591	T3S R9E 18BCC	800	780	150	150	0	BUCHLI,D J	39.9	60.5	60.1	60.9	59.8	61.7	61.4	61.2	45.8	55.1	57.2	52.1	57.3	55.1	56.5
610701	T3S R9E 20AAA	600	600	0	0	0	ST FRANCIS FARMS,	1,128.0	425.3	320.7	129.4	135.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
604109	T3S R9E 20AAD	1,000	1,000	600	600	0	J & A FARMS,	81.4	115.6	122.2	65.4	59.8	81.8	66.3	53.0	48.8	50.5	55.4	50.5	58.8	50.5	0.0
610704	T3S R9E 20BBA	1,000	1,000	0	0	0	ST FRANCIS FARMS,	1,316.0	866.6	703.4	315.3	86.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
610703	T3S R9E 20DAA	757	757	0	0	0	SMITH, MILTON ETAL,P	564.0	554.3	456.2	148.3	166.2	615.8	0.0	156.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627924	T3S R9E 28	600	580	0	0	0	JOHNSON UTITLITIES INC	6.9	6.9	0.0	6.6	3.2	5.6	5.6	7.4	8.1	8.5	10.8	17.4	0.0	17.8	5.3
627923	T3S R9E 28BBC	850	850	0	0	0	JOHNSON UTITLITIES INC	189.4	262.5	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
610702	T3S R9E 29AAA	600	590	0	0	0	ST FRANCIS FARMS,	752.0	1,075.6	938.2	370.7	573.4	727.5	535.7	303.8	0.0	0.0	0.0	271.0	0.0	0.0	0.0
624609	T3S R9E 2AAC	1,000	1,000	800	800	0	BHP COPPER INC,	205.8	217.2	236.6	192.6	114.5	69.2	14.6	73.8	163.7	96.7	124.6	113.9	3.3	117.8	0.0
615303	T3S R9E 2AAD	1,000	1,000	0	0	0	AZ STATE LAND DEPT,	205.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612169	T3S R9E 31AAA	740	740	1,500	1,500	0	CHAPMAN,H J	544.3	310.0	214.0	252.0	362.0	0.0	0.0	150.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612171	T3S R9E 31AAA	713	713	1,200	1,200	0	CHAPMAN,H J	386.6	265.0	17.0	154.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612337	T3S R9E 31ABB	774	774	2,800	2,800	0	HORNBROOK, DONALD,J	333.0	504.0	506.0	768.0	751.0	358.6	416.0	482.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612338	T3S R9E 31CAA	670	631	2,800	2,800	0	HORNBROOK, DONALD,J	268.0	547.0	305.0	746.0	502.3	303.1	343.7	448.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612175	T3S R9E 31DBA	692	690	1,400	1,400	0	CHAPMAN,H J	30.1	30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
627922	T3S R9E 32BBC	748	748	0	0	0	JOHNSON UTITLITIES INC	690.6	262.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
619399	T3S R9E 34AAA	662	662	1,462	1,462	0	HERSETH FEEDLOTS INC,	1,114.0	1,419.0	648.5	1,120.0	736.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
619403	T3S R9E 34ADD	692	651	1,200	1,200	0	HERSETH FEEDLOTS INC,	419.0	42.8	333.0	302.0	143.0	0.0	0.0	0.0	0.0	0.0	24.2	0.0	0.0	0.0	0.0
619398	T3S R9E 34BAA	612	612	1,056	1,056	0	HERSETH FEEDLOTS INC,	603.0	687.6	245.1	685.0	597.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
619400	T3S R9E 34DBA	763	734	1,297	1,297	0	HERSETH FEEDLOTS INC,	971.0	859.1	574.6	1,034.0	738.0	4.2	3.9	0.3	0.0	0.0	47.3	0.0	134.5	0.0	0.0
610620	T4S R8E 1AAA	520	520	900	900	0	NALBANDIAN, PETER,	391.2	435.6	66.0	0.0	0.0	628.1	455.6	171.7	0.0	0.0	72.6	0.0	0.0	0.0	0.0
619402	T4S R9E 3AAA	504	504	650	650	0	HERSETH FEEDLOTS INC,	346.0	404.4	0.0	0.0	0.0	0.0	0.0	0.1	6.7	0.0	0.0	0.0	0.0	0.0	0.0
619401	T4S R9E 3ABA	838	838	960	0	0	HERSETH FEEDLOTS INC,	653.0	564.3	89.6	95.9	84.0	116.4	139.5	149.2	160.6	160.2	97.9	110.0	108.3	111.9	96.0
625476	T4S R9E 4AAA	589	589	1,200	1,200	0	BAXTER 602 LLC	163.0	162.0	236.0	231.7	67.4	119.5	313.4	270.1	2.0	1.5	1.5	1.5	1.5	33.2	13.0
625475	T4S R9E 4DDD	750	750	1,500	1,500	0	BAXTER 602 LLC	689.0	459.0	478.0	732.5	587.8	693.1	791.1	794.3	58.0	231.5	231.5	231.5	257.5	21.2	0.0
625477	T4S R9E 4DDD	643	590	1,500	1,500	0	BAXTER 602 LLC	715.0	582.0	407.0	652.9	563.3	477.0	699.6	860.6	0.0	57.0	56.5	56.5	59.9	0.0	205.6
612173	T4S R9E 5BAB	635	620	1,100	1,100	0	F & A FUNDING,	198.8	184.0	151.5	54.6	136.4	90.7	190.0	137.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612172	T4S R9E 5BBB	800	780	1,100	1,100	0	F & A FUNDING,	282.5	224.2	213.9	83.0	258.7	124.7	289.0	246.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612170	T4S R9E 5CCA	683	680	500	0	0	DEMETRIA, JOHN LTD,	0.0	214.8	254.8	1.6	0.0	93.0	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
612174	T4S R9E 5DAA	916	900	750	750	0	CHANDLER 235 LTD,	0.0	468.3	584.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
610623	T4S R9E 6AAA	1,000	1,000	1,800	1,800	0	NALBANDIAN, PETER,	944.8	782.7	355.2	0.0	0.0	833.3	840.3	441.2	0.0	0.0	442.3	498.7	0.0	0.0	75.8
610622	T4S R9E 6ABA	860	860	1,800	1,800	0	NALBANDIAN, PETER,	1,530.5	1,301.2	402.4	0.0	0.0	1,056.3	661.6	550.4	0.0	0.0	519.0	463.4	0.0	0.0	24.2

Regno	Location	Well Depth (ft)	Casing Depth (ft)	Pump Rate (gpm)	Test Rate (gpm)	Draw-down (ft)	Owners Name	Annual Pumpage (acre-feet) 1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
610632	T4S R9E 6ADA	1,532	1,530	1,100	1,100	0	NALBANDIAN FARMS INC,	37.6	0.0	0.0	0.0	0.0	383.0	272.1	345.1	0.0	0.0	0.0	0.0	0.0	0.0	122.3
610624	T4S R9E 6BAA	1,530	1,530	2,200	2,200	0	NALBANDIAN FARMS INC,	948.0	700.5	86.4	0.0	8.1	657.9	610.7	495.6	0.0	0.0	6.2	1.6	8.1	0.0	101.7
610621	T4S R9E 6BBA	800	800	2,000	2,000	0	NALBANDIAN, PETER,	1,309.8	744.3	126.8	0.0	0.0	1,287.6	0.0	1,052.1	0.0	0.0	123.5	152.3	0.0	328.9	135.3
622013	T4S R9E 7AAA	760	760	1,100	1,100	0	SOL LAGOS FARMS II,	271.2	0.0	0.0	0.0	0.0	0.0	0.0	66.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
622014	T4S R9E 7AAD	867	867	1,800	1,800	0	SOL LAGOS FARMS II,	771.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
								215,290	175,175	158,675	141,323	166,141	199,298	215,911	164,289	75,742	75,979	112,584	107,636	129,908	103,669	103,773

APPENDIX B
Visual MODFLOW Datasets (CD)

EXHIBIT "C"

ARIZONA DEPARTMENT OF WATER RESOURCES
Hydrology Division
500 North Third Street, Phoenix, Arizona 85004
Telephone 602 417-2448
Fax 602 417-2425

RECEIVED
JUL 23 2001
ARIZONA WATER COMPANY
PHOENIX - EXECUTIVE

JANE DEE HULL
Governor

JOSEPH C. SMITH
Director

July 19, 2001

William M. Garfield, Vice President - Operations
Arizona Water Company
P.O. Box 29006
Phoenix, AZ 85038-9006

RE: Arizona Water Company, Apache Junction
Application for Physical Availability Demonstration #20-400448

Dear Mr. Garfield:

The Department has completed review of the report entitled *Hydrology Study Report Apache Junction Groundwater Flow Model* prepared for Arizona Water Company, by Clear Creek Associates, November 22, 2000. The area of investigation is the Arizona Water Company model boundary specified in the report. The study area encompasses about 420 square miles in the East Salt River Valley Sub-basin in the Phoenix Active Management Area.

In accordance with A.A.C. R12-15-702 (C), we have determined that 19,255 acre-feet per year of groundwater are physically available for 100 years under A.A.C. R12-15-703 (B) for assured water supply purposes in the subject area. This determination is based on the MODFLOW evaluation that simulated 19,255 acre-feet of pumping per year from supply wells within Arizona Water Company's service area. This water is also of adequate quality for purposes of A.A.C. R12-15-704. The amount of 19,255 acre-feet per year includes the amount of groundwater required to meet the current and committed demands of the Apache Junction system. According to available information, the current and committed groundwater demand is estimated at about 7,340 acre-feet per year. It is the Department's conclusion that, pumping up to a maximum of 19,255 acre-feet per year for 100 years will take the depth-to-static water level to less than 1,000 feet below land surface, the maximum depth allowed by A.A.C. R12-15-703 (B). **If the Department finds that the groundwater supply is not available because the assumptions and information used in determining the physical availability under the current criteria prove incorrect, the Department will modify the availability of groundwater accordingly.**

The results of the Department's hydrologic review fulfill the requirements of R12-15-702 (C) and can be cited in applications for a Certificate of Assured Water Supply or for a Designation of Assured Water Supply. These applications have certain additional requirements based on the assured water supply criteria referenced in A.R.S. § 45-576 and A.A.C. R12-15-701 *et. seq.* For further information on these requirements, please contact the Office of Assured and Adequate Water Supply at (602) 417-2460.

The Department's determination is an appealable agency action. In order to appeal this decision; you must request an appeal within thirty (30) days from receipt of this letter. I have enclosed a summary of the appeals process and an appeal form should you wish to pursue this option.

If you have any questions regarding the physical availability review, please contact me at (602) 417-2448.

Sincerely,

Greg Wallace
Chief Hydrologist

GW/KM/rd
202194

cc: Steve W. Correll, Clear Creek Associates
Steve Rossi, ADWR

8 REASONS WHY (WE BELIEVE) THE RECESSION IS OVER

We believe the worst recession since the 1930s is over. Signs of recovery are everywhere. It's time for investors to look forward and to stop looking back. In this report, we discuss eight reasons why we believe this recession may be over.

1 Leading economic indicators are positive.

The Conference Board's Index of Leading Economic Indicators, which is designed to anticipate changes in the economy by three to six months, rose 0.6% in July for its fourth consecutive gain. This gauge has an impressive track record of calling turns in the economy. The stock market, another leading economic indicator, has already rebounded 50% from its March lows.

2 Global economies are recovering.

The Organisation for Economic Co-operation and Development's (OECD)[1] composite leading indicators for its member countries recorded their largest increase in June since records began in 1962. For the first time ever, all 33 countries recorded an increase. Japan's economy grew this past quarter for the first time since early last year. Europe also appears to be pulling out of recession, with positive growth reported in the most recent quarters in Germany and France.

3 The job market is improving.

Non-farm payrolls fell by just 247,000 in June, while the unemployment rate eased from 9.5% to 9.4%. The rate of decline in payrolls has been improving since January, when payrolls declined by 741,000. Employment has been a lagging indicator of the economy, improving at the end of or well after every recession in the postwar period.

4 The Federal Reserve's efforts to stabilize the financial system worked.

The massive efforts to slash interest rates and provide trillions in funds to the financial system have succeeded in restoring conditions in the money and corporate credit markets. Corporate America has taken advantage of attractive rates to refinance old debt and fund new acquisitions. Companies issued more than $800 billion in new bonds during the first seven months of 2009 – nearly a third more than a year earlier. In the money markets, the three-month London interbank offered rate is down to 0.43%, less than one-tenth of where this short-term benchmark stood at the worst of the credit crisis last October.

5 Bank lending is increasing.

Banks' profitability and capitalization have improved, and banks have started lending again. According to the Fed's recent periodic survey of banks, about 30% said, on net, they tightened lending to businesses in May, June and July, but that's down from roughly 40% in April's survey. The percentage of banks that tightened standards on commercial real estate loans dropped 20 percentage points to 45%. For residential real estate, the percentage fell to 20% from a peak of about 75% a year ago. Most banks expected lending standards across all loans would remain tighter than their average levels over the past decade until at least the second half of 2010. However, the improvement in bank lending should be enough to support economic recovery.

6 Expectations for 2010 economic growth continue to improve.

- In a recent *Wall Street Journal* survey, 80% of economists said they believe the recession either has ended or will end by September. In addition, economists continue to upgrade expectations for growth in the rest of 2009 and beyond.
- The top 50 U.S. economists[2] expect the economy to grow 2.2% in the third quarter, after falling just 1% in the second quarter.
- Economists in August lifted their projection for third-quarter growth by 1.2 percentage points over July's estimate to 2.2%, according to the median of 55 forecasts in a Bloomberg News survey. That is the biggest such boost in surveys dating from May 2003. Forecasts for 2010 were raised to 2.3% from 2.1%.
- The International Monetary Fund said in a recently revised forecast that the world economy will expand 2.5% in 2010, compared with its April projection of 1.9%.

7 Housing has bottomed.

Sales of existing U.S. homes jumped more than expected in July to the highest level in almost two years, signaling the worst of the housing recession may have passed. Purchases climbed 7.2% to a 5.24 million annual rate, the most since August 2007, the National Association of Realtors said recently. The gain was the biggest since records began in 1999. The S&P/Case-Shiller home price index advanced 2.9% in the second quarter from the previous three months, the first increase since 2006 and the biggest in almost four years. Foreclosure-driven declines in prices, government credits for first-time buyers and near-record-low borrowing costs are expected to continue stoking demand.

8 Manufacturing is on the rebound.

The Fed said industrial production rose 0.5% in July, the first increase in nine months. European industrial orders increased 3.1% from May, the biggest gain in 19 months, according to the European Union's statistics office. For the first time since January 2008, an index based on a survey of U.S. purchasing managers crossed a threshold indicating factory output grew. Manufacturing activity in China, France and Australia, among other countries, also expanded in August, separate surveys showed. The pace of contraction in Germany and some other nations slowed markedly.

Why Does It Take So Long to Call Recessions "Officially Over"?

The official "scorekeeper" of recessions is the National Bureau of Economic Research (NBER), a private organization in Cambridge, Mass. These folks aren't terribly interested in forecasting turns in the economy. Instead, they focus on making sure their recession start and end dates are absolutely accurate and not subject to future revisions. Robert Hall, who heads the NBER's Business Cycle Dating Committee, recently said it is "more important" this time around for the group to adhere to the principle of not calling an end to the recession until after economic growth has surpassed its previous peak, "which could take 18 months or more to determine." The group took until July 2003, 20 months after the fact and well after stock prices had begun to recover, to declare the last recession had ended.

Don't Bet Against History

Historically, the stock market has performed well once recessions end. The chart below shows the performance of the S&P 500 six and 12 months after postwar recessions ended. While history is not always an accurate guide to the future, it does suggest that investors who are out of the market are betting against a lot of history.

S&P 500 Performance after Postwar Recessions

Recession End Dates	% Change 6 Months Later	% Change 12 Months Later
10/31/1949	10.97%	19.57%
5/25/1954	18.63	29.98
4/30/1958	17.77	37.12
2/28/1961	7.86	7.51
11/30/1970	15.06	4.49
3/31/1975	6.57	30.63
7/31/1980	1.28	1.82
11/30/1982	15.46	22.18
3/28/1991	3.55	12.14
11/30/2001	-1.66	-10.04
7/31/2009 (est.)	TBD	TBD
Average	**9.55%**	**15.54%**

Source: Ned Davis Research. Daily data starting in 1947. Six months measured by 126 market days; 12 months measured by 252 market days.

You Can't Recover If You're Not Invested

There are always risks to the outlook. The recovery could be uneven, or something unforeseen might derail the progress we've made. The stock market could correct at any time for any reason. But these things are unpredictable. Our advice remains the same: Don't base your investment decisions on predictions; base them on investment principles. Focus on the things you can control: the quality of the investments you own and the diversification of your portfolio. Maintain a long-term perspective.

It looks as though the economy is improving, but that doesn't mean you should throw caution to the wind. Instead, sit down with your Edward Jones financial advisor and talk about ways you can take advantage of the improving climate while still managing risk.

And remember, you can't recover if you're not invested.

1 The OECD, located in Paris, spells "organisation" as it's listed.

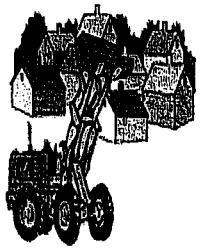
2 Latest Blue Chip Economic Indicators survey

Information in this report is as of 9/2/09.

Alan F. Skrainka, CFA
Chief Market Strategist

U.S. Census Bureau

2003 Building Permits



Annual New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

2003 Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	6,516	6,516	745,654,654	6,516	6,516	745,654,654
Browse	Two Family	26	52	3,505,196	26	52	3,505,196
Browse	Three and Four Family	23	90	3,493,721	23	90	3,493,721
Browse	Five or More Family	21	245	16,449,773	21	245	16,449,773
Browse	Total	6,586	6,903	769,103,344	6,586	6,903	769,103,344

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

Building Permit Estimates - U.S., State, and Metropolitan Areas Click this

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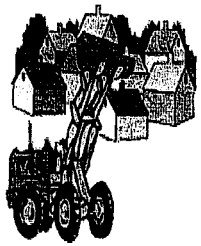
EXHIBIT "E"

U.S. Census Bureau

2004 Building Permits



Annual New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

2004 Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	10,041	10,041	1,224,011,137	10,020	10,020	1,221,528,608
Browse	Two Family	39	78	5,503,011	34	68	4,749,471
Browse	Three and Four Family	50	194	12,999,364	50	194	12,999,364
Browse	Five or More Family	9	54	2,848,049	9	54	2,848,049
Browse	Total	10,139	10,367	1,245,361,561	10,113	10,336	1,242,125,492

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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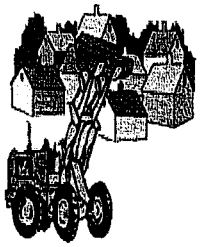
U.S. Census Bureau

2005 Building Permits



Annual New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

2005 Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	11,586	11,586	1,462,499,014	11,371	11,371	1,437,548,073
Browse	Two Family	20	40	2,714,607	8	16	1,095,000
Browse	Three and Four Family	40	138	10,464,851	33	112	8,782,034
Browse	Five or More Family	3	30	1,689,547	1	5	83,000
Browse	Total	11,649	11,794	1,477,368,019	11,413	11,504	1,447,508,107

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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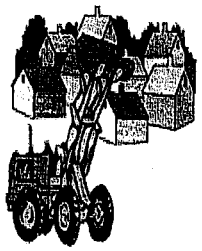
2006 Building Permits



Annual New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

2006 Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	8,470	8,470	1,110,584,637	7,660	7,660	999,219,293
Browse	Two Family	6	12	940,287	6	12	940,287
Browse	Three and Four Family	9	29	1,433,148	3	11	520,164
Browse	Five or More Family	2	41	2,916,615	1	36	2,595,306
Browse	Total	8,487	8,552	1,115,874,687	7,670	7,719	1,003,275,050

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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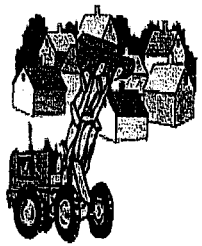
2007 Building Permits



Annual New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

2007 Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	6,221	6,221	772,573,693	6,065	6,065	754,921,701
Browse	Two Family	6	12	833,450	3	6	439,982
Browse	Three and Four Family	10	40	2,871,419	7	28	2,146,247
Browse	Five or More Family	6	30	2,162,754	0	0	0
Browse	Total	6,243	6,303	778,441,316	6,075	6,099	757,507,930

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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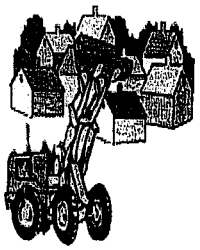
2008 Building Permits



Annual New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

2008 Go!

	Item	Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	3,014	3,014	370,179,921	3,014	3,014	370,179,921
Browse	Two Family	1	2	194,441	1	2	194,441
Browse	Three and Four Family	1	4	239,000	1	4	239,000
Browse	Five or More Family	0	0	0	0	0	0
Browse	Total	3,016	3,020	370,613,362	3,016	3,020	370,613,362

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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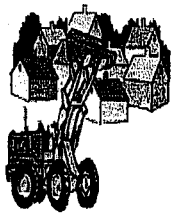
2009 Building Permits



Monthly New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

August 2009 Go!

	Item	Current Month						Cumulative Year to Date					
		Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	258	258	32,572,616	227	227	28,444,477	1,538	1,538	198,133,203	1,507	1,507	194,005,064
Browse	Two Family	0	0	0	0	0	0	0	0	0	0	0	0
Browse	Three and Four Family	0	0	0	0	0	0	0	0	0	0	0	0
Browse	Five or More Family	0	0	0	0	0	0	0	0	0	0	0	0
Browse	Total	258	258	32,572,616	227	227	28,444,477	1,538	1,538	198,133,203	1,507	1,507	194,005,064

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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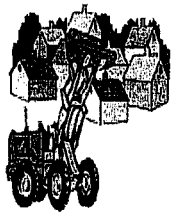
2008 Building Permits



Monthly New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

August 2008 Go!

	Item	Current Month						Cumulative Year to Date					
		Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	205	205	24,134,704	192	192	22,575,141	2,502	2,502	307,040,285	2,390	2,390	293,975,034
Browse	Two Family	0	0	0	0	0	0	2	4	325,597	1	2	194,441
Browse	Three and Four Family	0	0	0	0	0	0	2	7	461,843	1	4	239,000
Browse	Five or More Family	1	5	360,459	0	0	0	5	25	1,802,295	0	0	0
Browse	Total	206	210	24,495,163	192	192	22,575,141	2,511	2,538	309,630,020	2,392	2,396	294,408,475

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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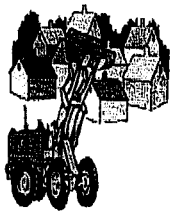
2007 Building Permits



Monthly New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

August 2007 Go!

	Item	Current Month						Cumulative Year to Date					
		Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	515	515	51,265,309	498	498	49,286,618	5,009	5,009	598,834,855	4,897	4,897	586,304,182
Browse	Two Family	0	0	0	0	0	0	6	12	833,450	3	6	439,982
Browse	Three and Four Family	0	0	0	0	0	0	10	40	2,871,419	7	28	2,146,247
Browse	Five or More Family	1	5	360,459	0	0	0	3	15	1,081,377	0	0	0
Browse	Total	516	520	51,625,768	498	498	49,286,618	5,028	5,076	603,621,101	4,907	4,931	588,890,411

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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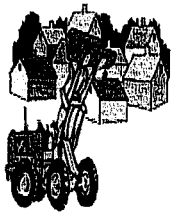
2006 Building Permits



Monthly New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

August 2006 Go!

	Item	Current Month						Cumulative Year to Date					
		Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	458	458	62,333,682	358	358	48,918,653	5,754	5,754	774,486,637	5,105	5,105	689,310,327
Browse	Two Family	1	2	150,708	0	0	0	16	32	2,317,076	6	12	940,287
Browse	Three and Four Family	2	6	309,339	1	3	157,175	14	45	2,472,389	3	11	520,164
Browse	Five or More Family	0	0	0	0	0	0	1	5	321,309	0	0	0
Browse	Total	461	466	62,793,729	359	361	49,075,828	5,785	5,836	779,597,411	5,114	5,128	690,770,778

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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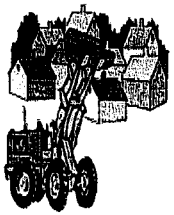
2005 Building Permits



Monthly New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

August 2005 Go!

	Item	Current Month						Cumulative Year to Date					
		Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	871	871	109,778,975	759	759	96,206,016	8,237	8,237	1,019,716,092	7,933	7,933	983,013,555
Browse	Two Family	1	2	150,708	0	0	0	14	28	1,962,338	8	16	1,095,000
Browse	Three and Four Family	5	17	1,120,262	3	9	532,436	36	124	9,298,620	32	109	8,196,446
Browse	Five or More Family	1	5	263,708	0	0	0	3	30	1,870,255	0	0	0
Browse	Total	878	895	111,313,653	762	768	96,738,452	8,290	8,419	1,032,847,305	7,973	8,058	992,305,001

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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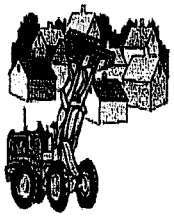
2004 Building Permits



Monthly New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

August 2004 Go!

	Item	Current Month						Cumulative Year to Date					
		Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	713	713	88,048,209	629	629	78,173,643	6,490	6,490	785,990,261	6,315	6,315	765,499,145
Browse	Two Family	2	4	293,708	1	2	143,000	31	62	4,396,445	29	58	4,131,939
Browse	Three and Four Family	3	12	705,000	3	12	705,000	23	87	5,499,845	23	87	5,499,845
Browse	Five or More Family	1	19	1,275,697	0	0	0	3	39	2,618,536	0	0	0
Browse	Total	719	748	90,322,614	633	643	79,021,643	6,547	6,678	798,505,087	6,367	6,460	775,130,929

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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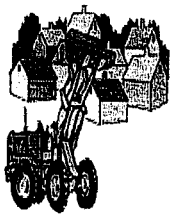
2003 Building Permits



Monthly New Privately-Owned Residential Building Permits
Pinal County, Arizona (021)

August 2003 Go!

	Item	Current Month						Cumulative Year to Date					
		Estimates with Imputation			Reported only			Estimates with Imputation			Reported only		
		Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost	Buildings	Units	Construction cost
Browse	Single Family	648	648	76,049,504	592	592	69,562,801	4,384	4,384	497,863,192	4,105	4,105	465,980,220
Browse	Two Family	2	4	204,000	2	4	204,000	17	34	2,275,583	17	34	2,275,583
Browse	Three and Four Family	0	0	0	0	0	0	13	52	1,643,144	13	52	1,643,144
Browse	Five or More Family	0	0	0	0	0	0	1	20	945,829	0	0	0
Browse	Total	650	652	76,253,504	594	596	69,766,801	4,415	4,490	502,727,748	4,135	4,191	469,898,947

[N/A = Reported data not available for the time period]
Source: U.S. Bureau of the Census

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EXHIBIT "F"

Economic *SYNOPSES*

short essays and reports on the economic issues of the day

2009 ■ Number 4

The Current Recession: How Bad Is It?

Charles S. Gascon, *Senior Research Associate*

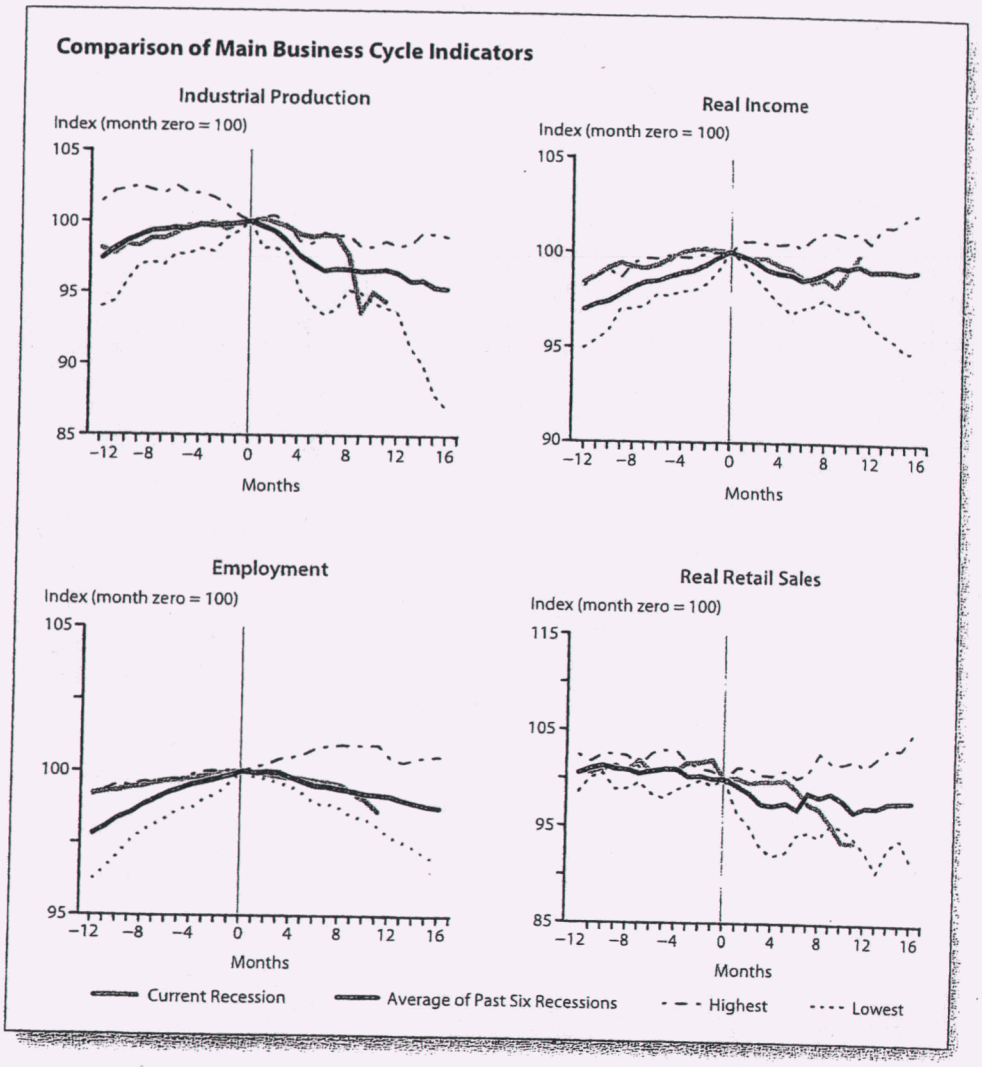
On November 28, 2008, the Business Cycle Dating Committee of the National Bureau of Economic Research (NBER) declared that a recession began in the United States in December 2007.[1] This committee defines a recession as "a significant decline in economic activity spread across the economy, lasting more than a few months, normally visible in production, employment, real income, and other indicators." The U.S. economy has experienced six recessions over the past 40 years. On average these recessions have lasted 10.7 months. The longest recessions—beginning in November 1973 and July 1981—each lasted 16 months. The shortest recession—beginning in January 1980—lasted only six months. Although the end of the current recession is unclear, many economists expect it to extend into mid-2009, a duration of around 18 months.

"In a recession, the severity of the decline is just as relevant as the duration of the recession."

The most skeptical economists believe that because of the contraction in the housing market and problems in financial markets, the magnitude of the current recession could be the most severe in decades, perhaps comparable to the Great Depression. Although the causes of the current recession may be unique, main recession indicators have moved in a predictable fashion.

In a recession, the severity of the decline is just as relevant as the duration of the recession. These two measures are not independent; a prolonged but shallow recession may have an aggregate impact similar to a short but deep recession.

To compare the current recession with the past six recessions, the chart plots four main economic indicators



used by the NBER: industrial production, real personal income less transfer payments, employment, and real retail sales and food services.[2] Each series is indexed to 100 at the start of the recession. The horizontal axis indicates the number of months before (negative values) and after (positive values) the start of a recession, where zero indicates the month the NBER determined the economy moved into a recession.[3] The black line indicates the averages over the past six recessions,[4] the blue line data on the most recent recession, and the two dashed lines the highest and lowest values of each series, capturing variability across the past recessions.

Based on these indicators, the current recession has been worse than average; however, the declines are not unprecedented. In the previous recessions, industrial production tended to decline sharply at the business cycle peak; in the current recession, it did not decline sharply until early 2008. In the current recession, real income declines have been significant; at the start of the recession, incomes were above their pre-recession averages but are now slightly below average. Current employment trends are consistent with past recessions, although in recent months employment has begun to approach its lowest levels. The most disturbing current indicator is the decline in real retail sales. Historically, retail sales have stabilized within months of the beginning of a recession; eleven months into this recession retail sales continue to decline.

Main recession indicators tend to support the claim that this recession could be the most severe in the past 40 years. However, we are still far from another Great Depression. The severities of the declines experienced so far have been consistent with past recessions, and although the length of the current recession could set a record, it will likely be only by a few months. ■

[1] The NBER is a not-for-profit corporation that sponsors economic research and promotes dialog on economic issues. By informal consensus, economists and policymakers accept the Business Cycle Dating Committee's judgment on business cycle turning points. The NBER report is available at wwwdev.nber.org/cycles/dec2008.html.

[2] Deflated using the Consumer Price Index for All Urban Consumers (1982-84 = 100).

[3] According to the NBER, recessions began in December 1969 (lasting 11 months), November 1973 (16), January 1980 (6), July 1981 (16), July 1990 (8), and March 2001 (8).

[4] Because some recessions were shorter than 16 months, the average is pulled upward toward the end of the sample.

Posted on January 8, 2009

Views expressed do not necessarily reflect official positions of the Federal Reserve System.