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AZ CORP COMMISSION  
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July 8, 2002

Arizona Corporation Commission  
**DOCKETED**

JUL - 8 2002

VIA HAND-DELIVERY

Chairman William A. Mundell  
Arizona Corporation Commission  
1200 West Washington  
Phoenix, Arizona 85007

DOCKETED BY 

Re: *Application of Arizona-American Water Company for Approval of a CAP  
Water Utilization Plan and Groundwater Savings Project  
Docket Nos. W-01656A-98-0577 & SW-02334A-98-0577*

Dear Chairman Mundell:

By this letter, Arizona-American Water Company offers the following comments and responses to your July 3, 2002 letter to Commissioners Irvin and Spitzer raising the possibility of a limited reopening of the evidentiary record in this case. In your July 3, 2002 letter, you have proposed another limited evidentiary hearing for the receipt of expert testimony regarding SCTA's allegation that hydrologic responses "are being detected as far as four miles downstream of the Agua Fria Recharge Facility blow off structure." Arizona-American respectfully requests that the Commission proceed with the July 11, 2002 Special Open Meeting and issue a final decision on the proposed Groundwater Savings Project because another limited evidentiary hearing is not necessary on the hydrological issues relating to the Agua Fria Recharge Facility.

On pages 4-6 of its response to SCTA's exceptions, Arizona-American addressed the problems with SCTA's latest arguments relating to the Agua Fria Recharge Facility. We would like to reiterate some of those points here. SCTA attached excerpts from the CAWCD Fourth Quarter Report and 2001 Annual Monitoring Report to its exceptions. That document was not part of the record below. In deciding whether to order another limited evidentiary hearing, the Commissioners should keep in mind that the existing evidentiary record and prior Commission decisions establish that the Agua Fria Recharge Facility will not provide any direct and immediate benefits to the Sun Cities. The record also establishes that the proposed Sun Cities Groundwater Savings Project will provide direct and immediate benefits to the Sun Cities.

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It is important to understand the location of the Agua Fria Recharge Facility in relation to the Sun Cities. The blow off structure for the Agua Fria Recharge Facility is located 7.5 miles north of the Sun Cities. The water is introduced in to the Agua Fria River at the blow off structure and then flows four miles south to the recharge basins located approximately 3.5 miles north of the northernmost part of Sun City. See Agua Fria Recharge Project Map (attached as exhibit A). The monitoring wells mentioned in the CAWCD report referenced by SCTA are located at those Agua Fria Recharge Facility basins. In other words, the hydrologic responses referenced by SCTA four miles south of the blow off structure simply reflect increased water levels from monitoring wells at the recharge basins. Those increased water levels do not indicate any direct impact in the Sun Cities and simply illustrate increased water levels expected at the recharge basins.

Arizona-American agrees that the Agua Fria Recharge Project is a substantial benefit to the region, but the record here establishes that the GSP, unlike the Agua Fria Recharge Project, will provide direct and immediate benefits to the Sun Cities. Another evidentiary hearing on that issue would contradict the Commission's findings in Decision No. 62293 because the Task Force and the ACC considered the Agua Fria Recharge Project and rejected it in favor of the GSP. Another evidentiary hearing also is unnecessary based on existing evidence in the record relating to the Agua Fria Recharge Facility.

In pre-filed testimony filed in 1999, SCTA's own expert Mr. Husted testified that recharge was not the preferred alternative because "[t]he CAWCD and MWD recharge projects may provide very long range and indirect benefits to Sun City ratepayers..." See Husted Pre-Filed Testimony, 9/10/1999, p. 9 (attached as exhibit B); 1/9/02 Tr. Husted Test., p. 83. Further, the evidentiary record on which the Commission based Decision No. 62293 included testimony relating to the hydrological impacts of the Agua Fria Recharge Facility on the Sun Cities. In September 1999, the CAP Task Force introduced pre-filed rebuttal testimony from Dess Chappelle as the Assistant Project Manager for the Central Arizona Project. See 9/30/99 Pre-Filed Rebuttal Testimony of Dess Chappelle (attached as exhibit C). Mr. Chappelle supported the GSP and, as part of his testimony, he introduced a hydrologic report prepared by Herbert H. Schuman regarding "Utilization of Central Arizona Project Water in Sun City and Sun City West." Id. Mr. Schuman utilized an ADWR digital groundwater flow model to evaluate impacts of various CAP water options on the Sun Cities and determined that the Agua Fria Facility would offer minimal benefits to the Sun Cities:

"Figure 7 shows the projected water-level changes that can be expected at the end of 20 years of recharging 100,000 acre-feet/year at the Central Arizona Water Conservation District's recharge site on the Agua Fria about 3.5 miles north of Sun City. Only about one foot water-level change is projected in the Sun City and Sun City West areas after recharging 100,000 acre-feet/year for 20 years."

Chairman William A. Mundell  
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See Schuman Report, 9/21/99, p. 2. Based on that testimony, the Commission rendered Decision No. 62293 and approved the GSP concept instead of the Agua Fria Recharge Facility.

Given the factual record and circumstances underlying this docket, the recent arguments raised by SCTA relating to the Agua Fria Recharge Facility are contrary to the evidence and prior Commission decisions. SCTA does not raise any valid points related to recent hydrological data at the Agua Fria Recharge Facility site. Another evidentiary hearing on these issues would unnecessarily delay this docket even further and relitigate an issue already decided by the Commission in Decision No. 62293. Such hearing would delay a final decision by the Commission for several months and delay a project designed to alleviate groundwater problems at a time when the state of Arizona is in the midst of a severe drought. The proposed Groundwater Savings Project clearly is in the public interest and Arizona-American urges the Commissioners to approve the Project at the July 11, 2002 Special Open Meeting.

Very truly yours,

**GALLAGHER & KENNEDY, P.A.**

By:   
Michael M. Grant  
Todd C. Wiley

TCW/bo

**Original and ten** copies filed this  
5th day of July 2002, with:

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Arizona Corporation Commission  
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Chairman William A. Mundell  
July 8, 2002  
Page 4

**Copy** of the foregoing hand-delivered  
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Chairman William A. Mundell  
July 8, 2002  
Page 5

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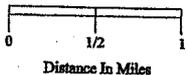
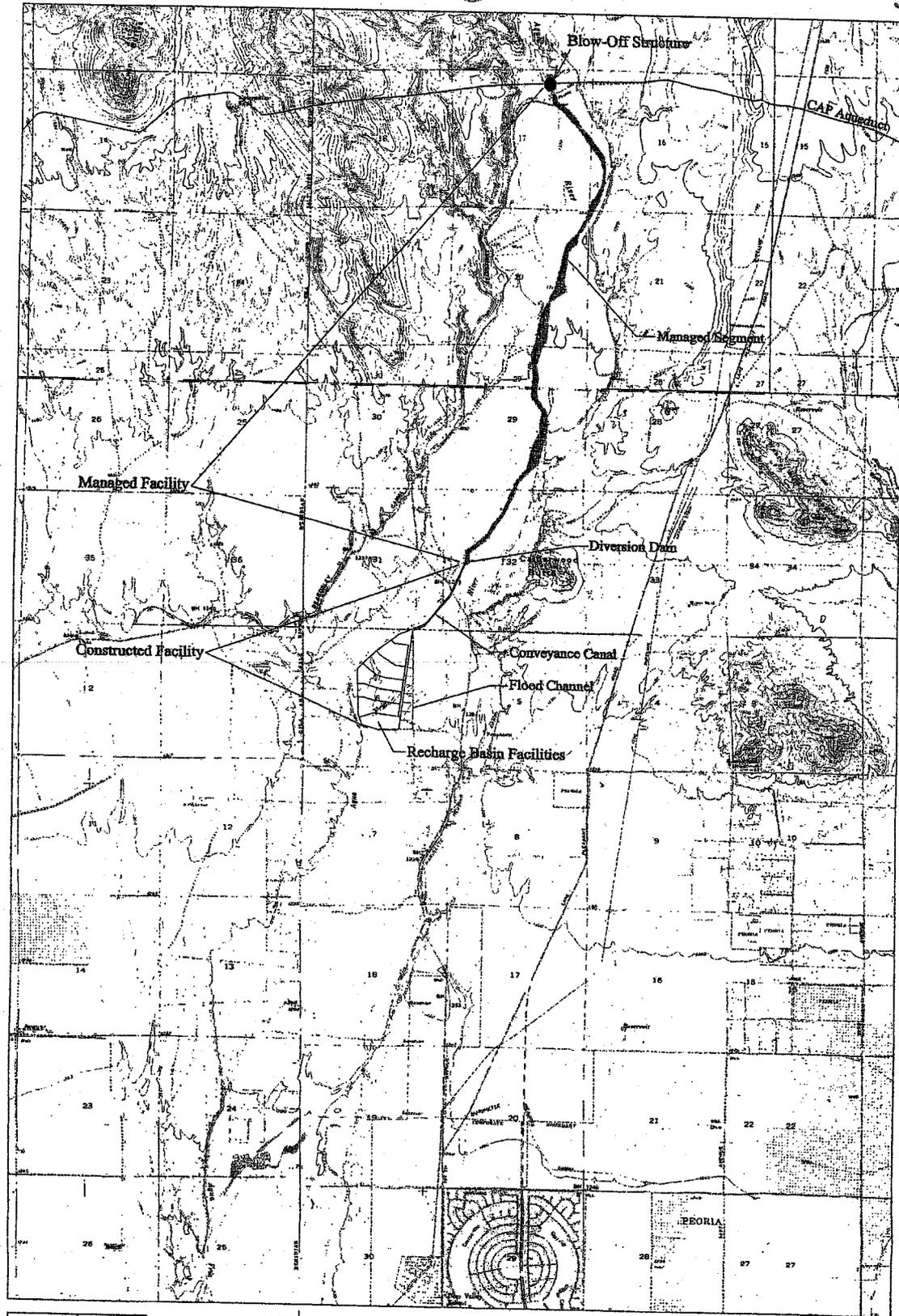
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By:

15015-0006/1029620v2



A



R1W | R1E



Explanation

 Managed Segment

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**Project Location Map**  
**Agua Fria Recharge Project**

Figure 1

**B**

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BEFORE THE ARIZONA CORPORATION COMMISSION

CARL J. KUNASEK  
Commissioner - Chairman  
JIM IRVIN  
Commissioner  
WILLIAM A. MUNDELL  
Commissioner

IN THE MATTER OF THE JOINT ) DOCKET NO. W-01656A-98-0577  
APPLICATION OF SUN CITY WATER ) SW-02334A-98-0577  
COMPANY AND SUN CITY WEST )  
UTILITIES COMPANY FOR APPROVAL OF )  
CENTRAL ARIZONA PROJECT WATER )  
UTILIZATION PLAN AND FOR AN )  
ACCOUNTING ORDER AUTHORIZING A )  
GROUNDWATER SAVINGS FEE AND )  
RECOVERY OF DEFERRED CENTRAL )  
ARIZONA PROJECT EXPENSES. )  
\_\_\_\_\_ )

TESTIMONY OF DENNIS HUSTEAD

On Behalf of

SUN CITY TAXPAYERS ASSOCIATION  
("SCTA")

September 10, 1999

DIRECT TESTIMONY OF  
DENNIS HUSTEAD  
DOCKET NOS. W-01656A-98-0577 and SW-02334A-98-0577

1  
2  
3  
4 **Q. Please state your name, title and business address.**

5 A. My name is Dennis Hustead. I am a Registered Civil Engineer with Hustead  
6 Engineering. My business address is 568 W. Moon Valley Drive, Phoenix,  
7 Arizona, 85023.

8  
9 **Q. Please state your qualifications to testify in this matter.**

10 A. I am a Registered Civil Engineer in the states of Arizona and California with  
11 thirty-five years experience. I have significant expertise in managing the  
12 planning and design of major public works and transportation projects  
13 throughout Arizona and California. My statement of professional qualifications  
14 is provided in Attachment DH - 1.

15  
16 **Q. Who are you testifying on behalf in this proceeding?**

17 A. I am testifying on behalf of the Sun City Taxpayers Association ("SCTA").

18  
19 **Q. SCTA retained your services for what purpose?**

20 A. I was retained by SCTA to review the technical and economic impacts of  
21 Citizens' proposed plan for putting CAP water to use and to develop possible  
22 modifications or alternatives if possible. I also reviewed the recharge options  
23 potentially available to put the CAP water to proper use.

24 **Q. What is the cost of Citizens' proposed CAP utilization plan (Option 4) to**  
25 **Sun City Water Company and its ratepayers over the remaining life of the**  
26 **CAP subcontract?**

1 DIRECT TESTIMONY OF  
2 DENNIS HUSTEAD  
3 DOCKET NOS. W-01656A-98-0577 and SW-02334A-98-0577  
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5 A. I have estimated the total cost of Citizens' proposed Cap Utilization Plan  
6 (Option 4) to Sun City Water Company and its ratepayers based upon the data  
7 available in the Final Report of the CAP Task Force. My use of the data  
8 supplied by Citizens throughout my testimony does not indicate acceptance of  
9 Citizens' calculations or Citizens' positions regarding recovery. The purpose of  
10 these calculations are to provide the Arizona Corporation Commission with a  
11 better understanding of the full cost and impact of Citizens' proposal over the  
12 remaining life of the CAP subcontract. I estimate there are 42 years remaining  
13 on the initial term of Citizens' CAP subcontract, with a right to renew for an  
14 additional 50 years. It is important that the Arizona Corporation Commission  
15 consider the long-term benefits and costs to these companies and their  
16 ratepayers; not just the immediate benefits and costs.

17 Further, my calculations will tend to understate the actual costs because I have  
18 assumed a constant cost for O&M and CAP water over the remaining term of  
19 the CAP subcontract, where it is reasonable to anticipate inflationary increases.  
20 I have also assumed the golf courses will contribute \$131,000 per year for using  
21 the CAP water in lieu of pumping. I have also averaged Citizens' proposal  
22 Capital Cost Component using 50% of the estimated cost of construction as the  
23 average base over the remaining life of the Cap subcontract. Based upon the  
24 foregoing assumptions, over a 42 year period, the total impact of Citizens'  
25 proposal (Option 4) is \$58,282,000.  
26

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5 Q. Do you think it prudent to approve Citizens' proposed plan, or any plan  
6 dependent on placing CAP water on the golf courses before there are  
7 enforceable contracts in place with the golf courses?

8 A. Definitely not. The entire concept is dependent on the golf courses taking the  
9 CAP water. Therefore, without contracts in place, the proposal is speculative at  
10 best. Moreover, without a binding contract, the revenues Citizens is projecting  
11 \$5,502,000 (\$131,000 per year x 42 years) in fees from the golf courses to help  
12 offset the costs of the proposed plan are likewise speculative.

13 Q. Did your review of Citizens' proposed plan (Option 4) for use of CAP  
14 water discern any problems with the plan from an engineering viewpoint.

15 A. My review of Citizens' proposed plan (Option 4) reached the conclusion that the  
16 plan is far more costly than it needs to be. Specifically, it includes extra costs  
17 for a pump station and a reservoir, which are simply not necessary. Regarding  
18 the pump station, the delivery system should be a closed pipeline from the CAP  
19 turnout to delivery at the golf courses. This negates the need for a pump  
20 station. This is true because the turnout at the CAP canal at Lake Pleasant Road  
21 is at an approximate elevation of 1500 feet, and the golf courses are at  
22 elevations ranging from 1300' to 1200'. Thus, the pipeline will be operating  
23 with a head of over 200 feet and will produce sufficient pressure to deliver the  
24 flow to each golf course without the need for a pump station.

25 Regarding the reservoir, there is no need to store water in a reservoir prior to  
26 delivery to the golf courses because the golf courses already have reservoirs on

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5 site. These golf reservoirs are designed to store the daily irrigation  
6 requirements of the golf course (continuous water flow over 24 hours and  
7 irrigate at night during a 12-hour period), plus an emergency supply of water to  
8 last one to three days. Thus, the reservoir designed under Citizens' proposed  
9 plan (Option 4) is simply not needed.

10 Further, I determined that it would be most cost effective to maximize CAP  
11 water deliveries to Sun City West golf courses where a distribution system  
12 already exists and thereby minimize the installation of a new distribution  
13 system in Sun City. I will refer to this alternative as "Option 4 Modified".

14  
15 Q. What are the cost impacts of the Option 4 Modified on Sun City Water  
16 Company?

17 A. Eliminating the pump station and reservoir and maximizing deliveries to Sun  
18 City West, reduces total construction costs from about \$15 million to about \$9  
19 million. A table of Capital Cost for Citizens' plan as modified is shown in  
20 Attachment DH - 2. Sun City Water Company's costs would be reduced from  
21 over 9.6 million dollars to approximately 5.7 million dollars. Importantly, this  
22 cost allocation is based on Citizens allocating 4,189 af to Sun City and 2,372 af  
23 to Sun City West. If cost allocations followed the place of use, Sun City Water  
24 Company's costs would be even lower, but Sun City West's costs would  
25 increase.  
26

5 The elimination of the pump station and reservoir from the system under  
 6 Citizens' proposed plan would also reduce annual O&M costs as follows:

7 Annual Costs in \$1,000s

	Citizens' Plan (as proposed)		Citizens' Plan (as modified)	
	<u>Sun City</u>	<u>Sun City West</u>	<u>Sun City</u>	<u>Sun City West</u>
8 Reservoir O&M	36	20	0	0
9 Pipeline Maint.	10	5	10	5
10 Pump Station Maint.	40	31	0	0
11 Pump Station Power	165	102	0	0
12 O&M Contingency	47	30	5	2
13 GW Pumping Offset	(131)	(90)	(131)	(90)
14 Total Annual Costs	\$150	\$89	(\$116)	(\$83)

15 Again, the foregoing table reflects Citizens' speculative assumption that the  
 16 golf courses will actually take delivery of and pay for CAP water. The  
 17 assumption is speculative until there are binding contracts in place with the golf  
 18 courses.

19  
 20 Q. What is the total economic impact of the Option 4 Modified on Sun City  
 21 Water and its ratepayers over the remaining life of the CAP subcontract?

22 A. Under Option 4 Modified, the cost of CAP water would not change, but the  
 23 capital component and O&M would decrease significantly. I did not have the  
 24 time or data necessary to calculate the precise total impact, but have  
 25 approximated the cost to provide a comparison between the various plans.  
 26

5 Using the same methodology as set forth for calculating total costs of Citizens'  
6 proposal (Option 4), the estimated costs of Option 4 modified are \$40,214,000.

7 **Q. Did your review of Citizens' proposed plan (Option 4) reveal the possibility**  
8 **of yet another alternative plan for putting CAP water to use?**

9 **A.** Yes. A joint transmission facility could be built with the Aqua Fria Division so  
10 all CAP water available to Citizens could be delivered to its certificated area.  
11 The joint transmission pipeline would be constructed from the CAP canal at  
12 Grand Avenue to the Aqua Fria delivery point at Sarival Avenue, and would  
13 continue along Grand Avenue and the Beardsley alignment to a tie at the Sun  
14 City West delivery system at the Hillcrest Golf Course. Other alignments  
15 should be examined to determine the most cost-effective route. The existing  
16 Sun City West distribution system would deliver the water supply to all the golf  
17 courses in Sun City West and transport the remainder of the CAP supply to the  
18 existing pump station at Beardsely and 107th Avenue. From this point, the Sun  
19 City distribution would deliver the supply to only the Willow Brook and Union  
20 Hills Golf courses. See Attachment DH - 3 which shows the system layout  
21 under this alternative plan.

22 **Q. What are the project cost impacts of the alternative plan?**

23 **A.** This alternative plan actually costs about \$10 million compared to the \$15  
24 million for Citizens' proposed plan (Option 4) or the \$9 million for Option 4  
25 Modified. However, under this alternative the Aqua Fria Division would also  
26 be able to deliver its full CAP allocation. A significant portion (62.8%) of the

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5 construction costs for the joint facilities would be allocated to the Agua Fria  
6 Division and away from Sun City and Sun City West. Certain costs would be  
7 allocated to the Sun Cities only and some costs would be assigned to a  
8 particular water system. Compared to Citizens' proposed plan (Option 4),  
9 where Sun City and Sun City West ratepayers are being asked to provide  
10 approximately \$21,761,000 in cost of capital, this alternative reduces this  
11 potential obligation to about \$15,783,000. Further, it provides the Agua Fria  
12 Division a means of delivering its 11,093 af of CAP water to its service area.  
13 Please see Attachment DH - 4 for details on the construction costs under this  
14 alternative plan.

15 Q. What is the total economic impact of the alternative plan on Sun City  
16 Water Company and its ratepayers over the remaining life of the CAP  
17 subcontract?

18 Utilizing the same methodology as set forth above, the estimated cost of this  
19 alternative to Sun City Water and its ratepayers over the remaining 42 year term  
20 of the CAP subcontract would be approximately \$34,362,000.

21 Q. Did you review the possible options of putting the CAP water to use by  
22 either leasing capacity at CAWCD's Agua Fria Recharge Project or  
23 utilizing the Groundwater Savings Project/Exchange with Maricopa Water  
24 District?

25 A. Yes. I reviewed these two options using the data provided by Citizens. Under  
26 the CAWCD Agua Fria Recharge Project option, Citizens would lease recharge

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DIRECT TESTIMONY OF  
DENNIS HUSTEAD  
DOCKET NOS. W-01656A-98-0577 and SW-02334A-98-0577  
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capacity in the CAWCD's Agua Fria Recharge Project. Water would be conveyed from the CAP canal to the recharge facility by gravity via the channel of the Agua Fria River. Recharged water would be recovered through existing wells in Sun City and Sun City West. The total cost of this option to Sun City Water Company over the remaining life Citizens' CAP subcontracts would be approximately \$26,844,000.

Under the Groundwater Savings Project/Exchange with Maricopa Water District option, CAP water would be delivered through an existing distribution system to farms located in MWD's service area that have historically used groundwater pumped by MWD. By doing this, every gallon of groundwater not pumped by MWD would legally available to Citizens be withdrawn later as CAP water. CAP water recharged or exchanged with MWD would be recovered through existing wells in Sun City and Sun City West or from other recovery wells, even if the water was not used in the Sun Cities. If the water is withdrawn, especially if it withdrawn for use outside the Sun Cities, there would be no net benefit to the aquifer or the Sun City Water Company's ratepayers. The total cost of this option to Sun City Water Company over the remaining 42 year life of Citizens' CAP subcontracts is estimated to be \$20,334,000.

5 Q. Please summarize the total economic impact of all of the options reviewed  
6 on the Sun City community over the life of Citizens' CAP subcontracts.

7 A. Option: Total Cost:

8 Citizens' Project (Option 4)	\$58,282,000
9 Option 4 Modified	\$40,214,000
10 Alternative Joint Project	\$34,362,000
11 CAWCD/Agua Fria Recharge Project	\$26,844,000
12 MWD Recharge Project	\$20,334,000

13 These calculations are summarized on Attachment DH - 5.

14  
15 Q. Do any of the alternatives you reviewed provide direct benefits to Sun City  
16 Water Company ratepayers?

17 A. The CAWCD and MWD recharge projects may provide very long range and  
18 indirect benefits to Sun City Water Company ratepayers if the water is not  
19 recovered, but there is nothing in Citizens' filing that allows me to quantify this  
20 benefit. Further, the benefits would be substantially the same for persons  
21 residing elsewhere in the region.

22  
23 The benefits to Sun City Water Company ratepayers would be more direct and  
24 greater with any of the three golf course recharge alternatives I have discussed.  
25 However, again, nothing in Citizens' filing allows me to quantify these benefits  
26 or permits me to determine whether the benefits are sufficient to justify

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5 incurring the significant costs associated with direct delivery to the golf  
6 courses.

7 Q. What is your opinion of Citizens' request to include recovery of deferred  
8 CAP recovery charges?

9 A. I believe that these costs have accrued because Citizens, for more than ten (10)  
10 years, failed to design a plan to put CAP water to use. Thus, to retroactively  
11 collect these charges from existing customers, many of whom may not have  
12 resided in Sun City during the period the charges were incurred, is not  
13 equitable. If any of these deferred costs are to be collected from the ratepayers,  
14 a better method might be to charge a connection fee to all new developments  
15 and new existing service reconnections.

16 Q. Do you agree with Citizens' proposed method of recovering costs of its  
17 CAP utilization plan?

18 A. No. The Final Report of the CAP Task Force, page 14) states that "CAP water  
19 should be considered the first water supply delivered to customers, roughly the  
20 first 3,500 gallons, instead of making CAP water a portion of every gallon  
21 delivered. If CAP water is assessed based on consumption, then the larger  
22 water users will unfairly subsidize small water users even though on a per  
23 household basis the demand is comparable." I disagree with this statement.

24  
25 The best method to recover the cost for utilization of CAP water is from  
26 customers entering the system today. To the extent CAP costs are recovered

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2 DENNIS HUSTEAD  
3 DOCKET NOS. W-01656A-98-0577 and SW-02334A-98-0577  
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5 from existing customers, these costs should be blended with the rates generally  
6 and not recovered as a flat per household charge. The more water consumed by  
7 a customer, the greater the need for CAP water. Therefore, CAP costs should  
8 be recovered based upon usage, if not totally recovered from customers entering  
9 the system. This places the greatest burden on those using the most water,  
10 encourages conservation and protects persons on fixed incomes.

11 Q. At this time, can you recommend which option, if any, should be adopted  
12 by the Commission to put the CAP water to use?

13 A. No. Although I now have a good understanding of the costs for each of the  
14 options, I was unable to perform an independent cost/benefit analysis or to  
15 quantify the value of potential direct and demonstrable benefits to the Sun City  
16 community. Certainly the golf course recharge options provide more potential  
17 to directly benefit Sun City's ratepayers than the other recharge options, but at  
18 significant cost. The CAWCD and MWD recharge projects appear to provide  
19 regional benefits rather than direct benefits for the Sun Cities. To the extent  
20 benefits of these projects are regional in nature, the costs of such recharge  
21 projects should be borne equally throughout the region. Such costs spreading  
22 already occurs when the AWB, CAWCD or CAGR D utilize these recharge  
23 sites.

24 Q. Does this conclude your testimony?

25 A. Yes.

**C**

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09 01 1999

Citizens Water Resources

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3 William G. Beyer, #004171  
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5

6 **BEFORE THE ARIZONA CORPORATION COMMISSION**

7 CARL J. KUNASEK  
CHAIRMAN  
8 JAMES M. IRVIN  
COMMISSIONER  
9 WILLIAM A. MUNDELL  
COMMISSIONER

10 IN THE MATTER OF THE JOINT )  
11 APPLICATION OF SUN CITY WATER )  
12 COMPANY AND SUN CITY WEST )  
13 UTILITIES COMPANY FOR )  
14 APPROVAL OF CENTRAL ARIZONA )  
15 PROJECT WATER UTILIZATION )  
ORDER AUTHORIZING A )  
GROUNDWATER SAVINGS FEE AND )  
RECOVER OF DEFERRED CENTRAL )  
ARIZONA PROJECT EXPENSES. )

DOCKET NO. W-01656A-98-0577  
SW-02334A-98-0577

NOTICE OF FILING  
REBUTTAL TESTIMONY

16

17 The CAP Task Force hereby provides Notice of Filing Rebuttal Testimony for  
18 Carole Hubbs and Dess Chappelle in the above-referenced docket.

19 Respectfully submitted this September 30, 1999.

20

21

BEYER, McMAHON & LaRUE

22

23



24

William G. Beyer, Esq.

25

26

27

1 AN ORIGINAL AND TEN COPIES  
of the foregoing mailed this  
2 30th day of September, 1999  
to:

3

4 Docket Control  
Arizona Corporation Commission  
5 1200 W. Washington  
Phoenix, Arizona 85007  
6

7

8 COPIES of the foregoing mailed/  
hand delivered this 10th day of  
9 September, 1999 to the following:

10 Jerry Rudibaugh, Chief Hearing Officer  
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11 Arizona Corporation Commission  
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12 Phoenix, Arizona 85007

13 Lyn Farmer  
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Q: Please state your name and address.

A: Dess Chappellear, and I live at 13837 W. Oak Glenn Drive, Sun City West, Arizona 85375.

Q: Please state your employment background.

A: I am currently retired, but I spent over 38 years in water resources development with the Department of the Interior, Bureau of Reclamation. My most recent assignment was Assistant Project Manger of the Central Arizona Project.

Q: Please state your professional qualifications.

A: I was a professional engineer, now retired, and my qualifications are indicated on the attached exhibit.

Q: Have you been involved in the CAP Task Force?

A: Yes. I was a member of the CAP Task Force referred to in the basic pleadings filed by Citizens Utilities Company, and actively participated in all of the hearings and deliberations of that group.

Q: Have you reviewed the Statement of the CAP Task Force which has been submitted to the Commission as a part of this Docket?

A: Yes.

Q: In your view, is that Statement an accurate summary of the position of the CAP Task Force?

A: Yes. I would, however, recommend that the two "safeguards" which were suggested be put in any Order crafted by the Commission (see Section 6, page 14 of the Statement) should be expanded to include a fixed time limit be placed on the life of the contract for the short-term arrangement between Citizens and MWD. As has been pointed out by several commentators, that

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arrangement offers virtually no real benefits to the Retirement Communities, and should only last for the 42 month deadline established for the construction of the pipeline infrastructure required for the long-term solution to the use of CAP water.

Q: For purposes of your testimony today, will you adopt that Statement as your own testimony?

A: Yes.

Q: What is the purpose of your testimony today?

A: To supplement the Statement of the CAP Task Force in response to testimony which has been provided by certain other parties to this proceeding.

Q: Have you read the testimony provided by Mary Elaine Charlesworth representing the Sun City Taxpayers Association ("SCTA")?

A: Yes I have.

Q: Are there elements of that testimony with which you would disagree, and if so, what?

A: Yes, I disagree with much of that testimony, but perhaps the area which is most contrary to my views would be her statements on page 6 to the effect that CAP water is not critical to Sun City. It is disappointing to see that after all the years of experience and fact finding which has taken place regarding the groundwater situation in the Sun Cities, that SCTA still does not recognize that the Sun Cities are over-drafting their water table and that serious and immediate consequences are flowing from that situation. As was repeated several times for emphasis in the Statement by the CAP Task Force, the current over-drafting of the groundwater aquifer in the area of the retirement communities is inescapably leading to subsidence and water quality problems.

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3 Further, the current regulatory environment has made it clear that such  
4 overdrafting will no longer be tolerated. As a result, we cannot agree that CAP  
5 water is not needed in the Sun Cities.

6 Q: Have you reviewed the testimony of Claudio Fernandez of the Corporation  
7 Commission staff, and do you have any comment on his testimony?

8 A: Yes. Although I respect the conclusions reached by Mr. Fernandez, I was  
9 disappointed to see an apparent failure to recognize that the use of CAP water  
10 on the golf courses is the only approach which will directly affect a benefit to  
11 the ratepayers of the Sun Cities and Youngtown. We take particular exception  
12 to the conclusions which Mr. Fernandez seemed to reach in support of a  
13 possible, future Agua Fria recharge program as described on page 8 of his  
14 testimony. As was confirmed in the investigations of the CAP Task Force,  
15 discharge at remote sites north of the retirement communities may well benefit  
16 the Northwest Valley region as a whole, it will offer no real benefit to the  
17 retirement communities, at least not for many decades to come. The major  
18 reason for this is the extremely low propagation rates of underground water. A  
19 secondary reason is the potential for water recharged in the Agua Fria river  
20 bed to flow into the low spots of the Northwest valley aquifer, such as the Luke  
21 cone of depression, and thus not be of any real benefit to the Sun Cities  
22 residents.

23 Q: Have the issues of subsidence and the remote recharge plans been of  
24 continuing interest to the CAP Task Force?

25 A: Yes they have. Even though the materials presented to the CAP Task Force  
26 during its deliberations appeared conclusive regarding the fact that any remote  
27 recharge plan which could be considered did not really provide a direct benefit

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to the ratepayers of the retirement communities, it was felt that a more definitive analysis of that issue could be helpful in explaining the issue to the communities. As a result, all the governance organizations of the retirement communities (Rec Centers, HOA, PORA, Youngtown) asked Mr. Herb Schumann, a recognized expert in hydrogeology, to review the issue and provide us with a further analysis. Mr. Schumann did so, and his most recent study paper on this matter is attached as Exhibit A and included in my testimony, along with a summary of Mr. Schumann's qualifications.

We believe that Mr. Schumann's analysis should be helpful to the Commission in recognizing that remote recharge plans simply do not benefit the retirement communities who would have to pay for the CAP water to implement them.

Q: Was there a special reason why the CAP Task Force submitted a statement as compared to the usual Q & A format used to provide testimony to the Commission?

A: Yes, there were several reasons the use of a Statement seemed important to us. At the prior Commission hearing on this matter, the Commission members in effect challenged the people of the retirement communities to come together and work out what they felt was best for their communities with respect to how CAP water should be put to beneficial use and then report that recommendation back to the Commission. The responsible leadership of Sun City, Sun City West and Youngtown did just that in the form of the work of the CAP Task Force study team. The Task Force team reported the results of its study to the Boards of Directors of the Sun City Homeowners Association (HOA), the Recreation Centers of Sun City, the Property Owners and Residents Association of Sun City West, the Recreation Centers of Sun City

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3 West, and the city council of the Town of Youngtown, all of whom constitute  
4 the governance organizations of the retirement communities. Those  
5 organizations accepted and endorsed the findings and conclusions of the CAP  
6 Task Force. As a result, it was felt that testimony by some one person was  
7 inadequate to convey that the retirement communities as a group had  
8 responded to the Commission's earlier challenge, and that it was a group  
9 statement being made to the Commission.

10 Further, it was felt that the most important service which the CAP Task Force  
11 could perform for the Commission was to convey the sense of why the  
12 combined organizations of the retirement communities had come to the  
13 conclusion which they had. The Statement of the CAP Task Force was thus  
14 intended as an explanation of the logic and reasoning which had been the  
15 basis for the recommendation which the retirement communities are making to  
16 the Commission. A statement format was used since we were trying to  
17 convey not just the facts which had guided the Task Force, but their reasoning  
18 from those facts.

19 In addition, various members of the Corporation Commission had  
20 recommended that the governance organizations should make a special effort  
21 to make sure that the recommendations of the CAP Task Force had been  
22 communicated, on a broad basis, to as many of the residents of the retirement  
23 communities as possible. The Commissioners' concern was that they wanted  
24 whatever recommendation that was brought forward to truly reflect the will of  
25 the majority of the people in those communities. Thus, the Statement was also  
26 a communication back to the Commission explaining that the governance  
27 organization of the retirement communities had indeed met that burden through

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seminars, public forums, publications and the like, and felt they were on a sound basis in stating that the recommendations of the CAP Task Force met with a strong and positive level of support from within the communities who would have to pay the costs of implementing the recommendations.

However, I have included, by reference in this rebuttal testimony, the Statement previously submitted by the CAP Task Force, and stand ready to answer any questions on it..

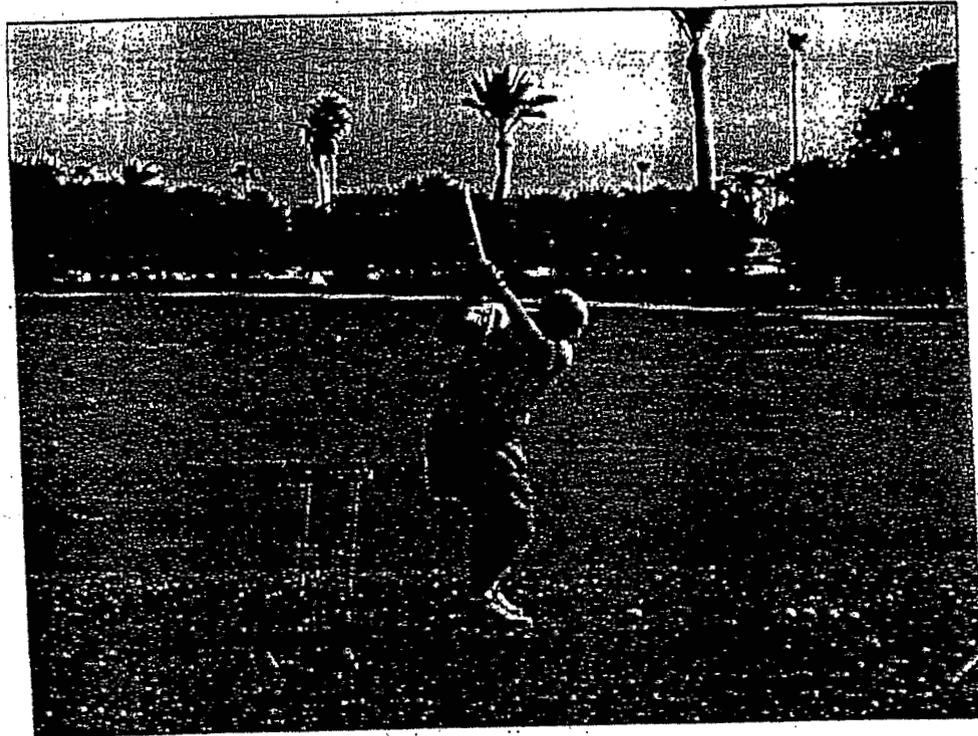
Q: Does this conclude your testimony?

A: Yes.

*Dess Chappellear*  
Dess Chappellear

Date: 9-30-99

UTILIZATION OF CENTRAL ARIZONA PROJECT  
WATER IN SUN CITY AND SUN CITY WEST, AZ



Prepared By

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September 21, 1999

UTILIZATION OF CENTRAL ARIZONA PROJECT  
WATER ON GOLF COURSES IN  
SUN CITY AND SUN CITY WEST, AZ

Prepared For

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September 1999

# UTILIZATION OF CENTRAL ARIZONA PROJECT WATER IN SUN CITY AND SUN CITY WEST, AZ

By

Herbert H. Schumann

The citizens of Sun City and Sun City West are willing to pay for Central Arizona Project (CAP) water provided they get a direct benefit from the utilization of the CAP water. The utilization must also improve the condition of the alluvial aquifer in their local area. This paper will address those concerns and suggest a plan for the utilization of the CAP water.

## CONCERNS AND BACKGROUND

The citizens of Sun City and Sun City West are concerned about the need to utilize renewable water resources in view of the historic and projected large-scale groundwater depletion in the west Salt River Valley.

The west Salt River Valley is underlain by several thousand feet of alluvial sediments that store large quantities of ground water (Eaton, Peterson and Schumann, 1972). These sediments yield large volumes of water to properly designed deep wells. Figure 1 shows that in 1900, prior to large-scale groundwater development, groundwater flowed from north to south across the area. In 1900, the groundwater system was believed to be in balance, because the rates of inflow or recharge were about equal to rates of discharge.

## GROUNDWATER DEPLETION

Historically, pumping rates have far exceeded rates of replenishment or recharge to the alluvial-aquifer system. Figure 2 indicates that between 1900 and 1983, groundwater pumping had caused water levels in wells to decline more than 300 feet throughout much of the western Salt River Valley. Figure 3 indicates that, by 1991, a deep cone of depression extended from the area west of Glendale to the northeast into the areas of Sun City and Sun City West.

In 1995, the Arizona Department of Water Resources (ADWR) developed a digital groundwater flow model to evaluate future changes in the elevation of water in the alluvial aquifer system which underlies the Salt River Valley. The groundwater flow model indicated that continued groundwater depletion would occur in the northern part of the western Salt River Valley.

Figure 4 shows the projected elevations of water levels in wells in the year 2025. According to the ADWR model, the deepest part of the cone of depression will be located in the area of Sun City and Sun City West. Figure 5 shows model projections of water level changes for the period 1983 to 2025 and indicates that an additional 300 feet of water-level decline may occur in the Sun City, Sun City West and Peoria areas.

Figure 6 shows the static water levels in well (A-3-1)4baa, which is located in the northeastern part of Sun City. These data indicate a decline in the static water level from 84 feet in 1924 to more than 405 feet below the land surface in 1994. These data confirm the large-scale groundwater depletion that has occurred.

Figure 7 shows the projected water-level changes that can be expected at the end of 20 years of recharging 100,000 acre-foot/year at the Central Arizona Water Conservation District's recharge site on the Agua Fria about 3.5 miles north of Sun City. Only about one foot of water-level change is projected in the Sun City and Sun City West areas after recharging 100,000 acre-foot/year for 20 years.

## CONCERNS

Groundwater depletion has necessitated the deepening of existing wells and the drilling of new deep wells to provide the large volumes of water needed for municipal and irrigation use. Today, the cost of drilling and equipping a new large-capacity well in the northern part of the western Salt River Valley can approach \$500,000. Groundwater depletion has also resulted in increased pumping levels (the depths from which water must be lifted by the pumps) and corresponding large increases in the cost of pumping groundwater.

In some areas, new deep wells have encountered water of poor chemical quality and relatively high temperatures that present operational problems. Large fluoride concentrations have been measured in water samples from some of the newer deep wells.

## LAND SUBSIDENCE AND EARTH FISSURE HAZARDS

Groundwater depletion has caused the aquifer system to compact and aquifer compaction has produced large areas of land subsidence in the west Salt River Valley. Land subsidence is the permanent lowering or the sinking of the land surface that results from fluid withdrawal or subsurface mining activities. Land subsidence is a natural geologic process, which has been accelerated by the depletion of the alluvial aquifer in the western Salt River Valley. Rates of land subsidence usually range from a few thousandths to a few tenths of a foot per year and land subsidence is often unrecognized until serious problems occur.

Land subsidence and resultant systems of earth fissures present serious environmental and geologic hazards that have caused many millions of dollars of damage to engineering structures including buildings, streets, roads, highways, railroads, water wells, canals, aqueducts and flood control structures in the west Salt River Valley. Differential or uneven land subsidence has caused changes in the slope of sanitary sewer lines and storm drains, has disrupted underground utilities, and has damaged public and private property.

Earth fissures, locally known as "earth cracks", occur on the edges of subsiding areas and may form long earth fissure zones. Earth fissures often transect natural drainage patterns and can capture large volumes of surface flow. Surface runoff, captured by earth fissures, causes rapid erosion along the sides of the fissures to produce fissure gullies. Fissure gullies can be more than 15 feet deep, 30 to 40 feet wide and as much as two miles long. Large open fissures pose serious safety hazards to people and to domestic animals. Earth fissures extend to large depths below the gullies and can provide vertical pathways for rapid downward movement of toxic contaminants toward the water table (Schumann and Genualdi, 1986).

Figure 8 shows land subsidence, earth fissures and wells damaged by land subsidence in the western Salt River Valley (Schumann, 1996). Areas of maximum land subsidence generally correspond to areas of maximum water-level decline (see Figures 2 and 8). Slightly more than 18 feet of land subsidence occurred between 1957 and 1991 at the intersection of Olive Avenue and Reems Road, which is located about four miles southwest of Sun City.

## BENEFITS OF UTILIZATION OF CAP WATER TO WATER LOCAL GOLF COURSES

1. It is estimated that the infrastructure necessary to deliver CAP water to the golf courses could be constructed within only one to two years. Only a minimum level of treatment would be necessary to use CAP water on the golf courses.
2. Discontinuing pumping of groundwater would have a very positive and immediate effect on local groundwater conditions. Water levels and pumping levels in nearby wells would rise and the cost of pumping water would be reduced in the local area.
3. Discontinuing pumping of groundwater for golf course watering in Sun City and Sun City West will reduce the stress on the alluvial aquifer system and thereby help reduce the potential for land subsidence and earth fissure hazards.
4. Wells now being used to provide water for golf courses could be utilized to provide emergency water supplies for municipal use or turf irrigation during periods of drought or outages in the CAP system.
5. The proposed infrastructure could facilitate the use of CAP water for municipal use at some time in the future. The CAP water would require only the same level of treatment as water from other surface water sources.
6. The hydrologic benefits of utilization of CAP water would be nearly immediate as opposed to the 20 years projected for benefits from the proposed remote recharge project.

## RECOMMENDATIONS

1. Utilization of CAP water to water golf courses in the Sun City and Sun City West is suggested. Pumping groundwater to water those golf courses should be discontinued.
2. The prompt utilization of CAP water on golf courses in City City and Sun City West will provide benefits to the local citizens in a relatively short period of time. Recharging the CAP water at a remote site may not provide benefits to some of the citizens within their lifetime.

## REFERENCES CITED

Eaton, G.P., Peterson, D.L., Schumann, H.H., 1972, Geophysical, geological, and geochemical reconnaissance of the Luke Salt Body, central Arizona: U.S. Geological Survey Professional Paper 753, 28p.

Schumann, Herbert H., and Genualdi, Robert B., 1988, Land subsidence, earth fissures, and water-level change in southern Arizona: Arizona Bureau of Geology and Mineral Technology Map Report 23, 1 sheet.

Schumann, Herbert H., 1996, Land subsidence and earth fissures in the west Salt River Valley, Maricopa County, Arizona: Proceedings of the 9th Annual Symposium of the Arizona Hydrological Society, Prescott, AZ, Sept. 12-14, 1996, 5p.

## LIST OF FIGURES

### Figure

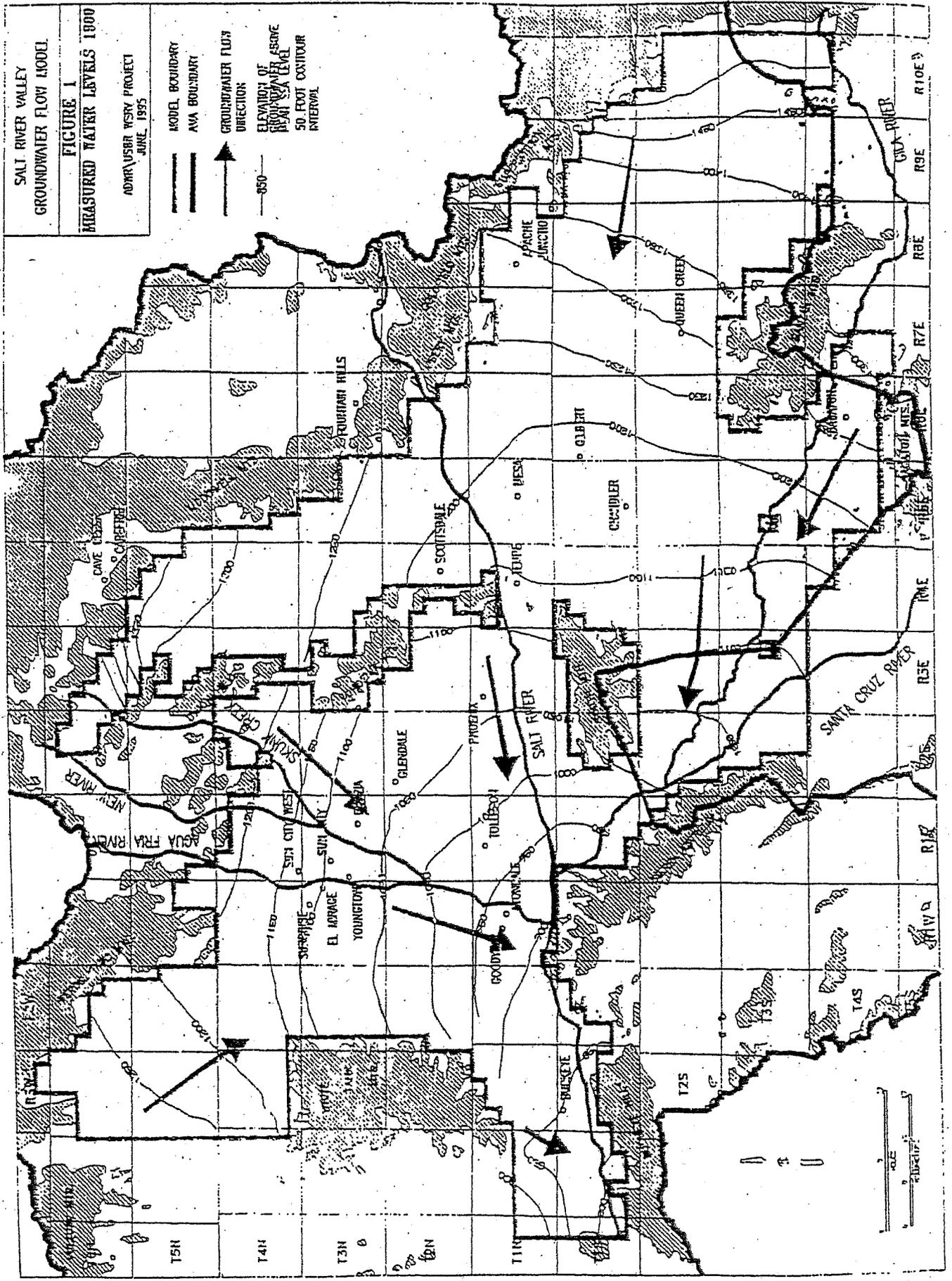
1. Map showing measured water levels in the Salt River Valley 1900.
2. Map showing changes in water levels in the Salt River Valley 1900 to 1983.
3. Map showing water levels in the Middle Alluvial Unit in the Salt River Valley.
4. Map showing simulated water level elevations in the Salt River Valley 2025.
5. Map showing simulated water level changes in the Salt River Valley 1983 to 2025.
6. Hydrograph of water levels in well (A-3-1)4baa
7. Map showing projected 1 foot groundwater level rise contour.
8. Map showing land subsidence in the west Salt River Valley 1957 to 1991.

SALT RIVER VALLEY  
GROUNDWATER FLOW MODEL

FIGURE 1  
MEASURED WATER LEVELS 1980

ADRIANUS WSRV PROJECT  
JUNE, 1995

- MODEL BOUNDARY
- AVA BOUNDARY
- GROUNDWATER FLOW DIRECTION
- ELEVATION OF BOUNDARY ABOVE SEA LEVEL
- 50-FOOT CONTOUR INTERVAL



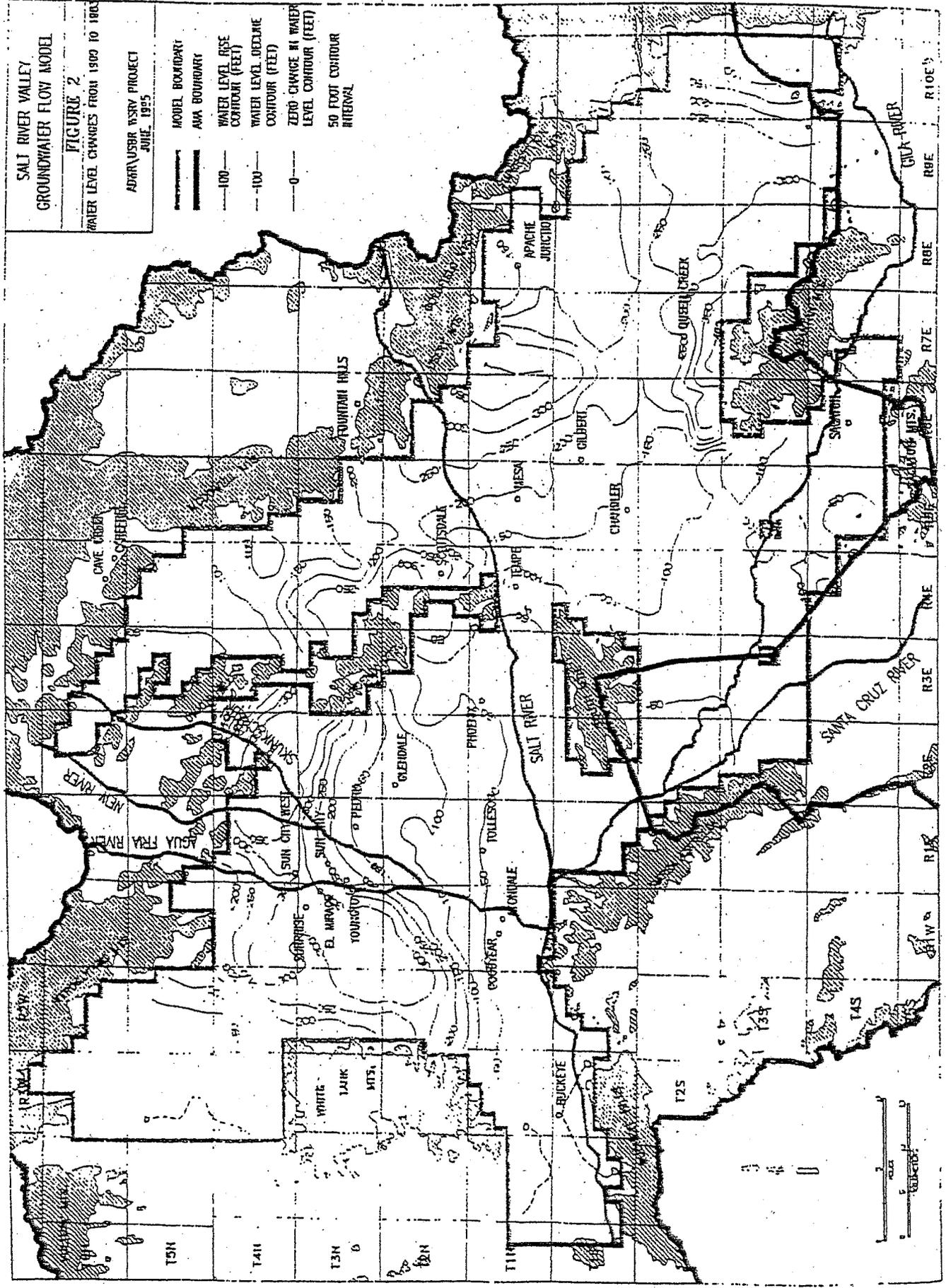
**SALT RIVER VALLEY  
GROUNDWATER FLOW MODEL**

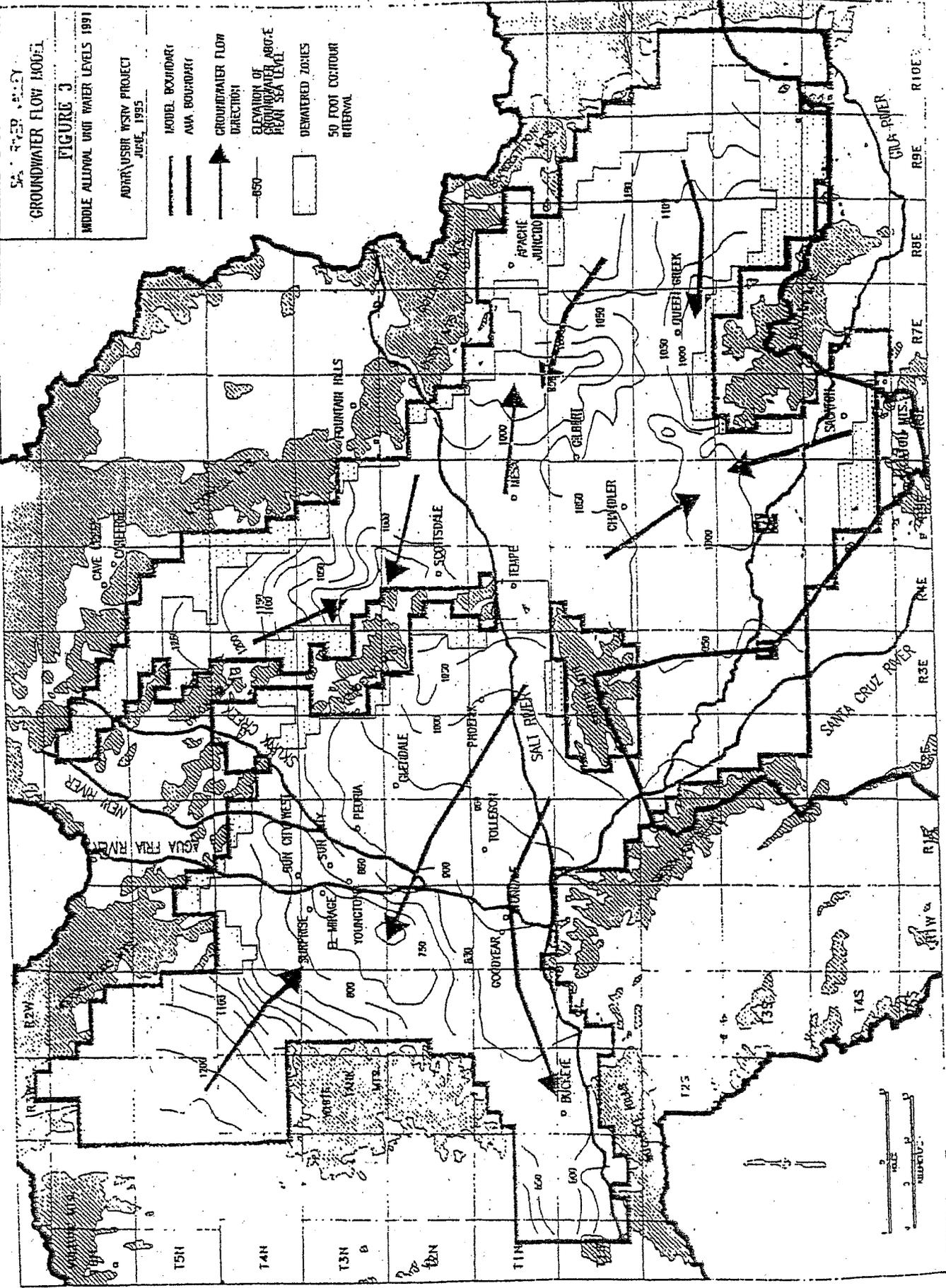
**FIGURE 2**

WATER LEVEL CHANGES FROM 1909 TO 1963

ADRIANUS BR. WSRV. PROJECT  
JULY, 1965

- MODEL BOUNDARY
- AWA BOUNDARY
- WATER LEVEL RISE CONTOUR (FEET)
- WATER LEVEL DECLINE CONTOUR (FEET)
- ZERO CHANGE IN WATER LEVEL CONTOUR (FEET)
- 50 FOOT CONTOUR INTERVAL





SACRAMENTO COUNTY  
 GROUNDWATER FLOW MODEL  
**FIGURE 3**  
 MIDDLE ALLOWANCE UNIT WATER LEVELS 1991

ADVANCED WSPV PROJECT  
 JUNE, 1995

MODEL BOUNDARY  
 AMA BOUNDARY  
 GROUNDWATER FLOW DIRECTION  
 ELEVATION OF GROUNDWATER ABOVE FROM SEA LEVEL  
 DEWATERED ZONES  
 50 FOOT CONTOUR INTERVAL

0 1 2 3  
 MILES  
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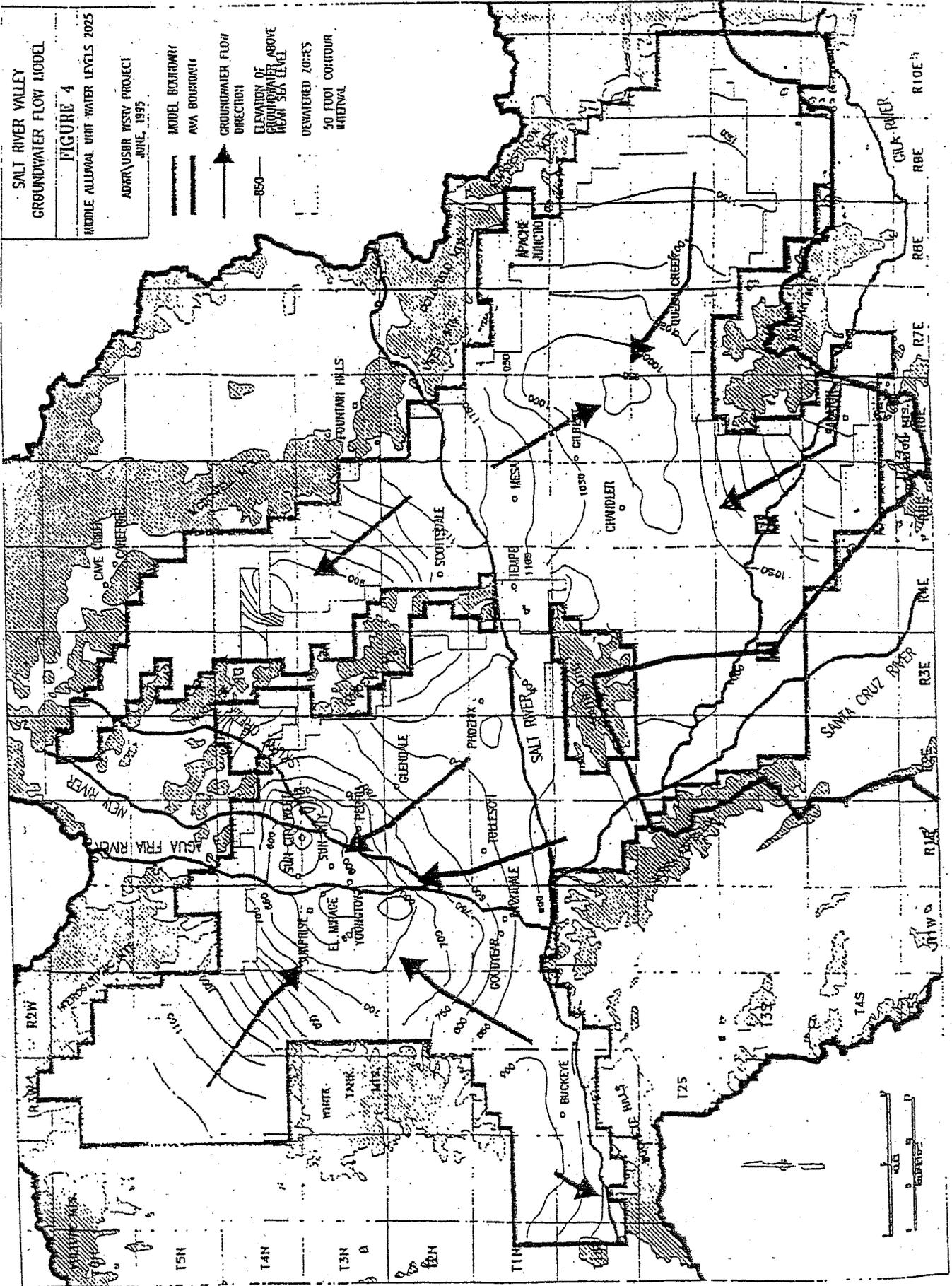
SALT RIVER VALLEY  
GROUNDWATER FLOW MODEL

FIGURE 4

MIDDLE ALLUVIAL UNIT WATER LEVELS 2025

ADRIANUSBR WISVY PROJECT  
JUNE, 1995

- MODEL BOUNDARY
- AVA BOUNDARY
- GROUNDWATER FLOW DIRECTION
- ELEVATION OF GROUNDWATER ABOVE MEAN SEA LEVEL
- DESATURATED ZONES
- 50 FOOT CONTOUR INTERVAL





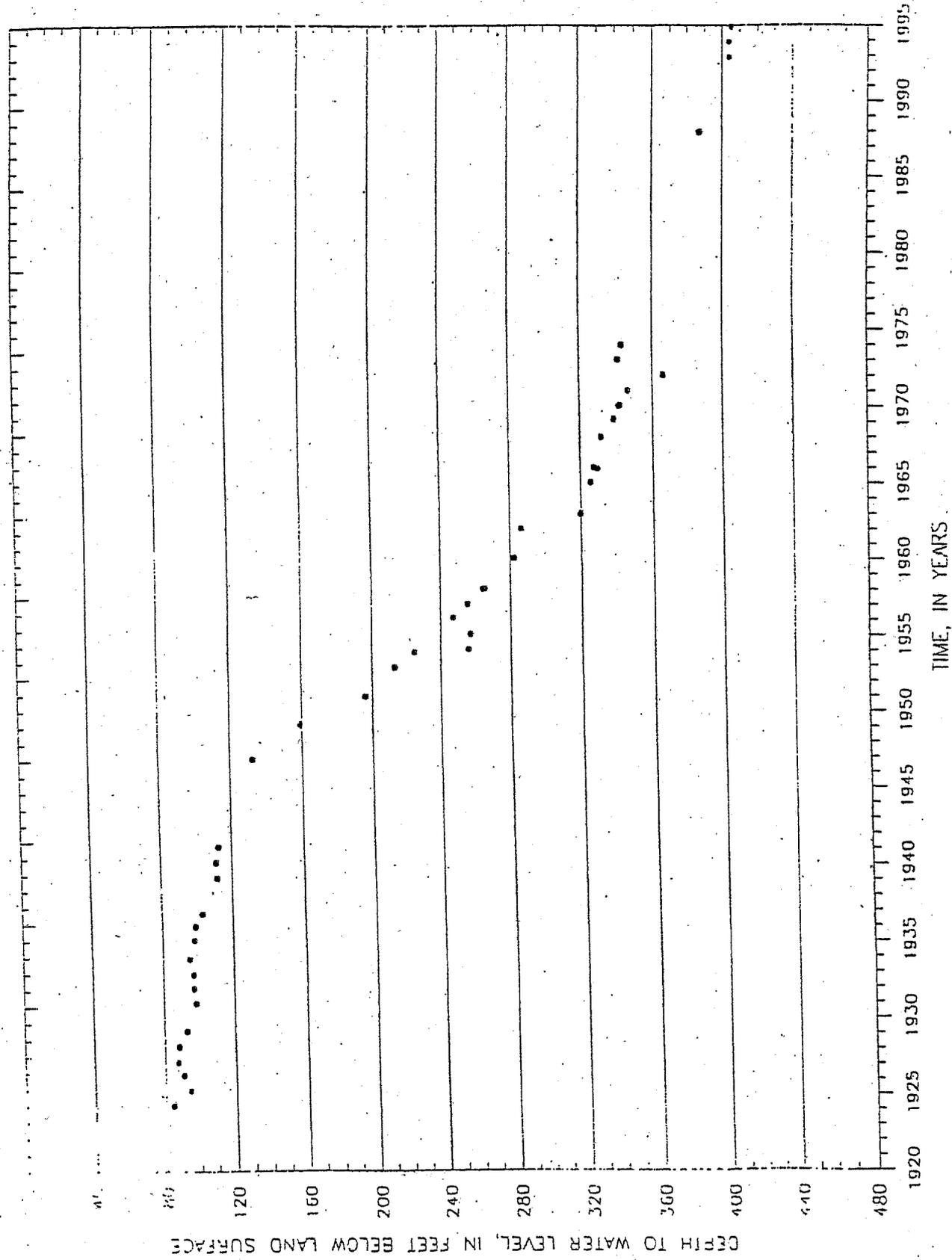


FIGURE 6. HYDROGRAPH OF WATER LEVELS IN WELL (A-3-1)4baa

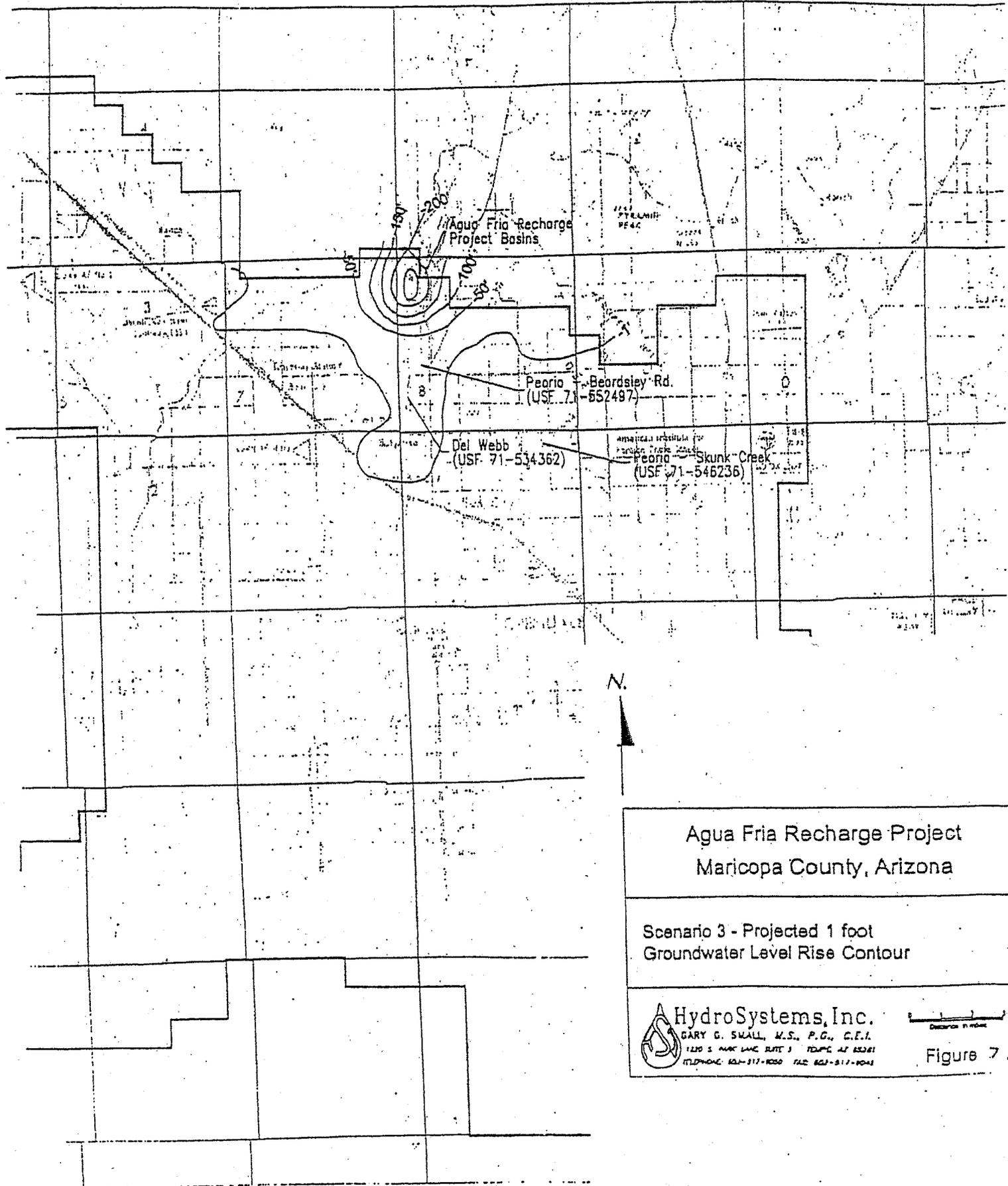
R.2W.

R.1W.

R.1E.

R.2E.

R.3E.



Agua Fria Recharge Project  
Maricopa County, Arizona

Scenario 3 - Projected 1 foot  
Groundwater Level Rise Contour

 HydroSystems, Inc.  
GARY G. SWALL, M.S., P.G., C.F.I.  
1220 S. MARK LANE SUITE 3 TEMPE, AZ 85281  
TELEPHONE 602-817-1000 FAX 602-817-1041



Figure 7.

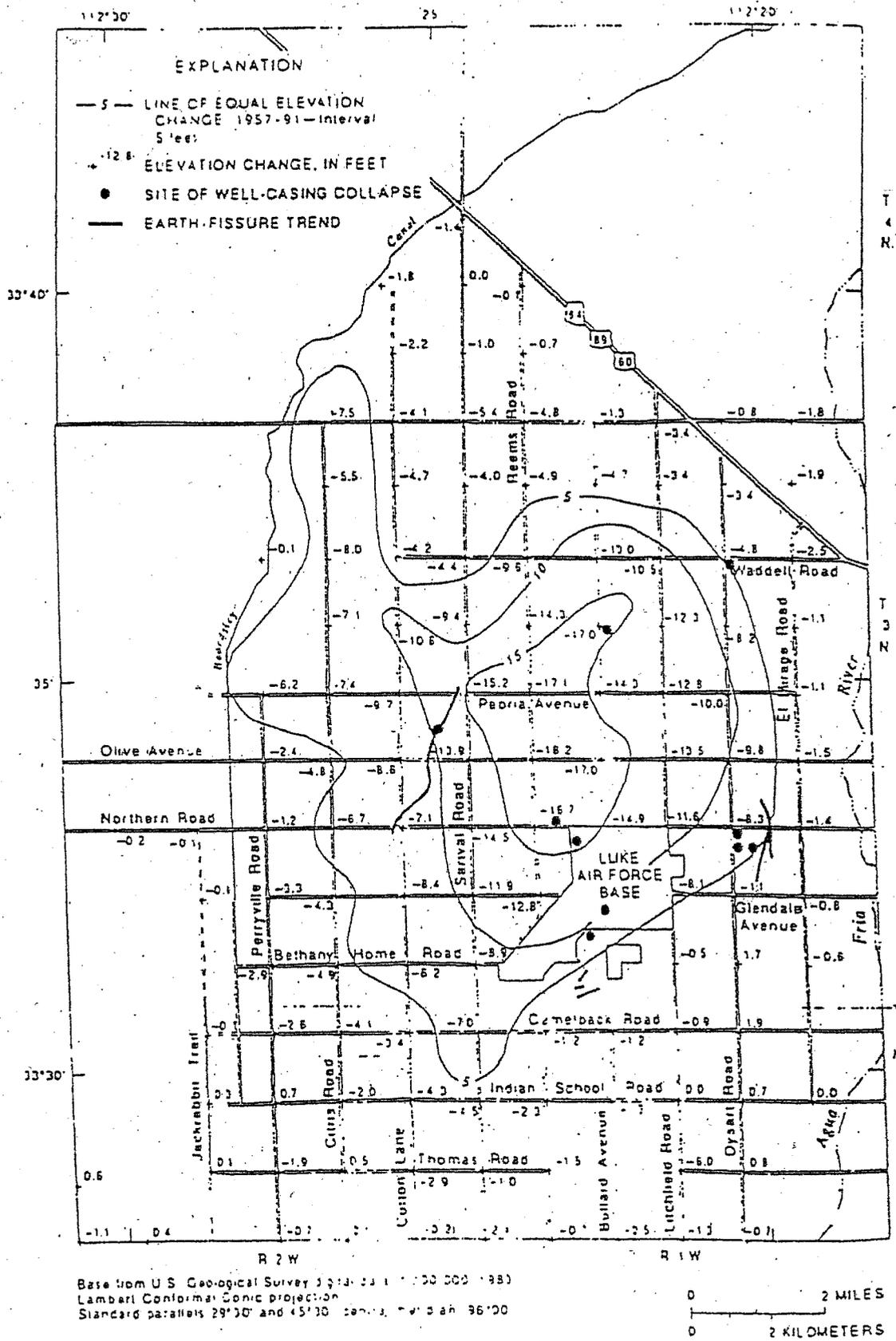


Figure 8. Map Showing Land Subsidence In The West Salt River Valley