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AZ CORP COMMISSION
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ADMITTED TO PRACTICE IN:
ARIZONA, COLORADO, MONTANA,
NEVADA, TEXAS, WYOMING,
DISTRICT OF COLUMBIA

December 13, 2007

Arizona Corporation Commission
DOCKETED

DEC 14 2007

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

DOCKETED BY

Re: Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-___

W-03718A-07-0687

To Whom It May Concern:

Enclosed for filing in the above-referenced and docketed proceeding are the original and thirteen (13) copies of an Application for an Opinion and Order of the Commission granting Sahuarita Water an extension of its existing Certificate of Convenience and Necessity, on behalf of Sahuarita Water Company, L.L.C.

Please let me know if you have any questions. Thank you for your assistance.

Sincerely,

Angela R. Trujillo
Secretary

Lawrence V. Robertson, Jr.

1 **BEFORE THE ARIZONA CORPORATION COMMISSION**

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2
3 **COMMISSIONERS**

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4 **MIKE GLEASON, Chairman**
5 **WILLIAM A. MUNDELL**
6 **JEFF HATCH-MILLER**
7 **KRISTIN K. MAYES**
8 **GARY PIERCE**

AZ CORP COMMISSION
DOCKET CONTROL

9 IN THE MATTER OF THE APPLICATION OF)
10 SAHUARITA WATER COMPANY, L.L.C. FOR)
11 AN EXTENSION OF ITS EXISTING)
12 CERTIFICATE OF CONVENIENCE AND)
13 NECESSITY IN ORDER TO PROVIDE WATER)
14 SERVICE TO AND WITHIN INCORPORATED)
15 AND UNINCORPORATED AREAS IN PIMA)
16 COUNTY, ARIZONA.)

W-03718A-07-0687

DOCKET NO. W-03718A-07-____
APPLICATION

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17 Sahuarita Water Company, L.L.C. ("Sahuarita Water"), by and through its undersigned
18 attorney, submits this Application for an Opinion and Order of the Commission granting
19 Sahuarita Water an extension of its existing Certificate of Convenience and Necessity ("CC&N")
20 in order to provide water service to and within incorporated and unincorporated areas within
21 Pima County, Arizona. In support of its Application, Sahuarita Water provides the following
22 information.

23 **I.**

24 **IDENTIFICATION OF APPLICANT**

25 Sahuarita Water is an Arizona limited liability company, and it is in good standing with
26 both the Commission's Utilities and Corporations Divisions. A Certificate of Good Standing
27 attesting to that effect is attached hereto as Appendix "A" and is incorporated herein by this
28 reference.

On December 20, 1995, in Decision No. 59431, the Commission granted Interchange
Water Company, Inc. ("IWC"), an Arizona corporation, a CC&N to provide water service to the
public in an area of approximately 3,000 acres within the Town of Sahuarita in Pima County,

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1 Arizona. The water service area therein certificated included the then contemplated master-
2 planned community of Rancho Sahuarita, which has since become a reality.¹ On November 2,
3 1999, in Decision No. 62032, the Commission authorized Rancho Sahuarita Water Company,
4 L.L.C. (“RSWC”), an Arizona limited liability company, to acquire the water system assets and
5 then existing CC&N of IWC. On June 25, 2004, in Decision No. 67068, the Commission
6 granted an extension of RSWC’s then existing CC&N to include additional properties in Pima
7 County, Arizona.

8 On October 15, 2007, RSWC filed Articles of Amendment For Rancho Sahuarita Water
9 Co., L.L.C. in which RSWC indicated that Mission Peaks 4000, LLC (“Mission Peaks 4000”), a
10 Nevada limited liability company, had acquired a 20% or greater member interest in RSWC. On
11 October 18, 2007, RSWC filed a further Articles of Amendment For Rancho Sahuarita Water
12 Co., L.L.C. in which RSWC indicated that its name was being changed to Sahuarita Water
13 Company, L.L.C. or “Sahuarita Water” as a defined term for purposes of this Application.

14 **II.**
15 **APPLICANT’S CONTACT PERSONS**
16 **AND CONTACT INFORMATION**

17 The name of and contact information for Sahuarita Water’s General Manager in
18 connection with this Application are as follows:

19 Mark J. Seamans
20 General Manager
21 Sahuarita Water Company, L.L.C.
22 P. O. Box 1520
23 Sahuarita, Arizona 85629
24 Phone: (520) 399-1105
25 Fax: (520) 399-1095
26 Email: Mseamans@ranchosahuarita.com

27 ¹ At present, Sahuarita Water is providing water service to approximately 4,250 customers located in the Rancho
28 Sahuarita and Rancho Resort residential communities. At buildout, it is currently anticipated that the Rancho
Sahuarita development will contain 10,100 single-family units, 1,460 multi-family units, and approximately 3.1
million square feet of commercial use. The aforesaid buildout is currently anticipated to occur in 2017.

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1 square feet of non-residential use, which will include commercial developments, recreation
2 centers, places of worship, and a police and fire station. In addition, current plans contemplate
3 one (1) high school, one (1) middle school and two (2) elementary schools. In response to
4 Mission Peaks 4000's request, Sahuarita Water has advised Mission Peaks 4000 that Sahuarita
5 Water is willing and able to provide the requested service, subject to (i) Sahuarita Water's prior
6 receipt of a CC&N extension from the Commission authorizing provision of the requested water
7 service on terms and conditions acceptable to Sahuarita Water, and (ii) the consummation of
8 Commission-approved line extension agreements and off-site facilities agreements between
9 Sahuarita Water and the master and/or subdivision developer(s) of Mission Peaks as and when
10 determined to be appropriate by Sahuarita Water. In turn, Mission Peaks 4000 has requested that
11 Sahuarita Water proceed with the preparation and filing of this Application. Copies of this
12 exchange of correspondence between Sahuarita Water and Mission Peaks 4000 are attached
13 hereto as Appendices "D" and "E," respectively, and are incorporated herein by this reference.

SAHUARITA MISSION

14
15 A copy of Sahuarita Mission's request for service is attached hereto as Appendix "F" and
16 is incorporated herein by this reference. Attached hereto as Appendix "G" and incorporated
17 herein by this reference is a copy of the legal description for Sahuarita Mission's acreage. As
18 noted in Appendix "F," Sahuarita Mission contemplates the ultimate development of 3,000
19 single-family units on the 471 acres which it owns. In response to Sahuarita Mission's request,
20 Sahuarita Water has advised Sahuarita Mission that Sahuarita Water is willing and able to
21 provide the requested service, subject to (i) Sahuarita Water's prior receipt of a CC&N extension
22 from the Commission authorizing provision of the requested water service on terms and
23 conditions acceptable to Sahuarita Water, and (ii) the consummation of Commission-approved
24 line extension agreements and off-site facilities agreements between Sahuarita Water and the
25 master and/or subdivision developer(s) of Sahuarita Mission's acreage as and when determined
26 to be appropriate by Sahuarita Water. In turn, Sahuarita Mission has requested that Sahuarita
27 Water proceed with the preparation and filing of this Application. Copies of this exchange of
28

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1 correspondence between Sahuarita Water and Sahuarita Mission are attached hereto as
2 Appendices "H" and "I," respectively, and are incorporated herein by this reference.

3 **ASLD**

4 A copy of ASLD's request for service is attached hereto as Appendix "J" and is
5 incorporated herein by this reference. Attached hereto as Appendix "K" and incorporated herein
6 by this reference is a copy of the legal description for ASLD's acreage. As noted in Appendix
7 "J," ASLD currently contemplates a buildout density of 2,300 single-family units for the 634
8 acres which it owns. In response to ASLD's request, Sahuarita Water has advised ASLD that
9 Sahuarita Water is willing and able to provide the requested service, subject to (i) Sahuarita
10 Water's prior receipt of a CC&N extension from the Commission authorizing provision of the
11 requested water service on terms and conditions acceptable to Sahuarita Water, and (ii) the
12 consummation of Commission-approved line extension agreements and off-site facilities
13 agreements between Sahuarita Water and the master and/or subdivision developer(s) of ASLD's
14 acreage as and when determined to be appropriate by Sahuarita Water. Copies of the exchange
15 of correspondence between Sahuarita Water and ASLD are attached as Appendices "J" and "L,"
16 respectively, and are incorporated herein by this reference.

17 **SUSD**

18 A copy of SUSD's request for service is attached hereto as Appendix "N" and is
19 incorporated herein by this reference². Attached hereto as Appendix "O" and incorporated
20 herein by this reference is a copy of the legal description for SUSD's acreage. SUSD's real
21 property consists of 112 acres, and is currently an uncertificated "island" within Sahuarita
22 Water's existing CC&N, which contains several SUSD facilities. The existing school facilities
23 on the SUSD acreage consist of a high school, a middle school and an elementary school. In
24 response to SUSD's request, Sahuarita Water has advised SUSD that Sahuarita Water is willing
25 and able to include SUSD's acreage within Sahuarita Water's certificated service area, subject to
26 Sahuarita Water's prior receipt of a CC&N extension from the Commission authorizing

27 _____
28 ² Appendix "M" was reserved for what was anticipated to be a second letter from ASLD to Sahuarita Water. The
wording of Appendix "J" obviates the necessity for a second letter from ASLD. Hence, Appendix "M" will not be
used at this time.

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1 provision of the requested water service on terms and conditions acceptable to Sahuarita Water.
2 In turn, SUSD has requested that Sahuarita Water proceed with the preparation and filing of this
3 Application. Copies of this exchange of correspondence between Sahuarita Water and SUSD are
4 attached hereto as Appendices "P" and "Q," respectively, and are incorporated herein by this
5 reference.

6 Attached hereto as Appendix "R" and incorporated herein by this reference is a copy of a
7 map which depicts the proposed extension of Sahuarita Water's CC&N which is the subject of
8 this Application. As may be noted therefrom, the boundaries of the Mission Peaks 4000,
9 Sahuarita Mission, ASLD and SUSD acreage, respectively, are depicted within the proposed
10 CC&N extension area.

11 **IV.**
12 **DESCRIPTION OF CONTEMPLATED**
13 **WATER SYSTEM FACILITIES**

14 Attached hereto as Appendix "S" and incorporated herein by this reference is a copy of a
15 November 2007 Water System Master Plan ("Water Plan") for Sahuarita Water, as prepared by
16 WestLand Resources, Inc. ("WestLand"). Because of the size of both (i) the population
17 increases which will occur in its existing CC&N at buildout, and (ii) the population that would
18 reside in the proposed CC&N extension area at projected buildout, Sahuarita Water retained
19 WestLand to prepare a comprehensive analysis and plan for use in connection with the future
20 development and management of Sahuarita Water's system. The Water Plan represents the
21 resulting work product and planning tool. As may be noted from the following table, which
22 appears on page 3 of the Water Plan, it is currently anticipated that at buildout of the existing
23 CC&N and the proposed CC&N extension areas, Sahuarita Water would be serving a projected
24 population of 82,681.³

25
26
27 ³ The 500 single-family units included in the Mission Peaks single-family unit total of 11,623 consists of families or
28 individuals who currently haul water to their homes, and conceivably might be interested in purchasing water from
Sahuarita Water on a standpipe basis, if Sahuarita Water's standpipe location in the Mission Peaks area would be
closer to them than their present source(s) of supply.

Future Developments Population Projections

Development	SF Units	MF Units	AA Units	Total Units	Projected Population
Rancho Sahuarita	10,086	-	1,460	11,546	29,860
State Land	2,300	-	-	2,300	6,210
Sahuarita Mission	3,000	-	-	3,000	8,100
Mission Peaks	11,623*	1,506	2,371	15,500	38,511
Total	27,009	1,506	3,831	32,346	82,681

* includes 500 units for a stand-pipe system that would benefit nearby residents that truck water

It is currently anticipated that the provision of water service to residential and non-residential customers located within the proposed CC&N extension area will begin in 2010.⁴ The following table sets forth by type of customer use and aggregate customer usage the water system development that it is anticipated will occur during the first five (5) years in that area. In that regard, the estimates of water system construction costs associated with the initial period of system development in the proposed CC&N extension area are included as a part of Appendix "T."

Sahuarita Water Company CC&N Extension 5-yr Summary

Year	Residential			Non-Residential			ADD (gallons)
	Single Family Units	Multi Family Units	Active Adult Units	Commercial (sq. ft.)	High School Students	Elementary School Students	
2010	100	174	100	30,000	1,226	2,350	154,108
2011	640	174	300	60,000	1,226	2,350	357,688
2012	1,430	174	600	90,000	1,226	2,350	655,318
2013	2,495	600	900	120,000	1,226	2,350	1,107,469
2014	3,335	1,000	1,361	150,000	1,226	3,637	1,552,402

Numbers are cumulative

The Water Plan consists of (i) 25 pages of discussion text, (ii) 17 tables, (iii) an appendix setting forth the demand calculations which were used in connection with determining and sizing needed new facilities and upgrades to existing facilities, and (iv) 2 engineering design exhibits depicting current and future water system plans for purposes of providing adequate and reliable water service within the existing CC&N and the proposed CC&N extension areas. The

⁴ However, water service to SUSD, which has existing facilities, would begin as soon as the necessary arrangements between SUSD and Sahuarita Water could be finalized.

discussion text, in turn, is organized into the following sections: Introduction; Scope and Approach; Engineering Criteria; Existing System Analysis; and Future System Analysis.

The following table summarizes Sahuarita Water's existing well production, booster station and storage reservoir capacities by pressure zones. In that regard, Pressure Zone 2950 N is shown separately since it operates on a separate infrastructure from the other three (3) current pressure zones.

Existing Reservoir/Booster Summary

Pressure Zone	Well Capacity (gpm)	Booster Capacity	Storage (gallons)
2850	3,300	0	2,200,000
2950	0	2,550	0
3050	0	2,250	0
Total	3,300	4,800	2,200,000
2950 N	0	1,850	350,000

Based upon the above-indicated population of 29,860 in the existing CC&N area at buildout, the following table sets forth WestLand's recommendations as to the indicated types of capacity on Sahuarita Water's system as of that point in time, including the addition of a fire flow capability.

Existing System Buildout Capacity Requirements

Zone	Well Requirement (PDD) (gpm)	Total Well Capacity ^a (gpm)	Fire Flow Requirement	Booster Requirement (PDD + FF)	Proposed Booster Capacity (gpm)	Storage Requirement ^b (ADD + FF)	Proposed Storage Capacity (gallons)
2850	1,658	3,900	1,500	N/A	N/A	1,373,664	2,200,000
2950	2,793	1,500	2,000	2,610	3,050	2,490,749	2,500,000
3050	483	0	2,250	2,733	4,650	408,058	
Total	4,934	5,400		5,343	7,700	4,272,471	4,700,000
2950 N	323	0	1,500	1,823	1,850	412,371 ^c	350,000
Total	323	0	1,500	1,823	1,850	412,371	350,000

^a The total well capacity is 6,900 gpm for Well No. 18, 21, 23, 24B and 25. However, to demonstrate the largest well out of service, 5,400 gpm is shown as the well capacity.

^b The proposed Fire Flow requirement of 1,500 gpm for 2 hours was added to the 2850 Zone Storage Requirement. The proposed fire flow requirement of 2,000 gpm for 4 hours was added to the 2950 Zone Storage Requirement. Because the 3050 Zone is served by the 2950 Zone reservoir at buildout the proposed fire flow requirement of 2,250 gpm for 4 hours was reduced to 250 gpm for 4 hours for the 3050 Zone Storage Requirement.

^c A Fire Flow requirement of 1,500 gpm for 2 hours was also added to the 2950 North Zone Storage Requirement.

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1 Exhibit 1 to the Water Plan also depicts the proposed water main infrastructure associated with
2 the recommended capacity additions and upgrades.

3 In the event that the Commission approves the proposed CC&N extension which is the
4 subject of this Application, Sahuarita Water's system capacity at buildout for the existing CC&N
5 area would be substantially increased beyond that capacity indicated in the immediately
6 preceding table. More specifically, five (5) new pressure zones would be created in connection
7 with the provision of water service to and within the CC&N extension area. The related new
8 facilities additions would include the drilling of approximately ten (10) new wells. It is currently
9 anticipated that the production capacity of eight (8) of the new wells would be 1,500 gpm each,
10 and that the two (2) other new wells would have a production capacity of 1,000 gpm and 750
11 gpm, respectively.

12 The Water Plan further recommends adding 10.7 million gallons of storage reservoir
13 capacity to the existing 2.55 million gallons of capacity, in order to produce a total of 13.25
14 million gallons of storage reservoir capacity to serve the combined requirements of the existing
15 CC&N and the proposed CC&N extension areas at buildout, including provision for a fire flow
16 requirement in each area. This total storage reservoir capacity amount includes 1,544,918
17 gallons of "excess" capacity.

18 The Water Plan also recommends a substantial increase in booster station capacity in
19 order that the appropriate pressures and flows could be maintained in the multiple pressure zones
20 which would exist on Sahuarita Water's expanded system. WestLand's specific
21 recommendations in this regard are detailed at pages 20-21 of the Water Plan. Each booster
22 station would be equipped with manual transfer switches for use of a portable backup generator
23 to insure continued operation in the event of a power outage; and, similar redundancy would
24 exist for booster pump maintenance and replacement.

25 Finally, the Water Plan contemplates dual large diameter water mains, which would
26 allow for both (i) the movement of large volumes of water through the system to storage
27 reservoirs located at higher elevations, and (ii) continued water transport during the shut-down of
28 one (1) main for maintenance purposes or in the event of a line break. Large diameter mains

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1 would also reduce system head loss, with a resultant reduction in electrical pumping costs. In
2 connection with the foregoing, the Water Plan also provides for a concept distribution system
3 loop for fire flow and redundancy purposes. Exhibit 2 to the Water Plan generally depicts the
4 location of the recommended facilities additions associated with the proposed CC&N expansion.

5 V.

6 ESTIMATED COST AND FINANCING OF
7 CONTEMPLATED WATER SYSTEM FACILITIES

8 Attached hereto as Appendix "T" and incorporated herein by this reference is an analysis
9 of the estimated cost of construction of the water system facilities in the proposed CC&N
10 extension area for the first five (5) years of development as contemplated by the Water Plan.
11 These estimates (Opinion of Probable Construction Cost) have been prepared by WestLand, and
12 are based upon a combination of water industry and construction industry indices, coupled with
13 actual experience in order to reflect conditions in the metropolitan Tucson area. Thomas J.
14 Bourassa, C.P.A., a utility consultant who is well known to the Commission and its Staff, in turn,
15 has taken these estimates and he and Sahuarita Water's Controller have projected Sahuarita
16 Water's plant account balances, by year, for the first five (5) years of operation. That
17 information is also included as a part of Appendix "T."

18 In conjunction with financing the construction of the aforesaid water system facilities,
19 Sahuarita Water currently anticipates that initially it would use a combination of funds provided
20 by master developer(s) and/or subdivision developer(s), and common equity. In that regard,
21 attached hereto as Appendix "U" and incorporated herein by this reference is a pro forma
22 Balance Sheet and a pro forma Income Statement reflecting the financial condition of Sahuarita
23 Water for five (5) projected twelve (12) month periods ending December 31 following the
24 commencement of water service to customers in the proposed CC&N extension area. Funds
25 obtained from master developer(s) and/or subdivision developer(s) would be by means of line
26 extension agreements and off-site facilities agreements approved by the Commission. The pro
27 forma Balance Sheet also includes supporting schedules which depict current projections of
28 advances in aid of construction and contributions in aid of construction which Sahuarita Water

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1 would receive in connection with the proposed CC&N extension. In addition, it is conceivable
2 that at some point in the buildout of the existing CC&N and CC&N extension areas, Sahuarita
3 Water may conclude that it also would be appropriate to finance a portion of the water system
4 capacity additions with long-term debt. In such event, Sahuarita Water would seek and obtain
5 Commission authorization before incurring any long-term debt.

6 The financing of transmission mains of 8-inch or less, as well as distribution facilities
7 within individual subdivisions in the existing CC&N and CC&N extension areas, will probably
8 continue to be accomplished in large measure by the use of line extension agreements approved
9 by the Commission. On occasion, and if consistent with Sahuarita Water's then current financial
10 needs, common equity might be considered as a means of financing for a portion of the overall
11 transmission system.

12 **VI.**

13 **PROPOSED RATES AND CHARGES**

14 Sahuarita Water proposes to charge its existing Commission-approved rates and charges
15 for water service in the proposed CC&N extension area.

16 **VII.**

17 **ESTIMATED ANNUAL OPERATING**
18 **REVENUES, EXPENSES AND CUSTOMERS**

19 Also attached hereto as part of Appendix "U" are schedules depicting, by year for the
20 first five (5) years of operation, the estimated annual number of customers and associated
21 operating revenues and expenses for Sahuarita Water's operations in the CC&N extension area.
22 These estimates have been prepared by the aforesaid Mr. Bourassa and Sahuarita Water's
23 Controller, and are based upon a combination of (i) development pace estimates provided by
24 Mission Peaks 4000/Sahuarita Mission/ASLD, (ii) projected expenditures prepared by Mr.
25 Bourassa in consultation with Sahuarita Water, and (iii) Sahuarita Water's current rates and
26 charges for water service.

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VIII.
ESTIMATED SCHEDULE FOR
CONSTRUCTION OF WATER SYSTEM FACILITIES

As indicated in Appendix "A" (Demand Calculations) to the Water Plan, it is currently anticipated that development in the proposed CC&N extension area will occur in multiple phases over a thirty (30) year period of time. However, it is important to recognize that the dates associated with projected commencement and completion of construction of facilities are estimates, not guarantees, and that the actual dates will be significantly influenced by the pace at which development actually occurs.

IX.
ANALYSIS OF ASSURED
WATER SUPPLY

Attached hereto as Appendix "V" and incorporated herein by this reference is a copy of (i) an Application For Modification of Designation of Assured Water Supply ("Modification Application"), and (ii) an Assured Water Supply Hydrology Report For Sahuarita Water Company ("Report"), as prepared by Brown and Caldwell, a highly respected engineering and hydrology firm providing professional consulting services to the water utility industry in a number of states, including Arizona. The Modification Application and the Report were submitted to the Arizona Department of Water Resources ("ADWR") on November 23, 2007. The Modification Application requests that Sahuarita Water's current Designation of Assured Water Supply be modified, by way of an increase, to reflect its ability to fully provide the projected water demand at buildout in both the existing CC&N and proposed CC&N extension areas for the statutorily-prescribed 100 years. Sahuarita Water currently has a Designation of Assured Water Supply from ADWR of 4,700 annual acre feet. As noted in the Executive Summary portion of the Report, the hydrogeologic analysis therein presented demonstrates the physical availability of 10,983 acre feet per year of local groundwater for both the existing CC&N and the proposed CC&N extension areas of Sahuarita Water at buildout for the requisite 100 year period.

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Upon receipt from ADWR of the Modification of Designation of Assured Water Supply which has been requested, Sahuarita Water will file a copy of the same with the Commission in the docketed proceeding which is established to process this Application.

In addition, on its own initiative, Sahuarita Water also retained Brown and Caldwell to conduct a well spacing-well impact analysis of the contemplated supply wells for the proposed CC&N extension area. Attached hereto as Appendix "W" and incorporated herein by this reference is a copy of the December 5, 2007 Well Impact Study Report prepared by Brown and Caldwell to reflect the results of that analysis. As may be noted therefrom, the groundwater level drawdowns caused by the contemplated supply wells would not exceed any of the drawdown limits allowed under ADWR's Well Spacing and Well Impact Rules.

X.

CURTAILMENT TARIFF

Attached hereto as Appendix "X" and incorporated herein by this reference is a copy of the Curtailment Plan Tariff ("Tariff") which the Commission has previously approved for use in Sahuarita Water's existing CC&N. In that regard, the water company has inserted the necessary signage information that was left blank in the Stage 3 and Stage 4 portions of the form of Tariff approved by the Commission. Sahuarita Water intends to use the same curtailment plan in connection with its proposed provision of water service to and within the proposed CC&N extension area.

XI.

ADDITIONAL APPROVALS

Sahuarita Water has a water utility franchise from Pima County, Arizona, which would, by its terms, also be applicable to the provision of water service to and within the proposed CC&N extension area.

In the event of a Commission decision granting Sahuarita Water the CC&N extension requested by this Application, and in connection with subsequent construction of the contemplated water system for the CC&N extension area, Sahuarita Water will file with the Commission copies of the Approval(s) to Construct and Approval(s) of Construction which are

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1 issued by the Arizona Department of Environmental Quality from time to time in connection
2 with the design and construction of the various phases of the water system for the CC&N
3 extension area.

4 **XII.**
5 **MISCELLANEOUS**

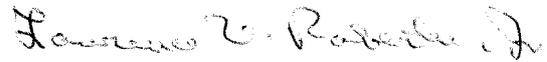
6 With the exception of the 112 acre SUSD acreage, which is located within the municipal
7 boundaries of the Town of Sahuarita, all of the acreage included within the proposed CC&N
8 extension area is not located within any city or town. In addition, such acreage is not located
9 within the existing certificated service area of any public service corporation or municipal
10 system providing water service. Finally, there are no existing water utility service connections
11 within the proposed CC&N extension area.

12 **XIII.**
13 **CONCLUSION**

14 WHEREFORE, and based upon the discussion set forth in the preceding sections of this
15 Application and the information contained in Appendices "A" through "X" hereto, Sahuarita
16 Water respectfully requests that the Commission issue an Opinion and Order granting Sahuarita
17 Water an extension to its existing CC&N thereby authorizing it to provide water service to and
18 within the area(s) legally described and graphically depicted in Appendices "C," "G," "K," "O"
19 and "R" hereto, respectively.

20
21 Dated this 13th day of December 2007.

22
23 Respectfully submitted,

24 

25 Lawrence V. Robertson, Jr.
26 Attorney for Sahuarita Water Company, L.L.C.

27 The original and thirteen (13) copies of
28 the foregoing Application have been
delivered to a courier this 13th day of

LAWRENCE V. ROBERTSON, JR.
ATTORNEY AT LAW
P.O. Box 1448
Tubac, Arizona 85646
(520) 398-0411

1 December 2007 for subsequent filing with:

2 Docket Control
3 Arizona Corporation Commission
4 1200 West Washington
5 Phoenix, Arizona 85007

6 A copy of the foregoing Application will
7 also be delivered by courier to:

8 Christopher Kempley, Chief Counsel
9 Legal Division
10 Arizona Corporation Commission
11 1200 West Washington Street
12 Phoenix, Arizona 85007

13 Ernest Johnson, Director
14 Utilities Division
15 Arizona Corporation Commission
16 1200 West Washington Street
17 Phoenix, Arizona 85007

18 Mark J. Seamans
19 General Manager
20 Sahuarita Water Company, L.L.C.
21 P. O. Box 1520
22 Sahuarita, Arizona 85629

23 
24 _____

25
26
27
28

APPENDIX "A"
(Certificate of Good Standing)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

STATE OF ARIZONA



Office of the
CORPORATION COMMISSION
CERTIFICATE OF GOOD STANDING

To all to whom these presents shall come, greeting:

I, **Brian C. McNeil**, Executive Director of the Arizona Corporation Commission, do hereby certify that

*****SAHUARITA WATER COMPANY, L.L.C.*****

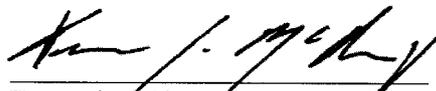
a domestic limited liability company organized under the laws of the State of Arizona, did organize on the 30th day of December 1996.

I further certify that according to the records of the Arizona Corporation Commission, as of the date set forth hereunder, the said limited liability company is not administratively dissolved for failure to comply with the provisions of A.R.S. section 29-601 et seq., the Arizona Limited Liability Company Act; and that the said limited liability company has not filed Articles of Termination as of the date of this certificate.

This certificate relates only to the legal existence of the above named entity as of the date issued. This certificate is not to be construed as an endorsement, recommendation, or notice of approval of the entity's condition or business activities and practices.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the Arizona Corporation Commission. Done at Phoenix, the Capital, this 3rd Day of December, 2007, A. D.




Executive Director

Order Number: 192037

APPENDIX “B”

(Letter from Mission Peaks 4000, L.L.C. requesting
water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

MISSION PEAKS 4000, LLC
901 North Green Valley Parkway, Suite 190
Henderson, NV 89074
(702) 458-8855

November 29, 2007

Mark J. Seamans
General Manager
Sahuarita Water Company, L.L.C.
P. O. Box 1520
Sahuarita, Arizona 85629

Re: Request for Water Service for Mission Peaks Master Planned Community

Dear Mr. Seamans:

Mission Peaks 4000, L.L.C. ("Mission Peaks 4000") hereby formally requests that Sahuarita Water Company, L.L.C. ("Sahuarita Water") undertake such actions as may be necessary to enable Sahuarita Water to become the lawful provider of water service to and within approximately 4,217 acres of land which Mission Peaks 4000 owns in an unincorporated area of Pima County, Arizona, northwest of the Town of Sahuarita. Attached to this letter as Appendix "A" are legal descriptions of the acreage in question.

Mission Peaks 4000 intends to cause or facilitate the development of a master-planned community on its aforesaid acreage, which may be known as the Mission Peaks Master Planned Community ("Mission Peaks"). As currently contemplated, Mission Peaks will consist of approximately (i) 11,123 single-family units, (ii) 2,371 active-adult units, (iii) 1,506 multi-family units, and (iv) an additional 1.1 million square feet of non-residential use, which will include commercial development, recreation centers, places of worship, schools and a police and fire station. In that regard, and as a result of previous discussions we have had with you upon this subject, it is our understanding that the projected water system demands associated with the Mission Peaks project have been included in a Water System Master Plan that WestLand Resources, Inc. has recently prepared for Sahuarita Water.

Please advise us in writing if Sahuarita Water is interested in becoming the lawfully authorized provider of water service to Mission Peaks. In that regard, you may use this request for water service in connection with any approvals Sahuarita Water must obtain from regulatory or permitting agencies or entities.

Sincerely,



Mathew Lawson
Vice President of Community Development
Mission Peaks 4000, L.L.C.

APPENDIX “C”

(Mission Peaks 4000, L.L.C. land legal description)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

July 27, 2007
Psomas # 95016-10

EXHIBIT A

LEGAL DESCRIPTION RANCHO SAHUARITA WATER COMPANY BOUNDARY

Section 24, Township 17 South, Range 12 East, Gila and Salt River Meridian,
Pima County, Arizona,

EXCEPT the north one-half of the north one-half said Section 24, and
FURTHER EXCEPTING any portion lying within the right-of way of Mission -Twin
Buttes Road.

Section 25, Township 17 South, Range 12 East, Gila and Salt River Meridian,
Pima County, Arizona,

EXCEPT any portion lying southerly of the northerly right of way line of Mission -
Twin Buttes Road.

Section 26, Township 17 South, Range 12 East, Gila and Salt River Meridian,
Pima County, Arizona.

The east one-half of Section 27, Township 17 South, Range 12 East, Gila and
Salt River Meridian, Pima County, Arizona.

A portion of northeast one-quarter of Section 34, Township 17 South, Range 12
East, Gila and Salt River Meridian, described as Parcel 2 of Quiet Desert
Ranches, recorded in Book 14 Records of Survey at Page 53, records of Pima
County, Arizona.

Those portions of the west one-half of Section 35, Township 17 South, Range 12
East, Gila and Salt River Meridian, described as Parcels 5, 12, 13 and 14 of
Quiet Desert Ranches, recorded in Book 13 Records of Survey at Page 70, being
corrected in Book 14 Records of Survey at Page 35, and again in Book 14
Records of Survey at Page 53, records of Pima County, Arizona.

The East one-half of Section 35, Township 17 South, Range 12 East, Gila and
Salt River Meridian, Pima County, Arizona,

EXCEPT any portion lying within the right of way of Mission -Twin Buttes Road
and **FURTHER EXCEPTING** any portion lying within the right of way of McGee
Ranch Road, also known as Twin Buttes - McGee Road.

July 27, 2007
Psomas # 95016-10

The North one-half of Section 36, Township 17 South, Range 12 East, Gila and Salt River Meridian, Pima County, Arizona,

EXCEPT any portion lying southeasterly of the northwesterly right of way line of Mission -Twin Buttes Road.

The southwest one-quarter of the northwest one-quarter of Section 1, Township 18 South, Range 12 East, Gila and Salt River Meridian, Pima County, Arizona,

EXCEPT any portion lying northeasterly of the southwesterly right of way line of Mission -Twin Buttes Road.

Lots 1 and 2 and the south one-half of the northeast one-quarter of Section 2, Township 18 South, Range 12 East, Gila and Salt River Meridian Pima County, Arizona,

EXCEPT any portion lying within the right of way of Mission -Twin Buttes Road.

Section 16, Township 17 South, Range 13 East, Gila and Salt River Meridian, Pima County, Arizona,

EXCEPT any portion lying northerly of the southerly right of way of Helmet Peak – Sahuarita Road.

Section 19, Township 17 South, Range 13 East, Gila and Salt River Meridian, Pima County, Arizona,

EXCEPT any portion lying within the right of way of Mission -Twin Buttes Road.

Section 20, Township 17 South, Range 13 East, Gila and Salt River Meridian, Pima County, Arizona,

EXCEPT any portion lying southerly of the northerly right of way line of Twin Buttes Road and **FURTHER EXCEPTING** the north 30 feet of the west one-half of said Section 20 and **FURTHER EXCEPTING** Lot 28 of Pimeria Alta Estates as recorded in Book 38 of maps and plats at page 9 therein, Records of Pima County, Arizona.

July 27, 2007
Psomas # 95016-10

The west one-half of Section 21, Township 17 South, Range 13 East, Gila and Salt River Meridian, Pima County, Arizona,

EXCEPT any portion lying easterly of the following described line;

COMMENCING at the northeast corner of said west one-half;

THENCE upon the north line of said west one-half, S 89°25'53" W, a distance of 959.80 feet to the **POINT OF BEGINNING**;

THENCE southerly upon the west line of that parcel as described in Docket 7437 at page 453 therein, Records of Pima County, Arizona, S 01°20'28" E to the northerly right of way line of Twin Buttes Road and the **POINT OF TERMINUS**.

FURTHER EXCEPTING any portion lying southerly of the northerly right of way line of Twin Buttes Road.

The north one-half and the southwest one-quarter of Section 30, Township 17 South, Range 13 East, Gila and Salt River Meridian, Pima County, Arizona,

EXCEPT any portion lying southerly of the northerly right of way line of Twin Buttes Road and **FURTHER EXCEPTING** any portion lying easterly and southerly of the westerly and northerly right of way lines of Mission -Twin Buttes Road.

See attached Exhibit B

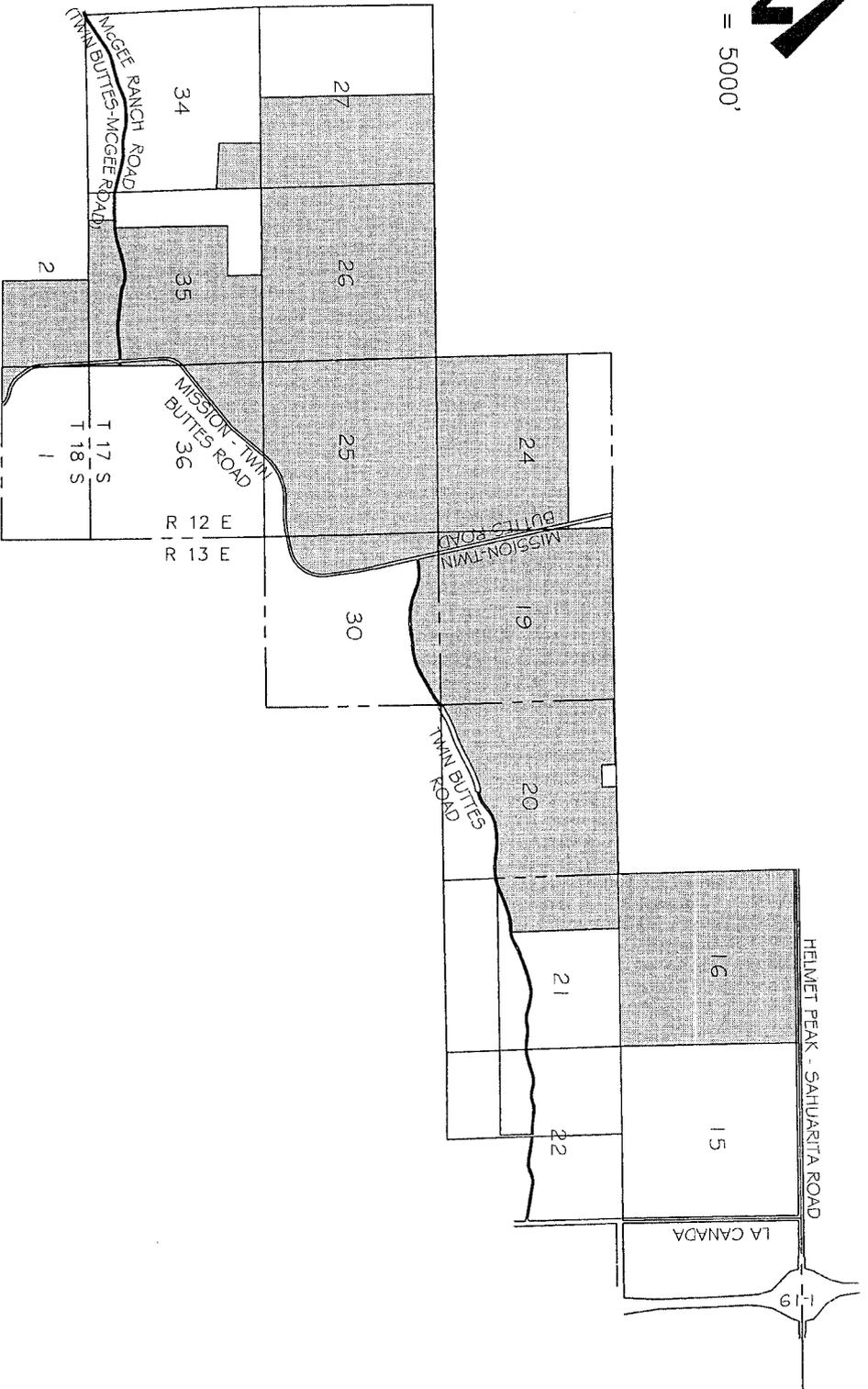
Prepared by:
Psomas



Ernest Gomez AZ. R.L.S. 27739



SCALE: 1" = 5000'



P S O M A S

800 E. Wetmore Road, Suite 110
Tucson, AZ 85719
(520) 292-2300 (520) 292-1290 fax
www.psomos.com

EXHIBIT B

RANCHO SAHUARITA WATER COMPANY BOUNDARY
PORTIONS OF SECTIONS 24-27, 34 & 35, TOWNSHIP 17 SOUTH, RANGE 12 EAST
AND PORTIONS OF SECTIONS 16, 19-21 & 30, TOWNSHIP 17 SOUTH, RANGE 13 EAST
AND PORTIONS OF SECTIONS 1 & 2, TOWNSHIP 18 SOUTH, RANGE 12 EAST
GILA & SALT RIVER MERIDIAN, PIMA COUNTY, ARIZONA

95016-10

DATE: July, 07 • DRAWN BY: mrf

APPENDIX “D”

(Sahuarita Water Company, L.L.C. letter
responding to Mission Peaks 4000, L.L.C.’s
request for water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

Sahuarita Water Company



November 29, 2007

Matt Lawson, Vice President Community Development
Mission Peaks 4000, L.L.C.
901 N. Green Valley Parkway, Suite 190
Henderson, Nevada 89074

Re: Request For Water Service For
Mission Peaks Master Planned Community
("Mission Peaks")

Dear Mr. Lawson:

This letter will acknowledge Sahuarita Water Company, L.L.C.'s ("Sahuarita Water") receipt of your November 29, 2007 letter requesting that Sahuarita Water undertake such actions as may be necessary to enable Sahuarita Water to become the lawful provider of water service to Mission Peaks which Mission Peaks 4000, L.L.C. ("Mission Peaks 4000") contemplates developing.

Sahuarita Water is interested in becoming the lawfully authorized provider of water service to Mission Peaks, and is willing and able to do so, subject to prior receipt of the necessary approvals and authorizations from governmental entities with jurisdiction over Sahuarita Water's water provider operations. These will include the receipt of the necessary certificate of convenience and necessity from the Arizona Corporation Commission ("ACC"), and ACC approval of such line extension agreements and off-site facilities agreements as Sahuarita Water may find to be necessary.

In that regard, as a condition to Sahuarita Water's willingness to proceed with such actions as may be necessary to obtain the requisite approvals and authorizations, Sahuarita Water will require that Mission Peaks 4000 reimburse Sahuarita Water for any expenses Sahuarita Water may incur in connection with such efforts. Sahuarita Water believes that the cost of such activities should not be borne by the ratepayers of its existing certificated service area.

If the foregoing condition is acceptable to Mission Peaks 4000, please so advise me in writing and Sahuarita Water will promptly undertake to obtain the approvals and authorizations necessary to enable it to be the lawful water provider to the Mission Peaks.

Sincerely,

Sahuarita Water Company, L.L.C.

By: 
Mark J. Seamans, General Manager

APPENDIX “E”

(Mission Peaks 4000, L.L.C.’s reply to Sahuarita Water Company, L.L.C.’s response to Mission Peaks 4000, L.L.C.’s request for water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

MISSION PEAKS 4000, LLC
901 North Green Valley Parkway, Suite 190
Henderson, NV 89074
(702) 458-8855

November 29, 2007

Mark J. Seamans
General Manager
Sahuarita Water Company, L.L.C.
P. O. Box 1520
Sahuarita, Arizona 85629

Re: Request for Water Service for Mission Peaks Master Planned Community

Dear Mr. Seamans:

The condition outlined in your letter of November 29, 2007 to me is acceptable to Mission Peaks 4000, L.L.C. ("Mission Peaks 4000"). Accordingly, please proceed with all actions necessary to enable Sahuarita Water Company, L.L.C. ("Sahuarita Water") to become the lawful water provider to Mission Peaks.

In that regard, please provide me with a copy of all documents filed with such governmental entities from whom the necessary approvals or authorizations are requested by Sahuarita Water; and, please provide me with periodic statements of fees and costs incurred by Sahuarita Water in connection with its efforts on our behalf, in order that Mission Peaks 4000 may either directly pay the same or reimburse Sahuarita Water.

Sincerely,



Mathew Lawson
Vice President Community Development
Mission Peaks 4,000, L.L.C.

APPENDIX “F”

(Letter from Sahuarita Mission Partners, L.L.C.
requesting water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____



SHARPE & ASSOCIATES, INC.

4549 E. Fort Lowell Road • Tucson, AZ 85712 • (520) 299-8766
FAX (520) 529-3137

November 28, 2007

Sahuarita Water Company, L.L.C.
P. O. Box 1520
Sahuarita, Arizona 85629

Attention: Mark J. Seamans
General Manager

Re: Request for Water Service For
Sahuarita Mission
("Sahuarita Mission")

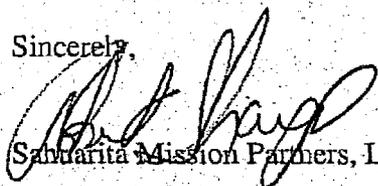
Dear Mr. Seamans:

Sahuarita Mission Partners, L.L.C. ("Sahuarita Mission") hereby formally requests that Sahuarita Water Company, L.L.C. ("Sahuarita Water") undertake such actions as may be necessary to enable Sahuarita Water to become the lawful provider of water service to and within approximately 471 acres of land which Sahuarita Mission owns in an unincorporated area of Pima County, Arizona, northwest of the Town of Sahuarita. Attached to this letter as Appendix "A" is a legal description of the acreage in question.

Sahuarita Mission intends to cause or facilitate the development of approximately 3,000 single-family residential units on its aforesaid acreage, which will be known as Sahuarita Mission. In that regard, and as a result of previous discussions we have had with you upon this subject, it is our understanding that the projected water system demands associated with Sahuarita Mission project have been included in a Water System Master Plan that WestLand Resources, Inc. has recently prepared for Sahuarita Water.

Please advise us in writing if Sahuarita Water is interested in becoming the lawfully authorized provider of water service to Sahuarita Mission. In that regard, you may use this request for water service in connection with any approvals Sahuarita Water must obtain from regulatory or permitting agencies or entities.

Sincerely,



Sahuarita Mission Partners, L.L.C.

APPENDIX “G”
(Sahuarita Mission Partners, L.L.C. land legal
description)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

ORDER NO. 61377 NGW

LEGAL DESCRIPTION
EXHIBIT "A"

AN UNDIVIDED 83.3335% INTEREST IN AND TO THE FOLLOWING DESCRIBED PARCELS:

PARCEL 1:

That portion of Sections 12 and 13, Township 17 South, Range 12 East, Gila and Salt River Meridian, Pima County, Arizona, described as follows:

BEGINNING at the Southwest corner of said Section 12;

THENCE North 00 degrees 26 minutes 09 seconds West along the West line of said Section 12 a distance of 1,850.77 feet to the Westerly right-of-way line of Mission Road as shown on Book 2 of Records of Survey at Page 57, Records of Pima County, Arizona, said point being on the arc of a non-tangent curve concave to the Southwest; a radial line of said curve through said point having a bearing of North 42 degrees 12 minutes 51 seconds East;

THENCE Southerly along the arc of said curve, to the right, having a radius of 2819.79 feet and a central angle of 08 degrees 52 minutes 55 seconds for an arc distance of 436.35 feet to a point of tangency;

THENCE South 48 degrees 34 minutes 14 seconds East along said right-of-way line a distance of 630.70 feet to a point of curvature of a tangent curve concave to the Northeast;

THENCE Southerly along the arc of said curve, to the left, having a radius of 1,195.92 feet and a central angle of 24 degrees 57 minutes 25 seconds for an arc distance of 520.94 feet to a point of tangency;

THENCE South 63 degrees 31 minutes 42 seconds East along said right-of-way line a distance of 162.19 feet to a point of curvature of a tangent curve concave to the Southwest;

THENCE Southerly along the arc of said curve, to the right, having a radius of 666.20 feet and a central angle of 60 degrees 46 minutes 44 seconds for an arc distance of 706.70 feet to a point of tangency;

THENCE South 02 degrees 44 minutes 58 seconds East along said right-of-way line a distance of 87.39 feet;

THENCE South 03 degrees 24 minutes 50 seconds East along the re-established right-of-way line of Mission Road a distance of 119.84 feet to a point of curvature of a tangent curve concave to the Northeast;

THENCE Southerly along the arc of said curve, to the left, having a radius of 1,959.86 feet and a central angle of 29 degrees 57 minutes 03 seconds for an arc distance of 1,024.55 feet to a point of tangency;

THENCE South 33 degrees 21 minutes 58 seconds East along said right-of-way line a distance of 384.19 feet to the South line of the North Half of the Northwest Quarter of said Section 13;

THENCE North 89 degrees 56 minutes 18 seconds West along the South line of said North Half a distance of 2,073.85 feet to the West line of said Northwest Quarter;

THENCE North 00 degrees 13 minutes 11 seconds West along said West line a distance of 1,119.95 feet to the POINT OF BEGINNING.

PARCEL (1):

That portion of Section 13, Township 17 South, Range 12 East, Gila and Salt River Base and Meridian, Pima County, Arizona, and that portion of the Waring Lode Mining Claim in Pima Mining District being shown on Mineral Survey No. 4187 on file in the Bureau of Land Management as granted by Patent recorded in Book 34 of Deeds of Mines at Page 220, Pima County Records, described as follows:

COMMENCING at the Southeast corner of said Section 13;

THENCE North 89 degrees 56 minutes 36 seconds West along the South line of said Section 13 a distance of 445.60 feet to the POINT OF BEGINNING, said point being on the Westerly right-of-way line of Mission Road as re-established from the existing paving of said road;

THENCE continue North 89 degrees 56 minutes 36 seconds West along said South line of section 13 a distance of 2,651.19 feet to a line 440.00 feet West of and parallel with North-South midsection line of said Section 13;

THENCE North 00 degrees 16 minutes 17 seconds West along said parallel line a distance of 3,740.03 feet to said right-of-way line of Mission Road;

THENCE South 33 degrees 21 minutes 58 seconds East along said right-of-way line a distance of 1,978.94 feet to a point of curvature of a tangent curve concave to the Northeast;

THENCE Southerly along the arc of said curve, to the left, having a radius of 1,482.40 feet and a central angle of 24 degrees 53 minutes 38 seconds for an arc distance of 644.07 feet to a point of tangency;

THENCE South 58 degrees 15 minutes 35 seconds East along said right-of-way line a distance of 434.74 feet to a point of curvature of a tangent curve concave to the Southwest;

THENCE Southerly along the arc of said curve, to the right, having a radius of 1,147.53 feet and a central angle of 32 degrees 57 minutes 21 seconds for an arc distance of 660.05 feet to a point of tangency;

THENCE South 25 degrees 15 minutes 14 seconds East along said right-of-way line a distance of 430.75 feet to a point of curvature of a tangent curve concave to the Southwest;

THENCE Southerly along the arc of said curve, to the right, having a radius of 857.41 feet and a central angle of 13 degrees 52 minutes 12 seconds for an arc distance of 297.58 feet to a point of tangency;

THENCE South 11 degrees 30 minutes 02 seconds East along said right-of-way line a distance of 352.14 feet to the POINT OF BEGINNING.

EXCEPT from the above described properties and any and all rights to oil, gas, minerals and associated hydrocarbons as reserved in Docket 2220 at Page 266 and in Docket 7944 at Page 306.

PARCEL III:

That portion of Section 13, Township 17 South, Range 12 East, Gila and Salt River Base and Meridian, Pima County, Arizona, and that portion of the Waring Lode Mining Claim in Pima Mining District being shown on Mineral Survey No. 4187 on file in the Bureau of Land Management as granted by patent recorded in Book 34 of Deeds of Mines at Page 220, Pima County Records, described as follows:

BEGINNING at the Southeast corner of said Section 13;

THENCE North 89 degrees 55 minutes 36 seconds West along the South line of said Section 13 a distance of 343.54 feet to the Easterly right-of-way line of Mission Road as re-established from the existing paving of said road;

THENCE North 11 degrees 28 minutes 02 seconds West along said right-of-way line a distance of 172.50 feet to a point of curvature of a tangent curve concave to the West;

THENCE Northerly along the arc of said curve, to the left, having a radius of 957.49 feet and a central angle of 13 degrees 52 minutes 12 seconds for an arc distance of 231.79 feet to a point of tangency;

THENCE North 25 degrees 18 minutes 14 seconds West along said right-of-way line a distance of 430.76 feet to a point of curvature of a tangent curve concave to the Southwest;

THENCE Northerly along the arc of said curve, to the left, having a radius of 1,247.53 feet and a central angle of 32 degrees 57 minutes 22 seconds for an arc distance of 717.57 feet to the point of tangency;

THENCE North 58 degrees 15 minutes 38 seconds West along said right-of-way line a distance of 434.74 feet to a point of curvature of a tangent curve concave to the Northeast;

THENCE Northerly along the arc of said curve, to the right, having a radius of 1,382.00 feet and a central angle of 24 degrees 53 minutes 38 seconds for an arc distance of 600.62 feet to a point of tangency;

THENCE North 33 degrees 21 minutes 58 seconds West along said right-of-way line a distance of 2519.86 feet to a point of curvature of a tangent curve concave to the Northeast;

THENCE Northerly along the arc of said curve, to the right, having a radius of 1,859.86 feet and a central angle of 29 degrees 57 minutes 08 seconds for an arc distance of 972.27 feet to a point of tangency;

THENCE North 03 degrees 24 minutes 50 seconds West along said right-of-way line a distance of 40.50 feet to a point 75.00 feet South of and parallel with the North line of said Section 13, said point being on the South right-of-way line of Helmet Peak Road;

THENCE South 89 degrees 43 minutes 16 seconds East along said parallel line a distance of 3,606.47 feet to the East line of the Northeast Quarter of said Section 13;

THENCE South 00 degrees 18 minutes 59 seconds East along said East line a distance of 2,559.36 feet to the Southeast corner of said Northeast Quarter;

THENCE South 00 degrees 18 minutes 15 seconds East along the East Line of Government Lot 1 and 4 of said Section 13 a distance of 2,630.26 feet to the POINT OF BEGINNING;

EXCEPT any and all rights to oil, gas, minerals and associated hydrocarbons as reserved in Docket 2230 At Page 266 and in Docket 7944 at Page 31.

APPENDIX “H”

(Sahuarita Water Company, L.L.C. letter
responding to Sahuarita Mission Partners, L.L.C.’s
request for water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

Sahuarita Water Company



November 28, 2007

Robert M. Sharpe, General Partner
Sahuarita Mission Partners, L.L.C.
4549 E. Fort Lowell Road
Tucson, Arizona 85712

Re: Request For Water Service For
Sahuarita Mission ("Sahuarita Mission")

Dear Mr. Sharpe:

This letter will acknowledge Sahuarita Water Company, L.L.C.'s ("Sahuarita Water") receipt of your November 28, 2007 letter requesting that Sahuarita Water undertake such actions as may be necessary to enable Sahuarita Water to become the lawful provider of water service to the Sahuarita Mission acreage which Sahuarita Mission Partners L.L.C. ("Sahuarita Mission") contemplates developing or facilitating the development of.

Sahuarita Water is interested in becoming the lawfully authorized provider of water service to the Sahuarita Mission acreage, and is willing and able to do so, subject to prior receipt of the necessary approvals and authorizations from governmental entities with jurisdiction over Sahuarita Water's water provider operations. These will include the receipt of the necessary certificate of convenience and necessity from the Arizona Corporation Commission ("ACC"), and ACC approval of such line extension agreements and off-site facilities agreements as Sahuarita Water may find to be necessary.

In that regard, as a condition to Sahuarita Water's willingness to proceed with such actions as may be necessary to obtain the requisite approvals and authorizations, Sahuarita Water will require that Sahuarita Mission reimburse Sahuarita Water for Sahuarita Mission's proportionate share of any expenses Sahuarita Water may incur in connection with such efforts. Sahuarita Water believes that the cost of such activities should not be borne by the ratepayers of its existing certificated service area.

If the foregoing condition is acceptable to Sahuarita Mission, please so advise me in writing and Sahuarita Water will promptly undertake to obtain the approvals and authorizations necessary to enable it to be the lawful water provider to Sahuarita Mission.

Sincerely,

Sahuarita Water Company, L.L.C.

By: 

Mark J. Scamans, General Manager

APPENDIX “I”

(Sahuarita Mission Partners, L.L.C.’s reply to
Sahuarita Water Company, L.L.C.’s response to
Sahuarita Mission Partners, L.L.C.’s request
for water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____



SHARPE & ASSOCIATES, INC.

4549 E. Fort Lowell Road • Tucson, AZ 85712 • (520) 299-8766
FAX (520) 529-3137

November 28, 2007

Sahuarita Water Company, L.L.C.
P. O. Box 1520
Sahuarita, Arizona 85629

Attention: Mark J. Seamans
General Manager

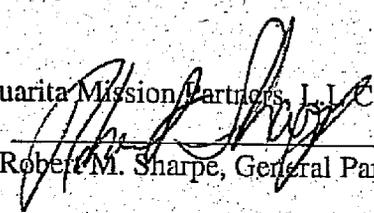
Re: Request For Water Service For
Sahuarita Mission ("Sahuarita Mission")

Dear Mr. Seamans:

The condition outlined in your letter of November 28, 2007 to me is acceptable to Sahuarita Mission Partners, L.L.C. ("Sahuarita Mission"). Accordingly, please proceed with all actions necessary to enable Sahuarita Water Company, L.L.C. ("Sahuarita Water") to become the lawful water provider to Sahuarita Mission.

In that regard, please provide me with a copy of all documents filed with such governmental entities from whom the necessary approvals or authorizations are requested by Sahuarita Water; and, please provide me with periodic statements of fees and costs incurred by Sahuarita Water in connection with its efforts on our behalf, in order that Sahuarita Mission may either directly pay the same or reimburse Sahuarita Water.

Sincerely,

Sahuarita Mission Partners, L.L.C.
By: 
Robert M. Sharpe, General Partner

APPENDIX “J”

(Letter from Arizona State Land Department
requesting water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____



Janet Napolitano

Mark Winkelman

December 12, 2007

Sahuarita Water Company, L.L.C.
P. O. Box 1520
Sahuarita, Arizona 85629

Attention: Mark J. Seamans
General Manager

Re: Request for Water Service For
Arizona State Land Department ("ASLD")

Dear Mr. Seamans:

Arizona State Land Department ("ASLD") hereby formally requests that Sahuarita Water Company, L.L.C. ("Sahuarita Water") undertake such actions as may be necessary to enable Sahuarita Water to become the lawful provider of water service to and within approximately 634 acres of land which ASLD owns in an unincorporated area of Pima County, Arizona, northwest of the Town of Sahuarita. Attached to this letter as Appendix "A" is a legal description of the acreage in question.

ASLD intends to facilitate the development of approximately 2,300 single-family residential units on its aforesaid acreage. In that regard, it is ASLD's understanding that the projected water system demands associated with such development have been included in a Water System Master Plan that WestLand Resources, Inc. has recently prepared for Sahuarita Water.

Please advise us in writing if Sahuarita Water is interested in becoming the lawfully authorized provider of water service to ASLD's acreage. In that regard, you may use this request for water service in connection with any approvals Sahuarita Water must obtain from regulatory or permitting agencies or entities. This can be accomplished by Sahuarita Water's actions with the Arizona Corporation Commission and by issuing ASLD a letter of intent to serve.

Sincerely,

Jamie Hogue
Deputy Commissioner
Arizona State Land Department

C: Paul Wichmann, Southern Arizona State Land Department

May 24, 2006

EXHIBIT "A"

Rancho Maria: Description of State Parcel in Section 16

Section 16, Township 17 South, Range 13 East of the Gila and Salt River Meridian, Pima County, Arizona.

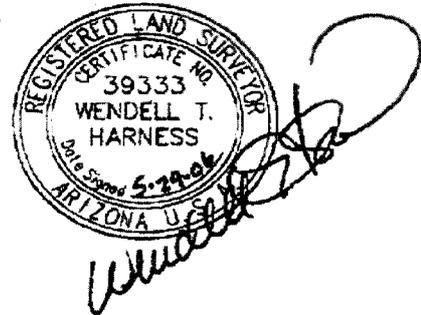
Excepting therefrom that portion of said Section 16 lying within the right-of-way of Helmet Peak Road, Road Proceeding No. 1019 as recorded in Book 8 of Road Maps at Page 97, records of Pima County, Arizona.

See Exhibit 'B' attached hereto and made a part hereof.

Prepared for and on behalf of

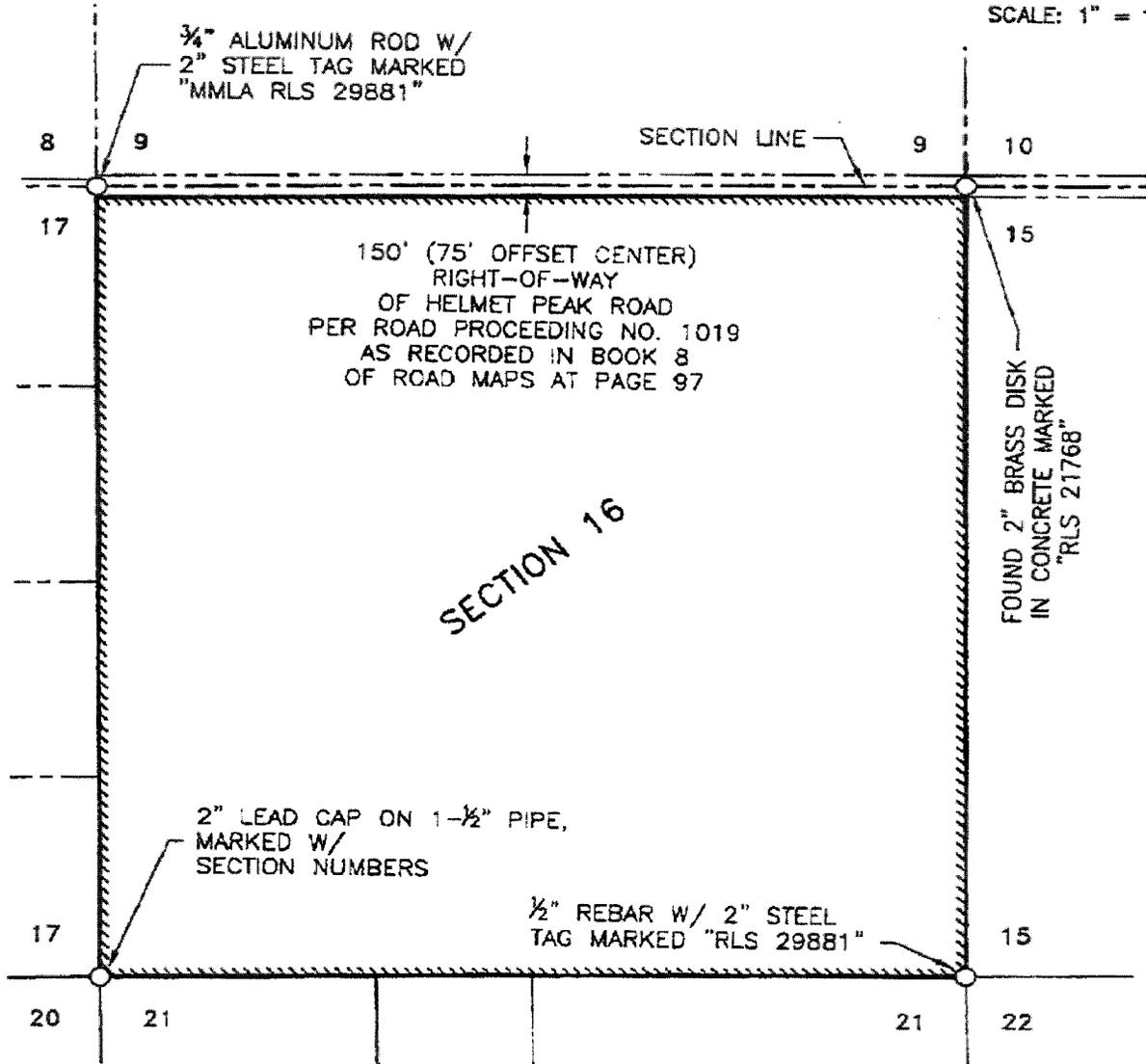
**M M L A
P S O M A S**

Project No. 95016-10





SCALE: 1" = 1000'



**M M L A
P S O M A S**
 300 E. Wilcox Blvd., Suite 110, Tucson, AZ 85711
 Tel: (520) 292-2200 (500) 440-3675
 Fax: (520) 292-1200
 www.mmla-psomas.com

95016-10

EXHIBIT "B"
STATE PARCEL

IN SECTION 16, TOWNSHIP 17 SOUTH, RANGE 13 EAST,
 GILA & SALT RIVER MERIDIAN, PIMA COUNTY, ARIZONA

DATE: 05/23/06 • DRAWN BY: PMF



APPENDIX “K”
(Arizona State Land Department legal description)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

May 24, 2006

EXHIBIT "A"

Rancho Maria: Description of State Parcel in Section 16

Section 16, Township 17 South, Range 13 East of the Gila and Salt River Meridian, Pima County, Arizona.

Excepting therefrom that portion of said Section 16 lying within the right-of-way of Helmet Peak Road, Road Proceeding No. 1019 as recorded in Book 8 of Road Maps at Page 97, records of Pima County, Arizona.

See Exhibit 'B' attached hereto and made a part hereof.

Prepared for and on behalf of

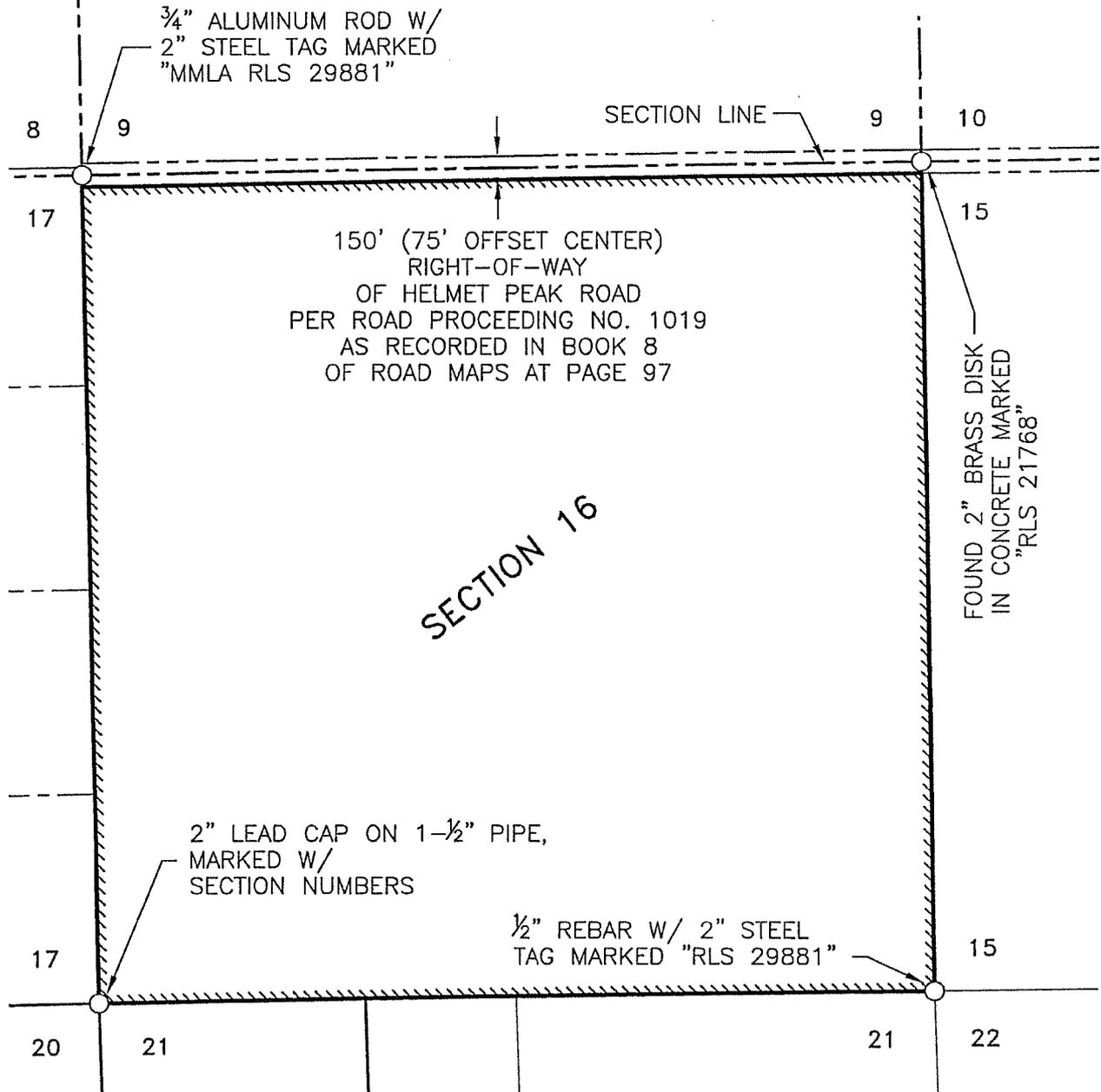
**M M L A
P S O M A S**

Project No. 95016-10





SCALE: 1" = 1000'



**M M L A
P S O M A S**

800 E. Walmore Road, Suite 110, Tucson, AZ 85719
Tel (520) 292-2300 (800) 441-5875
Fax (520) 282-1190
www.mmla-psomas.com

95016-10

EXHIBIT "B"

STATE PARCEL

IN SECTION 16, TOWNSHIP 17 SOUTH, RANGE 13 EAST,
GILA & SALT RIVER MERIDIAN, PIMA COUNTY, ARIZONA

DATE: 05/23/06 • DRAWN BY: PMF



Wendell T. Harness

APPENDIX “L”

(Sahuarita Water Company, L.L.C. letter
responding to Arizona State Land Department’s
request for water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

Sahuarita Water Company



December 12, 2007

Ms. Jamie Hogue
Deputy State Land Commissioner
Arizona State Land Department
1616 W. Adams
Phoenix, Arizona 85007

Re: Request For Water Service For
Arizona State Land Department

Dear Ms. Hogue:

This letter will acknowledge Sahuarita Water Company, L.L.C.'s ("Sahuarita Water") receipt of your December 12, 2007 letter requesting that Sahuarita Water undertake such actions as may be necessary to enable Sahuarita Water to become the lawful provider of water service to certain acreage which the Arizona State Land Department ("ASLD") currently owns, and anticipates development of, in the vicinity of the Town of Sahuarita, Arizona.

Sahuarita Water is interested in becoming the lawfully authorized provider of water service to the aforesaid acreage owned by ASLD, and is willing and able to do so, subject to prior receipt of the necessary approvals and authorizations from governmental entities with jurisdiction over Sahuarita Water's water provider operations. These will include the receipt of the necessary certificate of convenience and necessity from the Arizona Corporation Commission ("ACC"), and ACC approval of such line extension agreements and off-site facilities agreements with master and/or subdivision developers as Sahuarita Water may find to be necessary in connection with the development of such acreage.

Sincerely,

Sahuarita Water Company, L.L.C.

By: 
Mark J. Seamans, General Manager

Corporate Office: 4549 E Ft Lowell Rd. Tucson, AZ 85712 Ph. (520) 299-8766 Fax: (520) 529-3137

Field Office: c/o Rancho Resort, 15900 S. Rancho Resort Blvd., P.O. Box 1520, Sahuarita, AZ 85629-0530
Ph. (520) 399-1105 Fax (520) 399-1095

APPENDIX “N”

(Letter from Sahuarita Unified School District
requesting water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____



350 W. Sahuarita Road, Building 10
Sahuarita, AZ 85629-9000
Ph: (520) 625-3502 x1001
Fax: (520) 625-4609
Office of the Superintendent

November 28, 2007

Sahuarita Water Company, L.L.C.
P. O. Box 1520
Sahuarita, Arizona 85629

Attention: Mark J. Seamans
General Manager

Re: Request for Water Service For
Sahuarita Unified School District No. 30
("SUSD")

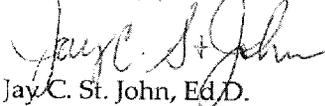
Dear Mr. Seamans:

Sahuarita Unified School District No. 30 ("SUSD") hereby formally requests that Sahuarita Water Company, L.L.C. ("Sahuarita Water") undertake such actions as may be necessary to enable Sahuarita Water to become the lawful provider of potable water service to and within approximately 112 acres of land which SUSD owns in the Town of Sahuarita, Arizona. Attached to this letter as Appendix "A" is a legal description of the acreage in question.

SUSD owns 112 acres of land, which is surrounded by, but not included within; Sahuarita Water's currently certificated water service area. SUSD has a high school, a middle school and an elementary school located on its acreage, which is provided water from a private well owned and operated by SUSD. However, SUSD is desirous of connecting the aforesaid school facilities to a public water provider system, such as Sahuarita Water, for potable use only. In that regard, and as a result of previous discussions we have had with you upon this subject, it is our understanding that the projected potable water system demands associated with SUSD facilities have been included in a Water System Master Plan that West Land Resources, Inc. has recently prepared for Sahuarita Water.

Please advise us in writing if Sahuarita Water is interested in becoming the lawfully authorized provider of potable water service to SUSD. In that regard, you may use this request for potable water service in connection with any approvals Sahuarita Water must obtain from regulatory or permitting agencies or entities.

Respectfully yours,


Jay C. St. John, Ed.D.
Superintendent of Schools

APPENDIX “O”
(Sahuarita Unified School District land legal
description)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____



Stantec

DESCRIPTION OF A PORTION OF LAND FOR PROPOSED ANNEXATION TO SAHUARITA WATER COMPANY

DESCRIPTION of land for proposed annexation to Sahuarita Water Company, located in a portion of Sections 11 and 12, Township 17 South, Range 13 East, Gila & Salt River Meridian, Town of Sahuarita, Pima County, Arizona. Said land being more fully described as follows:

COMMENCING AT the East quarter corner of Section 11, said point being a found 2 inch aluminum capped rebar, stamped 7141, from which the South corner of said Section 11 bears South 00°57'31" East, 2618.40 feet; Thence South 00°57'31" East, 1170.32 feet, along the East line of Section 11; Thence leaving said East line, North 89°02'29" East, 204.26 feet to the **TRUE POINT OF BEGINNING**;

Thence North 69°49'40" East, 188.39 feet;

Thence North 55°35'53" East, 413.17 feet;

Thence South 75°31'01" East, 357.94 feet;

Thence North 71°13'27" East, 249.57 feet;

Thence South 61°40'53" East, 464.57 feet;

Thence North 65°15'39" East, 262.49 feet;

Thence South 00°52'36" East, 1567.35 feet to a point on the North Right of Way line of Sahuarita Road;

Thence North 89°38'31" West along said Right of Way, 1952.32 feet;

Thence continue along said Right of Way South 89°07'56" West, 1491.01 feet to a point on the East Right of way line of Rancho Sahuarita Boulevard;

Thence North 00°56'50" West along said Right of Way, 981.30 feet;

Stantec

Project: Sahuarita Water Company
Job No: 185120207

Thence leaving said Right of Way continue North 00°56'50" West, 252.76 feet;

Thence North 89°07'37" East, 1296.43 feet;

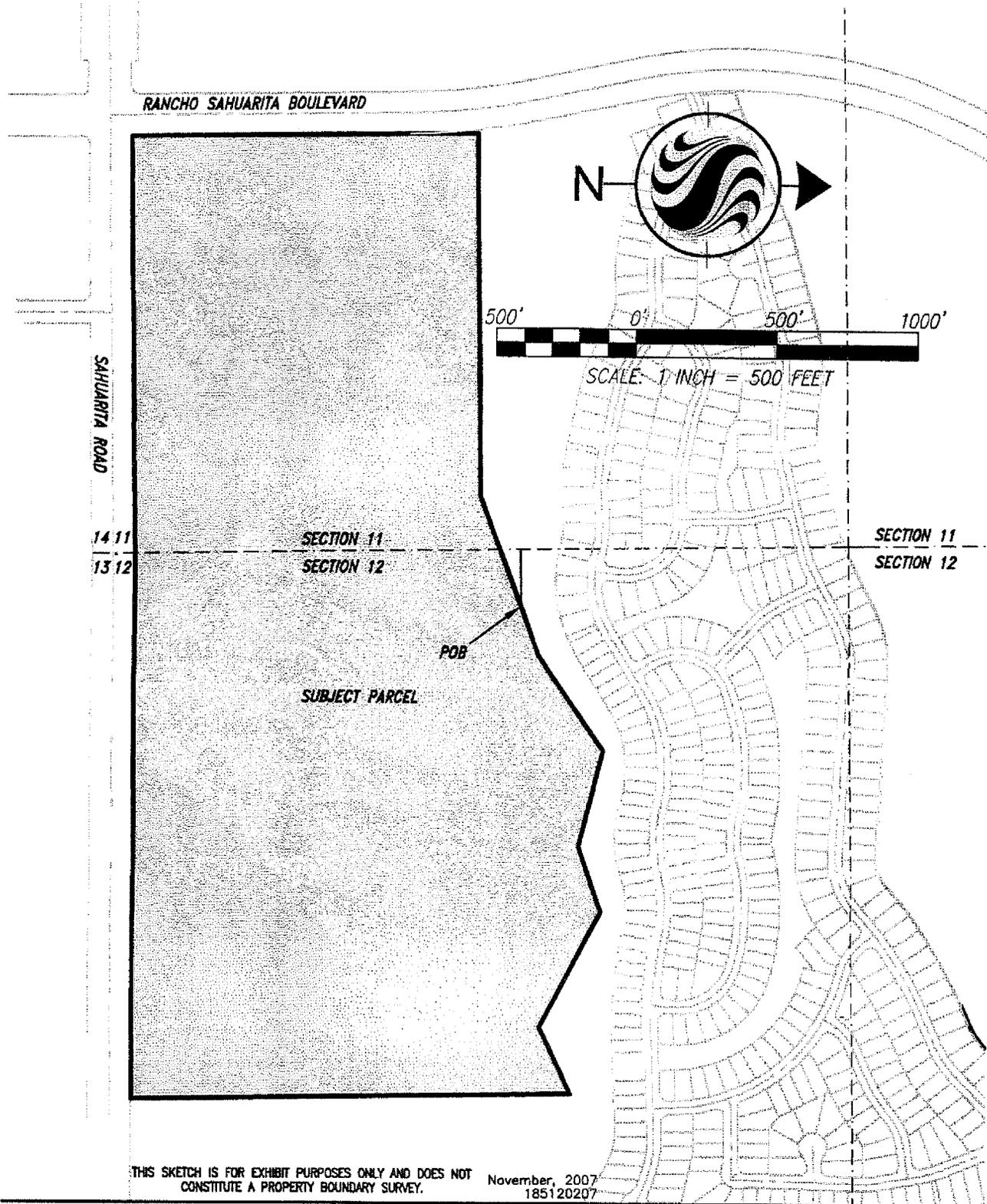
Thence North 69°49'40" East, 421.13 feet to the **POINT OF BEGINNING**.

Disclaimer: Stantec Consulting accepts no liability for this description if it has been modified or reformatted in any way from its original format and content, or used for any purpose other than that for which it was originally intended.

Prepared by Nathan L. Gardner, RLS 36786
Prepared for and on behalf of Stantec Consulting Inc.
Prepared on November 6, 2007
Project Number: 185120207

W:\active\185120207\survey\legals\ANNEX PARCEL 071106.doc





Stantec

Stantec Consulting

201 North Bonita Ave

Tucson AZ U.S.A.

85745-2999

Tel. 520.750.7474

Fax. 520.750.7470

www.stantec.com

Client/Project

Sahuarita Water Company

T. 17, R. 13, SEC. 11 & 12

Figure No.

1.0

Title

Annexation Easement Exhibit

APPENDIX “P”

(Sahuarita Water Company, L.L.C.’s letter
responding to Sahuarita Unified School District’s
request for water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

Sahuarita Water Company



November 28, 2007

Dr. Jay St. John, Superintendent
Sahuarita Unified School District No. 30
P. O. Box 26
350 W. Helmet Peak Road
Sahuarita, Arizona 85629

Re: Request For Potable Water Service For
Sahuarita Unified School District No. 30 ("SUSD")

Dear Dr. St. John:

This letter will acknowledge Sahuarita Water Company, L.L.C.'s ("Sahuarita Water") receipt of your November 27, 2007 letter requesting that Sahuarita Water undertake such actions as may be necessary to enable Sahuarita Water to become the lawful provider of potable water service to SUSD's existing school facilities within the Town of Sahuarita.

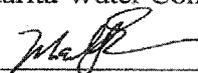
Sahuarita Water is interested in becoming the lawfully authorized provider of potable water service to SUSD, and is willing and able to do so, subject to prior receipt of the necessary approvals and authorizations from governmental entities with jurisdiction over Sahuarita Water's water provider operations. These will include the receipt of the necessary certificate of convenience and necessity from the Arizona Corporation Commission ("ACC"), and ACC approval of such line extension agreements and off-site facilities agreements as Sahuarita Water may find to be necessary.

In that regard, as a condition to Sahuarita Water's willingness to proceed with such actions as may be necessary to obtain the requisite approvals and authorizations, Sahuarita Water will require that SUSD reimburse Sahuarita Water for SUSD's proportionate share of any expenses Sahuarita Water may incur in connection with such efforts. Sahuarita Water believes that the cost of such activities should not be borne by the ratepayers of its existing certificated service area.

If the foregoing condition is acceptable to SUSD, please so advise me in writing and Sahuarita Water will promptly undertake to obtain the approvals and authorizations necessary to enable it to be the lawful water provider of potable water to SUSD.

Sincerely,

Sahuarita Water Company, L.L.C.

By: 
Mark J. Seamans, General Manager

Field Office: c/o Rancho Resort, 15900 S. Rancho Resort Blvd., P.O. Box 1520, Sahuarita, AZ 85629-0530
Ph. (520) 399-1105 Fax (520) 399-1095

APPENDIX “Q”

(Sahuarita Unified School District’s reply to
Sahuarita Water Company, L.L.C.’s response to
Sahuarita Unified School District’s request
for water service)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____



350 W. Sahuarita Road, Building 10
Sahuarita, AZ 85629-9000
Ph: (520) 625-3502 x1001
Fax: (520) 625-4609
Office of the Superintendent

November 28, 2007

Sahuarita Water Company, L.L.C.
P. O. Box 1520
Sahuarita, Arizona 85629

Attention: Mark J. Seamans
General Manager

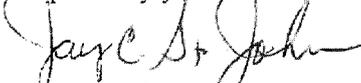
Re: Request For Potable Water Service For
Sahuarita Unified School District No. 30
("SUSD")

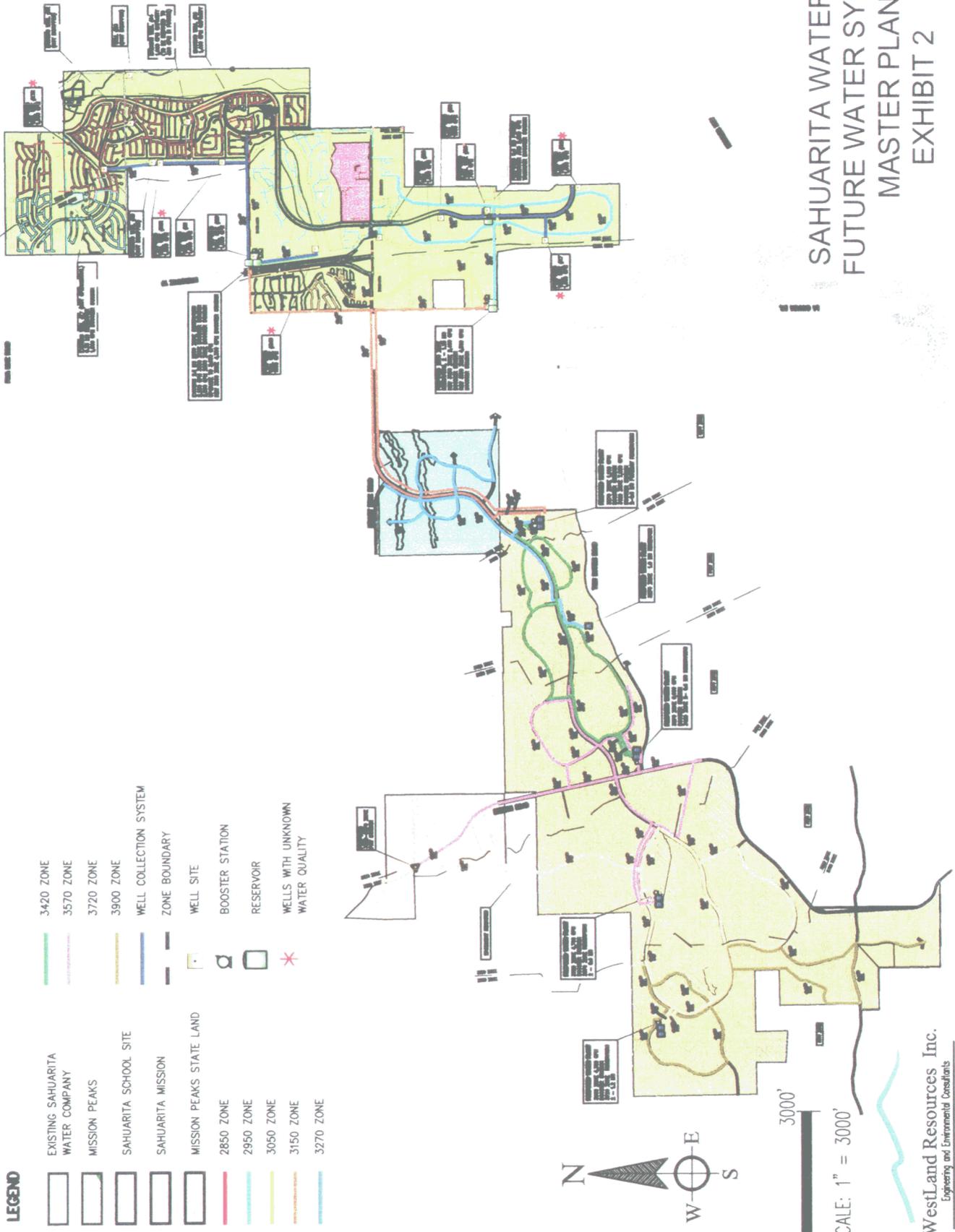
Dear Mr. Seamans:

The condition outlined in your letter of November 28, 2007 to me is acceptable to Sahuarita Unified School District No. 30 ("SUSD"). Accordingly, please proceed with all actions necessary to enable Sahuarita Water Company, L.L.C. ("Sahuarita Water") to become the lawful water provider of potable water to SUSD in the Town of Sahuarita.

In that regard, please provide me with a copy of all documents filed with such governmental entities from whom the necessary approvals or authorizations are requested by Sahuarita Water; and, please provide me with periodic statements of fees and costs incurred by Sahuarita Water in connection with its efforts on our behalf, in order that SUSD may either directly pay SUSD's proportionate share of the same or reimburse Sahuarita Water.

Respectfully yours,


Jay C. St. John, Ed.D.
Superintendent of Schools



SAHUARITA WATER CO. FUTURE WATER SYSTEM MASTER PLAN EXHIBIT 2

November 20, 2007

WestLand Resources Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, AZ 85712 (520) 206-9555

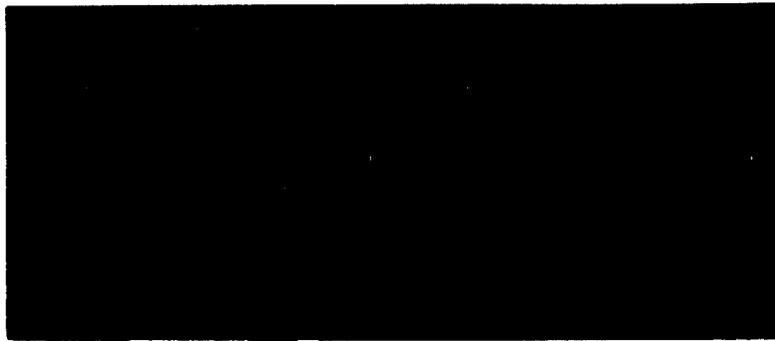
APPENDIX “R”
(Map of Proposed CC&N Extension Area)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

APPENDIX “S”

(November 2007 Water System Master Plan, as
prepared by WestLand Resources, Inc.)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____



WestLand Resources, Inc.
Engineering and Environmental Consultants

**SAHUARITA
WATER COMPANY, LLC**

**WATER SYSTEM
MASTER PLAN**

Prepared for:

SAHUARITA WATER COMPANY
15900 Rancho Resort Blvd, Bldg No. 3
Sahuarita, Arizona 85629
(520) 399-1105

Prepared by:

WESTLAND RESOURCES, INC.
4001 E. Paradise Falls Drive
Tucson, Arizona 85712
(520) 206-9585



NOVEMBER 2007
Project No. 217.132 A 8000

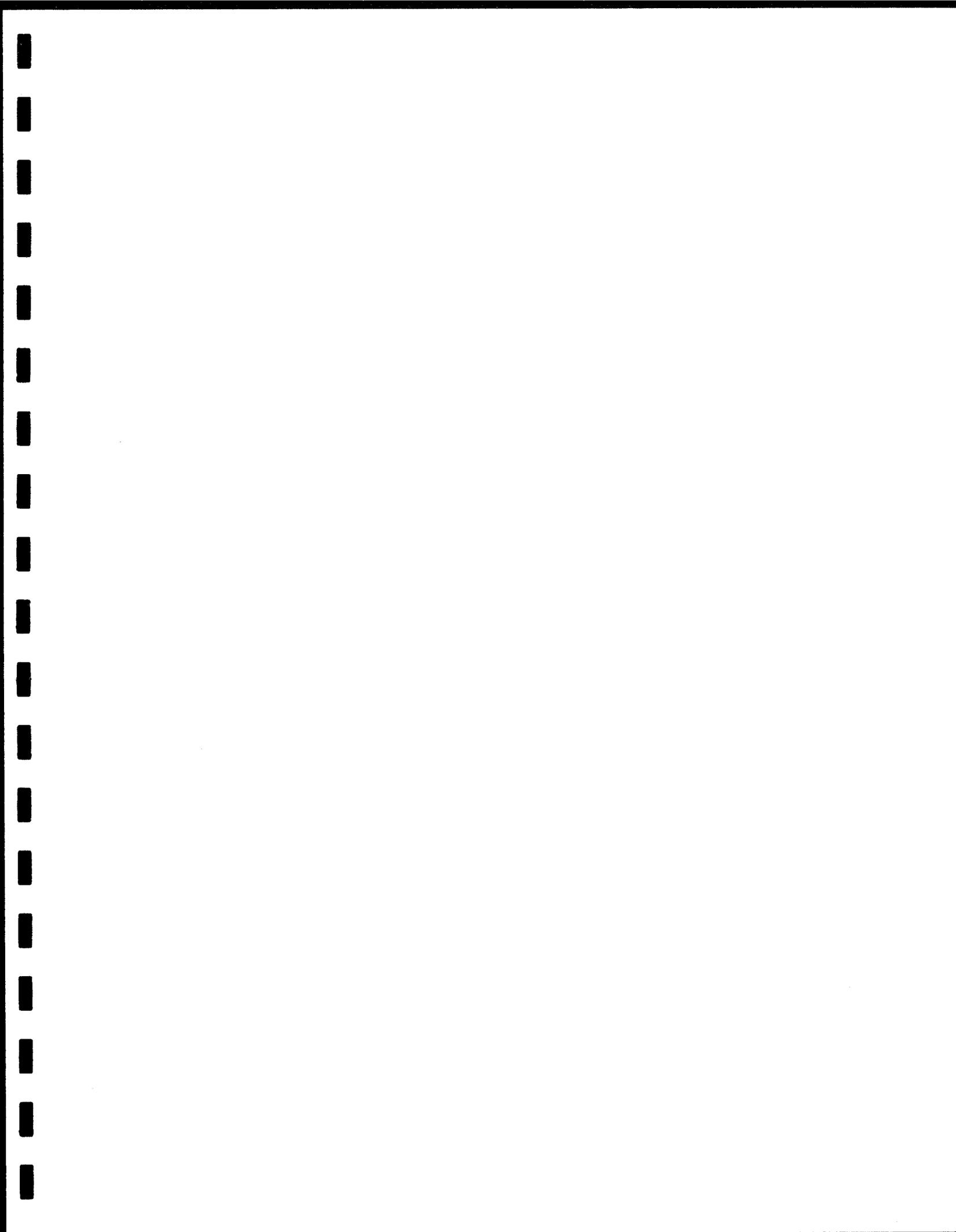


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- Exhibit 1. Existing Water System Master Plan
- Exhibit 2. Future Water System Master Plan

LIST OF ACRONYMS

ACC	Arizona Corporate Commission
ADD	Average Daily Demand
ADEQ	Arizona Department of Environmental Quality
ADWR	Arizona Department of Water Resources
CC&N	Certificate of Convenience and Necessity
gpad	gallons per acre per day
gpcd	gallons per capital per day
gpm	gallons per minute
lf	lineal feet
MCL	maximum contaminant level
MG	million gallons
MGD	million gallons per day
PDD	Peak-day Demand
PDEQ	Pima County Department of Environmental Quality
PHD	Peak-hour Demand
ppb	parts per billion
PRV	pressure reducing valve
psi	pounds per square inch
USEPA	US Environmental Protection Agency

CHAPTER 1. INTRODUCTION

The Sahuarita Water Company (SWC) is a private water utility currently located within the Town of Sahuarita, Arizona. The water company's current Certificate of Convenience and Necessity (CC&N) encompasses 3,314 acres that is generally located 10 miles south of Tucson City limits and straddles Interstate 19 (Exhibit 1). The current CC&N for the SWC approximately coincides with the Rancho Sahuarita Master Planned Community. SWC is requesting that the existing CC&N boundary be expanded to include an additional 5,445 Acres (Exhibit 2). Projects within the requested expansion include Mission Peaks, State Land, Sahuarita Mission, and an existing Sahuarita Unified School District school site. This water system master plan report will cover the buildout of the existing system and the expansion areas.

1.1. EXISTING CC&N SITE AND FACILITIES

The current Rancho Sahuarita property, contained within the existing CC&N boundary, is relatively flat with no major geologic formations within the site. The parcel of land gradually slopes eastward to the Santa Cruz River at approximately two percent. The highest portion of the property, located at La Cañada Drive and El Toro Road, is at an elevation of 2,920. The lowest point within the property is near the northeast corner at an elevation of 2,670.

The property surrounding SWC is primarily undeveloped land to the north, pecan orchards located along the east property boundary, and Asarco Mining Facilities and tailing areas to the west. Las Quintas Serenas Water Company is located southwest of the existing SWC CC&N. A Sahuarita Unified School District (SUSD) high, middle, and elementary school is surrounded by the existing CC&N boundary along Sahuarita Road. The CC&N is proposed to be extended to include the school site, which is currently served by its own well and distribution system.

The Rancho Sahuarita property, contained within the existing CC&N boundary, was at one time owned by Asarco, Inc. Portions of the original Asarco well fields are located within the property boundaries. Within the site boundaries are six large production wells which served the Asarco Mining Complex. The large production wells were originally served by three-phase overhead power and large transmission mains transporting the water northerly and then pumping westerly to the Mining Complex. Four of the six original production wells within the property are no longer operating. All pumps, motors, and associated equipment have been removed and the well casings capped. Two of the wells have been rehabilitated and are now serving the Rancho Sahuarita system; well numbers 14 and 18 are discussed further in this report.

1.2. OBJECTIVES

The current CC&N boundary is proposed to be extended to serve three new offsite projects west of the current CC&N boundary and the school site that is currently surrounded by the existing CC&N boundary. This master plan will address existing facilities and present future infrastructure requirements to serve both the existing CC&N service area and the proposed extension of the CC&N service area.

1.3. SYSTEM DEVELOPMENT AREA AND LAND USES

This report will be broken into the existing development area and future development areas. The existing service area is confined by the existing SWC CC&N boundary.

The existing Rancho Sahuarita Specific Plan consists of low- to high-density residential, a town center, regional commercial center, park industrial, public facilities, and open space. At buildout the current Rancho Sahuarita development will contain approximately 10,100 single-family (SF) units, 1,460 active-adult units, and approximately 3.1 million square feet of commercial use. Rancho Sahuarita's buildout is planned to occur in 2017.

Future developments, shown in Exhibit 2, consist of State Land, Sahuarita Mission, Mission Peaks, and an existing SUSD school site and are summarized below.

The State Land parcel consists of 634 acres, located in Section 16, Township 17 South, Range 13 East, and has a planned buildout density of 2,300 SF units. Planned non-residential use consists of commercial development and several proposed schools (one high school, one middle school, and one elementary school).

Sahuarita Mission consists of 471 acres, located in Sections 12 and 13, Township 17 South, Range 12 East, and has a planned buildout density of 3,000 SF units.

Mission Peaks consists of 4,216 acres, located in portions of Sections 19, 22, and 30 of Township 17 South, Range 13 East, portions of Sections 24 thru 27, 34, 35, and 36 of Township 17 South, Range 12 East, and portions of Sections 1 and 2 of Township 18 South, Range 12 East. Mission Peaks is anticipated to include 15,000 units. Within the 15,000 units, there are 11,123 single-family units, 2,371 active-adult units, 1,506 multi-family units. In addition to this number, 500 existing offsite units will be included to the water demands for this property as they may be served by the SWC potable water infrastructure at buildout of Mission Peaks. These units are in the Magee Ranch area. They are currently served by Las Quintas in an existing stand-pipe system. They may be served by a similar stand-pipe system located at the westerly border of Mission Peaks closer to their property by the proposed SWC. Mission Peaks will also include the development of an additional 1.1 million square feet of non-residential use. Non-residential use consists of commercial development, recreation centers, worship, and a police and fire station. Several proposed schools will also be located within Mission Peaks with one high school, one middle school, and two elementary schools planned.

The existing SUSD school site consists of 112 acres, located in portions of Sections 11 and 12, Township 17 South, Range 13 East and is surrounding by the existing SWC CC&N boundary. The existing school consists of a high school, middle school, and elementary school.

1.4. POPULATION PROJECTIONS

Population projections are determined based on land use type and number of units. Single-family (SF) units are estimated to have a persons per housing unit population of 2.7. Multi-family (MF) housing units are estimated to have a persons per housing unit population of 1.9. Active-adult (AA) housing units are estimated to have a persons per housing unit population of 1.8. The existing Sahuarita Water Company CC&N area has a projection population of 29,860 persons based on the criteria above. Future population is estimated based on the projected number of housing units and summarized in the Table 1. Buildout of the existing and future expansion area is projected at approximately 82,700 persons.

Table 1. Future Developments Population Projections

Development	SF Units	MF Units	AA Units	Total Units	Projected Population
Rancho Sahuarita	10,086	-	1,460	11,546	29,860
State Land	2,300	-	-	2,300	6,210
Sahuarita Mission	3,000	-	-	3,000	8,100
Mission Peaks	11,623*	1,506	2,371	15,500	38,511
Total	27,009	1,506	3,831	32,346	82,681

*Includes 500 units for a stand-pipe system that would benefit nearby residents that truck water.

CHAPTER 2. SCOPE AND APPROACH

2.1. WATER SOURCE CAPACITY AND QUALITY REQUIREMENTS

The Arizona Department of Environmental Quality (ADEQ) requires that the well system be capable of providing peak day demand (PDD) for the entire system with the largest well out of service. The Master Plan will develop the capacity requirements and locations for wells to meet this requirement. All new sources will be tested for water quality to determine if treatment is required to meet the current ADEQ water quality requirements.

2.2. STORAGE REQUIREMENTS

Reservoir storage capacity is a highly critical element in the design and operation of water systems. The storage will provide operational flexibility and system reliability. Reservoir storage is used primarily to accommodate hourly fluctuations and demand, PDD fluctuations, fire flow requirements, and emergency reserve storage. Each of these requirements added together form the required storage capacity for each zone. Current ADEQ criteria typically require 1.0 times the average daily demand (ADD) peak month plus fire flow requirements to be the minimum storage capacity per zone. Under certain circumstances, specifically in service areas with multiple wells, the storage capacity may be lowered. Pima County Department of Environmental Quality (PDEQ) has generally allowed the total storage to be reduced to ADD plus fire flow for a multiple well system. Storage capacity may be based on existing consumption and phased as the water system expands. Storage should be provided in the zone where the usage is required or be available to be readily transferred to the zone of use.

The goal of the Master Plan is to develop future reservoir capacity using floating storage wherever possible. The highest zones may be an exception, as an appropriate floating reservoir location may not be available. The water surface of a floating reservoir is set at the high water elevation for the zone, which is generally about 100-feet above the highest home in the zone. This allows the homes within the zone boundary to be served directly from the reservoir by gravity and the system pressure to be regulated by the reservoir elevation. This method provides a highly reliable system with very low pressure fluctuations. The system will also continue to operate during power outages using the stored water in the reservoir system.

2.3. PRESSURE REQUIREMENTS

Pressure extremes in water systems result in a potential for contamination to enter the system. Low pressures may allow polluted fluids to be forced into the system. High pressures may cause ruptures or breaks. Normal working pressure in the distribution system should not be less than 40 pounds per square inch (psi). System pressures under peak hour conditions should not drop below 35 psi anywhere within the system. The system shall be designed to maintain a minimum pressure of 20 psi at ground level at all

points in the distribution system under all conditions of flow. Typically, a hydraulic analysis is run at a minimum of 25 psi in order to ensure that there is a minimum of 20 psi at any given household. This is generally understood to mean that the minimum residual pressure must be 20 psi for each customer in a fire flow event from any hydrant, during a flow condition of peak day plus fire flow. Maximum pressures as high as 100 psi can be allowed in small, low-lying areas not subject to high flow rates and surge pressure. The Uniform Plumbing Code limits the highest water pressure within the individual property owners' plumbing to 80 psi. Regulating the pressure from the meter to the customer is the responsibility of the customer.

2.4. FIRE FLOW REQUIREMENTS

There are generally two considerations to providing adequate fire flow. The first consideration includes offsite requirements such as the volume of fire flow storage available in reservoirs, adequately designed pressure zones, and the size of transmission mains. The second factor is the internal distribution system within the neighborhood, including main sizes, adequate looping, and fire hydrant placement. The goal of the Master Plan is to develop adequately sized reservoirs, properly designed pressure zones, and water transmission mains sized to provide fire flow to existing areas, if possible, and to provide adequate fire flow for new development.

Fire flow requirements for homes typically vary from 1,000 to 1,750 gallons per minute (gpm), depending on the size of the home. The typical residential subdivision will have a fire flow requirement of 1,000 gpm for houses under 3,600 square feet and 1,750 gpm for houses 3,600 square feet and above. The standard duration requirement for residential fire flow is two hours. Commercial facility fire flow requirements also vary depending on the square footage of the commercial building, occupancy type, building material type, exposure distance to other buildings, and whether the structure is sprinklered. Typical commercial facilities will have fire flow requirements from 1,500 to 2,500 gpm for a two to four hour duration. Fire flows can be adjusted by the local fire district, if the nature of the system or the rural nature of the area precludes the full fire flow per the International Fire Code. For purposes of the Master Plan, the fire flow will be assumed to be the different for each zone (see Tables 8 and 14) based on different types of non-residential use in each zone.

2.5. WATER MAIN REQUIREMENTS

The goal for the Master Plan is to describe a spine water transmission system that will transport the appropriate volume of source water to the zone of which it is utilized. Spine mains will also be sized to transport the appropriate volume of fire flow throughout each zone. The transmission and distribution systems should be sized and arranged to minimize friction-generated line losses and provide redundancy. It is recommended that the policy of SWC shall be to require or provide looped water transmission and distribution systems for the water main grid system wherever possible. In addition, appropriate valve

locations and intervals should be required to isolate small sections of main during breakages and reduce the number of residences out of service.

2.6. LAND AND EASEMENT REQUIREMENTS

The Master Plan will help to provide locations and sizes for future wells, reservoirs, booster stations, future treatment facilities, and major transmission mains to serve the water system. These facilities will be generally located on water system maps. Many factors and constraints will be required to determine the final location for each site. These factors include the proximity to existing water transmission mains, the proximity to three-phase power, access to local public streets, specific elevation requirements for floating reservoirs, hydrologic requirements for well sites, noise and buffer requirements for booster stations and wells, aesthetic screening requirements for aboveground facilities, and the cost of land and/or the availability of other preferable sites.

2.7. SYSTEM UPGRADES

The Master Plan will develop the system design criteria to guide the utility in designing proposed water facilities. The system design criteria will include methods for demand calculations, peaking factors, water supply requirements, the number and capacity of wells required, reservoir storage and booster station capacity requirements, emergency backup systems, distribution system sizing, and treatment and water system grid requirements.

The Master Plan will identify requirements for the existing CC&N boundary and future CC&N expansion at buildout, and specify the required new facilities and existing facility upgrades. These facilities will include additional and/or upgraded wells, booster station additions and upgrades, reservoir capacity additions, and transmission and distribution main extensions.

CHAPTER 3. ENGINEERING CRITERIA

Based on the information presented in Chapter 2, the system design criteria for the Master Plan are described below in terms of demand, supply, storage, and distribution system assumptions. The criteria presented in this chapter follow ADEQ, Arizona Department of Water Resources (ADWR), and Arizona Administrative Code (AAC) standards.

3.1. DEMAND CRITERIA

- Average daily per capita water usage for Single-Family and Active Adult residential 110 gpcd
- Average daily per capita water usage for Multi-Family residential 90 gpcd
- Average daily per square foot commercial, industrial,
Institutional water use (gallons per day per square foot).....0.12*
- Average daily water usage for elementary/middle school use 25 gallons per student per day (gpsd)
- Average daily water usage for high school use 43 gpsd
- Average number of persons per Single-Family dwelling unit.....2.7
- Average number of persons per Active Adult dwelling unit.....1.8
- Average number of persons per Multi-Family dwelling unit.....1.9
- Ratio of peak-day to average-day use2.0
- Ratio of peak-hour to average-day use3.2

*Based on Arizona Administrative Code Title 18, Chapter 9, Shopping Center no food or laundry, sewage assumed to be 85 percent of water usage.

gpcd – gallons per capita per day
 gpad – gallons per acre per day

3.2. SUPPLY CRITERIA

- Well capacity to meet PDD with the largest well out of service.
- Minimum supply from well and boosters pumping to elevated storage to meet PDD.
- Minimum booster capacity to zones without elevated storage to meet peak hour demand (PHD) or PDD plus fire flow, whichever is larger.

3.3. STORAGE CRITERIA

- Provide storage volume equal to a minimum of 1.0 times the ADD.
- Provide additional storage volume required to provide fire flow for a specific duration to each zone (see Tables 8 and 14)
- Provide valving at reservoirs to allow a change in the direction of supply to lower zones if required for fire flow.
- Provide two equally sized reservoirs at critical sites for phasing and maintenance considerations.

3.4. DISTRIBUTION SYSTEM CRITERIA

- System design and construction to meet Sahuarita Water Company, City of Tucson Water Department, and Arizona Department of Health Services requirements.
- Maximum friction head loss for lines up to and including 8 inches in size to be 8 feet per 1,000 feet or less. Head loss for lines over 8 inches in size to be 5 feet per 1,000 feet or less, according to pipe size. Maximum head losses will be determined by hydraulic modeling studies to maintain the required flow and system pressures.
- Distribution lines to be sized and arranged to provide required fire flows and to move source water to the zones with which it is utilized.
- The SWC pressure zones and zone boundaries are at 100 and 150-foot elevation differences for most of the system.
- Provide a line-size valve, normally closed, or a PRV station at pipelines crossing zone boundaries.
- Water will be supplied at the customer's meter within a static pressure range of 43 to 87 psi in 100-ft zones and 43 to 108 psi in 150-ft zones. Due to localized conditions, certain locations may receive water pressure slightly less or greater.

CHAPTER 4. EXISTING SYSTEM ANALYSIS

4.1. EXISTING SYSTEM OVERVIEW

The existing Sahuarita Water CC&N area is separated into pressure zones with zone boundaries located at 100-foot intervals. The high water elevations of the zone boundaries are also spaced at approximately 100-foot intervals. Typical static pressure fluctuations within the system will vary from approximately 40 psi at the top of the zone to 87 psi at the bottom of the zone, although static pressures will vary with daily demand fluctuations and fire flow conditions. The zone boundaries and high water elevations of the existing SWC CC&N area are shown in Table 2. The zone delineation is shown on Exhibit 1. The existing water system is divided into the following zones: 2850, 2950, and 3050. The 2950 Zone is further divided into two areas, a north area and a south area. For this report, the south 2950 Zone will be considered the 2950 Zone, while the north area will be noted as 2950 North (2950 N). The 2950 North Zone is presented individually in some subsequent tables, since this zone operates on a separate system of infrastructure than the other zones.

The 2850 Zone is currently served by gravity from two floating 2850 Zone Reservoirs and direct connection of Well Nos. 14 and 18 into the zone. The 2950 and 3050 Zones are currently served by booster stations pumping from storage at the 2850 Zone Reservoir. The 2950N Zone is served by a booster station pumping from storage at the Well No. 17 reservoir. In the future the 2950 Zone reservoir will be served by gravity from a proposed 2950 Zone floating reservoir.

Table 2. SWC Pressure Zone Boundaries

High Water (elev)	Elevation Boundaries	Static Pressure (psi)
2850	2650 – 2750	87 – 43
2950 and 2950 N	2750 – 2850	87 – 43
3050	2850 – 2950	87 – 43

The existing Sahuarita Water system currently delivers groundwater from two production wells to the 2850 Zone reservoir. The water supply must be distributed to the rest of the system through a booster station and reservoir system. The wells must provide sufficient capacity to meet PDD with the largest well out of service.

There are two reservoirs that serve to pressurize or float on the 2850 Zone. The floating storage serves as forebay storage for a booster station that provides pressure for the 2950 and 3050 Zones.

Exhibit 1 shows the existing infrastructure including wells, reservoirs, booster stations, and transmission mains.

4.2. EXISTING UNITS AND NON-RESIDENTIAL AREA

4.2.1. Existing Units

Table 3 demonstrates the number of existing units per zone within Sahuarita Water Company CC&N boundary. These numbers represents the number of connections as of April 2007.

Table 3. SWC Existing Units

Zone	Units
2850 Zone	2,973
2950 Zone	225
2950 N Zone	144
3050 Zone	357
TOTAL	3,699

4.2.2. Existing Non-Residential Area

Table 4 shows the existing non-residential acreage totals. This information was provided by Sahuarita Water Company.

Table 4. SWC Existing Non-Residential Areas

Zone	Use	Square Feet
2850 Zone	Main Lake Clubhouse, Lake, Lake Park, and Wastewater Treatment Plant	35,000 for Clubhouse and the Wastewater Treatment Plant, with an additional 17.5 acres for the Lake and Lake Park
2950 Zone	Post Office, Temporary Municipal Complex, Fire Department	24,000
2950 N Zone	Sonora Clubhouse	15,000
3050 Zone	Rancho Resort Clubhouse	15,000
TOTAL		89,000

4.3. EXISTING WELLS

The well capacity within the existing Sahuarita Water system consists of two active wells (Well Nos. 14 and 18) with a total capacity of 1,900 gpm for Well No. 14 plus 1,400 gpm for Well No. 18 for a total of 3,300 gpm or 4.75 million gallons per day (MGD). There are also four existing capped wells. The existing active wells and their capacities are shown in Table 5.

Table 5. Active Wells

Facility Name	Capacity (gpm)	Capacity (MGD)
Well No. 14	1,900	2.73
Well No. 18	1,400	2.02
TOTAL/AVERAGE	3,300	4.75

4.4. EXISTING RESERVOIRS AND BOOSTER STATIONS

The capacities and elevations of reservoirs and booster stations within Sahuarita Water are summarized in Table 6. The total booster station capacity within the Sahuarita Water system is approximately 6,650 gpm and the total reservoir capacity is 2.55-million gallons (MG).

Table 6. Existing Reservoir/Booster Summary

Pressure Zone	Well Capacity (gpm)	Booster Capacity	Storage (gallons)
2850	3,300	0	2,200,000
2950	0	2,550	0
3050	0	2,250	0
TOTAL	3,300	4,800	2,200,000
2950 N	0	1,850	350,000

4.5. EXISTING SYSTEM DEMANDS

The SWC verified the total number of existing connections for residential and commercial use (see Section 4.2). These values were used to calculate estimated existing demands. The number of units within each zone was used to calculate ADD, PDD, and PHD for each zone based on the engineering criteria presented in Chapter 2. This information is presented in Table 7. The 2950 North Zone is presented individually since this zone operates on a separate infrastructure system than the other zones. The 2950 North Zone is supplied source water to an on-site forebay reservoir by the 2850 Zone. The 2950 North Zone booster pumps water from the forebay reservoir to the 2950 North Zone distribution system and the booster is controlled by the pressure on the discharge side of the hydropneumatic tank.

As of the end of October 2007, actual water company source pumping records indicated a total volume of 1,212 acre-feet of water since the beginning of 2007. This equates to approximately 914 gpm over a 300 day period.

Table 7. Existing Demand

Pressure Zone	Existing Units	Existing Commercial (square feet)	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
2850	2,973 (SF)	35,000 ^a	616	1,232 ^b	1,972
2950	225 (SF)	24,000	48	97	155
3050	357 (AA)	15,000	50	101	161
TOTAL	3,189 (SF) 357 (AA)	74,000	714	1,430	2,288

^aThe 2850 Zone also includes demands for Lake and Lake Park. These demands were based on numbers received from Diane McKenzie at the Sahuarita Water Company and are not represented as a square footage.

^bThe 2850 Zone demand was calculated as follows: residential and non-residential demands were multiplied by a factor of 2 for conversion to PDD (as described in Chapter 3). The WWTP, Lake, and Lake Park demands were added as ADD since these properties should not experience significant peaking factors.

2950 N	76 (SF) 68 (AA)	15,000	26	53	84
TOTAL	76 (SF) 68 (AA)	15,000	26	53	84

The usage demands were calculated based on the previous design criteria and are as follows:

$$\text{ADD} = \text{SF Units} \times 2.7 \times 110 \text{ GPCD}/1,440 = 0.21 \text{ gpm/SF unit}$$

$$\text{ADD} = \text{AA Units} \times 1.8 \times 110 \text{ GPCD}/1,440 = 0.14 \text{ gpm/AA unit}$$

$$\text{PDD} = \text{ADD} \times 2.0 = 0.42 \text{ gpm/SF unit}$$

$$\text{PDD} = \text{ADD} \times 2.0 = 0.28 \text{ gpm/AA unit}$$

$$\text{PHD} = \text{ADD} \times 3.2 = 0.67 \text{ gpm/SF unit}$$

$$\text{PHD} = \text{ADD} \times 3.2 = 0.45 \text{ gpm/AA unit}$$

4.6. EXISTING SYSTEM FIRE FLOW REQUIREMENTS

Table 8 presents the existing fire flow requirements for each of the zones.

Table 8. Existing Fire Flow Requirements

Pressure Zone	Fire Flow Demand (gpm)	Fire Flow Duration (hours)	Total Fire Flow Storage (gallons)
2850	1,500	2	180,000
2950	2,000	4	480,000
3050	1,500	2	180,000
2950 N	1,500	2	180,000

4.7. EXISTING SYSTEM REQUIREMENTS

A summary of the existing requirements and the existing infrastructure is shown in Table 9. Exhibit 1 also presents the existing infrastructure and pipelines.

The table below demonstrates that the well production of both wells (Well Nos. 14 and 18) is above existing PDD demands. However, by ADEQ standards, the well production system must be able to

provide PDD when the largest well is out of service. The largest well is Well No. 14 at 1,900 gpm of flow. Therefore, with only Well No. 18 at 1,400 gpm to serve the system, the projected well requirement is just under the recommended criteria. Considering the actual demand recorded by the water company is approximately 914 gpm, the current well capacity is sufficient to provide existing demands with the largest well out of service. Plans are currently being designed to add a new well (Well No. 23) to the system.

The existing storage capacity is currently above the recommended standards presented in Chapter 3.

Table 9. Existing System Capacity Requirements

Zone	Well Requirement (PDD) (gpm)	Total Well Capacity (gpm)	Fire Flow Requirement	Booster Requirement (PDD + FF)	Existing Booster Capacity (gpm)	Storage Requirement ^b (ADD + FF)	Existing Storage Capacity (gallons)
2850	1,232	1,400 ^a	1,500	N/A	N/A	1,067,181	2,200,000
2950	97	0	2,000	2,097	2,550	369,705	
3050	101	0	1,500	1,601	2,250	72,486	
TOTAL	1,430	1,400		3,198	4,800	1,509,372	2,200,000

^aThe total well capacity is 1,400 gpm for Well No. 14 and 1,900 gpm for Well No. 18. However, to demonstrate the largest well out of service, 1,400 gpm is shown as the well capacity.

^bThe existing Fire Flow requirement of 1,500 gpm for 2 hours was added to the 2850 Zone Storage Requirement.

2950 N	53	0	1,500	1,553	1,850	259,836 ^c	350,000
TOTAL	53	0	1,500	1,553	1,850	259,836	350,000

^cA Fire Flow requirement of 1,500 gpm for 2 hours was also added to the 2950 North Zone Storage Requirement.

4.8. EXISTING SYSTEM BUILDOUT REQUIREMENTS

A summary of the existing system buildout requirements for the current CC&N boundary and the proposed infrastructure is shown in Table 10. Exhibit 1 also presents the proposed infrastructure and pipelines.

At buildout, the production capacity of Well No. 14 will be replaced by Well Nos. 23. Well No. 14 production capacity is planned to be replaced by source capacity from a newly drilled well in the future to insure greater system reliability since this well is reaching the projected life expectancy for a production well. It has been determined that Well No. 14 will be downsized to provide water to the current Town of Sahuarita Lake, Lake Park, and right-of-ways under a existing Type I water right. This well is planned to be taken off-line by the fourth quarter of 2010. Additional well production capacity needed will be provided by Well Nos. 21, 24B, and 25. Future storage capacity will consist of two 1.25 MG floating 2950 Zone reservoirs. Once the 2950 Zone reservoir is operational, the 2950 Zone booster will no longer be required to provide fire flow and will be sized to move PDD for the 2950 Zone. The 3050 Zone is planned to be served by two pressure controlled booster stations, one is currently existing and the second will be constructed at the new 2950 Zone reservoir site.

Table 10. Existing System Buildout Capacity Requirements

Zone	Well Requirement (PDD) (gpm)	Total Well Capacity ^a (gpm)	Fire Flow Requirement	Booster Requirement (PDD + FF)	Proposed Booster Capacity (gpm)	Storage Requirement ^b (ADD + FF)	Proposed Storage Capacity (gallons)
2850	1,658	3,900	1,500	N/A	N/A	1,373,664	2,200,000
2950	2,793	1,500	2,000	2,610	3,050	2,490,749	2,500,000
3050	483	0	2,250	2,733	4,650	408,058	
TOTAL	4,934	5,400		5,343	7,700	4,272,471	4,700,000

^aThe total well capacity is 6,900 gpm for Well No. 18, 21, 23, 24B and 25. However, to demonstrate the largest well out of service, 5,400 gpm is shown as the well capacity.

^bThe proposed Fire Flow requirement of 1,500 gpm for 2 hours was added to the 2850 Zone Storage Requirement. The proposed fire flow requirement of 2,000 gpm for 4 hours was added to the 2950 Zone Storage Requirement. Because the 3050 Zone is served by the 2950 Zone reservoir at buildout the proposed fire flow requirement of 2,250 gpm for 4 hours was reduced to 250 gpm for four hours for the 3050 Zone Storage Requirement.

2950 N	323	0	1,500	1,823	1,850	412,371 ^c	350,000
TOTAL	323	0	1,500	1,823	1,850	412,371	350,000

^cA Fire Flow requirement of 1,500 gpm for 2 hours was also added to the 2950 North Zone Storage Requirement.

CHAPTER 5. FUTURE SYSTEM ANALYSIS

5.1. FUTURE SYSTEM OVERVIEW

The expansion area of the Sahuarita Water CC&N boundary is separated into pressure zones with zone boundaries located at 150-foot intervals. The high water elevations of the zone boundaries are also spaced at approximately 150-foot intervals. The standard pressure for a typical 150-foot zone is 43 to 108 pounds per square inch (psi). For the 180-foot zone, the pressure will be approximately 43 to 122 psi, although static pressures will vary with daily demand fluctuations and fire flow conditions. Individual pressure-reducing valves (PRVs) will be required for all homes with main pressures greater than 80 psi. The zone boundaries and high water elevations of the proposed extension area of the SWC CC&N area are shown in Table 11. The existing SUSD School will be served by the existing 2950 Zone. The zone delineation is shown on Exhibit 2. The proposed water system expansion is divided into the following zones: 3270, 3420, 3570, 3720, and 3900.

Each zone is served by one or a combination of the following methods: floating reservoir, booster stations pumping from storage, or booster stations pumping to a reservoir that floats the zone.

Table 11. Proposed Sahuarita Water Company Pressure Zone Boundaries

Zone	High Water (ft)	Boundaries (ft)	Static Pressure (psi)	Ultimate Control Method
3270	3270	3020 to 3170	108 - 43	Level
3420	3420	3170 to 3320	108 - 43	Level
3570	3570	3320 to 3470	108 - 43	Level
3720	3720	3470 to 3620	108 - 43	Level
3900	3900	3620 to 3800	122 - 43	Pressure

5.2. PROPOSED CC&N BUILDOUT SYSTEM DEMANDS

The future buildout populations and demands are based on the zones as discussed in previous sections. The buildout demands were based on the latest land planning information for each project. The projected number of units served at buildout is approximately 32,300 units, as shown in Table 1. Within the 32,300 units, there are approximately 27,000 single-family units, 3,800 active-adult units, 1,500 multi-family units. The non-residential square footage is projected to be approximately 4.2 million square feet. The breakdown of these units and the associated water demands in terms of ADD, PDD, and PHD are presented in Table 12. Further analyses of all calculations are presented in Appendix A.

Table 12. Buildout Water Usage Summary

Pressure Zone	Future Units	Non-residential (Sq. Ft)	Number of Students	Average Daily Demand (gpm)	Peak Daily Demand (gpm)	Peak Hour Demand (gpm)
2850	3,992 (SF)	67,000	-	829	1,658	2,653
2950	5,603 (SF)	1,793,252	1,226 (HS) 3,150 (ES)	1,396	2,793	4,468
2950-N	491 (SF) 428 (AA)	15,000	-	161	323	516
3050	1,032 (AA)	1,197,683	-	242	483	773
3270	1,999 (SF) 174 (MF)	344,355	478 (HS) 2,028 (ES)	511	1,022	1,636
3420	375 (SF) 226 (MF) 1,161 (AA)	70,855	-	270	539	863
3570	3,478 (SF) 1,106 (MF) 1,210 (AA)	619,271	1,287 (ES)	1,089	2,178	3,485
3720	5,079 (SF)	-	478 (HS) 2,028 (ES)	1,097	2,194	3,510
3900	5,992 (SF)	70,855	-	1,242	2,484	3,974
TOTAL	27,009 (SF) 1,506 (MF) 3,831 (AA)	4,178,271	2,182 (HS) 8,493 (ES)	6,837	13,674	21,878

(HS) High School (ES) Elementary School

5.3. FUTURE SYSTEM SIZING

The previously provided water system design criteria were used to develop the future water system buildout capacity requirements for Sahuarita Water Company. Future system requirements include the capacity of wells, storage, boosters, and mains to serve future demands. The proposed future system upgrades are shown on Exhibit 2.

Exhibit 2 shows the interconnection of zones including production requirements, booster station facility capacities, and reservoir sizes. The proposed infrastructure is noted and proposed transmission mains are shown as solid lines. This exhibit identifies the zones without reservoirs where the boosters are required to provide PDD plus fire flow.

5.3.1. Wells

Well production requirements are based on meeting PDD. Sufficient reserve capacity is required to meet PDD with the largest well out of service.

A new arsenic standard that defines the maximum contaminant level of arsenic at 10 parts per billion (ppb) has been approved by the US Environmental Protection Agency (USEPA). Recent ADEQ MAPS tests results indicated that arsenic levels in both existing Well Nos. 14 and 18 are currently under the 10 ppb requirement. Well No. 14 production capacity is planned to be replaced by a newly drilled well in

the future to insure greater system reliability since this well is reaching the projected life expectancy for a production well. It has been determined that Well No. 14 will be downsized to provide water to the current Town of Sahuarita Lake, Lake Park, and right-of-ways under a existing Type I water right. This well is planned to be taken off-line by the fourth quarter of 2010.

In order to serve future demands, it is planned that approximately 10 new wells will be drilled to serve Sahuarita Water Company. The locations for these wells can be found on Exhibit 2. Exploratory borings have been conducted at five (Wells Nos. 21, 22, 23, 25, and 26) of the ten proposed well locations to verify lithology and groundwater quality. Water Quality results show that arsenic levels do not currently exceed the arsenic maximum contaminant level (MCL) or can be kept below the new requirement through well design. Additional exploratory drilling is expected to be done within the next few months on Well No. 24B for further investigation. It is anticipated that the production capacity of these wells will be approximately 1,500 gpm each; with the exception of Well No. 21 that has a projected capacity of 1,000 gpm and Well No. 26 with a projected capacity of 750 gpm. The first production well to be drilled will be Well No. 23, due to it's proximity to existing facilities. Well Site Nos. 17R, 18, 19R, and 21 are planned to pump via dedicated well collection main to the existing reservoirs located near Well No. 23. Well No. 25 is expected to pump directly into the 2950 pressure zone. The remaining wells, Well Nos. 26, 27, 28, and 30 are anticipated to pump through dedicated well collection mains to a forebay reservoir then pumped into the future 2950 Zone reservoir via booster station for distribution through the proposed water system. Depending on the capacities of each of these wells, there is the potential for more or less wells.

Each well will be equipped with a manual transfer switch to allow a portable backup generator to power the wells during a power outage.

A summary of the required well capacities and the future additional well capacity required is presented in Table 13.

Table 13. Future Well Capacity Requirements

	Buildout PDD capacity (gpm)
System Requirement:	13,674
	Future Well Capacity (gpm)
Future Wells:	
17R	1,500
18	1,400
19R	1,500
21	1,000
23	1,500
24B	1,500
25	1,500
26	750
27	1,500
28	1,500
30	1,500
14	This well will be downsized to serve non-potable demands of the Lake and Lake Park under the existing Town Type I Water right.
TOTAL	15,150*

*13,750 gpm with largest well out of service.

5.3.2. Future Fire Flow Requirements

The fire flow requirement for the 2950 North Zone is considered separate as it was in the existing system. The largest fire flow, in the 3050 Zone, will dictate the size of the planned 2950 Zone reservoirs.

Table 14. Future Fire Flow Requirements

Pressure Zone	Fire Flow Demand (gpm)	Fire Flow Duration (hours)	Total Fire Flow Storage (gallons)
2850	1,500	2	180,000
2950	2,000	4	480,000
2950 N	1,500	2	180,000
3050	2,250	4	540,000
3270	2,250	2	270,000
3420	1,750	2	210,000
3570	2,250	2	270,000
3720	2,250	2	270,000
3900	1,750	2	210,000

5.3.3. Storage

Storage sizing requirements are based on meeting 1.0 times the ADD plus fire flow. Fire flow demands will either be served by a floating reservoir for the 2850, 2950, 3270, 3420, 3570, and 3720 Zones, or via a pressurized booster station feeding off a reservoir for the 2950N, 3050, and 3900 Zones.

The storage requirements per zone are presented in Table 15. The Sahuarita Water system buildout requires an additional 10.7 MG of storage distributed throughout the system to meet the storage criteria. The proposed reservoir sizing to meet this requirement is summarized by zone in Table 16. These reservoirs are anticipated to be constructed at the locations shown on Exhibit 2. These reservoirs will float the 2950, 3270, 3420, 3570, and 3720 Zones and will have booster stations onsite to serve the 3050 and 3900 Zones. The booster station at the 2950 Zone will act as a redundant booster station to the existing 3050 Zone booster station at the existing 2850 Zone reservoir site. Normal practice for upgrading storage or supply is when the system demand is at 90 percent of the system supply or storage capacity.

There will also be a 0.6 MG Well Collection reservoir designed at the Well No. 26 site. This reservoir will serve as a forebay reservoir for the four new wells on the south side of the Rancho Sahuarita property; Well Nos. 26, 27, 28, and 30.

Table 15. Future Reservoir Capacity Requirements

Zone	Potable Storage Requirement (1.0 ADD/ gal)	Fire flow Storage Requirement (gal)	Total Storage Requirement (gal)	Total Existing Storage Capacity (gal)	Total Future Storage Capacity (gal)	Excess Storage Capacity ^a (gal)
2850	1,193,664	180,000	1,373,664	2,200,000	-	826,336
2950	2,010,749	480,000	2,490,749	0	2,500,000	9,251
2950 N	232,371	180,000	412,171	350,000	-	(62,171)
3050	348,058	540,000 ^b	348,058	0	0	(348,058)
3150	-	-	-	0	1,200,000	1,200,000
3270	736,034	270,000	1,006,034	0	1,000,000	(6,034)
3420	388,402	210,000	598,402	0	1,200,000	601,598
3570	1,568,160	270,000	1,838,160	0	1,800,000	(38,160)
3720	1,579,717	270,000	1,849,717	0	1,200,000	(649,717)
3900	1,788,127	210,000 ^c	1,788,127	0	1,200,000	(588,127)
Well Collection Forebay	-	-	-	0	600,000	600,000
TOTAL	9,845,281		11,705,082	2,550,000	10,700,000	1,544,918

^aParentheses indicate negative numbers

^bFire flow volume already provided in 2850 and 2950 Zone reservoirs

^cFire Flow volume already provided in 3720 Zone reservoir

Table 16. Proposed Reservoirs

Zone	Potable Storage Requirement (gallons)	Proposed Storage Reservoirs (gallons)
2850*	2,200,000	1,000,000 / 1,200,000
2950*	2,500,000	1,250,000 / 1,250,000
2950 N	350,000	350,000
3050	0	-
3150	1,200,000	600,000 / 600,000
3270*	1,000,000	1,000,000
3420*	1,200,000	600,000 / 600,000
3570*	1,800,000	900,000 / 900,000
3720*	2,400,000	1,200,000 / 1,200,000
Forebay	600,000	600,000
TOTAL	13,250,000	13,250,000

*Zones with floating storage

5.3.4. Booster Station and Transmission Facilities

5.3.4.1 Booster Stations

Booster station facility sizing is based upon conveying the PDD from zones with excess supply capacity to the zones within the water system without supply capacity. As can be seen on Exhibit 2, all of the SWC wells are located in the 2850 and 2950 Zones. This situation occurs because the greatest hydrologic water availability is located within these zones. The water that is extracted within these zones must, therefore, be transported through booster stations to the remaining zones in the system. In zones that are not served by floating reservoirs, the PDD and fire flow requirements must be supplied by the booster station.

The 2850 Zone is currently a floating zone and will remain a floating zone, so there are no booster station requirements for this zone. The 2950 Zone will be a floating zone upon construction of the new reservoir at the intersection of El Toro and La Cañada Drive. Until this time, the 2950 Zone will be served by the booster station at the existing 2.2 MG 2850 Zone reservoir site. The existing capacity of this booster station is 2,550 gpm. Per WestLand's 2950 Zone booster station plans designed in January 2004, the first pump of this booster station (250 gpm) is designed to be replaced by a 750 gpm pump to provide an ultimate flow at this booster station of 3,050 gpm.

There will be a second 3050 Zone booster station at the site of the new 2950 Zone reservoir at the intersection of El Toro and La Cañada Drive. This booster station is expected to have a capacity of approximately 2,400 gpm. This size is based on a portion of the buildout flow for the 3050 Zone PDD plus 2,250 gpm fire flow.

There will also be two 3150 Zone booster stations designed for the transport of flow from the 2850 and 2950 Zone Reservoirs to the forebay reservoirs located within Mission Peaks 3270 Zone. The 3150 Zone booster stations will be sized to move PDD to the 3270, 3420, 3570, 3720, and 3900 Zones to serve State Land, Mission Peaks, and Sahuarita Mission. The PDD demands of these zones is approximately 8,400 gpm, therefore each booster will provide 4,300 gpm. There will be an additional 2950 Zone booster located at the well collection forebay storage reservoir that will transported treated or blended water to the proposed 2950 Zone reservoir. This booster will move well capacity for Well Nos. 26, 27, 28, and 30 with an estimated combined capacity of 5,250 gpm.

The large capacity transfer booster stations (3150, 3420, 3570, 3720, and 3900 Zones) will be designed with equal sized transfer booster pumps. The transfer booster stations will have dual suction manifolds from each reservoir and dual discharge lines for redundancy and ease of maintenance. Each booster station will be equipped with backup generators to ensure continued operation during a power outage. All proposed booster stations will have an extra equal sized pump and separate electrical panels to operate each pump to allow for pumps to be taken off-line for maintenance or replacement without having to shut-down the entire booster station.

Table 17. Booster Station Capacity Analysis

Zone	PDD (gpm)	Fire Flow Requirements (gpm)	Total Required Booster Station Capacity (gpm)	Proposed Booster Station Capacity (gpm)
2850	1,658	1,500 However, this is a floating zone, and therefore fire flow is provided by the 2850 Reservoir.	N/A, Floating	N/A, Floating
2950	2,793	2,000 However, this is a floating zone, and therefore fire flow is provided by the future 2950 Reservoirs.	2,793	3,050
2950 N	323	1,500	1,823	1,850
3050	483	2,250	2,733	1-2,400* 1-2,250
3150	8,417	N/A	8,417	2- 4,300
3270	1,022	2,250 However, this is a floating zone, and therefore fire flow is provided by the future 3270 Reservoirs.	1,022	1,100
3420	539	1,750 However, this is a floating zone, and therefore fire flow is provided by the future 3420 Reservoirs.	7,395	7,500
3570	2,178	2,250 However, this is a floating zone, and therefore fire flow is provided by the future 3570 Reservoirs.	6,856	6,900
3720	2,194	2,250 However, this is a floating zone, and therefore fire flow is provided by the future 3720 Reservoirs.	4,678	4,700
3900	2,484	1,750	4,234	4,300

*Includes existing booster station at the 2850 Reservoir and proposed 2950 Zone reservoir (corner of El Toro and La Cañada Drive).

5.3.4.2 Transmission Mains

Exhibit 1 also shows the total capacity of transmission systems required for transporting water throughout the system. Main size requirements can then be estimated based upon maximum velocity requirements and maximum pipe friction losses in order to maintain adequate pressure within the system during PDD plus fire flow conditions. The 3150 Zone mains will transport PDD for the 3270, 3420, 3570, 3720, and 3900 Zones. Large diameter mains are proposed to reduce head losses, operating and pumping costs. Dual water mains transfer source water through the system and provide redundancy for future maintenance or replacement. The water main between the proposed forebay reservoir at Well No. 26 and the 2950 Zone reservoir will be required to transport well capacity from Well Nos. 26, 27, 28, and 30 with an estimated combined capacity of 5,250 gpm. Well collection mains are sized based on the well capacity being transported by them.

5.4. PROPOSED FACILITIES

The facilities proposed to meet the future system buildout requirements are described below. These facilities are also shown on Exhibit 2.

5.4.1. Well System Requirements

In accordance with Table 12, the future buildout capacity of the Sahuarita Water system is approximately 13,556 gpm, which is equivalent to approximately 19.5 million gallons per day (MGD) capacity requirements. As was discussed in Section 5.3.1, in order to meet these peak day demands, an additional seven wells at 1,500 gpm, one well at 750 gpm, and one well at 1,000 gpm will be required. These nine wells will be supplemented by an extra well in case of a well outage.

The future and existing well site locations are shown on Exhibit 2. This report is not considering existing Well Nos. 17, 18, 19, or 20 as part of the future system. Existing Well Nos. 17, 19, and 20 are planned to be abandoned. Wells Nos. 17 and 19 will be replaced by proposed Well Nos. 17R and 19R.

5.4.2. Reservoir System Requirements

Based upon Table 15, it is anticipated that approximately 10.7 MG of additional reservoir capacity will be required to provide 1.0 times the ADD plus fire flow. The proposed floating zone storage systems within the SWC system will provide service to the 2850, 2950, 3270, 3420, 3570, and 3720 Zones. The 2950 N, 3050, and 3900 Zones will be served via pumped storage. Reservoir capacity will be split between equally sized reservoirs, when possible, to allow for system flexibility and maintenance. The following new reservoirs are proposed:

- Two adjacent 1.25 MG 2950 Zone reservoirs located at the intersection of El Toro and La Cañada Drive at southwest corner of the 3050 Zone (Exhibit 1). These reservoirs will have a combined capacity of 2.5 MG.
- A 0.6 MG Well Collection reservoir located at Well Site No. 26. This will serve as a forebay reservoir to Well Nos. 26, 27, 28, and 30.
- Two adjacent 0.6 MG forebay reservoirs located along the eastern edge of the Mission Peaks project. These reservoirs will be phased and provide storage capacity for zones located within the Mission Peaks and Sahuarita Mission projects. These reservoirs will have a combined capacity of 1.2 MG.
- A 1.0 MG floating 3270 Zone reservoir located within the Mission Peaks project.
- Two adjacent 0.6 MG floating 3420 Zone reservoirs located within the Mission Peaks project. These reservoirs will be phased and provide storage capacity for zones located within the Mission Peaks and Sahuarita Mission projects. These reservoirs will have a combined capacity of 1.2 MG.
- Two adjacent 0.9 MG floating 3570 Zone reservoirs located within the Mission Peaks project. These reservoirs will have a combined capacity of 1.8 MG.
- Two adjacent 1.2 MG 3720 Zone floating reservoirs located within the Mission Peaks project. These reservoirs will have a combined capacity of 2.4 MG. Additional storage capacity for the 3720 and 3900 Zones is stored in the 3150 Zone forebay reservoirs.

5.4.3. Booster Station Requirements

The booster station locations, zone boundaries, and capacities are as follows:

- Upgrade to the existing 2950 Zone booster station will be required. The upgrade will upsize pump 1 of this booster station from 250 gpm to 750 gpm to a total flow of 3,050 gpm.
- A new 3050 Zone booster station will be required. This booster station will be designed at the intersection of El Toro and La Cañada Drive next to the proposed 2950 Zone reservoirs. This booster station is expected to have a capacity of approximately 2,400 gpm. This size is based on a portion of the buildout flow for the 3050 Zone PDD plus 2,250 gpm fire flow.

- An upgrade to the 2950 North Zone booster station will be required. A spare 550 gpm pump will be added as future Pump 4 to this manifold. The addition of a pump to the booster station will mean that the booster station capacity will meet the buildout requirements of PDD (2,793 gpm).
- There will be a 5,250 gpm Well Collection booster station located at Well Site No. 26. This will serve to transport water from the Well Collection Reservoir fed by Well Nos. 26, 27, 28 and 30.
- Two new 3150 Zone booster stations will be required. The booster stations will be located at the intersection of El Toro and La Cañada Drive next to the proposed 2950 Zone reservoirs and adjacent to the existing 2850 Zone reservoir site and Well No. 23. These booster stations will transfer PDD for the 3270, 3420, 3570, 3720, and 3900 Zones to the forebay reservoirs located on the eastern boundary of Mission Peaks. Each booster will have a 4,300 gpm capacity.
- A 3270 Zone booster station will be required to fill the 3270 Zone floating reservoir. This booster station will be controlled by the level in the reservoir. The booster will be sized to transfer PDD to the 3270 Zone. The proposed capacity of this booster station will be 1,100 gpm.
- A 3420 Zone booster station will be required to fill the 3420 Zone floating reservoir. This booster station will be controlled by the level in the reservoir. The booster will be sized to transfer PDD to the 3420, 3570, 3720, and 3900 Zones. The proposed capacity of this booster station will be 7,500 gpm and will be phased in according to capacity requirements.
- A 3570 Zone booster station will be required to fill the 3570 Zone floating reservoir. This booster station will be controlled by the level in the reservoir. The booster will be sized to transfer PDD to the 3570, 3720, and 3900 Zones. The proposed capacity of this booster station will be 6,900 gpm and will be phased in according to capacity requirements.
- A 3720 Zone booster station will be required to fill the 3720 Zone floating reservoir. This booster station will be controlled by the level in the reservoir. The booster will be sized to transfer PDD to the 3720 and 3900 Zones. The proposed capacity of this booster station will be 4,700 gpm and will be phased in according to capacity requirements.
- A 3900 Zone booster station will be required to provide PDD plus fire flow to the 3900 Zone. This booster station will be controlled by pressure in the 3900 Zone. The proposed capacity of this booster station will be 4,300 gpm and will be phased in according to capacity requirements. This site will be equipped with a back-up generator.

5.4.4. Transmission System Requirements

A number of mains are required in order to provide transport capacity between wells and reservoirs, provide additional capacity for fire flow to interior service areas, and improve the looping and layout of the distribution system. In addition to the transmission mains between reservoirs, a concept distribution system loop for fire flow and redundancy is proposed. The sizing of these mains should be confirmed through further detailed analysis.

Dual large diameter water mains are proposed to move large volumes of source water up through the system to the reservoirs in the highest zones. Dual mains allow continued water transport during a main break or shut-down needed for maintenance purposes. Large diameter mains reduce system head loss which in turn reduces the amount of pumping head needed to transport water from one zone to the next. A reduction in pumping head will equate to a reduction in pumping electrical costs.

APPENDIX A

**DEMAND
CALCULATIONS**

Rancho Sahuarita Water Meter Plan Demands - Summary

Residential	Non-residential	Peak Factors
2.7 pphu	0.12 gpdpsf	2 peak day
1.9 pphu	Commercial	3.2 peak hour
1.8 pphu		
110 gpcd	25 gpsd	
90 gpcd	43 gpcd	
single-family	Elementary School	
multi-family	High School	
active-adult		
single-family & Active-adult		
multi-family		

Demand Criteria

Zone	Residential				Non-Residential			Demand		
	Single Family units	Multi Family Units	Active Adult Units	Commerical (sq. ft.)	High School students	Elementary School students	ADD (gallons)	PDD (gpm)	PHD (gpm)	
2850	3,992	-	-	67,000	-	-	1,193,664	1,658	2,653	
2950	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	
2950N	491	-	428	15,000	-	-	232,371	323	516	
3050	-	-	1,032	1,197,683	-	-	348,058	483	773	
3270	1,999	174	-	344,355	478	2,028	736,034	1,022	1,636	
3420	375	226	1,161	70,855	-	-	388,402	539	863	
3570	3,478	1,106	1,210	619,271	-	1,287	1,568,160	2,178	3,485	
3720	5,079	-	-	-	478	2,028	1,579,717	2,194	3,510	
3900	5,992	-	-	70,855	-	-	1,788,127	2,484	3,974	
Total	27,009	1,506	3,831	4,178,271	2,182	8,493	9,845,281	13,674	21,878	

Revisions made per Matt on 8/24 (15000 units Mission Peaks + 2300 units State Land + 500 units McGee Ranch)
 Revisions made per Marian on 9/12 (revise active adult units (100% of units in 3050, 428 units in 2950N)(revise commerical SF per e-mailed spreadshe
 Revision made per Marian on 9/13 (revise hospital in 2950 zone to add 245,000 SF in 2017)

Rancho Sahuarita Water Meter Plan Demands - 2850 Zone

Residential 2.7 pphu single-family 1.9 pphu multi-family 1.8 pphu active-adult 110 gpcd single-family & Active-adult 90 gpcd multi-family	Demand Criteria Non-residential 0.12 gpdpsf Commercial 25 gpcd Elementary School 43 gpcd High School	Peak Factors 2 peak day 3.2 peak hour
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Year	Residential			Non-Residential				PDD (gpm)	PHD (gpm)	Fire Flow Requirement (gpm)
	Single Family units	Multi Family Units	Active Adult Units	Commerical (sq. ft.)	High School students	Elementary School students	ADD (gallons)			
2006	2,973	-	-	35,000	-	-	887,181	1,232	1972	1500
2007	3,356	-	-	35,000	-	-	1,000,932	1,390	2224	1500
2008	3,711	-	-	35,000	-	-	1,106,219	1,536	2458	1500
2009	3,781	-	-	35,000	-	-	1,127,157	1,565	2505	1500
2010	3,876	-	-	51,000	-	-	1,157,292	1,607	2572	1500
2011	3,992	-	-	59,000	-	-	1,192,704	1,657	2650	1500
2012	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2013	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2014	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2015	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2016	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2017	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2018	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2019	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2020	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2021	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2022	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2023	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2024	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2025	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2026	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2027	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2028	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2029	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2030	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2031	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2032	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2033	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500
2034	3,992	-	-	67,000	-	-	1,193,664	1,658	2653	1500

All development in this zone located in Rancho Sahuarita

Rancho Sahuarita Water Meter Plan Demands - 2950 Zone

	Demand Criteria	
Residential 2.7 pphu single-family 1.9 pphu multi-family 1.8 pphu active-adult 110 gpcd single-family & Active-adult 90 gpcd multi-family	Non-residential 0.12 gpdpsf Commercial 25 gpcd Elementary School 43 gpcd High School	Peak Factors 2 peak day 3.2 peak hour

Year	Residential					Non-Residential					PDD (gpm)	PHD (gpm)	Fire Flow Requirement (gpm)
	Single Family units	Multi Family Units	Active Adult Units	Commerical (sq. ft.)	High School students	Elementary School students	ADD (gallons)	PDD (gpm)	PHD (gpm)	Fire Flow Requirement (gpm)			
2006	225	-	-	24,000	-	-	69,705	97	155	2,000			
2007	225	-	-	288,196	-	-	101,409	141	225	2,000			
2008	1,064	-	-	376,305	1,159	2,900	483,502	672	1,074	2,000			
2009	1,214	-	-	473,252	1,226	3,044	546,166	759	1,214	2,000			
2010	1,590	-	-	698,252	1,226	3,150	687,488	955	1,528	2,000			
2011	1,778	-	-	993,252	1,226	3,150	778,724	1,082	1,730	2,000			
2012	2,307	-	-	1,043,252	1,226	3,150	941,837	1,308	2,093	2,000			
2013	2,907	-	-	1,199,252	1,226	3,150	1,138,757	1,582	2,531	2,000			
2014	3,507	-	-	1,296,252	1,226	3,150	1,328,597	1,845	2,952	2,000			
2015	4,107	-	-	1,510,252	1,226	3,150	1,532,477	2,128	3,406	2,000			
2016	4,707	-	-	1,548,252	1,226	3,150	1,715,237	2,382	3,812	2,000			
2017	5,307	-	-	1,793,252	1,226	3,150	1,922,837	2,671	4,273	2,000			
2018	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2019	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2020	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2021	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2022	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2023	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2024	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2025	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2026	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2027	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2028	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2029	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2030	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2031	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2032	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2033	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			
2034	5,603	-	-	1,793,252	1,226	3,150	2,010,749	2,793	4,468	2,000			

All development in this zone located in Rancho Sahuarita

Rancho Sahuarita Water Meter Plan Demands - 2950N Zone

	Demand Criteria	
Residential 2.7 pphu single-family 1.9 pphu multi-family 1.8 pphu active-adult 110 gpcd single-family & Active-adult 90 gpcd multi-family	Non-residential 0.12 gpdpsf Commercial 25 gpcd Elementary School 43 gpcd High School	Peak Factors 2 peak day 3.2 peak hour

Year	Residential			Non-Residential				ADD (gallons)	PDD (gpm)	PHD (gpm)	Fire Flow Requirement (gpm)
	Single Family units	Multi Family Units	Active Adult Units	Commerical (sq. ft.)	High School students	Elementary School students					
2006	76	-	68	15,000	-	-	37,836	53	84	1,500	
2007	161	-	143	15,000	-	-	77,931	108	173	1,500	
2008	341	-	297	15,000	-	-	161,883	225	360	1,500	
2009	378	-	330	15,000	-	-	179,406	249	399	1,500	
2010	429	-	374	15,000	-	-	203,265	282	452	1,500	
2011	491	-	428	15,000	-	-	232,371	323	516	1,500	
2012	491	-	428	15,000	-	-	232,371	323	516	1,500	
2013	491	-	428	15,000	-	-	232,371	323	516	1,500	
2014	491	-	428	15,000	-	-	232,371	323	516	1,500	
2015	491	-	428	15,000	-	-	232,371	323	516	1,500	
2016	491	-	428	15,000	-	-	232,371	323	516	1,500	
2017	491	-	428	15,000	-	-	232,371	323	516	1,500	
2018	491	-	428	15,000	-	-	232,371	323	516	1,500	
2019	491	-	428	15,000	-	-	232,371	323	516	1,500	
2020	491	-	428	15,000	-	-	232,371	323	516	1,500	
2021	491	-	428	15,000	-	-	232,371	323	516	1,500	
2022	491	-	428	15,000	-	-	232,371	323	516	1,500	
2023	491	-	428	15,000	-	-	232,371	323	516	1,500	
2024	491	-	428	15,000	-	-	232,371	323	516	1,500	
2025	491	-	428	15,000	-	-	232,371	323	516	1,500	
2026	491	-	428	15,000	-	-	232,371	323	516	1,500	
2027	491	-	428	15,000	-	-	232,371	323	516	1,500	
2028	491	-	428	15,000	-	-	232,371	323	516	1,500	
2029	491	-	428	15,000	-	-	232,371	323	516	1,500	
2030	491	-	428	15,000	-	-	232,371	323	516	1,500	
2031	491	-	428	15,000	-	-	232,371	323	516	1,500	
2032	491	-	428	15,000	-	-	232,371	323	516	1,500	
2033	491	-	428	15,000	-	-	232,371	323	516	1,500	
2034	491	-	428	15,000	-	-	232,371	323	516	1,500	

All development in this zone located in Rancho Sahuarita

Rancho Sahuarita Water Meter Plan Demands - 3050 Zone

Residential 2.7 pphu single-family 1.9 pphu multi-family 1.8 pphu active-adult 110 gpcd single-family & Active-adult 90 gpcd multi-family	Demand Criteria Non-residential 0.12 gpdpsf Commercial 25 gpcd Elementary School 43 gpcd High School	Peak Factors 2 peak day 3.2 peak hour
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Year	Residential			Non-Residential				ADD (gallons)	PDD (gpm)	PHD (gpm)	Fire Flow Requirement (gpm)
	Single Family units	Multi Family Units	Active Adult Units	Commerical (sq. ft.)	High School students	Elementary School students	Elementary School				
2006	-	-	357	15,000	-	-	-	72,486	101	161	2,250
2007	-	-	357	15,000	-	-	-	72,486	101	161	2,250
2008	-	-	357	15,000	-	-	-	72,486	101	161	2,250
2009	-	-	357	424,000	-	-	-	121,566	169	270	2,250
2010	-	-	357	739,000	-	-	-	159,366	221	354	2,250
2011	-	-	357	782,486	-	-	-	164,584	229	366	2,250
2012	-	-	357	854,378	-	-	-	173,211	241	385	2,250
2013	-	-	357	878,378	-	-	-	176,091	245	391	2,250
2014	-	-	357	985,734	-	-	-	188,974	262	420	2,250
2015	-	-	357	1,047,683	-	-	-	196,408	273	436	2,250
2016	-	-	357	1,197,683	-	-	-	214,408	298	476	2,250
2017	-	-	357	1,197,683	-	-	-	214,408	298	476	2,250
2018	-	-	661	1,197,683	-	-	-	274,600	381	610	2,250
2019	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2020	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2021	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2022	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2023	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2024	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2025	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2026	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2027	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2028	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2029	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2030	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2031	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2032	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2033	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250
2034	-	-	1,032	1,197,683	-	-	-	348,058	483	773	2,250

All development in this zone located in Rancho Sahuarita

Rancho Sahuarita Water Meter Plan Demands - 3270 Zone

	Demand Criteria	Peak Factors
Residential 2.7 pphu single-family 1.9 pphu multi-family 1.8 pphu active-adult 110 gpcd single-family & Active-adult 90 gpcd multi-family	Non-residential 0.12 gpdpsf Commercial 25 gpsd Elementary School 43 gpsd High School	2 peak day 3.2 peak hour

Year	Residential				Non-Residential				ADD (gallons)	PDD (gpm)	PHD (gpm)	Fire Flow Requirement (gpm)
	Single Family units	Multi Family Units	Active Adult Units	Commerical (sq. ft.)	High School students	Elementary School students	Commercial	High School				
2006	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-	-	-
2010	100	174	-	30,000	-	-	-	63,054	88	140	2,250	2,250
2011	200	174	-	60,000	-	-	-	96,354	134	214	2,250	2,250
2012	400	174	-	90,000	-	-	-	159,354	221	354	2,250	2,250
2013	800	174	-	120,000	-	-	-	281,754	391	626	2,250	2,250
2014	1,200	174	-	150,000	-	-	-	404,154	561	898	2,250	2,250
2015	1,600	174	-	180,000	478	2,028	478	597,808	830	1,328	2,250	2,250
2016	1,999	174	-	210,000	478	2,028	478	719,911	1,000	1,600	2,250	2,250
2017	1,999	174	-	240,000	478	2,028	478	723,511	1,005	1,608	2,250	2,250
2018	1,999	174	-	270,000	478	2,028	478	727,111	1,010	1,616	2,250	2,250
2019	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2020	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2021	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2022	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2023	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2024	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2025	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2026	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2027	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2028	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2029	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2030	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2031	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2032	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2033	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250
2034	1,999	174	-	344,355	478	2,028	478	736,034	1,022	1,636	2,250	2,250

Development in this zone is located in Mission Peaks and State Land

Rancho Sahuarita Water Mater Plan Demands - 3420 Zone

Residential 2.7 pphu single-family 1.9 pphu multi-family 1.8 pphu active-adult 110 gpcd single-family & Active-adult 90 gpcd multi-family	Demand Criteria Non-residential 0.12 gpdpsf Commercial 25 gpcd Elementary School 43 gpcd High School	Peak Factors 2 peak day 3.2 peak hour
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Year	Residential				Non-Residential				ADD (gallons)	PDD (gpm)	PHD (gpm)	Fire Flow Requirement (gpm)
	Single Family units	Multi Family Units	Active Adult Units	Commercial (sq. ft.)	High School students	Elementary School students						
2006	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-	-	-
2010	-	-	100	-	-	-	-	19,800	28	44	1,750	-
2011	-	-	300	-	-	-	-	59,400	83	132	1,750	-
2012	150	-	600	-	-	-	-	163,350	227	363	1,750	-
2013	375	226	900	-	-	-	-	328,221	456	729	1,750	-
2014	375	226	1,161	-	-	-	-	379,899	528	844	1,750	-
2015	375	226	1,161	-	-	-	-	379,899	528	844	1,750	-
2016	375	226	1,161	30,000	-	-	-	383,499	533	852	1,750	-
2017	375	226	1,161	60,000	-	-	-	387,099	538	860	1,750	-
2018	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2019	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2020	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2021	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2022	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2023	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2024	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2025	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2026	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2027	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2028	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2029	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2030	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2031	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2032	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2033	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-
2034	375	226	1,161	70,855	-	-	-	388,402	539	863	1,750	-

Development in this zone is located in Mission Peaks

Rancho Sahuarita Water Meter Plan Demands - 3720 Zone

	Demand Criteria	
Residential 2.7 pphu single-family 1.9 pphu multi-family 1.8 pphu active-adult 110 gpcd single-family & Active-adult 90 gpcd multi-family	Non-residential 0.12 gpcpsf Commercial 25 gpcsd Elementary School 43 gpcsd High School	Peak Factors 2 peak day 3.2 peak hour

Year	Residential				Non-Residential				ADD (gallons)	PDD (gpm)	PHD (gpm)	Fire Flow Requirement (gpm)
	Single Family units	Multi Family Units	Active Adult Units	Commerical (sq. ft.)	High School students	Elementary School students						
2006	-	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-	-	-	-	-	-
2015	-	-	-	-	-	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-	-	-	-	-	-
2017	-	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-	-
2019	700	-	-	-	478	2,028	2,028	279,154	388	620	2,250	200
2020	1,400	-	-	-	478	2,028	2,028	487,054	676	1,082	2,250	400
2021	2,100	-	-	-	478	2,028	2,028	694,954	965	1,544	2,250	600
2022	2,840	-	-	-	478	2,028	2,028	914,734	1,270	2,033	2,250	840
2023	3,340	-	-	-	478	2,028	2,028	1,063,234	1,477	2,363	2,250	840
2024	3,840	-	-	-	478	2,028	2,028	1,211,734	1,683	2,693	2,250	840
2025	4,340	-	-	-	478	2,028	2,028	1,360,234	1,889	3,023	2,250	840
2026	4,840	-	-	-	478	2,028	2,028	1,508,734	2,095	3,353	2,250	840
2027	5,079	-	-	-	478	2,028	2,028	1,579,717	2,194	3,510	2,250	840
2028	5,079	-	-	-	478	2,028	2,028	1,579,717	2,194	3,510	2,250	840
2029	5,079	-	-	-	478	2,028	2,028	1,579,717	2,194	3,510	2,250	840
2030	5,079	-	-	-	478	2,028	2,028	1,579,717	2,194	3,510	2,250	840
2031	5,079	-	-	-	478	2,028	2,028	1,579,717	2,194	3,510	2,250	840
2032	5,079	-	-	-	478	2,028	2,028	1,579,717	2,194	3,510	2,250	840
2033	5,079	-	-	-	478	2,028	2,028	1,579,717	2,194	3,510	2,250	840
2034	5,079	-	-	-	478	2,028	2,028	1,579,717	2,194	3,510	2,250	840

Sahuarita Mission Units

Development in this zone is located in Mission Peaks and Sahuarita Mission

Rancho Sahuarita Water Meter Plan Demands - 3900 Zone

Residential 2.7 pphu single-family 1.9 pphu multi-family 1.8 pphu active-adult 110 gpcd single-family & Active-adult 90 gpcd multi-family	Demand Criteria Non-residential 0.12 gpcpsf Commercial 25 gpcd Elementary School 43 gpcd High School	Peak Factors 2 peak day 3.2 peak hour
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Year	Residential			Non-Residential				ADD (gallons)	PDD (gpm)	PHD (gpm)	Fire Flow Requirement (gpm)
	Single Family units	Multi Family Units	Active Adult Units	Commerical (sq. ft.)	High School students	Elementary School students					
2006	-	-	-	-	-	-	-	-	-	-	-
2007	-	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-	-
2010	-	-	-	-	-	-	-	-	-	-	-
2011	-	-	-	-	-	-	-	-	-	-	-
2012	-	-	-	-	-	-	-	-	-	-	-
2013	-	-	-	-	-	-	-	-	-	-	-
2014	-	-	-	-	-	-	-	-	-	-	-
2015	-	-	-	-	-	-	-	-	-	-	-
2016	-	-	-	-	-	-	-	-	-	-	-
2017	-	-	-	-	-	-	-	-	-	-	-
2018	-	-	-	-	-	-	-	-	-	-	-
2019	-	-	-	-	-	-	-	-	-	-	-
2020	-	-	-	-	-	-	-	-	-	-	-
2021	-	-	-	-	-	-	-	-	-	-	-
2022	-	-	-	-	-	-	-	-	-	-	-
2023	-	-	-	-	-	-	-	-	-	-	-
2024	-	-	-	-	-	-	-	-	-	-	-
2025	-	-	-	-	-	-	-	-	-	-	-
2026	-	-	-	-	-	-	-	-	-	-	-
2027	750	-	-	70,855	-	-	231,253	321	514	1,750	1,750
2028	1,500	-	-	70,855	-	-	454,003	631	1,009	1,750	1,750
2029	2,250	-	-	70,855	-	-	676,753	940	1,504	1,750	1,750
2030	3,500	-	-	70,855	-	-	1,048,003	1,456	2,329	1,750	1,750
2031	4,250	-	-	70,855	-	-	1,270,753	1,765	2,824	1,750	1,750
2032	5,000	-	-	70,855	-	-	1,493,503	2,074	3,319	1,750	1,750
2033	5,750	-	-	70,855	-	-	1,716,253	2,384	3,814	1,750	1,750
2034	5,992	-	-	70,855	-	-	1,788,127	2,484	3,974	1,750	1,750

Development in this zone is located in Mission Peaks (500 homes served in McGee Ranch)

EXHIBIT 1

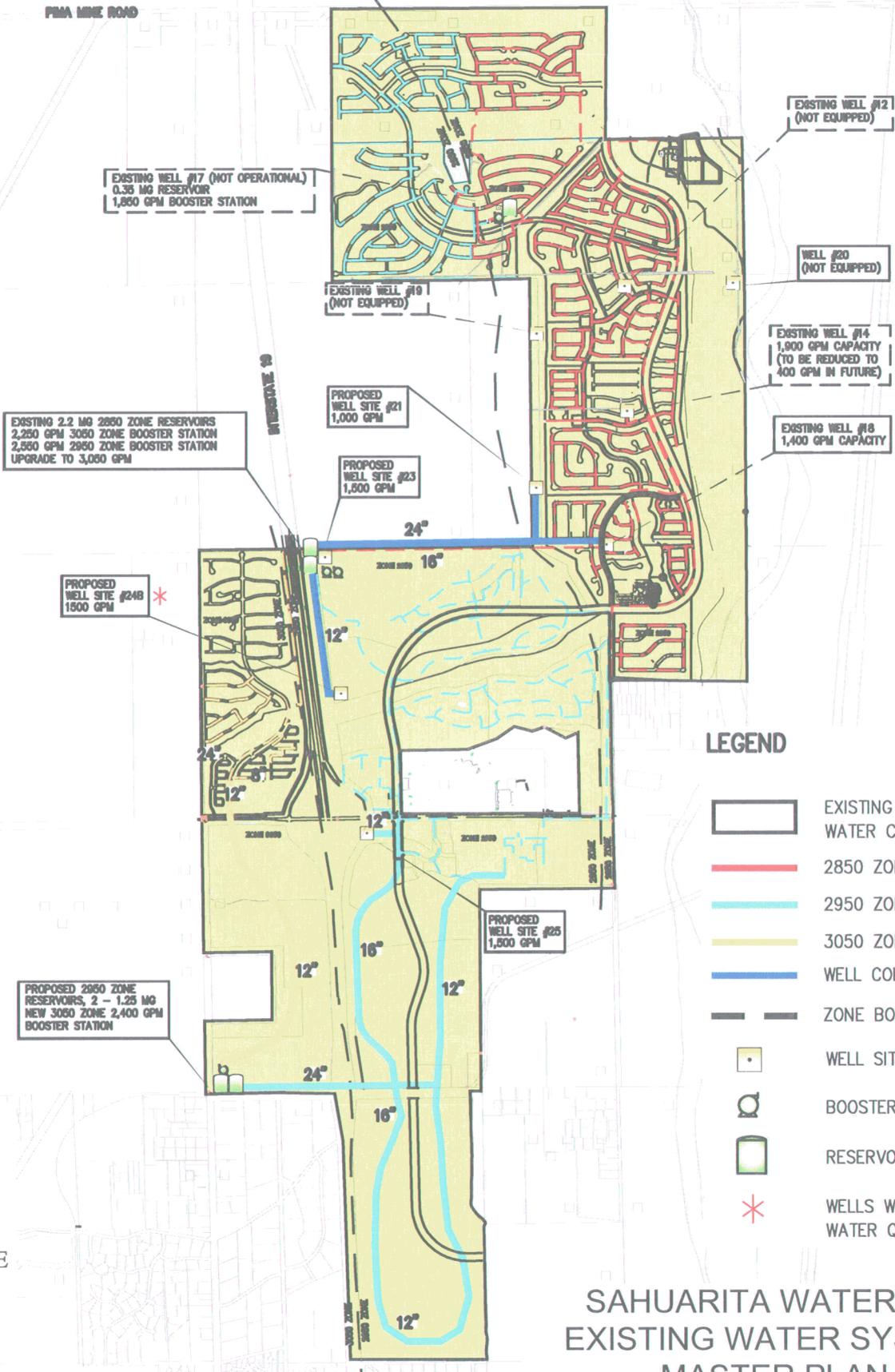
**EXISTING
WATER SYSTEM
MASTER PLAN**

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WestLand Resources Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Az 85712 (520) 208-9585

0' 3000'
SCALE: 1" = 3000'



SAHUARITA WATER CO.
EXISTING WATER SYSTEM
MASTER PLAN
EXHIBIT 1

November 20, 2007

EXHIBIT 2

**FUTURE
WATER SYSTEM
MASTER PLAN**

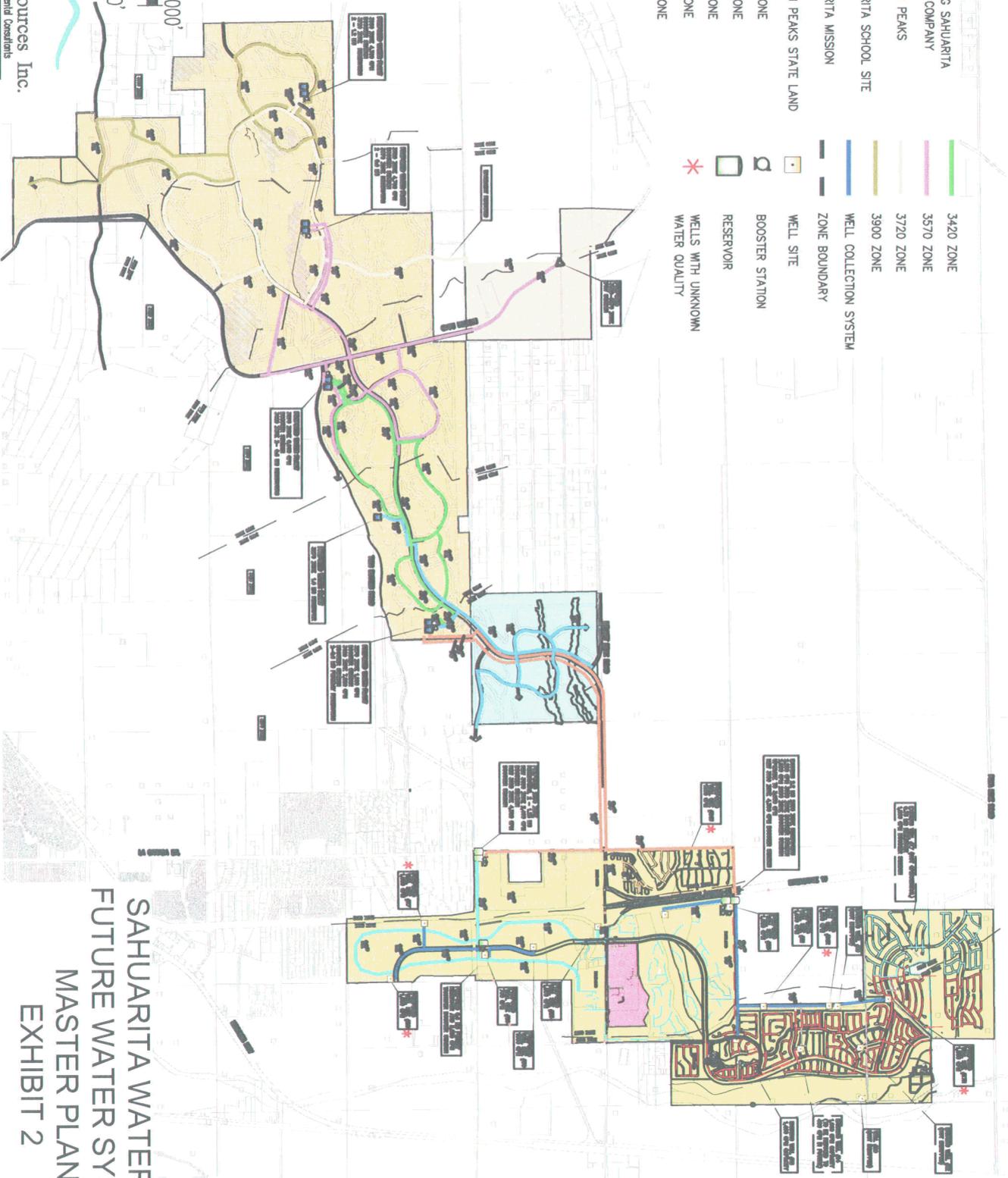
2007

WestLand Resources Inc.
 Engineering and Environmental Consultants
 4001 E. Granddise Field Drive
 Tucson, Az 85712 (520) 268-9999

SCALE: 1" = 3000'



- LEGEND**
- EXISTING SAHUARITA WATER COMPANY
 - MISSION PEAKS
 - SAHUARITA SCHOOL SITE
 - SAHUARITA MISSION
 - MISSION PEAKS STATE LAND
 - 2850 ZONE
 - 2950 ZONE
 - 3050 ZONE
 - 3150 ZONE
 - 3270 ZONE
 - 3420 ZONE
 - 3570 ZONE
 - 3720 ZONE
 - 3900 ZONE
 - WELL COLLECTION SYSTEM
 - WELL SITE
 - BOOSTER STATION
 - RESERVOIR
 - WELLS WITH UNKNOWN WATER QUALITY
 - ZONE BOUNDARY



**SAHUARITA WATER CO.
 FUTURE WATER SYSTEM
 MASTER PLAN
 EXHIBIT 2**

November 20, 2007

APPENDIX “T”

(Opinion of Probable Construction Cost, as prepared by WestLand Resources, Inc.; and, Projected Utility Plant Account Balances, as prepared by Thomas J. Bourassa, C.P.A.)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

Sahuarita Water Co., L.L.C
Plant
Projected Years

Line No.	Account	Description	A/IAC Spread	Depreciation Rate	Estimate	Engineering Permits, Etc.	Gross Amt	Year		A/D Balance	
								Additions	Balance		
1	301	Organization		0.00%					120,000		
2	302	Franchises		0.00%							
3	303	Land and Land Rights		0.00%					25,000		
4	304	Structures and Improvements		2.90%				3,636	125,387	5,454	
5	305	Collecting and Impounding Rese		2.90%							
6	306	Lake, River and Other Intakes		4.00%							
7	307	Wells and Springs		4.00%					1,551,481	93,089	
8	308	Infiltration Galleries and Tun		2.00%							
9	309	Supply Mains		5.00%							
10	310	Power Generation Equipment		5.00%	701,915	175,479	877,394	877,394	2,957,789	177,964	
11	311	Pumping Equipment		5.00%							
12	320	Water Treatment Equipment		3.30%	701,915	175,479	877,394	877,394	1,723,656	56,367	
13	330	Distribution Reservoirs and St	0%	2.00%	4,246,587	1,061,647	5,308,233	5,308,233	11,826,851	248,641	
14	331	Transmission and Distribution	100%	2.00%	740,813	185,203	926,016	926,016	1,382,786	22,963	
15	333	Services (AIAC)		3.30%							
16	334	Meters and Meter Installations (AIAC)		2.60%	240,218	60,054	300,272	300,272	455,768	9,968	
17	335	Hydrants	0%	2.40%							
18	336	Backflow Prevention Devices	100%	2.40%							
19	339	Other Plant and Miscellaneous		6.67%							
20	340	Office Furniture and Equipment		4.60%							
21	341	Transportation Equipment		12.90%							
22	342	Stores Equipment		5.00%							
23	343	Tools, Shop and Garage Equipme		6.30%							
24	344	Laboratory Equipment		6.70%							
25	345	Power Operated Equipment		9.00%							
26	346	Communication Equipment		9.00%							
27	347	Miscellaneous Equipment		9.00%							
28	348	Other Tangible Plant		9.00%							
29											
30											
31											
32											
33											
34											
35											
36											
37											
38											
39											
40											
41											
42											
43											
44											
45											
46											
47											
		Totals			\$ 6,631,447	\$ 1,657,862	\$ 8,289,309	\$ 8,289,309	\$ 443,850	\$ 20,168,718	\$ 614,447
		Composite Rate with 1/2 yr convention									2.20%
		Licenses, Taxes, Permits	0%								
		Engineering and Contingency	25%								
		Total			\$ 1,657,862	\$ 1,657,862					

Sahuarita Water Co., L.L.C
Plant
Projected Years

Line No.	Account	Description	A/IAC Spread	Depreciation Rate	Estimate	Engineering Permits, Etc.	Gross Amt	Additions	Depreciation	Balance	A/D Balance	Year						
												3						
1	301	Organization		0.00%	-	-	-	-	-	120,000	-							
2	302	Franchises		0.00%	-	-	-	-	-	-	-							
3	303	Land and Land Rights		0.00%	-	-	-	-	-	25,000	-							
4	304	Structures and Improvements		2.90%	-	-	-	3,636	-	125,387	9,091							
5	305	Collecting and Impounding Rese		2.00%	-	-	-	-	-	-	-							
6	306	Lake, River and Other Intakes		2.90%	-	-	-	-	-	-	-							
7	307	Wells and Springs		4.00%	-	-	-	62,059	-	1,551,481	155,148							
8	308	Infiltration Galleries and Tun		4.00%	-	-	-	-	-	-	-							
9	309	Supply Mains		2.00%	-	-	-	-	-	-	-							
10	310	Power Generation Equipment		5.00%	-	-	-	-	-	-	-							
11	311	Pumping Equipment		5.00%	-	-	-	147,889	-	2,957,789	325,854							
12	312	Water Treatment Equipment		5.00%	-	-	-	-	-	-	-							
13	313	Distribution Reservoirs and St		3.30%	729,992	182,498	912,490	912,490	71,937	2,636,146	128,304							
14	314	Transmission and Distribution	0%	2.00%	-	-	-	-	236,537	11,826,851	485,178							
15	315	Services (AIAC)	100%	3.30%	1,134,468	283,617	1,418,085	1,418,085	41,837	2,800,871	64,800							
16	316	Meters and Meter Installations (AIAC)		2.60%	351,343	87,836	439,178	439,178	17,559	894,946	27,527							
17	317	Hydrants	0%	2.40%	-	-	-	-	-	-	-							
18	318	Backflow Prevention Devices	100%	2.40%	-	-	-	-	-	-	-							
19	319	Other Plant and Miscellaneous		6.67%	-	-	-	-	-	-	-							
20	320	Office Furniture and Equipment		6.67%	-	-	-	-	-	-	-							
21	321	Transportation Equipment		4.60%	-	-	-	-	-	-	-							
22	322	Stores Equipment		12.90%	-	-	-	-	-	-	-							
23	323	Tools, Shop and Garage Equipme		5.00%	-	-	-	-	-	-	-							
24	324	Laboratory Equipment		6.30%	-	-	-	-	-	-	-							
25	325	Power Operated Equipment		6.70%	-	-	-	-	-	-	-							
26	326	Communication Equipment		9.00%	-	-	-	-	-	-	-							
27	327	Miscellaneous Equipment		9.00%	-	-	-	-	-	-	-							
28	328	Other Tangible Plant		9.00%	-	-	-	-	-	-	-							
29	329				-	-	-	-	-	-	-							
30	330				-	-	-	-	-	-	-							
31	331				-	-	-	-	-	-	-							
32	332				-	-	-	-	-	-	-							
33	333				-	-	-	-	-	-	-							
34	334				-	-	-	-	-	-	-							
35	335				-	-	-	-	-	-	-							
36	336				-	-	-	-	-	-	-							
37	337				-	-	-	-	-	-	-							
38	338				-	-	-	-	-	-	-							
39	339				-	-	-	-	-	-	-							
40	340				-	-	-	-	-	-	-							
41	341				-	-	-	-	-	-	-							
42	342				-	-	-	-	-	-	-							
43	343				-	-	-	-	-	-	-							
44	344				-	-	-	-	-	-	-							
45	345				-	-	-	-	-	-	-							
46	346				-	-	-	-	-	-	-							
47	347				-	-	-	-	-	-	-							
48	348				-	-	-	-	-	-	-							
Totals												\$ 2,215,802	\$ 553,951	\$ 2,769,753	\$ 2,769,753	\$ 581,454	\$ 22,938,470	\$ 1,195,901
Composite Rate with 1/2 yr convention												2.53%						
Licenses, Taxes, Permits												\$ -						
Engineering and Contingency												\$ 553,951						
Total												\$ 553,951						

Sahuarita Water Co., L.L.C
Plant
Projected Years

Line No.	Description	Account	AIAC Spread	Depreciation Rate	Estimate	Engineering Permits, Etc.	Year										
							Gross Amt	Additions	Depreciation	Balance	A/D Balance						
1	Organization	301		0.00%													
2	Franchises	302		0.00%													
3	Land and Land Rights	303		0.00%									25,000				
4	Structures and Improvements	304		2.90%									125,387	12,727			
5	Collecting and Impounding Rese	305		2.00%													
6	Lake, River and Other Intakes	306		2.90%													
7	Wells and Springs	307		4.00%	1,391,851	347,963	1,739,814	1,739,814	96,856				3,291,294	252,004			
8	Infiltration Galleries and Tun	308		4.00%													
9	Supply Mains	309		2.00%													
10	Power Generation Equipment	310		5.00%													
11	Pumping Equipment	311		5.00%									147,889	473,743			
12	Water Treatment Equipment	320		5.00%													
13	Distribution Reservoirs and St	330		3.30%	1,012,255	253,064	1,265,319	1,265,319	107,871				3,901,465	236,174			
14	Transmission and Distribution	331	0%	2.00%	2,148,512	537,128	2,685,640	2,685,640	263,393				14,512,490	748,571			
15	Transmission and Distribution (AIAC)	331	100%	2.00%	1,931,636	482,909	2,414,545	2,414,545	80,163				5,215,416	144,963			
16	Services (AIAC)	333		3.30%													
17	Meters and Meter Installations (AIAC)	334		2.60%	573,910	143,478	717,388	717,388	32,595				1,612,333	60,122			
18	Hydrants	335		2.40%													
19	Hydrants (AIAC)	335	0%	2.40%													
20	Backflow Prevention Devices	336	100%	6.67%													
21	Other Plant and Miscellaneous	339		6.67%													
22	Office Furniture and Equipment	340		4.60%													
23	Transportation Equipment	341		12.90%													
24	Stores Equipment	342		5.00%													
25	Tools, Shop and Garage Equipme	343		6.30%													
26	Laboratory Equipment	344		6.70%													
27	Power Operated Equipment	345		9.00%													
28	Communication Equipment	346		9.00%													
29	Miscellaneous Equipment	347		9.00%													
30	Other Tangible Plant	348		9.00%													
31																	
32																	
33																	
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36																	
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45																	
46																	
47																	
Totals											\$ 7,058,164	\$ 1,764,541	\$ 8,822,705	\$ 8,822,705	\$ 732,403	\$ 31,761,175	\$ 1,928,304
Composite Rate with 1/2 yr convention											2.31%						
Licenses, Taxes, Permits											\$ -	-					
Engineering and Contingency											\$ 1,764,541						
Total											\$ 1,764,541						

Sahuarita Water Co., L.L.C
Plant
Projected Years

Line No.	Account	Description	AIAC Spread	Depreciation Rate	Estimate	Engineering Permits, Etc.	Gross Amt	Additions	Depreciation	Balance	A/D Balance
					\$		\$	\$	\$	\$	\$
1	301	Organization		0.00%						120,000	
2	302	Franchises		0.00%							
3	303	Land and Land Rights		0.00%						25,000	
4	304	Structures and Improvements		2.90%					3,636	125,387	
5	305	Collecting and Impounding Rese		2.90%							16,363
6	306	Lake, River and Other Intakes		2.90%							
7	307	Wells and Springs		4.00%					131,652	3,291,294	
8	308	Infiltration Galleries and Tun		4.00%							383,655
9	309	Supply Mains		2.00%							
10	310	Power Generation Equipment		5.00%							
11	311	Pumping Equipment		5.00%					147,889	2,957,789	
12	312	Water Treatment Equipment		5.00%							621,633
13	313	Distribution Reservoirs and St		3.30%							
14	314	Transmission and Distribution		2.00%	757,977	189,484	947,471	947,471	128,748	3,901,465	364,923
15	315	Services (AIAC)	0%	2.00%	1,910,470	477,617	2,388,087	2,388,087	289,725	15,459,961	1,048,296
16	316	Meters and Meter Installations (AIAC)	100%	3.30%					128,189	7,603,503	273,152
17	317	Hydrants		2.60%	545,335	136,334	681,669	681,669	50,762	2,294,002	110,904
18	318	Hydrants (AIAC)	0%	2.40%							
19	319	Backflow Prevention Devices	100%	2.40%							
20	320	Other Plant and Miscellaneous		6.67%							
21	321	Office Furniture and Equipment		6.67%							
22	322	Transportation Equipment		4.60%							
23	323	Stores Equipment		12.90%							
24	324	Tools, Shop and Garage Equipme		5.00%							
25	325	Laboratory Equipment		6.30%							
26	326	Power Operated Equipment		6.70%							
27	327	Communication Equipment		9.00%							
28	328	Miscellaneous Equipment		9.00%							
29	329	Other Tangible Plant		9.00%							
30	330										
31	331										
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189	489										
190	490										

APPENDIX “U”

(Sahuarita Water Company, L.L.C.’s (i) Balance Sheet, (ii) Income Statement, and (iii) Annual Operating Revenues, Expenses and Customers for Projected Years 1 through 5, as prepared by Thomas J. Bourassa, C.P.A.)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

Sahuarita Water Co., L.L.C
Projected Balance Sheets
For the Years Ended

Line No.	Beginning of Year	Label	1st Year Changes	1	2	3	4	5
2		Assets						
4		Utility Plant	11,879,409	11,879,409	20,168,718	22,938,470	31,761,175	35,778,402
5		Accumulated Depreciation	(170,596)	(170,596)	(614,447)	(1,195,901)	(1,928,304)	(2,818,926)
7		Cash	206,770	231,770	616,526	560,521	179,239	346,959
10		Total Assets	\$ 11,915,582	\$ 11,940,582	\$ 20,170,797	\$ 22,303,090	\$ 30,012,110	\$ 33,306,436
12		Equity and Liabilities						
13		Equity						
16		Common Stock, Net of	11,188,486	11,183,486	18,039,441	18,049,027	22,048,307	22,048,307
17		Retained Earnings	38,186	38,186	29,082	116,872	430,355	576,507
19		Total Equity	\$ 11,196,672	\$ 11,221,672	\$ 18,068,524	\$ 18,165,899	\$ 22,478,661	\$ 22,624,814
22		Liabilities & Deferred Credits						
23		Advances in Aid of Construction	580,783	580,783	1,705,988	3,370,394	6,164,726	8,759,029
24		Contributions in Aid of						
25		Construction	140,140	140,140	407,260	798,000	1,432,970	2,037,560
26		Less: Amortization	(2,013)	(2,013)	(10,975)	(31,203)	(64,247)	(114,967)
27		Customer Deposits						
28		Long-Term Debt						
30		Total Liabilities and Deferred Credits	718,910	718,910	2,102,273	4,137,191	7,533,449	10,681,622
35		Total Equity & Liab.	\$ 11,915,582	\$ 11,940,582	\$ 20,170,797	\$ 22,303,090	\$ 30,012,110	\$ 33,306,436

- (a) Plant Additions (See Appendix T, pages 1.1 through 1.5)
- (b) Depreciation Computations (See Appendix T, pages 1.1 through 1.5)
- (c) Cash flows (See Appendix U, page 1.5)
- (d) Financing (See Appendix U, page 1.1)
- (e) Profit or loss from operations (See Appendix U, page 2)
- (f) Advances-in-Aid of Construction (See Appendix U, pages 1.2 and 1.4)
- (g) Contributions-in-Aid of Construction (See Appendix U, page 1.3)

Sahuarita Water Co., L.L.C
Schedule of Developer Advances and Refunds
Projected Years

Line No.	Year				
	1	2	3	4	5
Developer Advances Collected					
Developer Advances - Trans & Dist.	\$ 456,770	\$ 926,016	\$ 1,418,085	\$ 2,414,545	\$ 2,388,087
Total Collected	\$ 456,770	\$ 926,016	\$ 1,418,085	\$ 2,414,545	\$ 2,388,087
Cummulative Collected	\$ 456,770	\$ 1,382,786	\$ 2,800,871	\$ 5,215,416	\$ 7,603,503
Developer Advances Refunded (a)					
Based on Revenues		28,627	68,599	122,566	213,028
Total Refunds	\$ -	\$ 28,627	\$ 68,599	\$ 122,566	\$ 213,028
Cummulative Refunds	\$ -	\$ 28,627	\$ 97,226	\$ 219,791	\$ 432,820
Cummulative Balance	\$ 456,770	\$ 1,354,159	\$ 2,703,645	\$ 4,995,625	\$ 7,170,684
(a) Refund Rate per Year					10% based on revenues.

Sahuarita Water Co., L.L.C
Schedule of Contributions-In-Aid of Construction
Projected Years

APPENDIX U
 Schedule 1.3

Line No.	Year				
	1	2	3	4	5
Contributions (Hook-up Fees)					
Residential	130,900	259,000	381,500	626,850	595,350
Commercial	8,120	8,120	8,120	8,120	8,120
Irrigation	1,120	-	1,120	-	1,120
Developer Contributions					
Developer Contributions	\$ -	\$ -	\$ -	\$ -	\$ -
Total Collected	\$ 140,140	\$ 267,120	\$ 390,740	\$ 634,970	\$ 604,590
Cummulative Collected	\$ 140,140	\$ 407,260	\$ 798,000	\$ 1,432,970	\$ 2,037,560
Amortization					
Composite Rate (1/2 Yr Conv.)	1.44%	2.20%	2.53%	2.31%	2.49%
Amortization	\$ 2,013	\$ 8,963	\$ 20,228	\$ 33,044	\$ 50,720
Cummulative Amortization	\$ 2,013	\$ 10,975	\$ 31,203	\$ 64,247	\$ 114,967
Cummulative Balance	\$ 138,127	\$ 396,285	\$ 766,797	\$ 1,368,723	\$ 1,922,593

Sahuarita Water Co., L.L.C
Schedule of Service Line and Meter Installation Refunds
Projected Years

APPENDIX U
 Schedule 1.4

Line No.	1	2	3	4	5
Service Line and Meter Installations					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12	\$ 118,745	\$ 234,950	\$ 346,075	\$ 568,643	\$ 540,068
13	5,268	5,268	5,268	5,268	5,268
14	-	-	-	-	-
15	\$ 124,013	\$ 240,218	\$ 351,343	\$ 573,910	\$ 545,335
16					
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38					

(a) Refund Rate per Year
 10%

Sahuarita Water Co., L.L.C
 Projected Cash Flows
 For the Years Ended

Line No.	Year	1	2	3	4	5
2						
3						
4						
5						
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Sahuarita Water Co., L.L.C
 Projected Statements of Income
 For the 12 Months Ended

Line No.	Description	Cost Per	Year				
			1	2	3	4	5
			\$ 286,271	\$ 685,987	\$ 1,225,657	\$ 2,130,282	\$ 2,814,506
1	Minimum						
2	Metered Water Revenues(g)		\$ 286,271	\$ 685,987	\$ 1,225,657	\$ 2,130,282	\$ 2,814,506
3	Unmetered Water Revenues						
4	Other Water Revenues						
5	Total estimated Revenues		\$ 286,271	\$ 685,987	\$ 1,225,657	\$ 2,130,282	\$ 2,814,506
6	Variable Expenses						
7	Pumping Power (per 1,000 gallons)(b)	0.30	6,178	24,045	53,916	102,096	163,021
8	CAGR Costs	See Gallons Sold Summary	7,634	33,812	85,460	180,165	317,474
9	Repairs & Maint.(a)(b)	0.25 /month/customer	589	2,328	5,329	10,231	16,454
10	Gen. Insurance (a)(b)	0.80 /month/customer	1,829	7,451	17,054	32,740	52,652
11	Water Treatment & Testing (d)(b)	0.10 /1,000 gallon	2,059	8,015	17,972	34,032	54,340
12	Billing, Postage, Operations (a)(b)	17.00 /month/customer	38,862	158,325	362,401	695,722	1,118,859
13			\$ 57,150	\$ 233,976	\$ 542,133	\$ 1,054,986	\$ 1,722,802
14	Other Expenses						
15	Depreciation net of Amortization of CIAC (h)		168,584	434,888	561,226	699,359	839,901
16	Office (b)	\$ 2,500	2,500	2,575	2,732	2,985	3,360
17	Legal & Accounting (b)	\$ 2,500	2,500	2,575	2,732	2,985	3,360
18	Miscellaneous Expenses (b) (e)	\$ 1,200	1,200	1,236	1,311	1,433	1,613
19	Income Taxes		-	-	-	-	-
20	Property Taxes (f)	See Property Tax	16,526	23,692	40,456	72,708	108,415
21			\$ 191,310	\$ 464,966	\$ 608,458	\$ 779,469	\$ 956,648
22	Total Other Expense		\$ 191,310	\$ 464,966	\$ 608,458	\$ 779,469	\$ 956,648
23			\$ 248,460	\$ 698,942	\$ 1,150,591	\$ 1,834,455	\$ 2,679,450
24	Total Operating Expenses		\$ 248,460	\$ 698,942	\$ 1,150,591	\$ 1,834,455	\$ 2,679,450
25	Operating income (loss)		\$ 37,811	\$ (12,955)	\$ 75,066	\$ 295,827	\$ 135,056
26	Less:						
27	Interest (Expense) Income on Work. Cap. (c)		375	3,852	12,724	17,656	11,096
28	Interest Expense Long-term Debt (c)	3.00%	-	-	-	-	-
29			\$ 38,186	\$ (9,104)	\$ 87,790	\$ 313,482	\$ 146,152
30	Net Income		\$ 38,186	\$ (9,104)	\$ 87,790	\$ 313,482	\$ 146,152
31							
32							
33	(a) Per customer per month						
34	(b) Annual Inflation of:						
35	(c) If Applicable						
36	(d) ADEQ based on per 1,000 gallons sold						
37	(e) Miscellaneous Expenses of \$100 per month						
38	(f) Property Tax Calculation (Appendix U, page 2.4)						
39	(g) Revenues (see Appendix U, page 2.1)						
40	(h) Depreciation and amortization (see Appendix T, pages 1.1 to 1.5 and Appendix U, page 1.3)						
41							

Sahuarita Water Co., L.L.C.
Customer Counts
For Projected Years Ended

APPENDIX U
Page 2.2

Line No.	Year Ended	1	2	3	4	5
1	Residential	374	1,114	2,204	3,995	5,696
2	5/8 inch					
3	3/4 inch					
4	1 inch					
5	2 inch					
6	3 inch					
7	Commercial					
8	5/8 inch					
9	3/4 inch					
10	1 inch	2	4	6	8	10
11	2 inch	3	6	9	12	15
12	3 inch					
13	Irrigation					
14	5/8 inch					
15	3/4 inch	1	1	2	2	3
16	1 inch	1	1	2	2	3
17	2 inch					
18	Total	381	1,126	2,223	4,019	5,727
19	1/2 Year Convention					
20	Year Ended	1	2	3	4	5
21	Residential	187.00	744.00	1,659.00	3,099.50	4,845.50
22	5/8 inch					
23	3/4 inch					
24	1 inch					
25	2 inch					
26	3 inch					
27	Commercial					
28	5/8 inch					
29	3/4 inch					
30	1 inch	1.00	3.00	5.00	7.00	9.00
31	2 inch	1.50	4.50	7.50	10.50	13.50
32	3 inch					
33	Irrigation					
34	5/8 inch					
35	3/4 inch	0.50	1.00	1.50	2.00	2.50
36	1 inch	0.50	1.00	1.50	2.00	2.50
37	2 inch					
38	3 inch					
39	Total	190.50	753.50	1,674.50	3,121.00	4,873.00

Line No.	Year Ended	1	2	3	4	5
1	Residential	17,952	71,424	159,264	237,552	465,168
2	5/8 Inch					
3	3/4 Inch					
4	1 Inch					
5	2 Inch					
6	3 inch					
7	Commercial					
8	5/8 Inch					
9	3/4 Inch	300	900	1,500	2,100	2,700
10	1 Inch					
11	2 Inch	810	2,430	4,050	5,670	7,290
12	3 inch					
13	Irrigation					
14	5/8 Inch	450	900	1,350	1,800	2,250
15	3/4 Inch					
16	1 Inch	1,080	2,160	3,240	4,320	5,400
17	2 Inch					
18						
19						
20						
21						
22						
23						
24						
25	Total	20,592	77,814	169,404	311,442	482,808
26	Acre Feet	63.19	238.80	519.88	955.78	1481.68
27						
28						
29	CAGR Costs					
30	Year					
31	2010	40.0%	\$ 302.00			a
32	2011	43.3%	\$ 327.00			a
33	2012	46.7%	\$ 352.00			a
34	2013	50.0%	\$ 377.00			b
35	2014	53.3%	\$ 402.00			b
36						
37						
38						
39						
40						
41						
42						
43						
44						

Replenishment Obligation (per acre foot) Note
 40.0% a
 43.3% a
 46.7% a
 50.0% b
 53.3% b

a - Published advisory costs
 b - Additional \$25/year

Sahuarita Water Co., L.L.C
Schedule for the Computation of Projected
Property Taxes for the Years Ended

APPENDIX U
Page 2.4

Line No.	Year				
	1	2	3	4	5
Revenue Component 1	\$ 286,271	\$ 286,271	\$ 286,271	\$ 685,987	\$ 1,225,657
Revenue Component 2	286,271	286,271	685,987	1,225,657	2,130,282
Revenue Component 3	286,271	685,987	1,225,657	2,130,282	2,814,506
Average 3 years of revenue	286,271	419,510	732,638	1,347,308	2,056,815
Average 3 years of revenue times 2	\$ 572,543	\$ 839,019	\$ 1,465,276	\$ 2,694,617	\$ 4,113,630
Add:					
Construction Work in Progress at 10%	0	0	0	0	0
Deduct:					
Book Value of Transportation Equipment	0	0	0	0	0
Full Cash Value	\$ 572,543	\$ 839,019	\$ 1,465,276	\$ 2,694,617	\$ 4,113,630
Times Assessment Ratio	23.00%	22.50%	22.00%	21.50%	21.00%
Assessed Value	\$ 131,685	\$ 188,779	\$ 322,361	\$ 579,343	\$ 863,862
Property Tax Rate	12.55%	12.55%	12.55%	12.55%	12.55%
Computed Property Tax	\$ 16,526	\$ 23,692	\$ 40,456	\$ 72,708	\$ 108,415

Sahuarita Water Co., L.L.C
Schedule of Projected Revenues
For the Years Ended

Line No.		Year	1	2	3	4	5
<u>Projected Customers / Residential 5/8 Inch Meter</u>							
6	Estimated connections installed by year end (Cumulative)		374	1,114	2,204	3,995	5,696
8	Estimated connection installed during the year		374	740	1,090	1,791	1,701
10	1/2 Year Convention for Revenue		187.00	744.00	1,659.00	3,099.50	4,845.50
<u>Projected Revenue</u>							
14	Annual gallonage delivered (in 1,000's)		17,952	71,424	159,264	297,552	465,168
15	Assuming average usage per month of:						
16	Daily Gallons	8,000	49,867	198,400	442,400	826,533	1,292,133
17	Residential:						
18	Monthly Mins.	\$ 16.00	\$ 35,904	\$ 142,848	\$ 318,528	\$ 595,104	\$ 930,336
19	Commodity Rev.		39,943	158,918	354,362	662,053	1,034,999
20	from						
21	Charge per/1,000	6,000 gals					
22	Charge per/1,000	up to					
23	Charge per/1,000	up to					
24	Charge per/1,000	10,000 gals					
25	Over	10,000 gals					
27	Establishment Fees at	\$ 25.00	\$ 9,350	\$ 18,500	\$ 27,250	\$ 44,775	\$ 42,525
28	Total Revenue		\$ 85,197	\$ 320,266	\$ 700,140	\$ 1,301,932	\$ 2,007,860
31	AWWA factor used	1.00					

Sahuarita Water Co., L.L.C
Schedule of Projected Revenues
For the Years Ended

Line No.	Description	1	2	3	4	5
Projected Customers / Irrigation 3/4 Inch Meter						
6	Estimated connections installed by year end (Cumulative)	1	1	2	2	3
7	Estimated connection installed during the year	1	-	1	-	1
8	1/2 Year Convention for Revenue	0.50	1.00	1.50	2.00	2.50
Projected Revenue						
14	Annual gallonage delivered (in 1,000's)	450	900	1,350	1,800	2,250
15	Assuming average usage per month of:					
16	Daily Gallons	1,250	2,500	3,750	5,000	6,250
17	Commercial					
18	Monthly Mins. 1 Inch Meter	\$ 150	\$ 300	\$ 450	\$ 600	\$ 750
19	Commodity Rev.					
20	Minimum Charge Gals. in minimum Charge per 1,000	\$ 2.05				
21	from		\$ 2.75			
22	up to	1,212	2,425	3,637	4,849	6,062
23	Charge per 1,000					
24	Over					
25	Establishment Fees at	\$ 25	\$ -	\$ 25	\$ -	\$ 25
26	Total Revenue	\$ 1,387	\$ 2,725	\$ 4,112	\$ 5,449	\$ 6,837
29	AWWA Factor Used					
30						
31						
32						
33						
34						
35						
36						
37						
38						

Sahuarita Water Co., L.L.C
Schedule of Projected Revenues
For the Years Ended

Line No.	Description	1	2	3	4	5
<u>Projected Customers / Irrigation 1 Inch Meter</u>						
6	Estimated connections installed by year end (Cumulative)	1	1	2	2	3
8	Estimated connection installed during the year	1	-	1	-	1
10	1/2 Year Convention for Revenue	0.50	1.00	1.50	2.00	2.50
<u>Projected Revenue</u>						
14	Annual gallonage delivered (in 1,000's)	1,080	2,160	3,240	4,320	5,400
15	Assuming average usage per month of:					
16	Daily Gallons	3,000	6,000	9,000	12,000	15,000
17	Commeical					
18	Monthly Mins. 1 Inch Meter	\$ 240	\$ 480	\$ 720	\$ 960	\$ 1,200
19	Commodity Rev.					
20	from	\$ 2,945	\$ 5,890	\$ 8,834	\$ 11,779	\$ 14,724
21	Minimum Charge					
22	Gals. in minimum Charge per/1,000	6,000	6,000	6,000	6,000	6,000
23	up to					
24	Charge per/1,000					
25	Over					
26	Establishment Fees at	\$ 25	\$ -	\$ 25	\$ -	\$ 25
27	Total Revenue	\$ 3,210	\$ 6,370	\$ 9,579	\$ 12,739	\$ 15,949
29	AWWA Factor Used					
30						
31						
32						
33						
34						
35						
36						
37						
38						

Sahuarita Water Co., L.L.C
 Schedule of Projected Revenues
 For the Years Ended

Line No.		1	2	3	4	5
1	Projected Customers / Commercial 1 Inch Meter					
2	Estimated connections installed by year end (Cumulative)	2	4	6	8	10
3	Estimated connection installed during the year	2	2	2	2	2
4	1/2 Year Convention for Revenue	1.00	3.00	5.00	7.00	9.00
5	Projected Revenue					
6	Annual gallonage delivered (in 1,000's)	300	900	1,500	2,100	2,700
7	Assuming average usage per month of:					
8	Daily Gallons	833	2,500	4,167	5,833	7,500
9	Commercial					
10	Monthly Mins. 1 Inch Meter	\$ 480	\$ 1,440	\$ 2,400	\$ 3,360	\$ 4,320
11	Commodity Rev.	\$ 699	\$ 2,097	\$ 3,495	\$ 4,893	\$ 6,291
12	Minimum Charge					
13	Gals. in minimum					
14	Charge per/1,000					
15	up to 15,000 gals					
16	Charge per/1,000					
17	up to 25,000 gals					
18	Charge per/1,000					
19	up to ##### gals					
20	Charge per/1,000					
21	Over ##### gals					
22	Establishment Fees at	\$ 50	\$ 50	\$ 50	\$ 50	\$ 50
23	Total Revenue	\$ 1,229	\$ 3,587	\$ 5,945	\$ 8,303	\$ 10,661
24	AWWA Factor Used					
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						

Sahuarita Water Co., L.L.C
 Schedule of Projected Revenues
 For the Years Ended

Line No.	Description	Year				
		1	2	3	4	5
1	Projected Customers / Commercial 2 Inch Meter					
6	Estimated connections installed by year end (Cumulative)	3	6	9	12	15
8	Estimated connection installed during the year	3	3	3	3	3
10	1/2 Year Convention for Revenue	1.50	4.50	7.50	10.50	13.50
12	Projected Revenue					
14	Annual gallonage delivered (in 1,000's)	810	2,430	4,050	5,670	7,290
15	Assuming average usage per month of:					
16	Daily Gallons	2,250	6,750	11,250	15,750	20,250
17	Commercial					
18	Monthly Mins. 2 Inch Meter	\$ 120.00				
19	Commodity Rev.	\$	\$ 6,480	\$ 10,800	\$ 15,120	\$ 19,440
20			4,982	8,303	11,624	14,945
21	from					
22	Charge per/1,000	\$ 2.05				
23	from	\$ 2.75				
24	Charge per/1,000	\$ 48,000				
25	from	\$ 2.75				
26	Charge per/1,000	\$ 80,000				
27	Over	\$ 2.75				
28						
29	Establishment Fees at	\$ 25.00				
30	Total Revenue	\$ 3,896	\$ 11,537	\$ 19,178	\$ 26,819	\$ 34,460
32	AWWA Factor Used					8.00

Sahuarita Water Co., L.L.C
Schedule of Projected Revenues
For the Years Ended

Line No.	Year	1	2	3	4	5
<u>Projected Customers / Irrigation 1 Inch Meter</u>						
6	Estimated connections installed by year end (Cumulative)	5	15	25	35	45
8	Estimated connection installed during the year	5	10	10	10	10
10	1/2 Year Convention for Revenue	2.50	10.00	20.00	30.00	40.00
<u>Projected Revenue</u>						
14	Annual gallonage delivered (in 1,000's)	11,520	46,080	92,160	138,240	184,320
15	Assuming average usage per month of:					
16	Daily Gallons	32,000	128,000	256,000	384,000	512,000
17	Commercial					
18	Monthly Mins. 1 Inch Meter	\$ 3,600	\$ 14,400	\$ 28,800	\$ 43,200	\$ 57,600
19	Commodity Rev.					
20		\$ 30,672	\$ 122,688	\$ 245,376	\$ 368,064	\$ 490,752
21	from					
22	Charge per/1,000					
23	Charge per/1,000					
24	Charge per/1,000					
25	Charge per/1,000					
26	Charge per/1,000					
27	Over					
28						
29						
30	Total Revenue	\$ 34,397	\$ 137,338	\$ 274,426	\$ 411,514	\$ 548,602
31						
32						
33	AWWA Factor Used					
34						
35						
36						

Sahuarita Water Co., L.L.C
 Schedule of Projected Revenues
 For the Years Ended

Line No.		1	2	3	4	5
1	<u>Projected Customers / Construction Water</u>					
2	Estimated connections installed by year end (Cumulative)	1	1	1	1	1
3	Estimated connection installed during the year	-	-	-	-	-
4	1/2 Year Convention for Revenue	1.00	1.00	1.00	1.00	1.00
5	<u>Projected Revenue</u>					
6	Annual gallonage delivered (in 1,000's)	57,150	111,750	164,550	269,400	256,200
7	Assuming average usage per unit added per month of:	4,762,500	9,312,500	13,712,500	22,450,000	21,350,000
8	Daily Gallons	158,750	310,417	457,083	748,333	711,667
9	Commercial					
10	Monthly Mins. 1 Inch Meter	\$ 1,440	\$ 1,440	\$ 1,440	\$ 1,440	\$ 1,440
11	Commodity Rev.	157,163	307,313	452,513	740,850	704,550
12	from					
13	Minimum Charge					
14	Gals. in minimum					
15	Charge per/1,000					
16	up to					
17	##### gals					
18	Establishment Fees at	\$ 25.00				
19	Total Revenue	\$ 158,603	\$ 308,753	\$ 453,953	\$ 742,290	\$ 705,990
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33	AWWA Factor Used		8.00			
34						
35						
36						

APPENDIX “V”

(Modification of Designation of Assured Water Supply Application, and the November 23, 2007 Assured Water Supply and Supporting Hydrology Report for Sahuarita Water Company, L.L.C., as prepared by Brown and Caldwell)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

ARIZONA DEPARTMENT OF WATER RESOURCES OFFICE OF ASSURED AND ADEQUATE WATER SUPPLY 3550 NORTH CENTRAL AVENUE, 2 nd FLOOR PHOENIX, ARIZONA 85012 (602) 771-8585 Fax: (602) 771-8689	DATE RECEIVED:
APPLICATION NO:	

DESIGNATION OR MODIFICATION OF DESIGNATION OF ASSURED WATER SUPPLY APPLICATION
PART A - GENERAL INFORMATION

- This is an application for: New Designation Modification of an existing designation
- Name of municipal provider: Sahuarita Water Company, LLC AMA: Tucson
 ADWR No. 56-000373.0000
- Name and address of person representing the municipal provider:
 Name: Mark Seamans
 Title: General Manager E-Mail: mseamans@ranchosahuarita.com
 Address: PO Box 1520, Sahuarita, AZ 85629 Phone: 520-399-1105 Fax: 520-399-1095
- Contact person for questions regarding this application:
 Name: Kristen Whatley
 Company: WestLand Resources, Inc. E-Mail: kwhatley@westlandresources.com
 Address: 4100 E. Paradise Falls Drive, Tucson, AZ 85712 Phone: 520-206-9585 Fax: 520-206-9518
- If not already on file with the Department, provide a map of the service area that includes the current and proposed distribution system and any treatment or storage facilities and reference as an attachment.

 Up to date service area map on file with the Department
 Hard copy of service area map attached Attachment: Attachment A
 Electronic copy of service area map attached Attachment: _____

I DO HEREBY certify that the information contained in **this application and all information accompanying it is true and correct to the best of my knowledge and belief.** **NOTE:** If the applicant is a city or town, include a resolution of the governing body of the city or town authorizing the person to sign the application.

J.V.C. Chalfant Senior Vice-President, Sahuarita Water Company
 Printed Name Title

 11-8-07
 Signature Date

PART E - FINANCIAL CAPABILITY

Please check one of the following and include attachments as necessary:

- The applicant has constructed adequate delivery, storage, and treatment works.
- The applicant has entered into written agreements requiring a potential developer to construct adequate delivery, storage, and treatment works.
Attachment: _____
- If the applicant is a city or town, the applicant has:
 - Adopted a five year capital improvement plan that provides for the construction, or the commencement of construction, of adequate delivery, storage, and treatment works in a timely manner, and has submitted a certification by the applicant's chief financial officer that finances are available to implement that portion of the five-year plan; or
 - Submitted evidence demonstrating that financing mechanisms are in place to construct adequate delivery, storage, and treatment works in a timely manner.
- If the applicant is a private water company, the applicant has received approval from the Arizona Corporation Commission for financing the construction of adequate delivery, storage, and treatment works.

PART F - CONSISTENCY WITH MANAGEMENT GOAL

Please check all that apply below:

- Enrollment of the water provider as a member service area in the Central Arizona Groundwater Replenishment District (Phoenix, Tucson and Pinal AMAs **ONLY**).
A separate application for membership must be filed with the Central Arizona Water Conservation District, and the membership documents **must be executed and recorded before** the Designation will be issued.
- Extinguishment of grandfathered groundwater rights dedicated to the municipal provider's water service area.
Provide evidence and reference the attachment: _____
- Other. Please specify: _____

PART G - WATER QUALITY

1. Are the well or wells from which water will be withdrawn by the municipal provider within one mile of a Water Quality Assurance Revolving Fund (WQARF) or Superfund site? Yes No.
If "Yes", please submit a contaminant migration and mitigation analysis demonstrating that the water supply will continue to meet the water quality requirements in A.A.C. Title 18, Chapter 4, and reference as attachment: _____
2. Municipal provider is or will be regulated by the Arizona Department of Environmental Quality (ADEQ) or another governmental entity with equivalent jurisdiction. If this applies, independent proof of adequate water quality is not required, please skip to Part H.
3. If the municipal provider serves or will serve 15 customers or less, provide current (within the last 60 days) analytical results on water samples taken from a well or wells constructed *within the service area*, demonstrating that the water meets the water quality requirements in A.A.C. Title 18, Chapter 4, and reference as attachment: _____

NOTE: Information on the required water quality analyses may be found at the ADEQ website <http://www.adeq.gov>.

PART H - CONSISTENCY WITH MANAGEMENT PLAN

1. For the municipal or county jurisdiction within which the service area is located, list any water conservation ordinances and briefly describe the sections that apply to the water service area. If they will serve as evidence of your demand projections, please reference as attachment.

Arizona Revised Statute 45.312 (State Plumbing Code Standards for Low Flow Fixtures)

2. Generally describe any other current or proposed conservation practices, rates, fees, restrictions, policies and devices to be utilized within the service area to meet the conservation requirements of the Management Plan: _____

Low water use plumbing fixtures for commercial and residential, non-invasive arid-tolerant landscape plants for residential front yards and commercial landscaping. Reclaimed water re-use on park landscaping, school yards, athletic fields, road medians and trails.

NOTE: If demand estimates rely on these conservation requirements, please reference attachment: _____

PART I - FEES

Please calculate fees by completing the appropriate items below, and include the total fees with your application. Payment may be made by cash, check, or credit card. Checks should be made payable to the Department of Water Resources. **Failure to enclose the required fees will cause the application to be returned. Fees for designations of assured water supply are authorized by A.R.S. § 45-113.**

IF THIS WATER PROVIDER HAS NOT BEEN DESIGNATED PREVIOUSLY, OR IF THIS APPLICATION IS A MODIFICATION OF AN EXISTING DESIGNATION THAT INCLUDES EVALUATION OF PHYSICAL, LEGAL, AND CONTINUOUS AVAILABILITY OR CONSISTENCY WITH MANAGEMENT GOAL, USE THE FEE CALCULATION METHOD BELOW:

- | | |
|---|-------------------|
| 1. Basic Application fee (includes first 1,000 acre-feet) | \$ <u>1000.00</u> |
| 2. Per-acre-foot review fee (for water use in excess of the first 1,000 acre-feet): | |
| Total acre-feet of current demand in this application | 1,348 |
| Less first 1,000 acre-feet | <u>-1000</u> |
| Acre-feet subject to additional review fees <u>348</u> x \$.50 per acre-foot: | <u>\$174.00</u> |
| 3. Subtotal (add items #1 and #2) <u>NOT TO EXCEED \$10,000</u> | <u>\$1174.00</u> |
| 4. Indicate the appropriate AMA and enter the associated Public Notice Fee: | \$ <u>225.00</u> |
| <input type="checkbox"/> Phoenix AMA \$ 52.00 | |
| <input checked="" type="checkbox"/> Tucson AMA \$ 225.00 | |
| <input type="checkbox"/> Pinal AMA \$ 125.00 | |
| <input type="checkbox"/> Prescott AMA \$ 75.00 | |
| <input type="checkbox"/> Santa Cruz AMA \$ 50.00 | |

5. **TOTAL FEE DUE (add items #3 and #4 - NOT TO EXCEED \$10,000):** \$ 1,399

IF THIS IS A MODIFICATION OF AN EXISTING DESIGNATION APPLICATION AND DOES NOT INCLUDE AN EVALUATION OF PHYSICAL, LEGAL, AND CONTINUOUS AVAILABILITY OR CONSISTENCY WITH MANAGEMENT GOAL, USE THE FEE CALCULATION METHOD BELOW:

- | | |
|--|------------------|
| 1. Basic Application fee (includes first 1,000 acre-feet) | \$ <u>500.00</u> |
| 2. Indicate the appropriate AMA and enter the associated Public Notice Fee: | \$ _____ |
| <input type="checkbox"/> Phoenix AMA \$ 52.00 | |
| <input checked="" type="checkbox"/> Tucson AMA \$ 225.00 | |
| <input type="checkbox"/> Pinal AMA \$ 125.00 | |
| <input type="checkbox"/> Prescott AMA \$ 75.00 | |

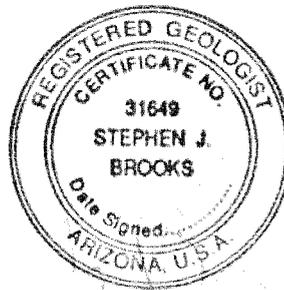
ASSURED WATER SUPPLY
HYDROLOGY REPORT FOR
SAHUARITA WATER COMPANY
(ATTACHMENT C OF MODIFICATION
OF DESIGNATION OF AN ASSURED
WATER SUPPLY APPLICATION)

Prepared for
SAHUARITA WATER COMPANY,
SAHUARITA, ARIZONA
November 21, 2007

ASSURED WATER SUPPLY HYDROLOGY REPORT FOR
SAHUARITA WATER COMPANY

SAHUARITA WATER COMPANY, SAHUARITA, ARIZONA

November 21 2007



BROWN AND CALDWELL

110 South Church Avenue, Suite 2300,
Tucson, Arizona 85701

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EXECUTIVE SUMMARY

The hydrogeologic analysis presented herein demonstrates the physical availability of 10,983 acre-feet per year (AF/yr) of local groundwater resources for 100 years for the existing and planned expansion of Sahuarita Water Company's (SWC) water service area. The physical availability demonstration provided by the hydrogeologic analyses supports a Modification of a Designation of an Assured Water Supply application for the Water Company. The planned expansion will serve potable groundwater resources to two proposed development projects including the Mission Peaks and Sahuarita Mission development projects, and an existing school site. Mission Peaks may also include development on an adjacent State Land parcel. Additional potable groundwater resources may also be served (bulk sales) to 500 existing off-site units at the adjacent Magee Ranch by a stand-pipe system. The existing school site includes the existing Sahuarita Unified School District Campus (K through 12). Additional development is also planned within the existing water service area including the Rancho Sahuarita Master-Planned Community. A total population of about 82,700 will be served potable groundwater resources by the Water Company in 2034, scheduled build out year, to about 32,400 housing units and associated commercial development.

Groundwater development from the local basinfill groundwater aquifer beneath SWC's existing water service area will be the principal source of water to meet projected SWC water demands. As of the date of this report, the SWC owns six wells and leases one well from the Town of Sahuarita. Groundwater is currently being withdrawn from two active wells, Well Nos. 14 and 18. Well No. 14, the leased Town of Sahuarita well, is also used to maintain lake levels of the Sahuarita Town Lake. The SWC has plans to install 10 new potable water supply wells to serve potable groundwater resources. Well No. 14 will be phased out for domestic use in 2009, but will continue to be used to maintain lake levels of the Sahuarita Town Lake by applying Type 1 water rights associated with the property area.

To demonstrate the physical availability of an Assured Water Supply (AWS) within the Tucson Active Management Area (AMA) utilizing groundwater resources, it is required that current, committed and projected groundwater withdrawals over 100 years will not result in the depth-to-water to exceed 1,000 feet from ground surface or depth to bedrock, whichever is less. Furthermore, groundwater must also be of acceptable quality for potable use. Lastly, the proposed water uses must be consistent with the Rules and Regulations of the Arizona Department of Water Resources (ADWR) pertaining to demonstration of an AWS within an AMA (A.R.S. 45-576).

The methods applied for the analyses were pre-approved by staff of the ADWR Hydrology Division, and Assured and Adequate Water Supply offices during a pre-application meeting held in mid-2007. Interim water demand analyses were also performed at the request of ADWR staff. The hydrologic study area agreed to by ADWR staff at the pre-application meeting covers an area of about 500-square miles south to the Santa Cruz County line and north to southern portions of the City of Tucson just northeast of Interstate 10.

Compilation and analyses of current, committed and projected water demands within the hydrologic study area indicate that future net groundwater withdrawals within the hydrologic study area will not increase significantly as a result of significant reductions in projected agricultural pumpage. Current water demands within the hydrologic study area total about 105,000 AF/yr. These current demands include municipal, agricultural and industrial demands including mine pumpage. Of the total, about 32 percent is attributed to agricultural pumpage and about 33 percent is attributed to mining and industrial pumpage. The total includes

1,259 acre-feet (AF) of municipal water demand in 2006 for SWC or about 1 percent of total groundwater pumped with the hydrologic study area.

Projected demands within the hydrologic study area, which include current and committed water demands, total about 111,500 AF/yr. This is an increase of only about 6 percent from current pumpage. This total includes 10,983 AF/yr of projected pumpage for SWC in 2034, which is the scheduled build-out year, or about 10 percent of projected pumpage. Committed water demands associated with approved or pending study area AWS analyses on record with ADWR totals about 18,500 AF/yr. The insignificant increase from current water demand totals is attributed to a reduction of about 22,000 AF/yr of agricultural pumpage for Farmers Water Company, located adjacent east to SWC, as agricultural lands are retired and developed for residential uses. This projected reduction of agricultural groundwater usage for Farmers Water Company is documented in the hydrology study submitted to ADWR in 2006, along with an application of an Analysis of an AWS for the water company.

To assess the future hydrologic impacts of future groundwater development by SWC, a three-dimensional, numerical groundwater flow model ("SWC model") was constructed for the southern portion of the Tucson AMA. In order to ensure consistency with current modeling efforts by ADWR, the primary source of information and guidance in the development of the model was ADWR's Modeling Report No. 13 by Dale Mason and Liciniu Bota, *Regional Groundwater Flow Model of the Tucson Active Management Area, Tucson, Arizona: Simulation and Application*, 2006 (ADWR, 2006) as well as the digital model files for the Tucson AMA model ("TAMA model"). The TAMA groundwater model was modified to incorporate new hydrogeologic data gathered from exploratory boring analyses and aquifer testing programs performed by Brown and Caldwell for the SWC in 2006 and 2007.

The groundwater model, incorporating current, committed and projected groundwater demands within an approximate 500-square mile hydrologic study area, was applied to project water-level conditions in 2107, a 100 year period. Computer simulations were performed including only 5 percent of about 20,000 AF of annual artificial recharge of Central Arizona Project water at the Pima Mine Road Recharge Project and with no recharge for the North Borrow Pit, both located just north of SWC. The hydrologic simulations analyses demonstrated that maximum depth-to-water in the vicinity of SWC's water supply wells is projected to range from 610 to 785 feet below land surface in 100 years. These projected depths meet the requirement for AWS analyses for the Tucson AMA in that depth-to-water in 100 years cannot exceed 1,000 feet from the ground level or depth-to-bedrock, whichever is less.

Groundwater quality analyses performed on groundwater samples collected from active wells and exploratory borings reveal favorable groundwater quality for potable use based on current regulatory limits. The proposed water uses will be consistent with the Rules and Regulations of ADWR, pertaining to demonstration of an AWS within an AMA (A.R.S. 45-576).

The hydrologic analyses presented invoke a number of conservative elements in demonstrating the physical availability of sufficient groundwater resources. The principal elements are as follows:

- New wastewater treatment plant will be constructed for the new developments. No effluent reuse or artificial recharge of effluent generated by the new developments was included in the hydrologic simulations. Potentially up to 60 percent of equivalent volume of pumpage may be available for future reuse or recharge.
- Mine and agricultural water usage in the hydrologic study area will likely not be at current levels for 100 years. Hydrologic simulations assume current levels of pumpage will remain constant. Mine life will likely be exhausted, and agriculture usage will likely be retired and transferred to municipal uses. A significant net reduction in overall water usage will likely occur.

- Artificial recharge of Central Arizona Project (CAP) water at the Pima Mine Road Recharge Project will likely continue into the distant future and potentially be augmented in the future. Currently annual recharge totals about 20,000 AF/yr. Hydrologic simulations only applied 5 percent of the total as required by ADWR. North Borrow pit may also be in operation within the simulated period.

1. INTRODUCTION

This report is submitted to the Arizona Department of Water Resources (ADWR) to support a Modification of a Designation of an Assured Water Supply for the Sahuarita Water Company (SWC) (formerly Rancho Sahuarita Water Company) in Sahuarita, Arizona. The SWC's Certificate of Convenience and Necessity (CC&N) water service area is located in Pima County, Arizona within the Tucson Active Management Area (Tucson AMA). AMAs are areas designated by the ADWR as areas deemed to require active groundwater management by the State of Arizona. The SWC's water service area is included in the Upper Santa Cruz River groundwater basin.

In 1996, hydroLOGIC Consultants, LLC prepared the original application and supporting hydrology study for a Designation of an Assured Water Supply for Interchange Water Company for a total of 10,800 single family housing units. Interchange Water Company was the former name of SWC. The study demonstrated the physical availability of 3,551 acre-feet per year (AF/yr) of groundwater for 100 years. In 2003, hydroLOGIC Consultants, LLC conducted a subsequent hydrology study to support a Modification of an Assured Water Supply application for an additional 3,000 single-family housing units and associated commercial development. This study demonstrated the physical availability of an additional 1,149 AF/yr of groundwater, with a total physical availability of 4,700 AF/yr of groundwater for 100 years.

The SWC is concurrently, as of the date of this report, in the process of expanding the current limits of the CC&N water service area under the regulatory authority of the Arizona Corporation Commission (ACC). The intent of the proposed expansion is to serve potable groundwater resources to two proposed residential and commercial development projects west of the existing CC&N area and an existing school site surrounded by the existing CC&N area. The two proposed developments include the Mission Peaks and Sahuarita Mission projects. The existing school site includes the Sahuarita Unified School District Campus (K through 12). Figure 1.1 illustrates the locations of these proposed developments and the school site. Mission Peaks may also include development on an adjacent State Land parcel. Additional groundwater resources may also be served (bulk sales) to 500 existing off-site units at the adjacent McGee Ranch by a stand-pipe system. The existing school site includes the Sahuarita Unified School District Campus (K through 12). Additional development is also planned within the existing water service area that includes the Rancho Sahuarita Master-Planned Community. A total population of about 82,700 will be served potable groundwater resources by the SWC in 2034, scheduled build-out year, to about 32,400 housing units and associated commercial development.

2. SCOPE OF WORK

The purpose of the analysis presented in this report is to demonstrate that sufficient local groundwater resources are physically available for the proposed water uses for the next 100 years. The report presents sections describing elements of water demand, supply, and adequacy. The proposed water uses will be consistent with the Rules and Regulations of ADWR, pertaining to demonstration of an AWS within an AMA (A.R.S. 45-576). To demonstrate the physical availability of an AWS within the Tucson AMA utilizing groundwater resources, it is required that current, committed and projected groundwater withdrawals over 100 years will not result in depth-to-water to exceed 1,000 feet from ground surface or depth to bedrock, whichever is less. Furthermore, groundwater must also be of acceptable quality for potable use. Methods applied for the analyses were presented and were in concurrence with staff of the ADWR Hydrology Division and Assured and Adequate Water Supply offices at a pre-application meeting held in mid-2007. Interim study area water demand analyses were performed at the request of ADWR staff. The hydrologic study area extent agreed to by ADWR at the pre-application meeting covers an area of about 500-square miles south to the Santa Cruz County line and north to southern portions of the City of Tucson just northeast of Interstate 10.

The scope of work for the hydrology study includes elements of demand, supply, and adequacy. Elements of demand include the compilation of past, current, committed, and projected water demands for SWC, including the new projected demand within the expanded CC&N area, other major water providers, and other water users within the defined hydrologic study area. The hydrologic study area with the locations of the principal water providers is shown on Figure 2.1. Elements of supply include an evaluation of the current hydrogeologic conditions to assess local groundwater resource availability. Elements of adequacy include calculations of physical availability of groundwater resources by quantifying projected water-level impacts in 100 years by three-dimensional groundwater computer modeling methods.

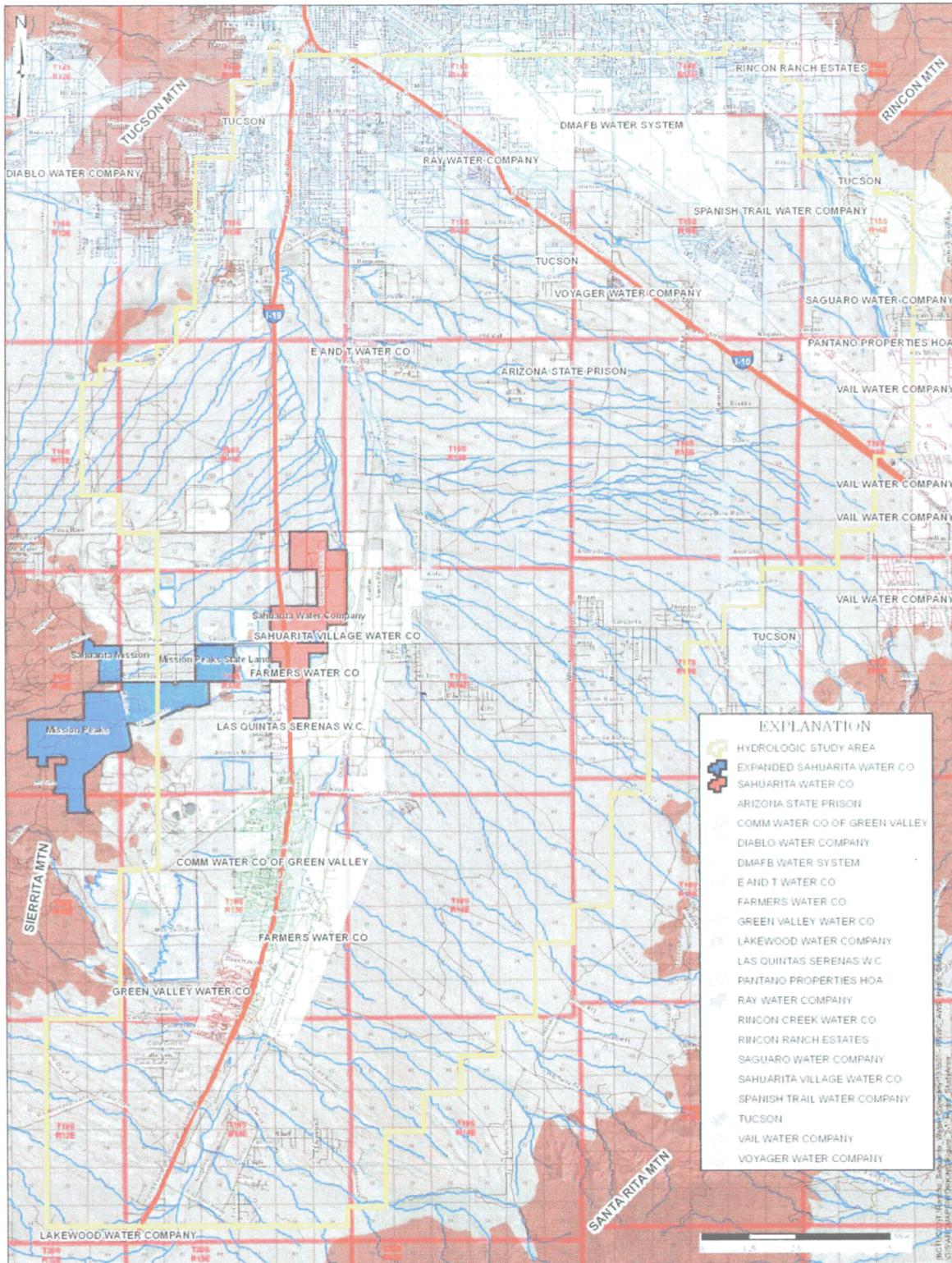


Figure 2-1 – Hydrologic Study Area

3. ELEMENTS OF DEMAND

3.1 SAHUARITA WATER COMPANY WATER DEMANDS

3.1.1 Current Water Demands

Potable water demands for SWC have grown in the past few years as a result of a strong housing market. By 2006, approximately 3,650 single-family and active-family adult housing units were served potable groundwater by the SWC. Table 3-1 below tabulates groundwater withdrawals for 2002 through 2006.

Table 3-1. SAHUARITA WATER COMPANY GROUNDWATER WITHDRAWALS (2002-2006) (AF)				
2002	2003	2004	2005	2006
433.55	621.1	732.1	983.8	1259.8
From ADWR "55"File database, 2007 for Rancho Sahuarita Water Company Wells No. 14 (ADWR Registration No. 55-611142) and Well No. 18 (ADWR Registration No. 55-611144)				

3.1.2 Projected Water Demands

As stated in Section 1.0, the SWC has plans to serve potable groundwater resources to an expanded water service area, as well as additional developments within the existing water service area of the Rancho Sahuarita Master-Planned Community. The expanded service area consists of two proposed residential and commercial development projects and an existing school site. The two proposed development projects include Mission Peaks and Sahuarita Mission development projects. The school site is the Sahuarita Unified School District Campus (K through 12). The locations of the proposed developments are shown on Figure 1.1. Mission Peaks development may also include development on an adjacent State Land parcel indicated on Figure 1.1. Additional potable water resources may also be served (bulk sales) to 500 existing off site units at the adjacent Magee Ranch by a stand-pipe system and is included in the water demand calculations.

The proposed developments will be built in phases. Build-out for all of these developments is projected for 2034. Table 3-2 below summarizes planned number and types of housing units, estimated square footage of associated commercial development, anticipated year of commencement of water service for the initial phase, and projected build-out year.

TABLE 3-2 SAHUARITA WATER COMPANY PROJECTED NEW DEVELOPMENTS AT BUILD-OUT (2034)								
Development	Commence Water Service -Initial Phase Year	Anticipated Build-out Year	Residential			Commercial (sq feet)	Schools	
			Single-Family Units	Active-Adult Units	Multi-Family Units		Elem. & Middle School (students)	High Schools (students)
Rancho Sahuarita	NA	2018	10,086	1,460		3,072,935	1,226	3,150
Mission Peaks & State Land Parcel	2010	2034	13,923 ¹	2,371	1,506	1,105,336	956	5,343
Sahuarita Mission	2011	2023	3,000					
Sub Total			27,009	3,831	1,506			
Total			32,346 housing units			4,178,271 sq feet of commercial development		

1 = includes 500 units for the Magee Ranch

Water demands were calculated with ADWR water demand constants from the Tucson Active Management Area Third Management Plan. Summary of water demand constants are tabulated in Table 3-3 below.

TABLE 3-3 SUMMARY OF WATER DEMAND CONSTANTS					
Development Type	Residential Occupancy Rate	Residential Water Demand Rate	Commercial Water Demand Rate	Elementary and Middle School Water Demand Rate	High School Water Demand Rate
	Capita Per Housing Unit (c/u)	Gallons Per Capita Per Day (gpcd)	Acre-feet Per Acre Per Year (AF/Ac/yr)	Gallons Per Student Per Day (gpsd)	Gallons Per Student Per Day (gpsd)
Single-Family Units	2.7	101			
Active-Adult Units	1.8	123			
Multi-Family Units	1.9	68			
Schools				25	43
Commercial			2.25		
Construction Water Use Rate = 10,000 gallons per lot					
Lost and Unaccounted for Water = 10 percent					

Based on the water demand constants in Table 3-3 and development parameters in Table 3-2, the total projected water demand at build-out year of 2034 for the SWC, including the expanded water service area, is calculated as 10,983 AF/yr. A water demand calculation spreadsheet is included as Appendix A.

3.2 HYDROLOGIC STUDY AREA WATER DEMANDS

3.2.1 Other Current Water Demands

Other current water demands (not including SWC) for the hydrologic study area were compiled from ADWR databases (2007a, 2007c and 2007c). Average recorded pumpage for 2002 to 2006 was considered representative of other current water demands. These water demands include water providers, agriculture and non-agriculture demands and are illustrated on Figure 3-1. These other current water demands total 103,072.5 AF/yr pumping from 335 wells within the hydrologic study area. Summary of water usage by sector for the hydrologic study area is tabulated in Table 3-4 below based on ADWR's water-use coding of water production wells (ADWR, 2007a).

Table 3-4. CURRENT WATER USAGE PER SECTOR		
SECTOR ¹	WATER USAGE (AVERAGE 2002 TO 2006) AF/yr	PERCENT OF TOTAL
IRRIGATION	32,988.1	32.0%
MUNICIPAL	22,132.8	21.5%
MINING	20,358.2	19.8%
INDUSTRIAL	13,741.0	13.3%
MONITORING	5,706.1	5.5%
DOMESTIC	4,079.2	4.0%
OTHER - MINERAL EXPL.	1,215.4	1.2%
OTHER - PRODUCTION	1,135.7	1.1%
UTILITY (WATER CO)	715.4	0.7%
UNKNOWN	441.5	0.4%
NONE	228.7	0.2%
COMMERCIAL	207.3	0.2%
TEST	87.4	0.1%
STOCK	35.6	0.0%
TOTAL	103,072.5	100.0%
1 – Sector Data from ADWR Wells "55" Database, 2007A.		

Exempt well pumpage was also included in the current demands, as requested by ADWR AWS staff to cover any "wildcat" subdivisions in the hydrologic study area. It was assumed that each exempt well in the hydrologic study area pumps about 1 AF/yr. A total of 1,041 exempt wells are included within the hydrologic study area and are also illustrated on Figure 3-1. As a result, an additional 1,041 AF/yr of exempt well pumping was included within the hydrologic study area.

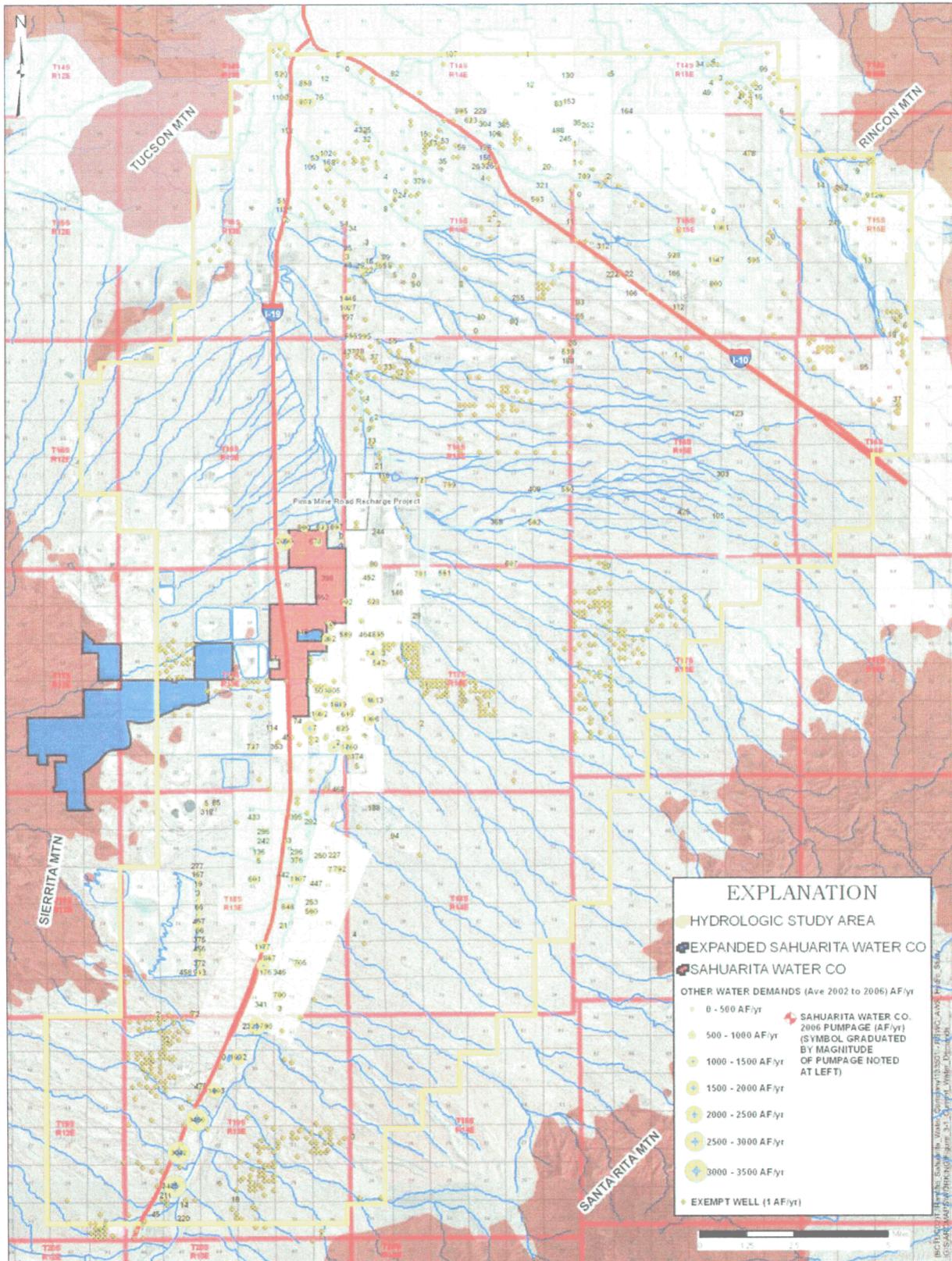


Figure 3-1 – Current Water Demands of the Hydrologic Study Area

3.2.2 Other Projected Water Demands

Projected water demands (not including SWC's current and expanded water service area water demands) include current and committed demands within the hydrologic study area. Current demands also include exempt well pumping, as mentioned in Section 3.2.1. Committed demands include approved and pending AWS demands not yet being served.

Based on interim discussions with ADWR AWS staff, ADWR requested that Brown and Caldwell quantify the full allotment of all active non-irrigation groundwater rights and unallocated service area rights within the hydrologic study area. Brown and Caldwell conducted an interim analysis by compiling the water rights within the hydrologic study area and comparing the total with average recorded pumpage for 2002 to 2006, which includes agricultural pumping.

ADWR provided Brown and Caldwell a listing of water rights in the study area from ADWR's Registry of Groundwater Rights (ROGR) database (2007b). Irrigation and Type 2 Non-Irrigation GFR were removed for the analysis, because it was conjectured that retirement of these irrigation rights will occur as growth of potable uses continue, and Type 2 Non-Irrigation may be moved anywhere throughout the Tucson AMA. Based on the analysis, total recorded pumpage for 2002 to 2006 was generally in agreement to total of groundwater rights. ADWR concurred that an average of 2002 to 2006 pumpage fully accounts for active non-irrigation groundwater water rights and could be utilized representing a portion of projected pumpage related to current demands.

An analysis of unallocated potable water demand was performed using ADWR's Assured and Adequate Water Supply database (2007c) to evaluate committed demands within the hydrologic study area. It was assumed that approved AWS analyses on record from 1975 through 2004 is part of the current demand being served and not part of committed demands. To evaluate this assumption, current 2006 recorded pumpage was compared to approved-AWS subdivision water demands from 1975 to 2004 within the hydrologic study area. If lot or demand information was not available in this database, Pima County Assessors information was reviewed for the information. ADWR water use constants were used to estimate water demands for these subdivisions. Similarly, approved applications associated with commercial demands were calculated by the acreage of the commercial project and utilizing a demand factor of 2.25 acre-feet per acre per year (AF/acre/year). The analysis determined that the total estimated water demands of approved AWS analyses through 2004 were approximately equivalent to the current demand, indicating that these demands can reasonably be assumed to part of the current demands.

As a result, committed demands are assumed to be any AWS analyses on record and approved or pending approval by ADWR from 2005 to the present. These data were compiled from ADWR Assured and Adequate Water Supply database (ADWR, 2007b). Water demands associated with applications approved prior to the year 2005 are considered currently being served and built-out, and therefore part of the current water demands. Water demands associated with applications approved from 2005 to present are classified as committed demands and are included in Table 3-5 below. These demands total to 15,008 AF/yr. Table 3-6 presents pending applications as of the date of this report totaling 479 AF/yr, also considered committed water demands.

Based on a review of Farmers Water Company AWS submittal for Sahuarita Farms (north half) and Continental Farms (south half) (Clear Creek Associates, 2006), much of the agricultural lands currently irrigated will become retired and be developed into residential subdivisions. Residential water demand based on Table 3-5 is 14,438 AF/yr. No build-out schedule for the residential development was noted. Continued irrigation demand will total 5,000 AF/yr. Current water demand for the water company based on average of 2002 to 2006 pumpage records totals 27,094 AF/yr. Assuming all current pumpage is attributed to agricultural uses, agricultural demands will be reduced by about 22,094 AF/yr.

Projected water demands within the hydrologic study area are illustrated on Figure 3-2.

TABLE 3-5. APPROVED ASSURED WATER SUPPLY APPLICATIONS 2006 TO PRESENT										
Water Provider	Application Name (Subdivision, Master Plan, Water Company, etc.)	Lots	Department File Number	Township		Range		Section	Demand (AF/yr)	Date Issued
Community Water Company of Green Valley	Las Campanas Blocks D & E, Lots 1-266 & Common Area A	268	27-401825	18	S	13	E	10	78.20	01/03/06
Community Water Company of Green Valley	La Joya Verde		27-401602	17	S	13	E	27	31.38	
Community Water Company of Green Valley	Las Campanas Blocks D & E, Lots 1-266 & Common Area A	268	27-401825	18	S	13	E	10	78.20	1/3/2006
Community Water Company of Green Valley	La Joya Verde		27-401602	17	S	13	E	27	31.38	
Community Water Company of Green Valley	La Joya Verde II		27-401633	17	S	13	E	35	14.86	
Community Water Company of Green Valley	La Joya Verde III		27-400885	17	S	13	E	35	42.76	
Community Water Company of Green Valley	La Joya Verde III		27-400886	17	S	13	E	35	46.26	
Community Water Company of Green Valley	La Joya Verde III		27-400887	17	S	13	E	35	26.24	
Farmers Water Company	De Anza Links II, Lots 1-17 and Common Areas A & B	17	27-401810	18	S	13	E	27 & 34	6.52	01/30/06
Farmers Water Company	Sahuarita Acres, Lots 1-71 and Common Area "A"	71	27-500023	17	S	14	E	8	21.81	04/09/07
Farmer's Water Company	Sahuarita Farms (N. half) and Continental Farms (S. half) ¹		28-500050						14,438.46	07/30/07
Green Valley Water District	Solar Del Viejo, Lots 1-81, Common Areas A & B	81	27-401607	18	S	13	E	22	26.65	03/17/05
Quail Creek Water	Stone House	222	27-401424	18	S	14	E	8	84.66	01/25/05
Ray Water Company	Cantera, an RCP Subdivision, Lots 1-143; Common Areas A, B & C; Blocks A & B	143	27-401727	15	S	14	E	10	57.06	11/15/06
Ray Water Company	Desert Point 2, Lots 1 - 45 and Common Areas "A" & "B"	45	27-402265	15	S	14	E	10	15.83	03/30/07
Undetermined	Swan Southlands Development	8525	28-401840	16	S	14	E		3117.36	06/12/06
Total									18,008 AF/yr	

1 – Sahuarita Farms and Continental Farms developments to retire agricultural uses.

Table 3-6. PENDING ASSURED WATER SUPPLY APPLICATIONS				
Department File Number	Application Name (Subdivision, Master Plan, Water Company, etc.)	Water Provider	Location	Demand (AF/yr)
27-700295.0000	La Joya Verde Rancho Abrego III, Lots 1-15 and Common Area "A"	Community Water Company of Green Valley	T17S, R13E, Sec 35	4.79
27-700275.0000	Las Campanas, Block C, Lots 1-283 and Common Area "A"	Community Water Company of Green Valley	T18S, R13E, Sec 10	91.14
27-700391.0000	La Jolla Verde Commercial	Community Water Company of Green Valley		16.00
27-401781.0000	Canoa Preserve	Farmers Water Company	T18S, R13E, Sec 35	36.38

Table 3-6. PENDING ASSURED WATER SUPPLY APPLICATIONS				
Department File Number	Application Name (Subdivision, Master Plan, Water Company, etc.)	Water Provider	Location	Demand (AF/yr)
27-700354.0000	Madera Highlands, Villages 27 and 29, Common Areas "D", "E", "F" and "G"	Farmers Water Company	T18S, R13E Sec 12, 13; T18S, R14E, Sec 18	70.52
27-500014.0000	Canoa Ranch, Block 27 South, Lots 1-356 and Common Areas "A" and "B"	Green Valley Water Company	T19S, R13E, Sec 8, 9, 16, 17	108.08
51-402270.0000	Elephant Head Partnership LLC	N/A	T19S, R14E, Sec 30	63.70
27-700397	Ridgeline	New Water Provider	T19S, R14E, Secs 18-20, 29-30	88.49
			Total	479 AF/yr

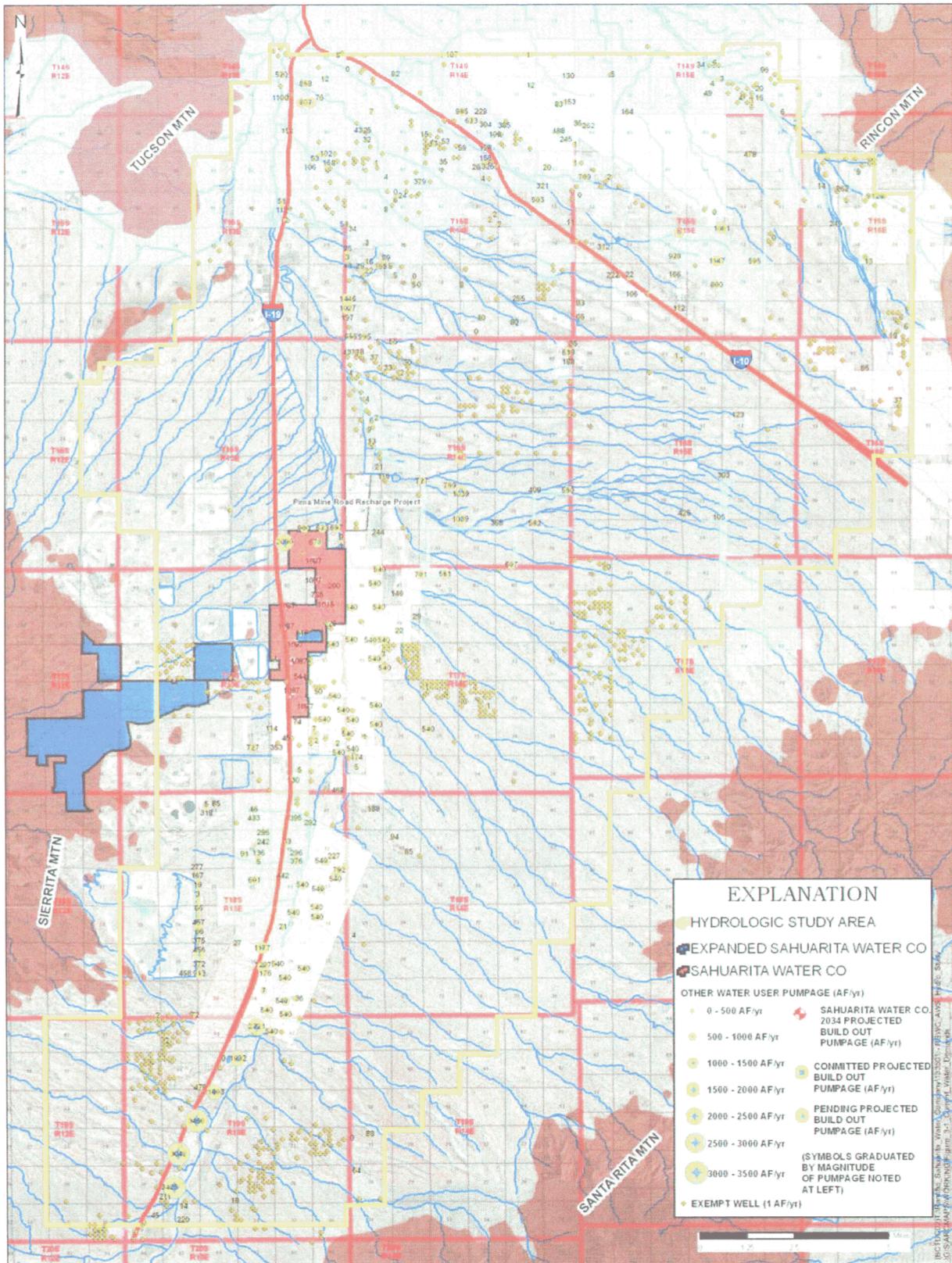


Figure 3-2 – Projected Future Water Demands of the Study Area

3.3 TOTAL WATER DEMANDS

Total water demands compiled for the hydrologic study area are tabulated in Table 3-7 below.

Table 3-7. SUMMARY OF TOTAL WATER DEMANDS WITHIN THE HYDROLOGIC STUDY AREA				
Water Demands	Sahuarita Water Company (AF/yr)	Other Water Demands (AF/yr)	Exempt Wells (AF/yr)	Total (AF/yr)
Current	1,259.8	103,072.5	1,041	105,373.3
Projected	10,983	80,978.5 ¹	1,041	93,002.5
Committed				18,008 ²
Pending Committed				479
Total Projected & Committed Water Demands in Hydrologic Study Area = 111,489.5 AF/YR				
1 - Includes reduction of agricultural pumpage for Farmers Water Company from 27,094 AF/yr to 5,000 AF/yr, an estimated reduction of 22,094 AF/yr.				
2 - Includes 14,438 AF/yr future potable water demands for Farmers Water Company.				

3.4 WATER SOURCE

Groundwater development from the local basinfill groundwater aquifer beneath the existing SWC's water service area will be the principal source of water to meet projected SWC water demands. The SWC, as of the date of this report, owns six wells and leases one well from the Town of Sahuarita. Information regarding these wells is included in Table 3-8 below. Groundwater is currently withdrawn from two active wells, Well Nos. 14 and 18. Well No. 14 is leased to the SWC by the Town of Sahuarita and is also used to maintain lake levels in the Sahuarita Town Lake.

Table 3-8. SAHUARITA WATER COMPANY WELLS								
Well No.	ADWR Well Registration No.	Cadastral Location	Casing Diameter (inches)	Casing Materials	Well Depth (feet)	Upper Screen Depth (ft bls)	Lower Screen Depth (ft bls)	Drill Date
1	55-562962	D(17-13)11 dcd	8	Steel, Milled Slots, 12 cuts per foot, 3/16"x3" Slots	500	430	490	9/26/1997
12	55-611141	D(17-13)01 abb	24	Steel, Milled Slots, 24 rows, 1/4"x3"	982	273	970	5/27/1970
14	55-611142	D(17-13)01 acc	24	Steel, Milled Slots, 20 rows, 1/4"x3"	1135	435	1135	10/9/1970
17	55-611143	D(16-13)36 cbc	24	Steel, Milled Slots, 24 rows, 1/4"x3"	1053	247	1030	12/20/1974
18	55-611144	D(17-13)01 cdd	20	Steel, Slotted	905	424	890	4/18/1975
19	55-611145	D(17-13)01 bac	24	Steel, Milled Slots, 24 rows, 1/4"x3"	990	210	972	5/5/1981
20	55-611146	D(16-13)36 ddd	24	Steel, Milled Slots, 26 rows, 1/4"x3"	975	240	975	9/22/1969

Note: Wells in bold are active wells as of the date of this report

Based on recent groundwater sampling and analysis, both wells, Well Nos. 14 and 18, produce potable groundwater. Other wells not utilized are considered to be beyond service life and plans are in place to abandon the wells. Well No. 1 has recently been converted to a monitoring well.

Based on water demand requirements at build-out in 2034, the SWC has plans to install 10 new potable water supply wells and phase out use of Well No. 14 for domestic use in 2009. This well will continue to be used to

maintain lake levels in the Sahuarita Town Lake by applying Type 1 water rights associated with the property area.

In 2006 and 2007 Brown and Caldwell conducted pilot hole and exploratory boring analyses programs to evaluate potential future well sites for the SWC. Groundwater production potential and groundwater quality were evaluated at 6 sites, and currently, as of the date of this report, evaluating 2 additional well sites. This pilot hole analysis conducted for Well Site No. 24 concluded that the well site is not a viable based on groundwater quality. This analysis is documented in a report titled *Well Site No. 24 Pilot Hole Analyses Report* dated September 6, 2007 (Brown and Caldwell, 2007b). Exploratory boring analyses were conducted at 5 additional well sites, Well Site Nos. 21, 22, 23, 25, and 26. Exploratory boring analyses at Well Site Nos. 21, 23, 25 and 26 revealed favorable groundwater production potential and groundwater quality. The exploratory boring analyses program is documented in a report titled *Well Site Nos. 21, 22, 23, 25, and 26 Exploratory Boring Analyses Report* dated September 6, 2007 (Brown and Caldwell, 2007c).

Table 3-9 tabulated water supply wells and future well sites to be utilized through build-out in year 2034 and beyond. As noted above, Well No. 14 will be phased out in 2009. Table 3-4 indicates whether groundwater production potential and groundwater quality has been confirmed or not as of the date of this report. Confirmation is noted where a well is existing or an exploratory boring analysis has been completed and verifying favorable groundwater production potential and groundwater quality for potable use. Well sites where confirmation has yet to be determined is slated for future exploratory boring analyses.

Figure 3-3 shows the location of these wells and future well sites. Other wells owned by the SWC, also noted on Figure 3-3, Well Nos. 1, 12, 17, 19, and 20, will not be used as a result of age and poor conditions of the wells.

Well	Active or Future Wells	ADWR Registration No.	Cadastral Location	Current or Anticipated Pump Capacity (gpm)	Groundwater Production Potential and Groundwater Quality Confirmed?	Projected Groundwater Production at Build-out (2034) (AF/yr)
Well No. 14	Active	55-611142	D-17-13 1ACC	1,900	Yes	0
Well No. 18	Active	55-611144	D-17-13 1CDD	1,400	Yes	1,014.9
Well Site No. 17R	Future	NA	D-16-13 36CCA	1,500	No	1,087.4
Well Site No. 19R	Future	NA	D-17-13 1BDB	1,500	No	724.9
Well Site No. 21	Future	NA	D-17-13 1CDB	1,000	Yes	1,087.4
Well Site No. 23	Future	NA	D-17-13 11BAA	1,500	Yes	1,087.4
Well Site No. 24B	Future	NA	D-17-13 11CAA	1,500	Yes	1,087.4
Well Site No. 25	Future	NA	D-17-13 14ABA	1,500	No	1,087.4
Well Site No. 26	Future	NA	D-17-13 14DDC	750	Yes	543.7
Well Site No. 27	Future	NA	D-17-13 23ACC	1,500	No	1,087.4
Well Site No. 28	Future	NA	D-17-13 23DDA	1,500	No	1,087.4
Well Site No. 30	Future	NA	D-17-13 14DBA	1,500	No	1,087.4
Total = 10,983 AF/yr						

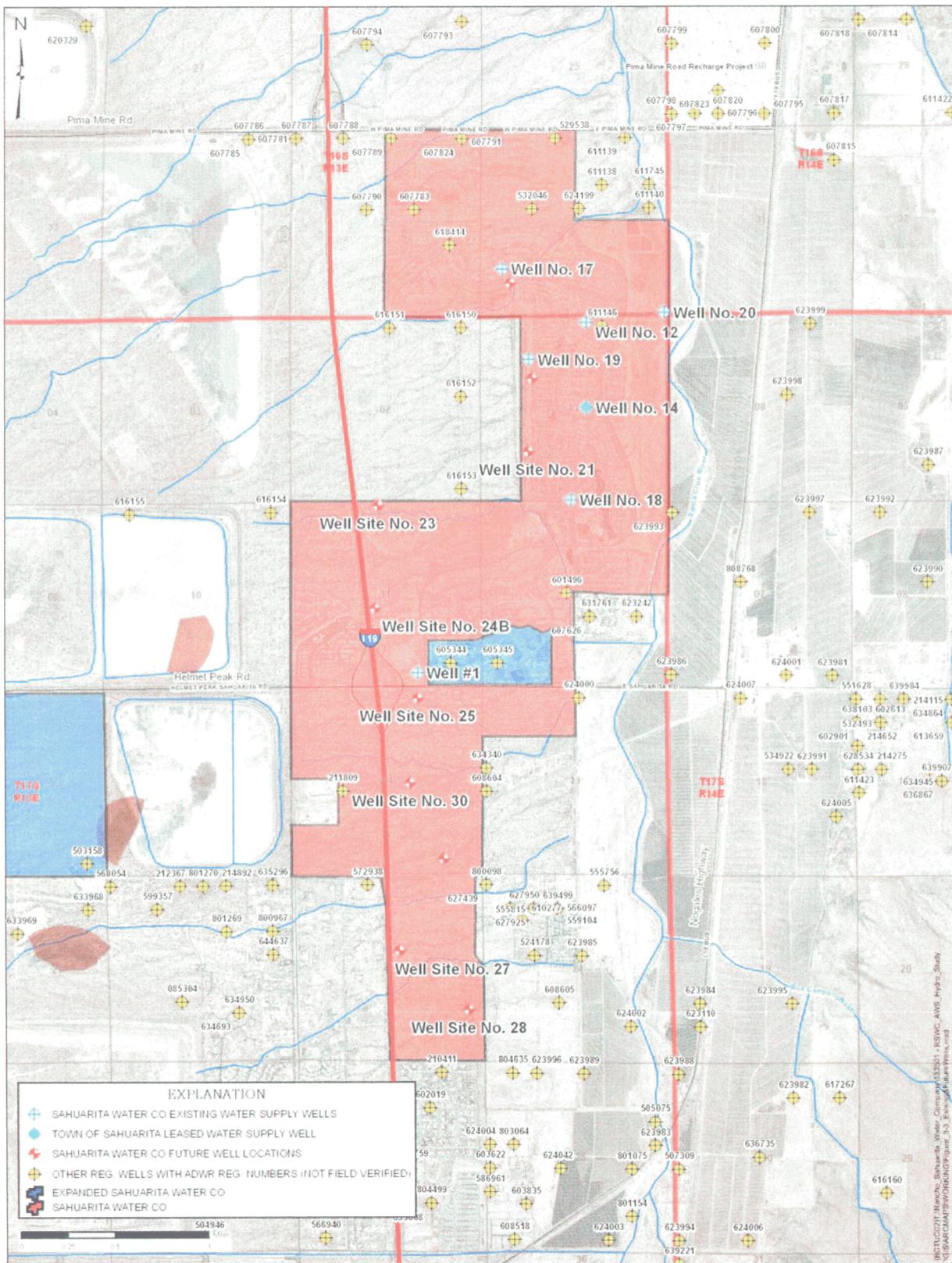


Figure 3-3 – Sahuarita Water Company's Existing and Future Planned Water Supply Well Locations

4. ELEMENTS OF SUPPLY

4.1 TOPOGRAPHY AND CLIMATE

The hydrologic study area consists of a moderately, southward sloping valley. The valley is defined to the southeast and west of the study area by the Santa Rita and Sierrita Mountains, respectively. Surface drainage is directed northward in the Santa Cruz River located east of the water service area. Land surface elevations within the study area range from about 2,900 feet above mean sea level (ft amsl) in the southern portion in the Green Valley area to 2,500 ft amsl north of the SWC's existing water service area near Tucson. The land surface slopes northward along the Santa Cruz River at an average rate of approximately 16 feet per mile in the existing water service area. Land surface also slopes eastward toward the river at an average rate of approximately 80 feet per mile within the existing water service area. Land surface altitudes rise to over 9,000 ft amsl in the Santa Rita Mountains southeast of the hydrologic study area, and to about 6,200 feet west of the hydrologic study area in the Sierrita Mountains.

Climate information was compiled from a weather station in the Sahuarita area (WRCC, 2007). Average annual high and low temperatures are reported at 84.7 and 48.1 degrees Fahrenheit, respectively. Average annual precipitation for 1956 to 1972 is reported as 10.62 inches.

4.2 GEOLOGIC SETTING

The hydrogeologic setting of the Upper Santa Cruz Valley in the Sahuarita area is composed of an aquifer system which is hydraulically bounded to the southeast by bedrock of the Santa Rita Mountains and to the west by bedrock of the Sierrita Mountains. The Santa Rita and Sierrita Mountains consist of low-permeable sedimentary, metamorphic and intrusive igneous rocks (Davidson, 1973). Bedrock of the Santa Rita Mountains outcrops approximately 12 miles southeast of the water service area. Bedrock of the Sierrita Mountains outcrops approximately 0.5 mile west of the central portion of the existing water service area.

Based on a regional geophysical study (Oppenheimer and Sumner, 1980) and exploratory boring analyses performed by Brown and Caldwell [2007b and 2007c]), depth to bedrock in the vicinity of the SWC existing water service area ranges from less than 800 feet in the southwestern portion of the water service to greater than 1,600 feet in the northeastern portion. For most of the water service area, depth to bedrock is generally between 1,000 and 1,600 feet in depth. A depth-to-bedrock map is presented as Figure 4-1.

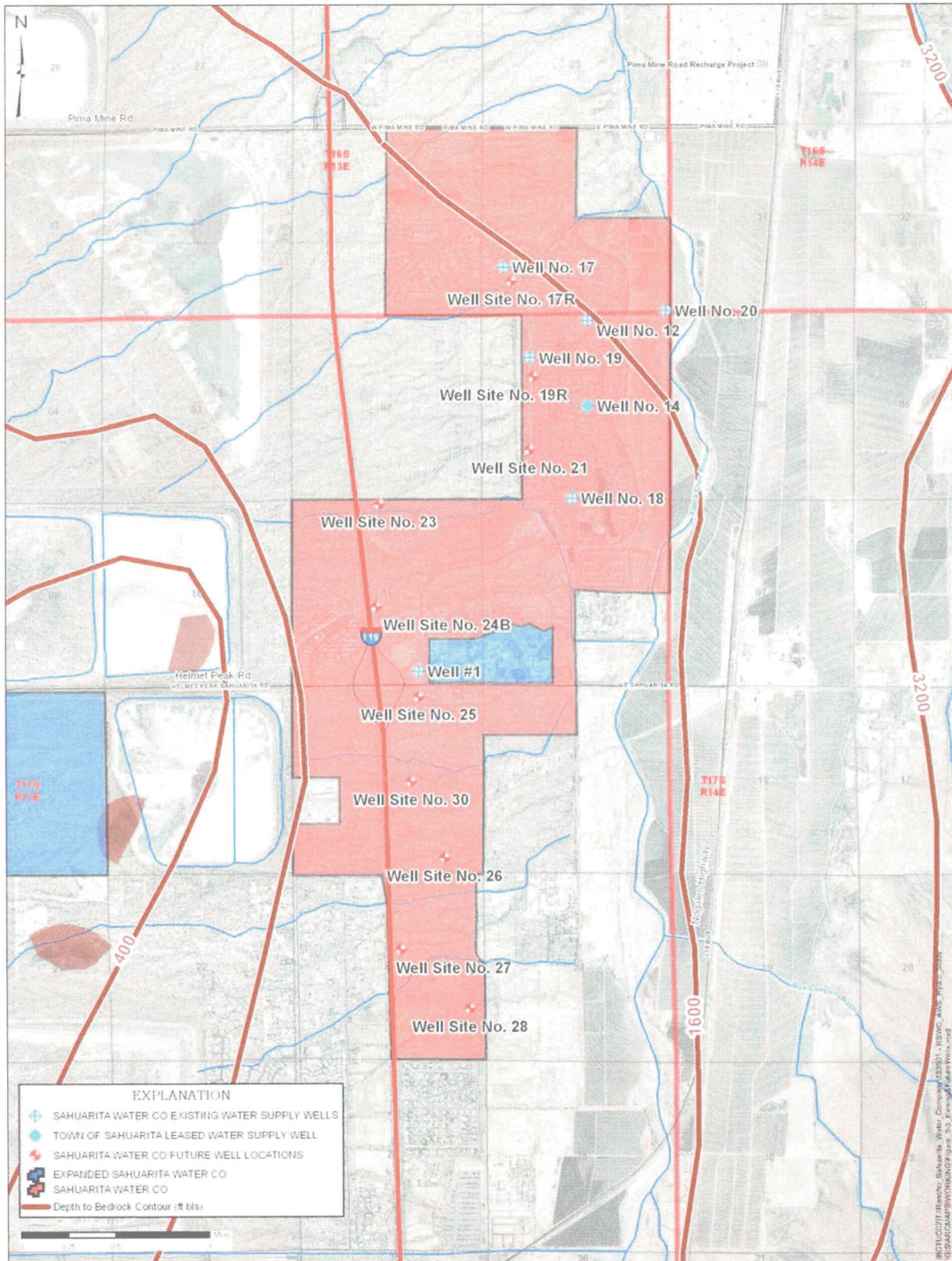


Figure 4-1 – Depth to Bedrock

4.3 HYDROGEOLOGIC CONDITIONS

4.3.1 Occurrence of Groundwater

The main aquifer beneath SWC's existing water service area penetrated by water supply wells in the area consists of saturated portions of the Fort Lowell formation (Qf) and upper and lower Tinaja beds (Tsu). These formations are basin-fill deposits. The Pantano formation (Tos) and underlying bedrock are relatively impermeable in comparison to overlying sediments. The Pantano formation (Tos) is suspected to be penetrated by some wells in the area and indicate favorable permeability characteristics where fracturing is suspected.

Groundwater flow is dictated by topography and by the spatial distribution of recharge and discharge, and generally flows to the north, northwest and west. Figure 4-2 depicts water level elevation contours constructed from 2005 to 2007 static water levels compiled from an ADWR (2007b) database and recent measurements performed by Brown and Caldwell (2007a and 2007b). Contours suggest a groundwater gradient of about 25 to 75 feet per mile. Northeast of the water service area, water level elevations are locally affected by artificial recharge of Central Arizona Project (CAP) water at the Pima Mine Road Recharge Project (PMRRP).

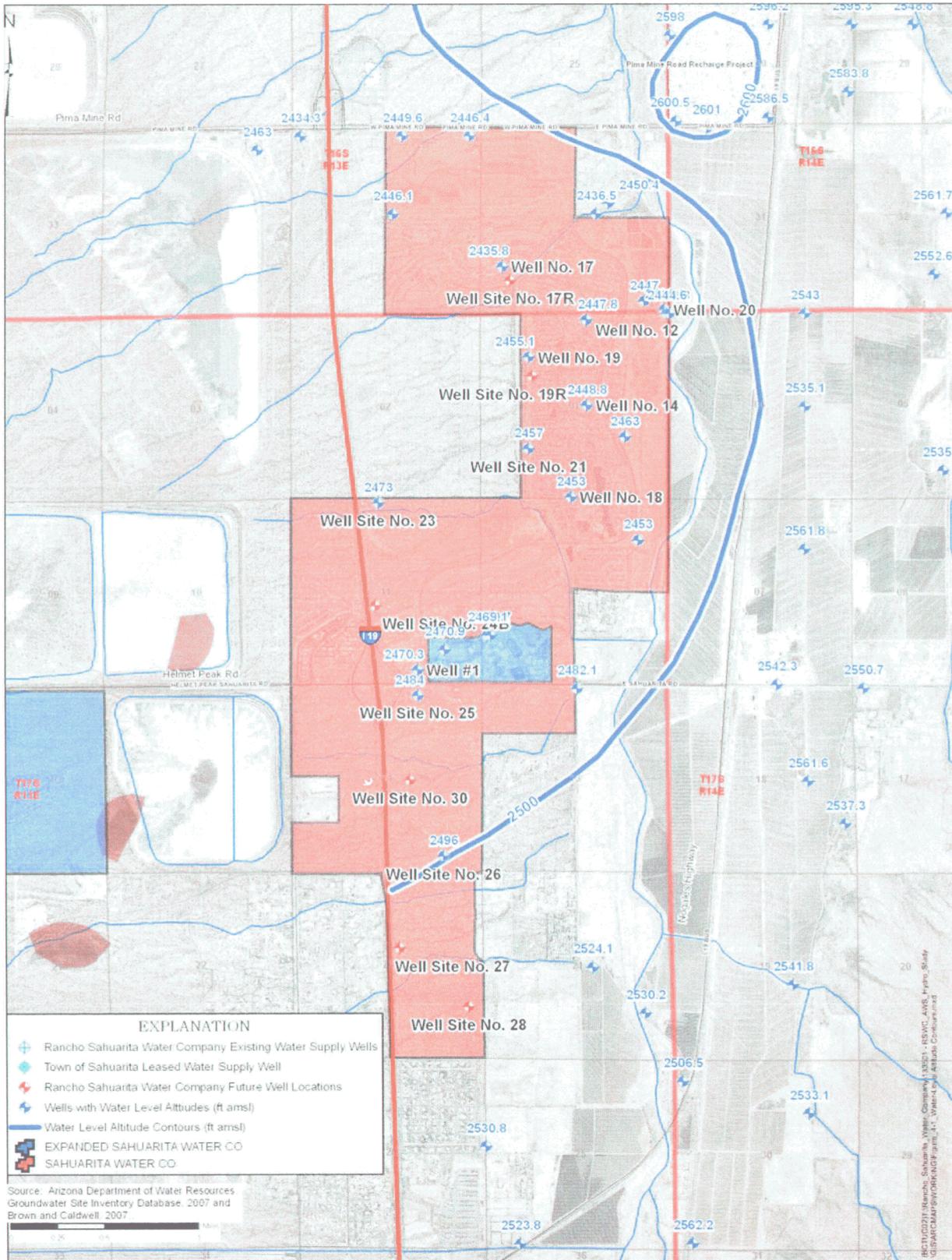


Figure 4-2 – Observed Water-Level Altitude Contours (2005-2007)

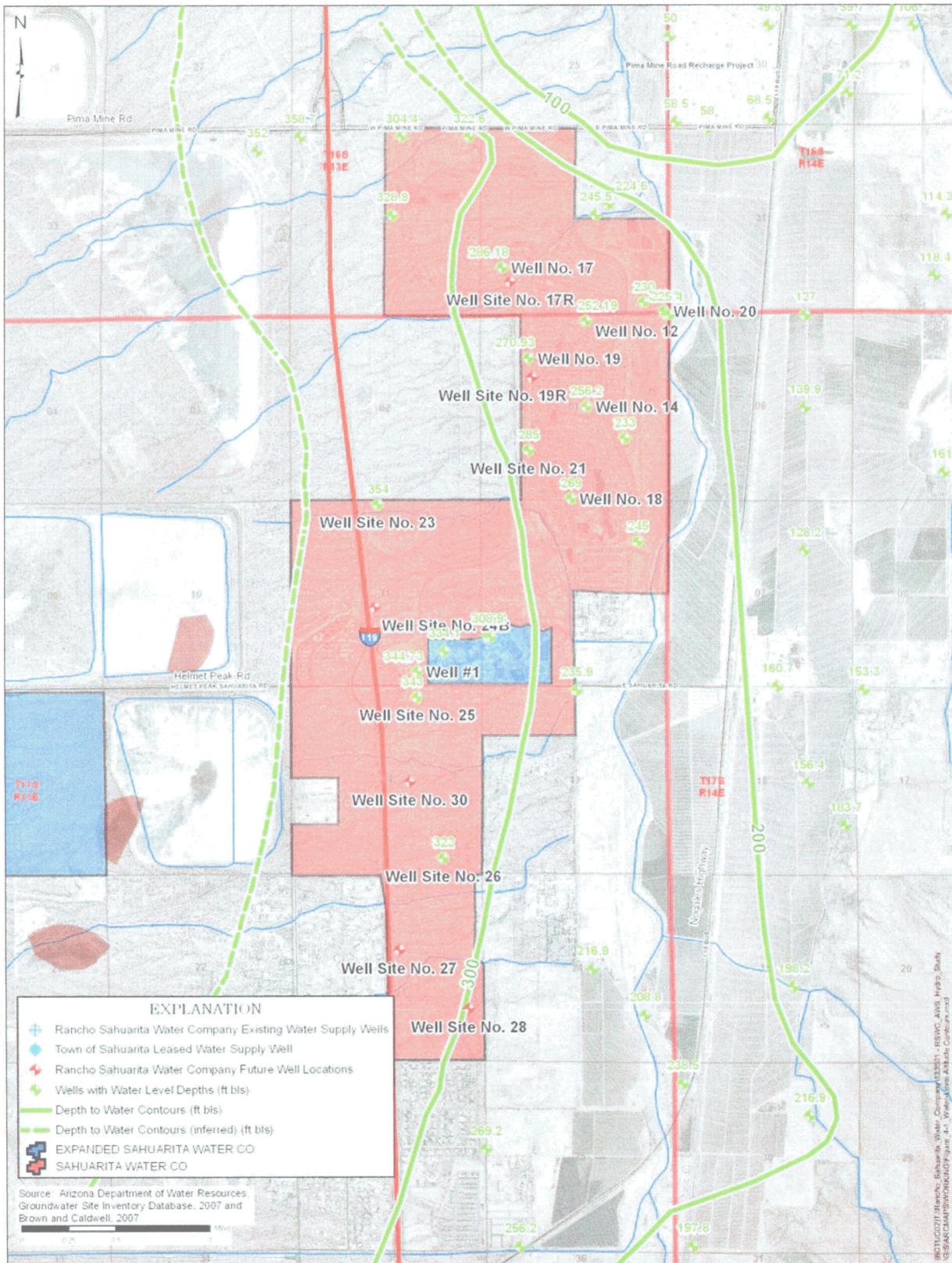


Figure 4-3 – Observed Water-Level Depth Contours (2005-2007)

Pilot testing of the PMRRP occurred between 1997 to 1999 when about 20,000 acre-feet (AF) of CAP water was artificially recharged in spreading basins. Full-scale operation of the facility began in December, 2001 when artificial recharge totaled about 30,000 AF/yr. Figure 4-3 depicts depth to water contours constructed from the same static water level data utilized in Figure 4-2 and indicates that depth to water ranges from less than 100 feet in the vicinity of the PMRRP. Along the Santa Cruz River, depth to water is between 200 and 300 feet. Depth to water increases to the west within the existing water service area from 200 to greater than 400 feet.

Hydrographs for a number of wells were constructed based on historical water level data to evaluate the historical groundwater conditions of SWC water service area. Hydrographs are included on Figure 4-4. Hydrographs generally indicate that in much of the area water levels have declined greater than 150 feet since the early 1960s. Since the 1980s, decline rates have reduced. In the vicinity of the PMRRP, water levels have increased or have been generally stable since about 2000.

Natural recharge to the aquifer system in the area occurs along the mountain front, as underflow from southern parts of the upper Santa Cruz River basin, and as stream channel recharge along the Santa Cruz River. The Santa Cruz River is an ephemeral stream east of SWC water service area, which only flows in response to significant precipitation events. Discharge of the aquifer system in the area occurs at water supply wells and as underflow to the central portion of the Tucson basin to the north.

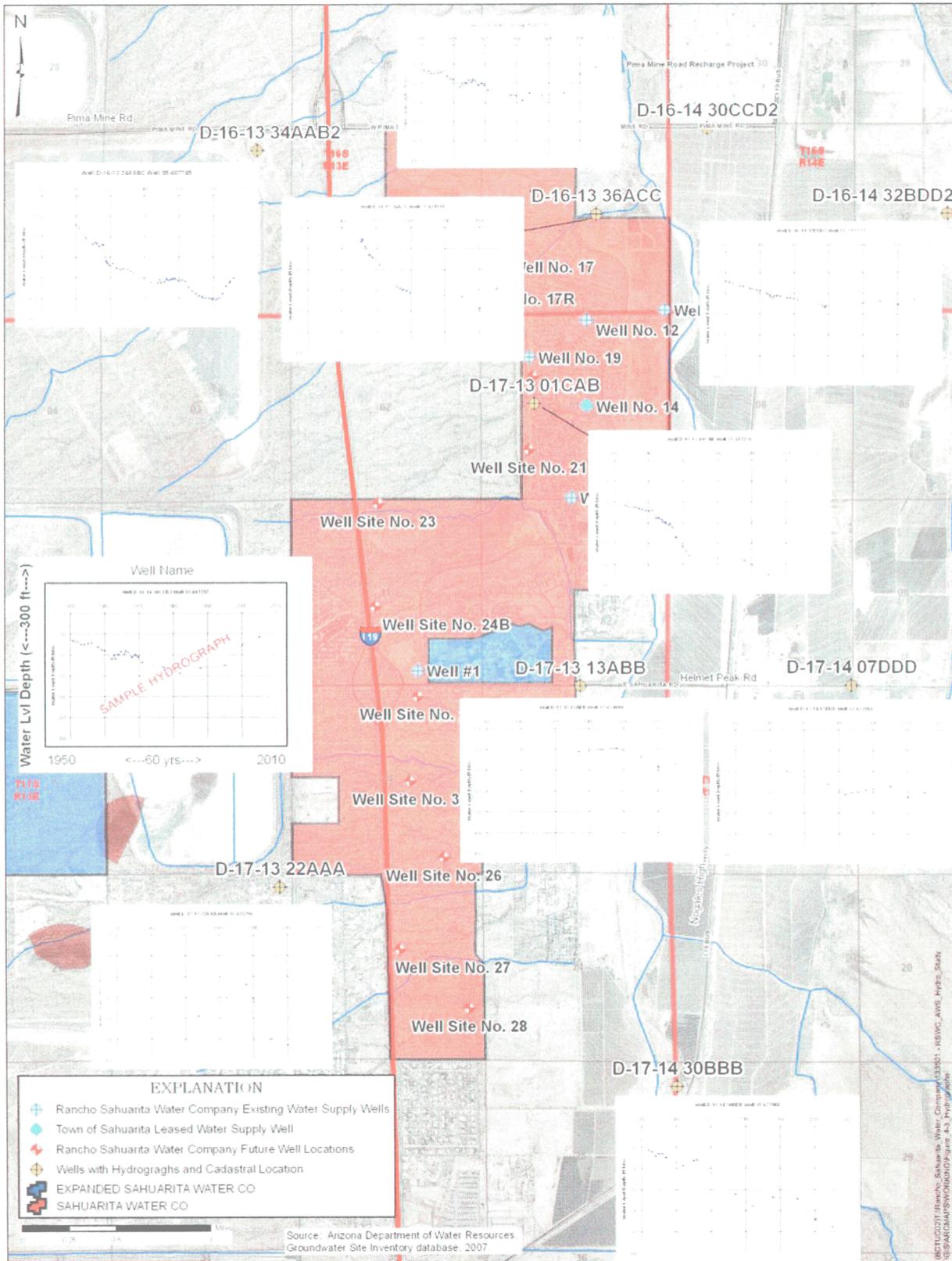


Figure 4-4 – Hydrographs

Based on Osterkamp (1973), rates of natural groundwater recharge at the mountain fronts and stream channels in the area range from 200 to 400 acre-feet (AF) per mile of mountain front or stream-channel. Based on these values and lengths of mountain front and ephemeral stream channels within the existing SWC water service area, annual local natural groundwater recharge is calculated at about 3,000 to 6,000 AF.

4.3.2 Aquifer Characteristics

Aquifer tests have recently been performed on four water supply wells within the vicinity of SWC. Brown and Caldwell conducted an aquifer test and analysis on the SWC's Well No. 14 in May 2006. This aquifer test and analysis is documented in a memorandum report, "Well Spacing/Well Impact Investigation – Rancho Sahuarita Water Company's Well #21 – D-17-13 01CDB," dated December 22, 2006. In addition, Brown and Caldwell conducted aquifer test and spinner flow meter survey analyses on the SWC's Well Nos. 12 and 19 in July 2007. These tests are documented in a report *Well Nos. 12 and 19 Aquifer Test Analyses and Well Production Evaluations* dated July 16, 2007 (Brown and Caldwell, 2007a). Lastly, Brown and Caldwell conducted an aquifer test and spinner flow meter survey analyses on Anamax Well No. 1 owned by Phelps Dodge Corporation and operated by Community Water Company of Green Valley. This test was performed in 2005. This aquifer test is documented in a memorandum report included as Appendix B.

Transmissivity (T-values) evaluated and specific capacities measured from these aquifer tests are summarized on Table 4-1, along with pertinent information regarding the test and well. Location of the wells and noted T-values and specific capacities are included on Figure 4-5.

WELLS TESTED WITH AN AQUIFER TEST AND SPINNER FLOW METER SURVEY													
Well	ADWR Registration No.	Cadastral Location	Surface Elevation (ft amsl)	Date of Test	Duration (hr)	Static Water Level (ft bls)	Tested Rate (gpm)	Pumping Water Level (ft bls)	Measured Specific Capacity (gpm/ft)	T-Value (gpd/ft)	Analysis T	Upper Perforations (ft bls)	Lower Perforations (ft bls)
Well No. 12	55-611142	D-17-13 1ABB	2700	5/3/2007	24	252.2	536	269	32.7	65,325	Ave DD/Rec	273	970
Well No. 14	55-611144	D-17-13 1ACC	2706	5/25/2006	24	256.4	1811	331	24.3	73,300	Rec	435	1,135
Well No. 19	55-611145	D-17-13 1BAC	2726	5/10/2007	24	270.92	520	283	44.4	134,900	Ave DD/Rec	210	972
Anamax No. 1	55-608518	D-17-13 25CCD	2781	7/27/2005	10	270	1885	297	69.9	227,000	Rec	601	1,885

Notes: ft amsl = feet above mean sea level
 hr = hour
 ft bls = feet below land surface
 gpm = gallons per minute
 gpm/ft = gallons per minute per foot of drawdown
 gpd/ft = gallons per day per foot of drawdown
 DD = water-level drawdown analysis
 Rec = water-level recovery analysis

Spinner flow meter surveys provided information on hydraulic characteristics of basin-fill deposits penetrated by the wells. Tables 4-2, 4-3 and 4-4 provide a summary of spinner flow meter survey analyses for Well Nos. 12 and 19 and the Anamax Well No. 1, respectively, including an estimation of hydraulic conductivity (K-values) of depth intervals in the well.

INTERVAL DEPTH (feet bls)	PRODUCTION (gpm)	PERCENTAGE OF FLOW (percent)	THICKNESS (feet)	GALLONS PER MINUTE PER FOOT	ESTIMATED HYDRAULIC CONDUCTIVITY (feet per day) ²
273 to 340 ¹	179	33.3	67	2.67	43
355 to 475	156	29.2	120	1.30	21
525 to 875	201	37.5	350	0.57	9

Note:

1 – Upper depth interval represents top of the screened interval. Survey evaluated flow below a depth of 318 feet, depth of access port, therefore flow characteristics of well not evaluated above this depth. Calculated hydraulic parameters for this zone are considered minimum values.

2 – Calculated by applying the average transmissivity value of drawdown and recovery analyses.

INTERVAL DEPTH (feet bls)	PRODUCTION (gpm)	PERCENTAGE OF FLOW (percent)	THICKNESS (feet)	GALLONS PER MINUTE PER FOOT	ESTIMATED HYDRAULIC CONDUCTIVITY (feet per day) ²
282 to 430 ¹	197	37.9	148	1.33	46
460 to 480	66	12.6	20	3.30	114
665 to 800	257	49.5	135	1.90	66

Notes:

1 – Upper depth of interval represents the dynamic pumping level during the survey. Survey evaluated flow below a depth of 318 feet, depth of access port, therefore flow characteristics of well not evaluated above this depth. Calculated hydraulic parameters for this zone are considered minimum values.

2 – Calculated by applying the average transmissivity value of drawdown and recovery analyses.

INTERVAL DEPTH (feet bls)	PRODUCTION (gpm)	PERCENTAGE OF FLOW (percent)	THICKNESS (feet)	GALLONS PER MINUTE PER FOOT	ESTIMATED HYDRAULIC CONDUCTIVITY (feet per day) ¹
600 to 780	473	25	180	2.62	42
820 to 900	600	32	80	7.50	121
940 to 980	165	9	20	8.25	66

INTERVAL DEPTH (feet bls)	PRODUCTION (gpm)	PERCENTAGE OF FLOW (percent)	THICKNESS (feet)	GALLONS PER MINUTE PER FOOT	ESTIMATED HYDRAULIC CONDUCTIVITY (feet per day) ¹
1,020 to 1,075	282	15	55	5.13	83
1,135 to 1,160	149	8	25	5.96	96
1,235 to 1,760 ²	214	11	525	0.41	7

Notes:

1 – Calculated by applying the transmissivity value of recovery analyses.

2 – Penetrates conglomerate likely associated with Pantano formation not basin fill deposits.

5. ELEMENTS OF ADEQUACY

5.1 GROUNDWATER MODELING ANALYSES

To assess the future hydrologic impacts of future groundwater development by SWC, a three-dimensional, numerical groundwater flow model ("SWC model") was constructed for the southern portion of the Tucson AMA. In order to ensure consistency with current modeling efforts by ADWR, the primary source of information and guidance in the development of the model was ADWR's Modeling Report No. 13 by Dale Mason and Liciniu Bota, *Regional Groundwater Flow Model of the Tucson Active Management Area, Tucson, Arizona: Simulation and Application*, 2006 (ADWR, 2006), as well as the digital model files for the Tucson AMA model ("TAMA model"). Model construction, parameterization, and groundwater inflows and outflows adhere strictly to the information provided in the above report for the SWC model domain. Digital model files for the steady-state, transient, and predictive model simulations developed by ADWR were used directly to generate the SWC model to avoid any potential deviations from ADWR's model development and construction. ADWR's Tucson AMA modeling report should be referenced for information regarding the hydrogeologic conceptualization for the SWC numerical model (ADWR, 2006).

The following discussion presents the details of the numerical groundwater model, methods used in its construction, and the results of two coupled transient simulations. The groundwater flow model was constructed using the MODFLOW 2000 computer code (Harbaugh et al, 2000). Development and Quality Assurance/Quality Control (QA/QC) of this numerical model was fully integrated with a Geographic Information System (GIS) (ARCGIS 9.1, ESRI, 2005) and standard format data sets to ensure that all results and compiled information will be fully compatible with current spreadsheet, database, GIS, and modeling software packages. All relevant hydrogeologic and groundwater demand data collected during the course of these analyses were also stored within the GIS and were imported directly into the modeling software. Groundwater Vistas, version 5.05 build 2 (ESI, 2007), was used to facilitate pre- and post-processing of the numerical model files. A digital version of this update to the Groundwater Vistas software is included in Appendix C, the compact disk containing the model files and supporting digital materials for this study.

5.2 DEVELOPMENT OF THE NUMERICAL FLOW MODEL

Two, coupled, transient groundwater simulations were developed to simulate past, current, and future groundwater conditions; however, both were based upon the same general numerical framework and have identical model grid construction and hydraulic parameterization. The simulations vary only in the modeled timeframes and allocation of groundwater pumping and PMRRP artificial recharge.

The first simulation ("base simulation") is based upon ADWR's transient TAMA groundwater model and simulates groundwater conditions from 1941 through 1999. Simulated water levels from ADWR's TAMA steady-state model were imported and used as initial conditions. Three main modifications were made to ADWR's TAMA model to create the SWC model: 1) model cell dimensions were refined to uniform ¼ mile by ¼ mile spacings, 2) the model domain was limited to the southern portion of the Tucson AMA, and 3) transmissivity values in the immediate vicinity of the SWC service area were updated in model layer 3 (representing the middle and lower Tinaja beds and the Pantano Formation) to reflect recent aquifer testing

data within and adjacent to the SWC service area. Additional information regarding these modifications to ADWR's TAMA model is presented in the following sections.

The second simulation ("AWS simulation") simulates the time period from 2000 through the end of 2107. This timeframe includes the 100-year projection period required for the purposes of this AWS hydrology study. Initial water level conditions were taken directly from the end of the last stress period for the base simulation (end of 1999). Table 5-1 presents the specifications of the SWC model. Specific details of the model construction including full inputs and water budget components can be found in Appendix C, as well as in ADWR's TAMA model report (ADWR, 2006).

TABLE 5-1. SPECIFICATIONS OF THE NUMERICAL FLOW MODEL	
Model Characteristics	Specifications
Active Model Domain	~470 square miles, ~301,000 acres
Units	Time: Days Length: Feet
Coordinate System	UTM 1927, NAD 12N GIS: lateral units in meters, vertical units in feet
Model Grid	130 rows by 96 columns, 37440 total cells, 18732 active cells
Cell Size	1320 feet by 1320 feet ¼ mile by ¼ mile
Layering – 3 Layers	Layer 1: Younger Alluvium and Fort Lowell Formation; Type 1 Unconfined Aquifer Layer 2: Upper Tinaja Beds; Type 3 Unconfined/Confined Aquifer Layer 3: Middle and Lower Tinaja Beds and Pantano Formation; Type 2 Unconfined/Confined Aquifer
Hydraulic Parameters	Distribution of hydraulic conductivity and storage values for Layers 1 and 2 identical to those from the Tucson AMA model Vertical Leakance values identical to those from the Tucson AMA model. Regional transmissivity values for Layer 3 based upon the Tucson AMA model. Local transmissivity values (vicinity of SWC service area) based upon interpolated/kriged distribution within 2-mile radius of recent aquifer testing locations.
MODFLOW Packages	Basic, Block-Centered Flow, Discretization, Output Control, Solver, Well, Constant Head, Evapotranspiration, Recharge
Base Simulation Stress Periods	1941 through 1999, 59 years 59 Transient, 1-year stress periods, 12 time steps per stress period. 1.2 multiplier

TABLE 5-2: SPECIFICATIONS OF THE RSWC HYDROLOGY MODEL	
AWS Simulation Stress Periods	2000 through 2107, 108 years 108 stress periods, 12 time steps per stress period, 1.2 multiplier
Recharge	Base Simulation: Identical to TAMA Model AWS Simulation: Based upon TAMA Base Case Future Model Simulation (Pima Mine Road recharge curtailed, recharge held at ADWR year 2025 estimates elsewhere)
Wells	Base Simulation: 1316 flux cells, identical to TAMA Model AWS Simulation: Imported as 1625 separate, grid independent, multi-layer analytical features (~1500 active pumping wells) (compiled as standard MODFLOW well file)
Boundary Conditions	Constant head boundaries along northern and southern edges of model domain for all layers
Initial Conditions	Base Simulation: TAMA Steady-state model heads AWS Simulation: Heads from end of Base Simulation (end of 1999)
Solution Method	Preconditioned Conjugate Gradient Solver Package version 2

5.2.1 Model Grid

The model grid was georeferenced to exactly match the alignment and location of ADWR's TAMA model domain and was uniformly refined to ¼ mile by ¼ mile spacings, producing for four model cells per original ADWR cell. The full extent of the model grid is shown on Figure 5-1 and was generated by removing the northernmost 59 rows from ADWR's TAMA model and refining the cell spacings by half. The location for the northern boundary of the RSWC model is located within Township 14 North, and was selected based upon the following criteria:

- It is a suitable distance (more than 13 miles) away from the northern boundary of the SWC service area; thus, limiting boundary effects
- It is just south of the historic, central Tucson groundwater basin pumping area, limiting the number of pumping wells with uncertain future pumping rates within the model domain and reducing the potential effects of sharp spatial (gradient) or temporal water level changes on boundary cell inputs
- It is just south of a major shift in the direction of groundwater flow from south to north, towards the northeast following the path of the Rillito River.

The location of the southern boundary of the model domain overlies that of the TAMA model. Moving upwards from Layer 3, model layers are regionally less extensive, representing the exposure of deeper hydrostratigraphic units at ground surface. The lateral extent of active cells for each model layer exactly matches those defined by ADWR for the southern portion of the Tucson AMA (ADWR, 2006).

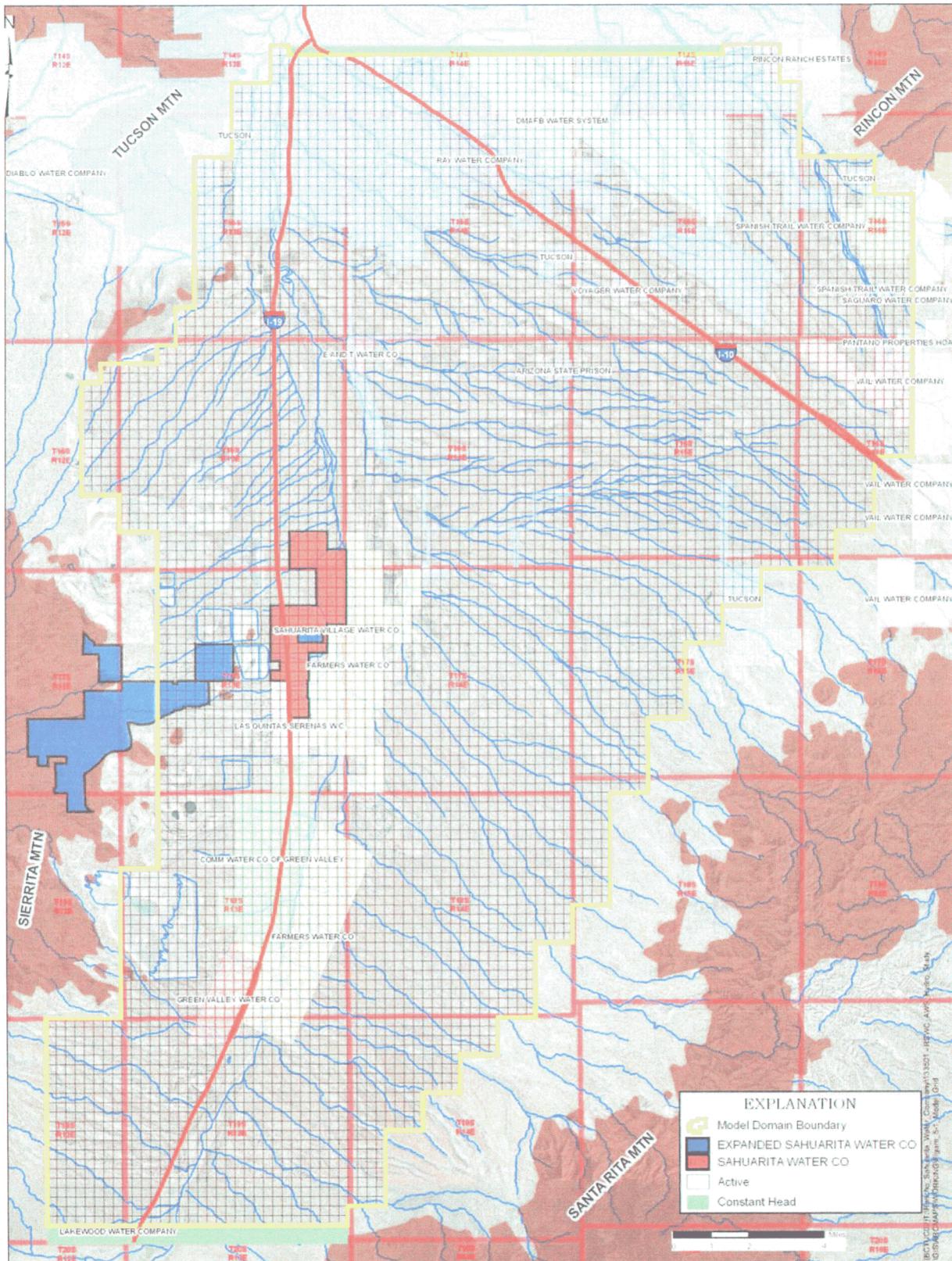


Figure 5-1 – Model Grid

5.2.2 Layering

General layer information is presented above in Table 5-1 and provided digitally in Appendix C. Elevations for layer top and bottom contacts are identical to those estimated by ADWR for the TAMA model, and were not modified for the SWC model domain.

5.2.3 Aquifer Parameters

All hydraulic conductivity, vertical leakance, and storage parameters are identical to those estimated by ADWR for the TAMA model. However, Layer 3 transmissivity values in the vicinity of the SWC service area were modified based upon recent aquifer test information for four wells screened within the deep aquifer system. Section 4.3.2 provides information for these tests, well information, and the resultant transmissivity and hydraulic conductivity estimates. Figure 4-5 shows the locations of the tested wells.

The following methodology was used to assign updated transmissivity values to Layer 3. The screened intervals for each tested well were compared to the estimated top elevations of Layer 3 (or bottom of Layer 2) from the TAMA model for each well site. Depth specific hydraulic conductivity values derived from spinner flow meter surveys were then multiplied by the thickness of each tested well's screened interval within Layer 3. This produced transmissivity values reflective of the aquifer characteristics of only Layer 3. Note that Well No. 14 did not have a spinner flow meter survey performed at its location, so the estimated transmissivity value for Layer 3 was based upon the overall hydraulic conductivity value from the aquifer test and the portion of the screened interval penetrating Layer 3. Table 5-2 presents the well-specific transmissivity values used to develop a local distribution for Layer 3.

FIGURE 5-2. ESTIMATED LAYER 3 TRANSMISSIVITY VALUES			
Well	TESTED TRANSMISSIVITY VALUE (feet squared per day)	GENERALIZED DEPTH TO TOP OF LAYER 3 ADWR TAMA Model (feet bls) ¹	ESTIMATED TRANSMISSIVITY VALUE FOR LAYER 3 (feet squared per day) ²
Well No. 12	8,732	~600	2,475
Well No. 14	9,798		8,572
Well No. 19	18,032		13,200
Anamax No. 1	30,344		27,000
Notes:			
1 – Model cells at and near these wells show a depth to the top of Layer 3 of generally 600'.			
2 – Calculated using results of aquifer testing presented in Section 4.3.2. The estimated value from the Anamax well was conservatively rounded downwards due to the high productivity of the deepest aquifer units at that location.			

These estimated transmissivity values were then kriged along with bounding transmissivities from the TAMA model Layer 3. The bounding values were located approximately two miles away from the north-south trend of the tested wells to produce a smoothed distribution of local transmissivity estimates within the regional array. The new kriged estimates were imported into the SWC model and used in both the base and AWS simulations. Note that these estimates were not allowed to influence Layer 3 model transmissivities more than 2 miles away from the linear trend of the test wells, and throughout the remainder of Layer 3 the original TAMA model transmissivity values were maintained. Incorporation of these transmissivity values were not deemed to adversely affect the TAMA model calibration, as discussed below in Section 5.2.8. The full distribution of all Layer 3 transmissivity values can be seen in the digital files provided in Appendix C.

5.2.4 Boundary Conditions

Transient proscribed head cells were used as boundary conditions for both the northern and southern boundaries of the model domain with no-flow boundaries to the east and west. Boundary conditions for the SWC model can be viewed on Figure 5-1.

Southern Proscribed Head Boundary Conditions

The locations of the southern proscribed head boundary cells are identical to those in ADWR's TAMA model. For the base simulation (1941-1999), the southern proscribed head values are identical to those in ADWR's TAMA transient model. For the AWS simulation (2000-2107), the southern proscribed head values are identical to those specified in ADWR's TAMA Base Case Future Model simulation through year 2025. Beyond this time frame the head values are held constant at the estimated 2025 value.

Northern Proscribed Head Boundary Conditions

In order to conservatively estimate the future impact of pumping in the northern portions of the Tucson AMA on water levels in the SWC model domain, the following methodology was followed. Initially, ADWR's TAMA Base Case Future Model simulation was run with the final stress period extended through 2107. From the year 2000 on, SWC existing and future pumping were updated and simulated explicitly within the model at their reported and projected pumping rates and proper locations. This essentially updated the TAMA Future model to reflect SWC's most recent projected pumping volumes. This approach also allowed for conservatively high water level decline estimates in the central Tucson basin for the next 100 years. As previously stated, the northern boundary of the SWC model is located along row 59 of ADWR's TAMA model grid. Head values from this row from the updated TAMA Future model simulation were exported for the full model period (1941-2107) and used as proscribed head values for the both the SWC base and AWS simulations. This methodology produced continuous proscribed head declines along the northern AWS model boundary throughout the AWS model time frame and also incorporated any impact of SWC's own future pumpage upon the proscribed head inputs.

5.2.5 Wells

For the base simulation, a total of 1316 pumping wells were included as flux cells. Pumping was applied at the same locations, layers, and magnitudes as those specified in the TAMA model. By the end of the simulation (end of 1999), approximately 116,000 AF/yr of pumping is simulated within the model domain.

For the AWS simulation, a total of 1625 individual pumping well locations were included in the model domain as grid independent analytical wells, which are compiled as standard flux cells during model runs. Table 5-3 below summarizes the various methods used to assign pumping in the AWS simulation. For the time period from year 2000 through 2006, all annual demands were imported directly from the tabulated groundwater withdrawals recorded in ADWR's "pumpyear" database at the appropriate registered well locations. Future committed demands were tabulated in two separate ways. Demands approved prior to 2005 were calculated by averaging the recorded annual pumping for the five year period from 2002 through 2006. These average pumping values were applied for the time period from 2007 through 2107 with the exception of future pumping for SWC and Farmers Water Company, which were both replaced with new AWS demands from recent permits. This approach is conservative in that it accounts for a total future committed demand in excess of both the approved amount as well as exceeding the amount of pumping recorded for only 2006. For all committed AWS demands approved after 2005 within the model domain, the permitted annual pumping was included in the model at "new" wells at the location of the new developments. All pending AWS demands were also simulated at their full requested demand amounts beginning in 2008 at the locations of the planned developments. Additionally, all exempt wells within the model domain were pumped at 1 AF/yr (1041 wells). Pumping by demand type can be found in Table 3-6, and total pumping

applied to the model at build-out totals 111,489.5 AF/yr. By then end of year 2107 of the AWS simulation, approximately 111,000 AF/yr of pumping is still sustained in the model, accounting for 98 percent of the total demand and including 100 percent of the SWC build-out demand. Detailed pumping information regarding well locations, pumping schedules, and demand type is provided in GIS format in Appendix Z.

Table 5-3 ALLOCATION OF GROUNDWATER PUMPING	
AWS SIMULATION TIME PERIOD	ASSIGNED GROUNDWATER PUMPING
2000 – 2006	Recorded pumping from ADWR records
2007 – 2107	Average of recorded pumping for 2002-2006 Committed Demands since 2005 Pending Demands Projected SWC Demand Exempt Well Pumping

5.2.6 Recharge and Evapotranspiration

For the base simulation, the magnitude and distribution of recharge is identical to that of the TAMA model. For the AWS model, groundwater recharge was imported from the TAMA Future model simulation, with the exception of future recharge at the Pima Mine Road Recharge Project (PMRRP) and the North Borrow Pit, both located north of SWC. The reported average annual recharge volume at PMRRP since the onset of full scale operations (2000 through 2005) was calculated and only 5 percent of this value was allowed to recharge at the site, representing the “cut to the aquifer” as specified by the A.R.S. § 45-852.01C. The average of reported recharge volumes for the PMRRP was approximately 21,386 AF/yr, and the simulated future recharge rate for the facility from 2008 through 2107 was approximately 1,069 AF/yr. No recharge was simulated for the North Borrow Pit.

5.2.7 Stress Periods and Initial Conditions

For the base simulation, 59 annual stress periods with 12 time steps each were used to simulate the time period from 1941 through 1999, matching the design of the TAMA model. Heads from the TAMA steady state model were used as the initial conditions. For the AWS simulation, 108 annual stress periods with 12 time steps each were used to simulate the time period from 2000 through 2107. Initial conditions were imported from the end of the base simulation.

5.2.8 Calibration

Because the SWC model was based strictly upon the framework of the ADWR TAMA model, the base simulation and early stress periods of the AWS model were qualitatively calibrated by comparing the groundwater contours and cell specific water levels with those from ADWR’s transient TAMA model (ADWR, 2006). The SWC model accurately reproduced ADWR’s water level conditions throughout the model domain during the 1941-1999 time periods; thus, the model was deemed to adhere to the appropriate calibration standards met by the TAMA model. Figure 5-2 presents a comparison of the simulated water levels in 2006 versus recently observed water levels.

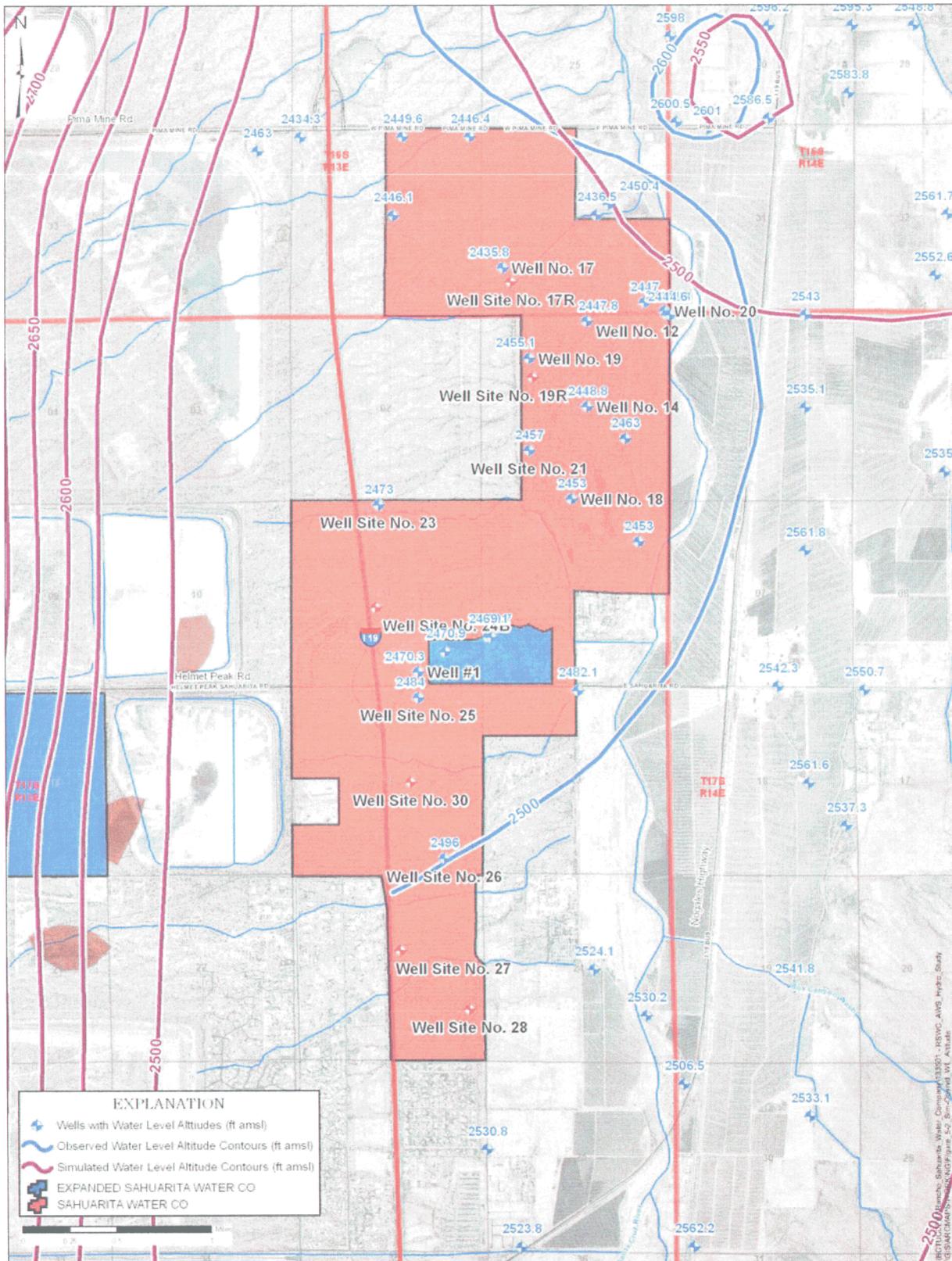


Figure 5-2 – Simulated and Observed Water Level Altitudes (2005-2007)

5.3 MODEL RESULTS

Detailed model simulation results are provided in MODFLOW and GIS formats in Appendix Z.

5.3.1 Water Levels Altitudes

Figure 5-3 presents model predicted groundwater altitudes in 2107 in the vicinity of SWC. In order to remove any potential bias due to effects of the inclusion of updated Layer 3 transmissivity values on the overall model calibration, the drawdown from the SWC model (from 1999 to 2107) was subtracted from ADWR's TAMA model simulated water levels for the end of 1999 to produce a final simulated head distribution. Groundwater elevations range from 2,001 to 2,072 ft amsl at the SWC service area, and flow generally proceeds from all directions towards the pumping center comprised by SWC, Community Water Company of Green Valley, and Farmers Water Company.

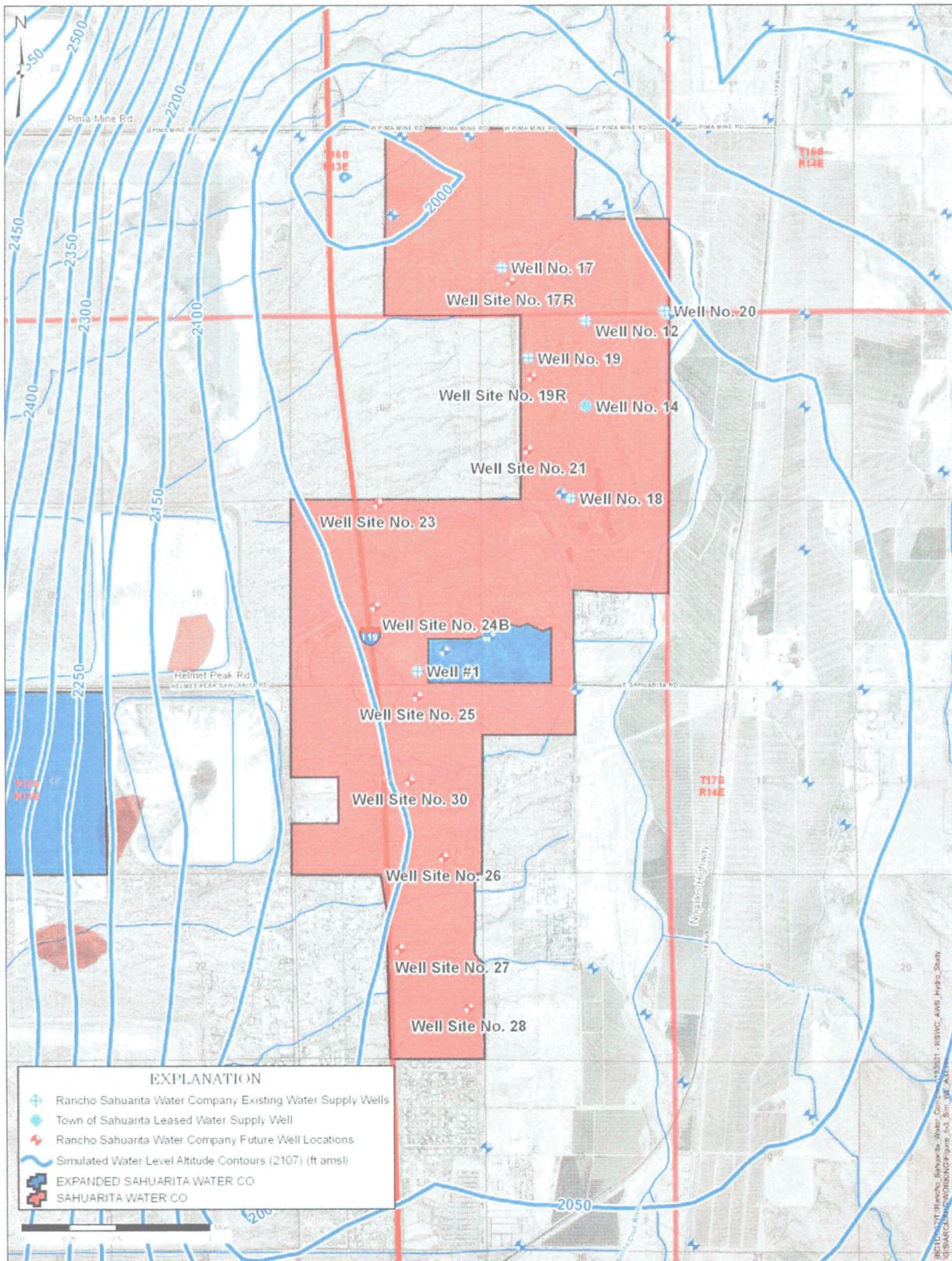


Figure 5-3 – Simulated Water Level Altitudes (2107)

5.3.2 Depth to Water

Figure 5-4 presents model simulated depths to water in 2107 in the vicinity of SWC. As described above, these depths-to-water were calculated by subtracting the final 100-year simulated head distribution discussed above from ground surface elevations for each model cell. Estimated depths-to-water at the SWC service area range from 610 to 785 feet below land surface (ft bls), with the greatest depths occurring in the eastern and southern portions.

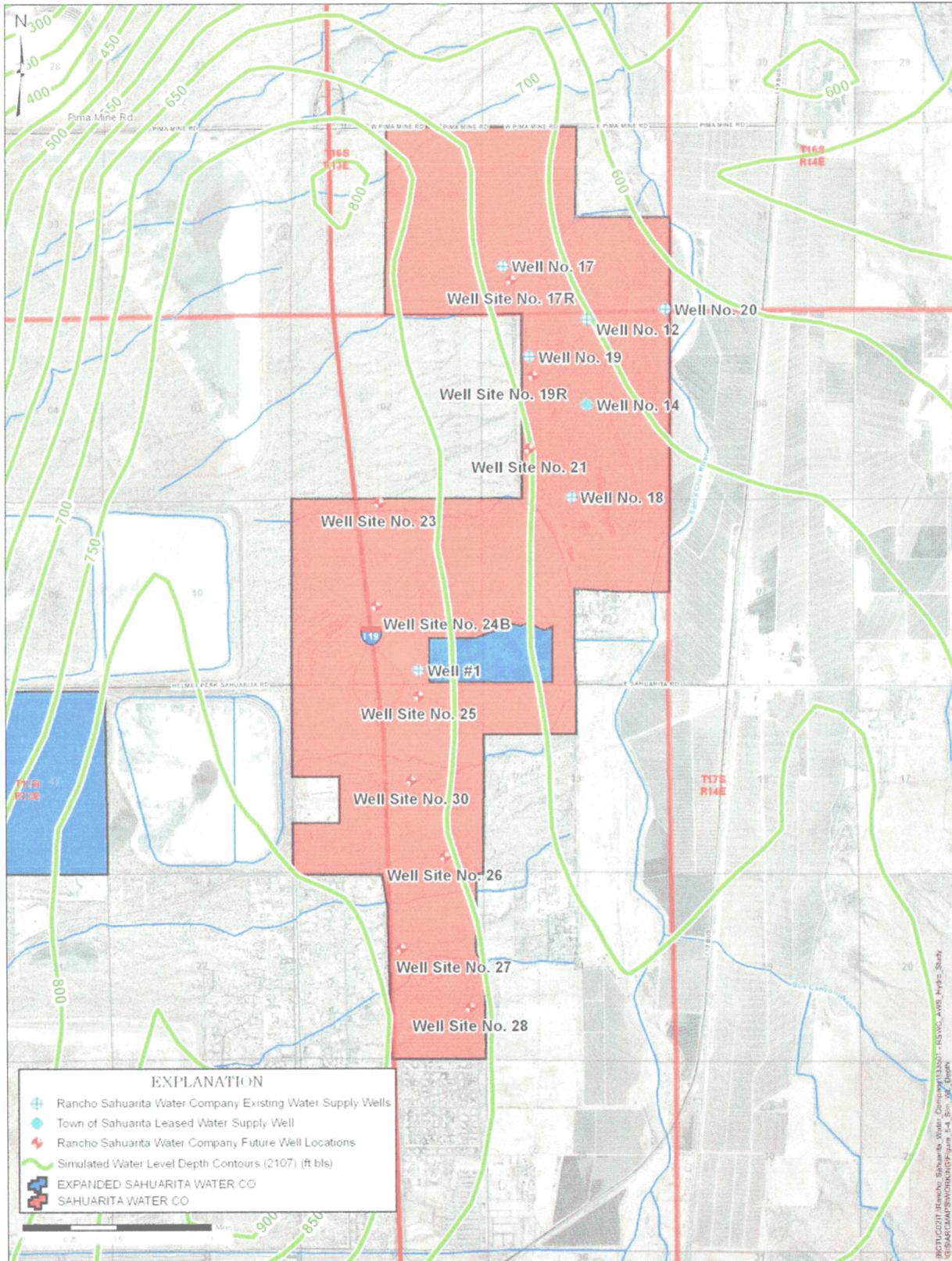


Figure 5-4 – Simulated Water Level Depths (2107)

6. CONCLUSIONS

The hydrogeologic analyses presented herein demonstrate the physical availability of 10,983 AF/yr of local groundwater resources for 100 years for the existing and planned expansion of SWC's water service area. The planned expansion is to serve potable groundwater resources to two proposed development projects including the Mission Peaks and Sahuarita Mission development projects, and an existing school site. The school site includes the Sahuarita Unified School District Campus (K through 12). Mission Peaks development may also include development on an adjacent State Land parcel. Additional potable groundwater resources may also be served (bulk sales) to 500 existing off site units at the adjacent Magee Ranch by a stand-pipe system. Additional development is also planned within the existing service area within the Rancho Sahuarita Master Planned Community.

To demonstrate the physical availability of an Assured Water Supply within the Tucson AMA utilizing groundwater resources, it is required that current, committed and projected groundwater withdrawals over 100 years will not result in depth-to-water to exceed 1,000 feet from ground surface or depth-to-bedrock, whichever is less. Furthermore, groundwater must also be of acceptable quality for potable use. Lastly, the proposed water uses must be consistent with the Rules and Regulations of ADWR pertaining to demonstration of an AWS within an AMA (A.R.S. 45-576).

To assess the future hydrologic impacts of future groundwater development by SWC, a three-dimensional, numerical groundwater flow model ("SWC model") was constructed for the southern portion of the Tucson AMA. In order to insure consistency with current modeling efforts by ADWR, the primary source of information and guidance in the development of the model was ADWR's Modeling Report No. 13 by Dale Mason and Liciniu Bota, *Regional Groundwater Flow Model of the Tucson Active Management Area, Tucson, Arizona: Simulation and Application*, 2006 (ADWR, 2006) as well as the digital model files for the Tucson AMA model ("TAMA model"). The groundwater model was modified to incorporate new hydrogeologic data gathered from exploratory boring analyses and aquifer testing programs performed by Brown and Caldwell for the SWC in 2006 and 2007.

The groundwater model, incorporating current, committed and projected groundwater water demands within an approximate 500-square mile hydrologic study area were applied to project water-level conditions in 2107, a 100 year period. Computer simulations were performed with only 5 percent of about 20,000 AF of annual artificial recharge of Central Arizona Project water at the Pima Mine Road Recharge Project and with no recharge for the North Borrow Pit, both located just north of SWC. The hydrologic simulations analyses demonstrated that maximum depth-to-water in the vicinity of SWC's water supply wells will range from 610 to 785 ft bls in 100 years. These projected depths meet the requirement for AWS analyses for the Tucson AMA in that depth to water in 100 years can not exceed 1,000 feet from the ground level or depth-to-bedrock, which ever is less.

Groundwater quality analyses performed on groundwater samples collected from active wells and exploratory borings reveal favorable groundwater quality for potable use based on current regulatory limits. The proposed water uses will be consistent with the Rules and Regulations of ADWR, pertaining to demonstration of an AWS within an AMA (A.R.S. 45-576).

The hydrologic analyses presented invoke a number of conservative elements in demonstrating the physical availability of sufficient groundwater resources. The principal elements area as follows:

- New wastewater treatment plant will be constructed for the new developments. No effluent reuse or artificial recharge of effluent generated by the new developments was included in the hydrologic simulations. Potentially up to 60 percent of equivalent volume of pumpage may be available for future reuse or recharge.
- Mine and agricultural water usage in the hydrologic study area will likely not be at current levels for 100 years. Hydrologic simulations assume current levels of pumpage will remain constant. Mine life will likely be exhausted, and agriculture usage will likely be retired and transferred to municipal uses. A significant net reduction in overall water usage will likely occur.
- Artificial recharge of Central Arizona Project (CAP) water at the Pima Mine Road Recharge Project will likely continue into the distant future and potentially augmented in the future. Currently annual recharge totals about 20,000 AF/yr. Hydrologic simulations only applied 5 percent of the total as required by ADWR. North Borrow pit may also be in operation within the simulated period.

7. LIMITATIONS

Report Limitations

This document was prepared solely for SWC in accordance with professional standards at the time the services were performed and in accordance with the contract between SWC and Brown and Caldwell, dated February 12, 2007. This document is governed by the specific scope of work authorized for SWC; it is not intended to be relied upon by any other party, except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by SWC and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

APPENDIX A

Sahuarita Water Company Projected Water Demand Calculations

Rancho Sahuarita Water Company Modification of Assured Water Supply Designation Demands

Demand Criteria		2.25 af/ac/yr	
2.7 ppbu	Single-family	25 gpcd	Commercial
1.8 ppbu	Active-Adult	43 gpcd	Elementary and Middle School
1.9 ppbu	Multi-family	10,000 gallon	High School
101 gpcd	Single-family		construction water
123 gpcd	Active-Adult		Lost and unaccounted for water
68 gpcd	Multi-family		10%

Phase	Year	Mission Peaks				Residential				Non-Residential				Total with Lost and unaccounted for (af/yr)							
		Single Family Units	Active Adult Units	Multi-Family Units	Active Adult Units	Single Family Units	Multi-Family Units	Residential Demand (af/yr)	Total Units	Construction Water (af/yr)	Commercial (Sq. Ft)	High Schools (students)	Elem. & Middle School (students)		Commercial (Sq. Ft)	High Schools (students)	Elem. & Middle School (students)	Non-Residential Demand (af/yr)	Total Water Use (af/yr)	Lost and Unaccounted for Water (af/yr)	
	2006				404				1093									5	1098	110	1208
	2007				489				1261									77	1356	136	1492
	2008				654				1725									193	1936	194	2129
	2009				687				1812									163	2014	201	2215
I	2010	100	100	174	731				2063	7000							3044	306	2398	240	2637
2	2011	400	300	174	785				2402	8160							3150	306	2764	276	3040
3	2012	950	600	174	790				2850	9779							3150	326	2833	326	3500
4	2013	1775	900	600	790				3524	12170							3150	345	3842	384	4337
5	2014	2375	1361	1000	790				4136	14471							3150	383	4600	460	5060
6	2015	2975	1961	1226	850				4658	16337							3150	409	5125	512	5637
7	2016	3574	1761	1506	910				5188	18256							3150	427	5674	567	6241
8	2017	3692	1861	1506	970				5530	19414							3150	448	6014	601	6615
9	2018	3692	1861	1506	1086				5819	20454							3150	455	6306	631	6937
10	2019	4192	2371	1506	1086				6189	21775							3150	544	6774	677	7451
11	2020	4692	2371	1506	1086				6415	22515							3150	555	6903	699	7602
12	2021	5192	2371	1506	1086				6641	23255							3150	555	7219	722	7941
13	2022	5692	2371	1506	1086				6867	23995							3150	555	7445	745	8190
14	2023	6192	2371	1506	1086				7097	24615							3150	555	7631	763	8384
15	2024	6692	2371	1506	1086				7323	25215							3150	555	7780	778	8558
16	2025	7192	2371	1506	1086				7515	26115							3150	555	7933	793	8726
17	2026	7692	2371	1506	1086				7817	27104							3150	559	8085	809	8894
18	2027	8192	2371	1506	1086				8046	27854							3150	559	8406	841	9247
19	2028	8692	2371	1506	1086				8275	28604							3150	559	8628	863	9491
20	2029	9192	2371	1506	1086				8504	29354							3150	559	8857	886	9743
21	2030	9692	2371	1506	1086				8733	30104							3150	559	9254	925	10180
22	2031	10192	2371	1506	1086				8962	30854							3150	559	9469	947	10415
23	2032	10692	2371	1506	1086				9191	31604							3150	559	9687	970	10667
24	2033	11192	2371	1506	1086				9420	32354							3150	559	9926	993	10919
25	2034	11692	2371	1506	1086				9649	33104							3150	559	9984	998	10983

Assumptions

Sahuarita Mission

Based on 600 Acres at 5 RAC
Buildout 240 units/yr starting 2011

Mission Peaks

3,624 SF units added per Matt Lawsons request (6/21/07)
Based on Water Master Plan Prepared November 2006
Estimated 25 yr Buildout, starting April 2010

Rancho Sahuarita

Residential and Commercial uses revised per Cori's projections (6/15/07)
Based on Water Master Plan Prepared November 2006
Estimated 10 yr Buildout
School estimates based on current and max number of students at Sahuarita and DeAnza Schools

Updated 10/24/07

APPENDIX B

Anamax No. 1 Aquifer Test Letter Report

Suite 2300, 110 South Church Avenue
Tucson, Arizona 85701

Tel: (520) 624-5744
Fax: (520) 791-2738

September 26, 2005

**BROWN AND
CALDWELL**

Mr. Norris West
Community Water Company of Green Valley
1501 South La Cañada Drive
Green Valley, Arizona 85622

128730.001.003

Subject: Evaluation at Anamax No. 1 Well

Dear Mr. West:

Brown and Caldwell conducted a well evaluation at the existing Anamax No.1 well in Green Valley, Arizona. Work completed included: 1) video logging after completion of well rehabilitation by brushing and bailing, 2) test pumping, 3) constant rate pumping accompanied by spinner logging and zonal groundwater sampling, and 4) measurement of water level recovery after completion of step 2. All pump removal and installation, well rehabilitation, and video logging were completed by Layne Christensen. Spinner logging and depth-discrete sampling were completed by Welenco. Laboratory analysis of water samples were completed by Legend Laboratories.

Results from the 10-hr constant rate pumping test indicate a transmissivity of approximately 227,000 gallons per day per foot (gpd/ft). Results from the spinner test indicate that approximately 87 percent of the total flow is contributed from the basin-fill alluvial aquifer, which based on well lithologic information extends to a depth of approximately 1,300 feet below ground surface (bgs). Zonal groundwater samples were collected from four different depths and one composite sample. The arsenic concentrations exceeded the maximum contaminant level (MCL) that will be effective in January 2006 for all five samples collected. However, the arsenic concentrations are not believed to be representative of zone-specific conditions in the aquifer but rather the result of long-term vertical mixing of water qualities from different depths. A detailed summary of all the associated well evaluation activities and findings are summarized below.

WELL EVALUATION AND DOWNHOLE TESTING

A well production evaluation was conducted on the Anamax No.1 well on July 27, 2005. The evaluation consisted of test pumping, spinner flowmeter survey, zonal groundwater sampling, and a water level recovery test.

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The Anamax No. 1 well was originally completed to a total depth of 2,516 feet with the perforated interval from 601 to 2,516 feet. The well penetrated basin-fill alluvium to a depth of 1,300 feet, conglomerate from 1,300 to 1960 feet, and arkose and siltstone to the total depth (Montgomery 2005). Currently the Anamax No. 1 well is open to a depth of approximately 1,885 feet.

Prior to conducting the downhole testing, a test pump was installed to a depth of approximately 560 feet bgs. A series of increasing pumping rates were conducted to evaluate the well specific capacity. At a pumping rate of approximately 3,280 gallons-per-minute (gpm) a drawdown of approximately 49 feet was measured resulting in a specific capacity of 67 gpm/foot of drawdown. Although only pumped for approximately 120 minutes at this rate, this indicated that Anamax No.1 well was a highly productive well. Based on this result it was decided to conduct the spinner-logging at a pumping rate of 2,000 gpm.

Geophysical Logging

Geophysical logging consisted of a spinner flowmeter survey. The spinner flowmeter survey is used to measure the groundwater flow rates (velocities) within a producing well. These measurements identify the more permeable zones and their relative contribution to the total flow of the production well. The flowmeter survey consisted of three logging runs, each at different line speeds. Because the spinner output is directly proportional to the fluid movement past the impeller, three different logging profiles are obtained to provide comparison of velocity profiles and increase the accuracy of flow rate calculations.

Analysis of the spinner log data indicates that at a pumping rate of 1,885 gpm, the basin-fill alluvial aquifer from the top of the perforations at 600 feet bgs to 1,300 feet bgs contributes approximately 87 percent (1,639 gpm) of the total flow. Thirteen percent (246 gpm) of the production then comes from the conglomerate. Within the alluvial aquifer, six main intervals of groundwater influx were identified, differentiated partly by hydraulic conductivity values. Two discrete water-bearing intervals were apparent within the conglomerate aquifer. The distribution of the groundwater production intervals in the Anamax No. 1 well and corresponding lithology is shown in Table 1.

TABLE 1. SPINNER FLOWMETER ANALYSIS

INTERVAL DEPTH (FEET, BLS)	PERCENTAGE OF FLOW (PERCENT)	GENERALIZED GEOLOGY
601 to 750	9	Alluvium
750 to 900	43	
940 to 1,040	10	
1,040 to 1,075	12	
1,130 to 1,160	7	
1,235 to 1,260	6	
1,350 to 1,410	6	Conglomerate
1,520 to 1,760	7	

Groundwater Sampling

Following the flowmeter survey, depth-specific groundwater samples were collected in the Anamax No.1 well with a wire-line sampling tool. The samples were collected to characterize the water quality throughout the screened portion of the aquifer, and were obtained from specific depths in the well based on analysis of the spinner flowmeter log and reported geologic strata penetrated by the well. The zonal samples were collected at depths of 790, 1,000, 1,100, and 1,270 feet. A composite sample from the pump discharge was also collected. All five samples were analyzed for arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, zinc, fluoride, nitrate, nitrite, sulfate, and total dissolved solids (TDS). Results of the laboratory analysis for each sample are presented in Appendix A. Results for selected constituents are summarized in Table 2.

TABLE 2. DEPTH-SPECIFIC SAMPLING ANALYTICAL RESULTS

SAMPLE INTERVAL (feet bls)	CONSTITUENT				
	TOTAL DISSOLVED SOLIDS	SULFATE	ARSENIC	FLUORIDE	CHROMIUM
Composite	275	64.3	0.017	1.74	<0.005
790	244	61.5	0.017	1.81	<0.005
1,000	283	73.1	0.015	2.28	<0.005
1,100	282	61.1	0.014	2.19	0.006
1,270	331	88.3	0.014	1.48	0.008
MCL	500a	250a	0.010	4	0.1

All concentrations in milligrams per liter (mg/L)
 bls = below land surface
 MCL = maximum contaminant level (Federal Standard)
 aSecondary Maximum Contaminant Level (not enforceable)
 Arsenic MCL as of January 23, 2006

Similar to all constituents that were analyzed (Appendix A), concentrations of the selected constituents shown on Table 2 for each depth-specific sample and the pump discharge sample appear to be moderately consistent. TDS concentrations ranged from 331 to 244 milligrams per liter (mg/L), sulfate from approximately 61 to 88 mg/L, arsenic from 0.014 to 0.017 mg/L, fluoride from 1.48 to 2.28 mg/L and chromium from less than 0.005 to 0.008.

Aquifer Test

During the flowmeter survey and sampling activities, the well was pumped for approximately 10 hours at a constant average rate of 1,885 gallons per minute (gpm). A plot of the water level decline within the well is presented on Figure 1. Based on this data a total of 27 feet of drawdown occurred resulting in a specific capacity of 70 gpm/ft of drawdown. This value is slightly lower than the specific capacity measured the previous day at a pumping rate of over 3,200 gpm, indicating that the well is well-developed. Following the cessation of pumping, a water level recovery test was conducted to obtain an estimate of aquifer transmissivity. A semi-log plot of the aquifer test data is presented as Figure 2. Review of the Theis Recovery Plot indicates a transmissivity of approximately 227,000 gallons per day per foot (gpd/ft).

Findings

Based on the zonal sampling results, the high arsenic concentrations encountered in the Anamax No. 1 well would appear to be distributed throughout the entire portion of the alluvial and conglomerate aquifers screened. However, several conditions indicate that most likely that the zonal sampling results do not reflect ambient conditions in the local aquifer regarding vertical distribution of water quality. These include:

- The consistency of the analytical results for each constituent in all samples,
- The length of the perforated interval in the well (i.e. groundwater production from potentially multiple aquifer units and variable lithology), and
- Historic well use (non-pumping for an extended period of time).

Recognized throughout many developed alluvial basins within the Basin and Range Physiographic Province in Arizona, an important hydrogeologic characteristic to consider that appears to prevail in the local aquifer system comprising the Anamax No. 1 well is the occurrence of a vertical hydraulic gradient. Hydraulic gradients can develop due to differences in the hydraulic conductivity of alluvial deposits together with long-term groundwater level declines from over-pumping or increases from recharge. The vertical hydraulic gradient would occur in the perforated portion of the well casing and potentially the annulus. Thus, under static conditions, water in the upper portion of the screened aquifer will migrate downward within the well casing and then, deeper in the well, horizontally into adjacent strata. The presence of

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significant arsenic concentrations in the upper-most sample (790 feet bgs) combined with high percentage of flow originating from the 750 – 900 feet bgs portion of the well suggests that this interval may be a primary source of the arsenic. Further studies would be needed to more definitively address this.

Conclusions

Although relatively old and unused for a number of years, Anamax No. 1 well is a highly productive well. Based on the well production evaluation it could likely sustain a pumping rate of over 3,000 gpm with a pump setting, using current depths to water, of approximately 375 to 400 feet below ground surface. Water quality appears to be very consistent for the constituents analyzed throughout the screened portion of the Anamax No. 1 well. However, the results do not appear to be representative of local aquifer conditions due to the reasons stated above. Long-term continuous pumping of the well could result in changes in water quality as water from the upper portions of the aquifer are purged from the system and further diluted from groundwater produced throughout lower sections of the well. It is unknown if the concentration of arsenic would be significantly reduced. Historic water quality data from the Anamax No. 1 well, if available, could be an indication. Conversely, operating the well on an intermittent or seasonal basis could result in no significant changes in water quality due to the current suggested hydraulic conditions within the well.

If you have any questions please do not hesitate to contact either of the undersigned at 520-624-5744.

Very truly yours,

BROWN AND CALDWELL

Steve Brooks, R.G.
Supervising Hydrologist

Michele Mahal
Staff Scientist II

Figure 1
Anamax #1 Well - Spinner Test Drawdown Data at Q = 1,885 gpm

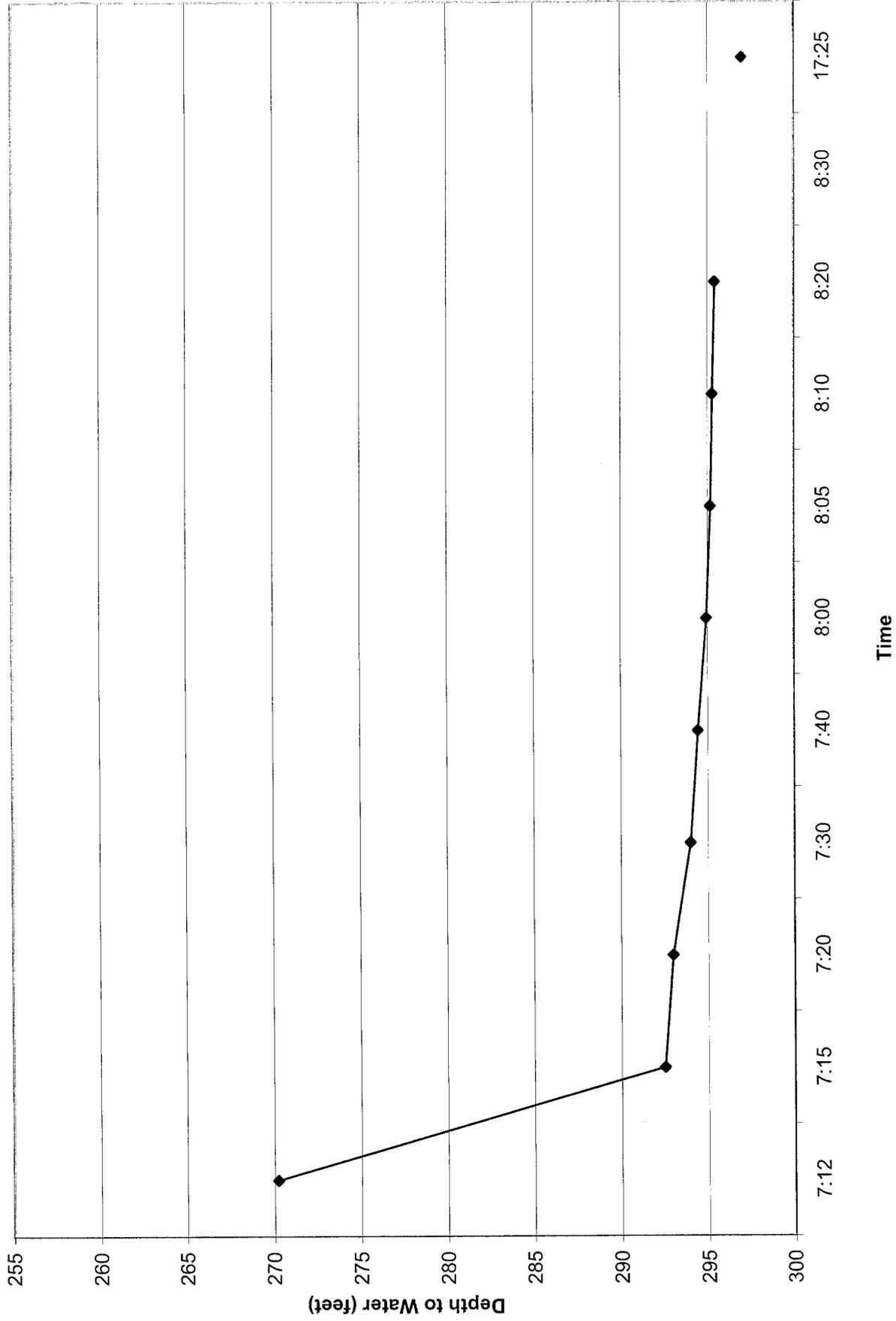
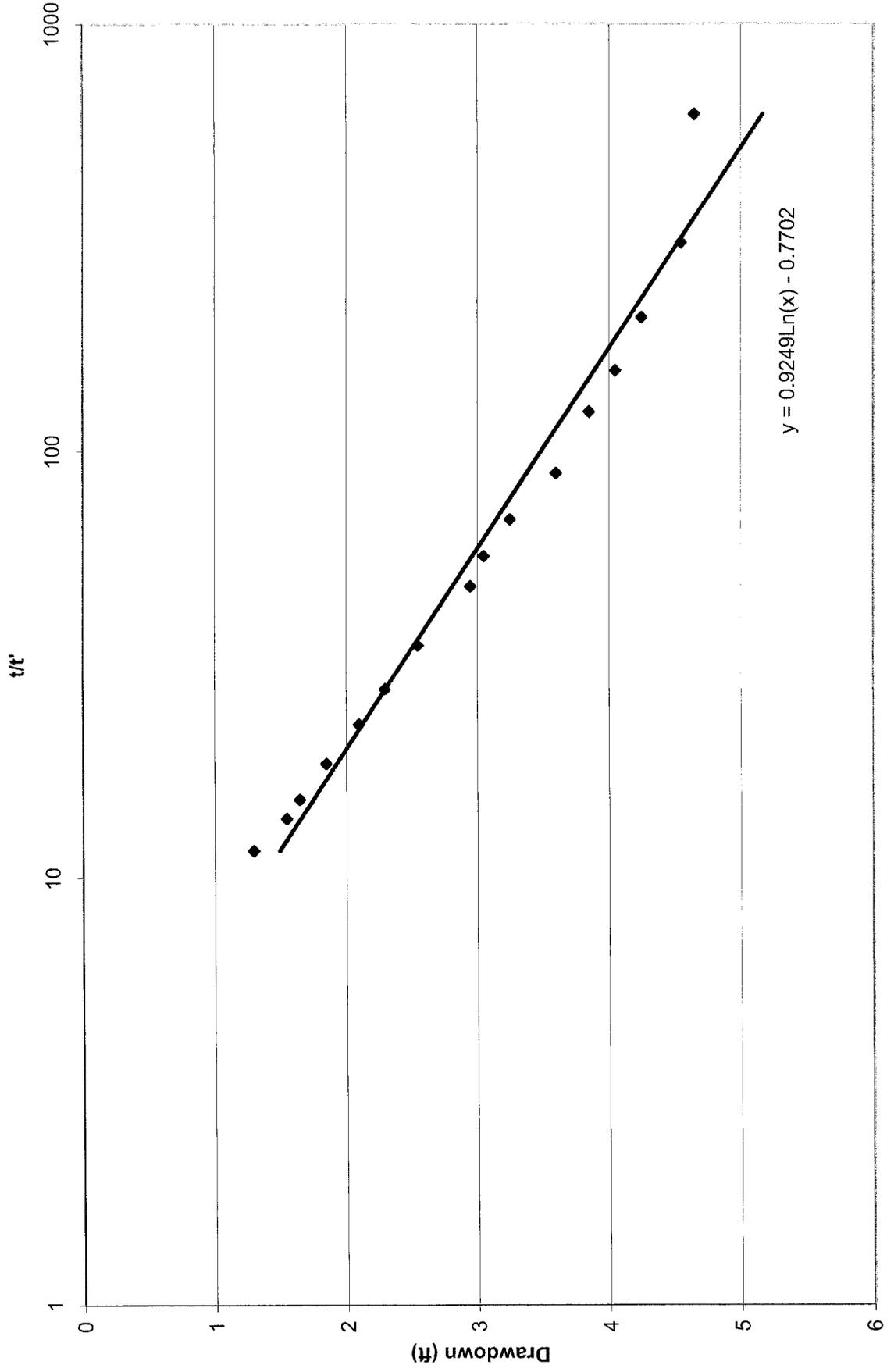


FIGURE 2
Anamax No. 1 Well - Recovery Data



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APPENDIX Z

MODFLOW and GIS Formats Data Files (Compact Disk Only in ADWR and SWC Submitted Reports)

APPENDIX “W”

(December 5, 2007 Well Impact Study Report for
Sahuarita Water Company, as prepared by Brown
and Caldwell)

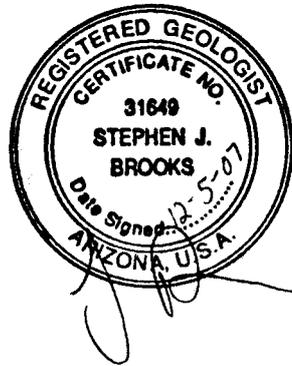
Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

WELL IMPACT STUDY REPORT
FOR SAHUARITA WATER
COMPANY

Prepared for
SAHUARITA WATER COMPANY,
SAHUARITA, ARIZONA
December 5, 2007

WELL IMPACT STUDY REPORT FOR
SAHUARITA WATER COMPANY

SAHUARITA WATER COMPANY, SAHUARITA, ARIZONA
December 5, 2007



BROWN AND CALDWELL

110 South Church Avenue, Suite 2300,
Tucson, Arizona 85701

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Table 3-4. ESTIMATED 10-FOOT WATER-LEVEL DRAWDOWN RADII AFTER 5 YEARS OF CONTINUOUS PUMPING AT BUILD-OUT PRODUCTION RATE FOR SAHUARITA WATER COMPANY FUTURE PLANNED WATER SUPPLY WELLS 3-4

EXECUTIVE SUMMARY

This report documents a well impact study conducted for the Sahuarita Water Company (SWC) to evaluate potential groundwater level impacts on neighboring wells not owned or operated by SWC from an augmentation of local groundwater development to serve potable water resources to an expanded water service area. The SWC is in the process of expanding the current limits of the Certificate of Convenience and Necessity (CC&N) water service area under the regulatory authority of the Arizona Corporation Commission (ACC). In 2006 the SWC developed about 1,260 acre-feet (AF) of groundwater to meet water demands. By 2034, the SWC has plans to develop about 11,000 AF annually to meet future potable water demands. More information on the development plans of SWC can be reviewed in the *Assured Water Supply Hydrology Report for Sahuarita Water Company* dated November 21, 2007 compiled by Brown and Caldwell.

Based on water demand requirements at build-out in 2034, the SWC has plans to install 10 new potable water supply wells and utilize one existing well into the future. Potential well sites were carefully selected with great emphasis in limiting water level impacts on neighboring wells not owned by SWC. To evaluate the potential water level impacts, the Arizona Department of Water Resources' (ADWR) well spacing rule R12-15-1302 "Well Spacing Requirements - Applications to Construct New Wells or Replacement Wells in New Locations Under A.R.S. § 45-599" was applied in the analysis.

The WINFLOW™ analytical element groundwater flow model was used to simulate two-dimensional, transient groundwater flow for the well impact study. The 10-foot drawdown radii contours that are projected to develop around each SWC well after five years of continuous pumping at the build-out production rates were calculated using the analytical groundwater model. The water-level drawdown radii contours are then compared to the locations of existing neighboring wells not owned by SWC.

The analytical model was used because a multi-well analysis is required (image well) to also simulate the projected hydrogeologic affects of shallow bedrock of the Sierrita Mountains to the west of the existing water service area. Image well theory provides a mechanism to create a "no flow" boundary at the shallow bedrock zone where the orientation of the boundary is near perpendicular to the pumping well.

Based on the well impact analyses presented, water-level drawdown impacts on neighboring wells from the augmentation of pumping of SWC wells will likely be nominal and will be in compliance with ADWR's well spacing requirements and well spacing regulations. All 10-foot drawdown radii calculated are 850 feet or less from the planned wells. No existing exempt and non-exempt wells are affected by greater than 10 feet or greater of additional water-level drawdown after 5 years of continuous pumping.

1. INTRODUCTION

This report documents a well impact study conducted for the Sahuarita Water Company (SWC) to evaluate potential groundwater level impacts on neighboring wells not owned or operated by SWC from an augmentation of local groundwater development to serve potable water resources to a proposed expanded water service area. The SWC is in the process of proposing to expand the current limits of the Certificate of Convenience and Necessity (CC&N) water service area under the regulatory authority of the Arizona Corporation Commission (ACC). The current CC&N and proposed expanded area is shown on Figure 1-1. In 2006 the SWC developed about 1,260 acre-feet (AF) of groundwater to meet water demands. By 2034, the SWC has plans to develop about 11,000 AF annually to meet future potable water demands. More information on the development plans of SWC can be reviewed in the *Assured Water Supply Hydrology Report for Sabuarita Water Company* dated November 21, 2007 compiled by Brown and Caldwell.

Based on water demand requirements at build-out in 2034, the SWC has plans to install 10 new potable water supply wells and utilize one existing well into the future. Potential well sites were carefully selected with great emphasis on avoiding any regulatory water level impacts on neighboring wells not owned by SWC. To evaluate the potential water level impacts, the Arizona Department of Water Resources' (ADWR) well spacing rule R12-15-1302 "*Well Spacing Requirements - Applications to Construct New Wells or Replacement Wells in New Locations Under A.R.S. § 45-599*" was applied. Relevant excerpt of Section D of the rule is stated as follows:

"If the director determines under subsection (B)(1) of this Section that the probable impact of the withdrawals from the proposed well or wells on one or more wells of record in existence as of the date of receipt of the application will exceed 10 feet of additional drawdown after the first five years of operation of the proposed well or wells, the director shall notify the applicant in writing of the location of the wells of record and the names and addresses of the owners of the wells as shown in the Department's well registry."

This criterion formed the basis of the well impact study. In summary the rules require that no neighboring water wells can be impacted by more than 10 feet of additional water-level drawdown from operation of each well over a 5 year period.

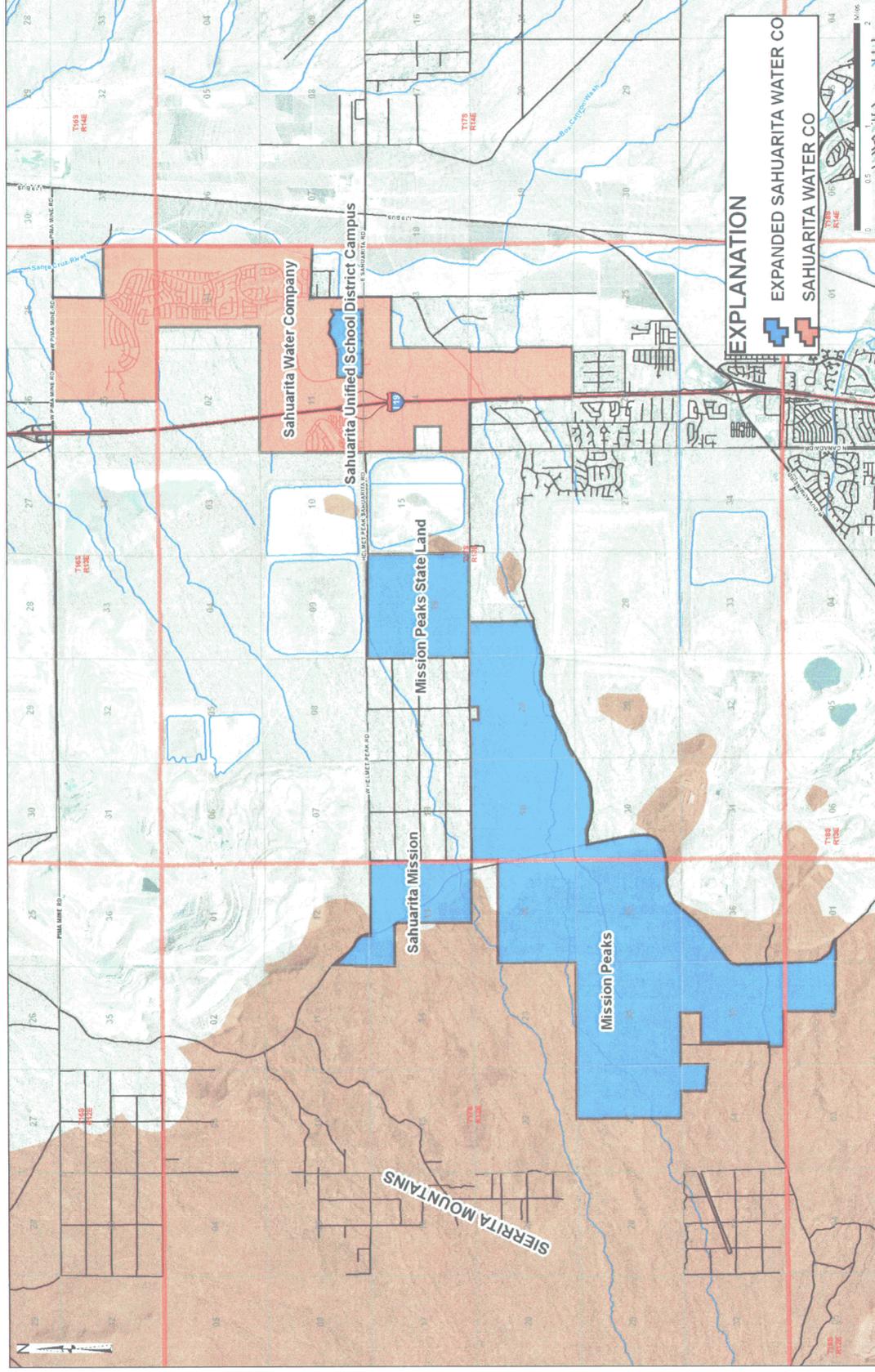


Figure 1-1 – Sahuarita Water Company's Certificate of Convenience and Necessity Current and Proposed Expanded Water Service Areas

2. CURRENT AND FUTURE GROUNDWATER DEVELOPMENT

Groundwater development from the local basinfill groundwater aquifer beneath the existing SWC's water service area will be the principal source of water to meet projected SWC water demands. The SWC, as of the date of this report, owns six wells and leases one well from the Town of Sahuarita. Information regarding these wells is included in Table 2-1 below. Groundwater is currently withdrawn from two active wells, Well Nos. 14 and 18. Well No. 14 is leased to the SWC by the Town of Sahuarita and is also used to maintain lake levels in the Sahuarita Town Lake.

Well No.	ADWR Well Registration No.	Cadastral Location	Casing Diameter (inches)	Casing Materials	Well Depth (feet)	Upper Screen Depth (ft bls)	Lower Screen Depth (ft bls)	Drill Date
1	55-562962	D(17-13)11 dcd	8	Steel, Milled Slots, 12 cuts per foot, 3/16"x3" Slots	500	430	490	9/26/1997
12	55-611141	D(17-13)01 abb	24	Steel, Milled Slots, 24 rows, 1/4"x3"	982	273	970	5/27/1970
14	55-611142	D(17-13)01 acc	24	Steel, Milled Slots, 20 rows, 1/4"x3"	1135	435	1135	10/9/1970
17	55-611143	D(16-13)36 cbc	24	Steel, Milled Slots, 24 rows, 1/4"x3"	1053	247	1030	12/20/1974
18	55-611144	D(17-13)01 cdd	20	Steel, Slotted	905	424	890	4/18/1975
19	55-611145	D(17-13)01 bac	24	Steel, Milled Slots, 24 rows, 1/4"x3"	990	210	972	5/5/1981
20	55-611146	D(16-13)36 ddd	24	Steel, Milled Slots, 26 rows, 1/4"x3"	975	240	975	9/22/1969

Note: Wells in bold are active wells as of the date of this report

Based on recent groundwater sampling and analysis, both wells, Well Nos. 14 and 18, produce potable groundwater. Other wells not utilized are considered to be beyond service life and plans are in place to abandon the wells. Well No. 1 has recently been converted to a monitoring well.

Based on water demand requirements at build-out in 2034, the SWC has plans to install 10 new potable water supply wells and phase out use of existing Well No. 14 for domestic use in 2009. Well No. 14 is leased to SWC from the Town of Sahuarita. This well will continue to be used to maintain lake levels in the Sahuarita Town Lake by applying Type 1 water rights associated with the property area. Well No. 18 will be utilized into the future but will likely be replaced on-site before the build-out year 2034.

In 2006 and 2007 Brown and Caldwell conducted pilot hole and exploratory boring analyses programs to evaluate potential future well sites for the SWC. Potential well sites were carefully selected with great emphasis on avoiding regulatory water level impacts on neighboring wells not owned by SWC. Groundwater production potential and groundwater quality were evaluated at 6 sites, and currently, as of the date of this report, evaluating 2 additional well sites. The pilot hole analysis conducted for Well Site No. 24 concluded that the well site is not viable based on groundwater quality. This analysis is documented in a report titled *Well Site No. 24 Pilot Hole Analyses Report* dated September 6, 2007 (Brown and Caldwell, 2007b). Exploratory boring analyses were conducted at 5 additional well sites, Well Site Nos. 21, 22, 23, 25, and 26. Exploratory boring analyses at Well Site Nos. 21, 23, 25 and 26 revealed favorable groundwater production potential and

groundwater quality. The exploratory boring analyses program is documented in a report titled *Well Site Nos. 21, 22, 23, 25, and 26 Exploratory Boring Analyses Report* dated September 6, 2007 (Brown and Caldwell, 2007c).

Table 2-2 tabulates water supply wells and future well sites planned to be utilized through build-out in year 2034 and beyond by SWC. Projected annual groundwater withdrawals and anticipated well capacities are indicated for each planned well. Well No. 14 will be phased out in 2009 and Well No. 18 will be utilized into the future but will likely be replaced before the build-out year 2034. Table 2-2 also indicates whether groundwater production potential and groundwater quality has been confirmed or not as of the date of this report. Confirmation is noted where a well is existing or an exploratory boring analysis has been completed verifying favorable groundwater production potential and groundwater quality for potable use. Well sites where confirmation has yet to be determined are slated for future exploratory boring analyses.

Figure 2-1 shows the location of these wells, future well sites and neighboring wells. Other wells owned by the SWC, also noted on Figure 2-1 and designated as Well Nos. 1, 12, 17, 19, and 20, will not be used as a result of age and poor conditions of the wells. Neighboring wells are registered wells compiled from ADWR well registry database (ADWR, 2007a) not owned by the SWC and location symbols denote wells as either exempt or non-exempt wells.

Well	Active or Future Wells	ADWR Registration No.	Cadastral Location	Current or Anticipated Pump Capacity (gpm)	Groundwater Production Potential and Groundwater Quality Confirmed?	Projected Groundwater Production at Build-out (2034) (AF/yr)
Well No. 14	Active	55-611142	D-17-13 1ACC	1,900	Yes	0
Well No. 18	Active	55-611144	D-17-13 1CDD	1,400	Yes	1,014.9
Well Site No. 17R	Future	NA	D-16-13 36CCA	1,500	No	1,087.4
Well Site No. 19R	Future	NA	D-17-13 1BDB	1,500	No	1,087.4
Well Site No. 21	Future	NA	D-17-13 1CDB	1,000	Yes	724.9
Well Site No. 23	Future	NA	D-17-13 11BAA	1,500	Yes	1,087.4
Well Site No. 24B	Future	NA	D-17-13 11CAA	1,500	No	1,087.4
Well Site No. 25	Future	NA	D-17-13 14ABA	1,500	Yes	1,087.4
Well Site No. 26	Future	NA	D-17-13 14DDC	750	Yes	543.7
Well Site No. 27	Future	NA	D-17-13 23ACC	1,500	No	1,087.4
Well Site No. 28	Future	NA	D-17-13 23DDA	1,500	No	1,087.4
Well Site No. 30	Future	NA	D-17-13 14DBA	1,500	No	1,087.4
Total = 10,983 AF/yr						

3. WELL IMPACT ANALYSES

3.1 METHODOLOGY

The WINFLOW™ analytical element groundwater flow model was used to simulate two-dimensional, transient groundwater flow for the well impact analyses. The 10-foot drawdown radii contours that are projected to develop around each well after five years of continuous pumping at the build-out production rates were calculated using the analytical groundwater model. The water-level drawdown radii contours are then compared to the locations of existing neighboring wells not owned by SWC.

The analytical model was used because a multi-well analysis is required (image well) to also simulate the projected hydrogeologic effects of shallow bedrock of the Sierrita Mountains to the west of the existing water service area. Image well theory provides a mechanism to create a “no flow” boundary at the shallow bedrock zone where the orientation of the boundary is near perpendicular to the pumping well.

The steady-state module of the model simulates groundwater flow in a horizontal plane using analytical functions developed by Strack (1989). The transient module uses equations developed by Theis (1935) and by Hantush and Jacob (1955) for confined and leaky aquifers, respectively. Each module uses the principle of superposition to evaluate the effects from multiple analytical functions (wells, etc.) in a uniform, regional flow field. An image well was used to simulate the negative hydrologic boundary associated with bedrock of the nearby Sierrita Mountains. The input parameters for the model include: (1) aquifer hydraulic conductivity, (2) aquifer thickness, (3) aquifer storage coefficient, (4) pumping rate from the aquifer and (5) pumping duration.

Representative aquifer parameters are required to develop the model. These aquifer parameters were evaluated from aquifer tests recently performed on three water supply wells operated by SWC. Brown and Caldwell conducted an aquifer test and analysis on the SWC’s Well No. 14 in May 2006. This aquifer test and analysis is documented in a memorandum report, “Well Spacing/Well Impact Investigation –Rancho Sahuarita Water Company’s Well #21 – D-17-13 01CDB,” dated December 22, 2006. In addition, Brown and Caldwell conducted aquifer test and spinner flow meter survey analyses on the SWC’s Well Nos. 12 and 19 in July 2007. These tests are documented in a report *Well Nos. 12 and 19 Aquifer Test Analyses and Well Production Evaluations* dated July 16, 2007 (Brown and Caldwell, 2007a).

Transmissivity (T-values) evaluated and specific capacities measured from these aquifer tests are summarized on Table 3-1, along with pertinent information regarding the tests and wells.

Well	ADWR Registration No.	Cadastral Location	Surface Elevation (ft amsl)	Date of Test	Duration (hr)	Static Water Level (ft bls)	Tested Rate (gpm)	Pumping Water Level (ft bls)	Measured Specific Capacity (gpm/ft)	T-Value (gpd/ft)	Analysis T	Upper Perforations (ft bls)	Lower Perforations (ft bls)
Well No. 12	55-611142	D-17-13 1ABB	2700	5/3/2007	24	252.2	536	269	32.7	65,325	Ave DD/Rec	273	970
Well No. 14	55-611144	D-17-13 1ACC	2706	5/25/2006	24	256.4	1811	331	24.3	73,300	Rec	435	1,135
Well No. 19	55-611145	D-17-13 1BAC	2726	5/10/2007	24	270.92	520	283	44.4	134,900	Ave DD/Rec	210	972

Notes: ft amsl = feet above mean sea level
 hr = hour
 ft bls = feet below land surface
 gpm = gallons per minute
 gpm/ft = gallons per minute per foot of drawdown
 gpd/ft = gallons per day per foot of drawdown
 DD = water-level drawdown analysis
 Rec = water-level recovery analysis

Effective hydraulic conductivity (K-value) of the local aquifer is required for the model and was evaluated by the following relationship between transmissivity and saturated thickness of the well under pumping conditions:

$$T = Kb$$

where

T = transmissivity of the aquifer perforated by the well;

b = saturated thickness of the aquifer perforated by the well under pumping conditions; and

K = effective hydraulic conductivity of the aquifer perforated by the well.

Table 3-2 below summaries the effective K-values calculated for the three wells that were tested and presents the average value used for all well impact analyses.

Well	Aquifer Thickness (b) (ft) ¹	T-Value (gpd/ft)	Effective K-Value (ft/d)
Well No. 12	697	65,325	12.5
Well No. 14	700	73,300	14.0
Well No. 19	689	134,900	26.2
Average Effective K-Value =			17.6

Notes: 1 – Based on saturation of perforated interval of well under pumping conditions during aquifer test.
 ft = feet
 gpd/ft = gallons per day per foot of drawdown
 ft/d = feet per day

Based on the average effective K-value and projected screen interval designs of the new wells that provide the saturated thickness of the local aquifer, estimated T-values for each well were calculated. Projected screen intervals of the wells are based in exploratory boring analyses performed at well sites and neighboring well sites (Brown and Caldwell, 2007c). The estimated T-values are tabulated in Table 3-3 below.

Well	Screen Top Depth (ft/bls)	Screen Bottom Depth (ft bls)	Pump Gallery Top (ft bls)	Pump Gallery Bottom (ft bls)	Saturated Screen Thickness (ft)	Estimated T-Value of Sat. Screen Interval (gpd/ft)
Well No. 18	424	890	0	0	466	61,237
Well Site No. 17R	450	1050	600	630	570	74,903
Well Site No. 19R	450	1050	600	630	570	74,903
Well Site No. 21	440	760	590	620	290	38,109
Well Site No. 23	450	1050	570	600	570	74,903
Well Site No. 24B	450	1050	780	810	570	74,903
Well Site No. 25	500	980	640	670	450	59,134
Well Site No. 26	700	980	800	830	250	32,852
Well Site No. 27	500	980	600	630	450	59,134
Well Site No. 28	500	980	600	630	450	59,134
Well Site No. 30	500	980	600	630	450	59,134

Notes: ft bls = feet below land surface
gpd/ft = gallons per day per foot of drawdown

Specific yield (or aquifer storage coefficient) of the local aquifer was estimated based on regional groundwater modeling investigations of the area (Mason and Bota, 2006 and Brown and Caldwell, 2007d). The models include specific yield values for Layer 2 of the models associated with the Fort Lowell formation and upper Tinaja beds, and Layer 3 of the models associated with the lower Tinaja beds and Pantano formation. Value for the Layer 2 was assigned at 0.16. Value for Layer 3 was assigned 0.08. Since the proposed well designs will produce groundwater mostly from Layer 3, but not the Pantano formation, a conservative estimate 0.10 was adopted. More detailed information regarding the geologic formations that makeup the local aquifer can be reviewed in the *Assured Water Supply Hydrology Report for Sahuarita Water Company* dated November 21, 2007 compiled by Brown and Caldwell.

3.2 RESULTS

The WINFLOW™ analytical element groundwater flow model results of projected 10-foot water-level drawdown radii contour distances are tabulated in Table 3-4 and illustrated on Figure 3-1, along with exempt and non-exempt wells not operated by SWC. Model input and output files for each analysis of each planned SWC well are included as Appendix A. Table 3-4 also indicates the approximate boundary location orientation used to define the extent of shallow bedrock of the Sierrita Mountains to the west. These boundary orientations are defined as Nos. 1, 2 and 3 and are illustrated on Figure 3-1. As noted previously, a near perpendicular orientation is desired to define the boundary relative to the pumping well locations. An

image well pumping at a rate equal of the pumping well was placed in the model at a “mirror” image location west of the boundary to effectively create a “no-flow” boundary.

Well	Sierrita Mtn Boundary No.	Projected 10-Foot Water-Level Drawdown Radius Distance From Well After 5 years of Continuous Pumping at Build-Out Production Rate (ft)
Well No. 18	1	~375
Well Site No. 17R	1	~175
Well Site No. 19R	1	~175
Well Site No. 21	1	~400
Well Site No. 23	1	~350
Well Site No. 24B	2	~400
Well Site No. 25	2	~650
Well Site No. 26	3	~200
Well Site No. 27	3	~650
Well Site No. 28	3	~500
Well Site No. 30	2	~850

Notes: ft = feet
gpd/ft = gallons per day per foot of drawdown

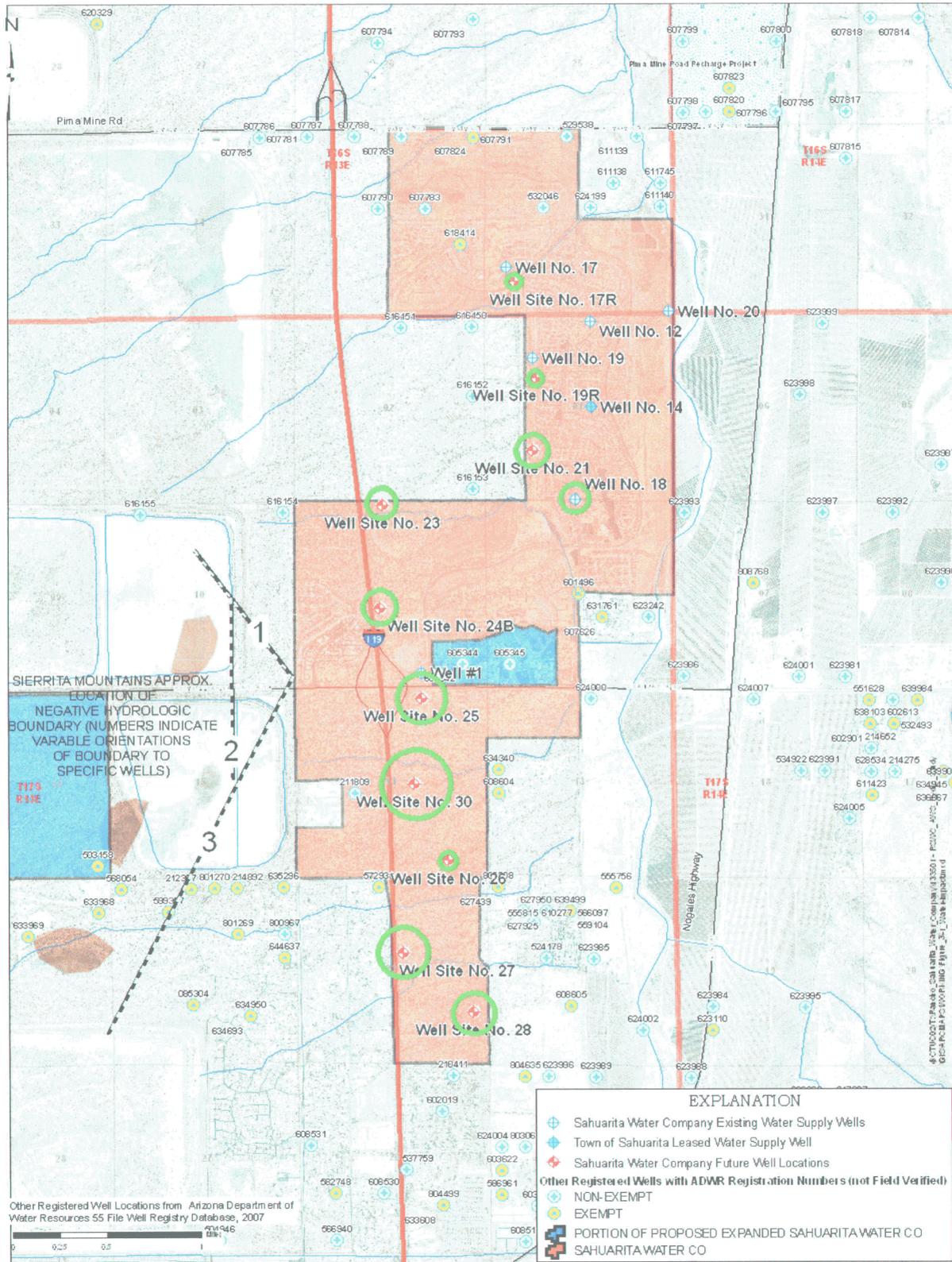


Figure 3-1 – Approximate Five Year, 10–Foot Water-Level Drawdown Impacts of Sahuarita Water Company Wells Pumping Individually at 2034 Build-Out Discharge Rates

4. CONCLUSIONS

Based on the well impact analyses presented, water-level drawdown impacts on neighboring wells from the augmentation of pumping of SWC wells will likely be nominal and will be in compliance with ADWR's well spacing requirements and well spacing regulations. All 10-foot drawdown radii calculated are 850 feet or less from the planned wells as indicated on Table 3-4. No existing exempt and non-exempt wells are affected by greater than 10 feet of additional water-level drawdown after 5 years of continuous pumping as illustrated on Figure 3-1.

5. LIMITATIONS

Report Limitations

This document was prepared solely for Sahuarita Water Company in accordance with professional standards at the time the services were performed and in accordance with the contract between Sahuarita Water Company and Brown and Caldwell, dated February 12, 2007. This document is governed by the specific scope of work authorized for Sahuarita Water Company; it is not intended to be relied upon by any other party, except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by Sahuarita Water Company and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

REFERENCES

- Arizona Department of Water Resources, Wells "55" Registry Database, July, 2007a.
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- Brown and Caldwell, Well Site Nos. 21, 22, 23, 25 and 26 Exploratory Boring Analyses Report, September 6, 2007c.
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BROWN AND CALDWELL

REF-1

APPENDIX A

WINFLOW™ Groundwater Model Output

BROWN AND CALDWELL

A

Well Impact Analysis - Well No. 18

375  Well No. 18

Image Well

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=====

WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by

James O. Rumbaugh, III

Douglas B. Rumbaugh

(c) 1995 Environmental Simulations, Inc.

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Date: 10/29/107
Time: 09:14:59.00

Input File: SWC18.WFL
Map File :

=====
=====

Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1
x1: 1639451.375000 y1: 11604817.000000
x2: 1642206.125000 y2: 11601294.000000
Discharge per length = 0.000000
Head in Center of Linesink = -3.445348
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1
Center of Well -- x: 1649772.000000 y: 11606167.000000
Radius = 0.750000
Pumping Rate = 121121.000000
Head at Well Radius = -23.542681
Well #2
Center of Well -- x: 1635652.000000 y: 11595127.000000
Radius = 0.750000
Pumping Rate = 121121.000000
Head at Well Radius = -23.542843

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

=====
=====

Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -466.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

=====
=====

Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1643873.500000
Minimum Y Coordinate = 11601414.530000

Maximum X Coordinate = 1656837.100000
Maximum Y Coordinate = 11609935.310000

Minimum Head = -13.839690
Maximum Head = -2.282738



Well No. 17R

Well No. 17R Well Impact Analysis

Storage Well

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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by
James O. Rumbaugh, III
Douglas B. Rumbaugh

(c) 1995 Environmental Simulations, Inc.

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Date: 10/29/107
Time: 09:38:35.00

Input File: SWC17R.WFL
Map File :

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=====

Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1

x1: 1639451.375000 y1: 11604817.000000
x2: 1642206.125000 y2: 11601294.000000
Discharge per length = 0.000000
Head in Center of Linesink = -2.617927
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1

Center of Well -- x: 1648076.000000 y: 11612302.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -20.673759

Well #2

Center of Well -- x: 1630107.000000 y: 11598253.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -20.673853

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

=====
=====

Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -570.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

=====
=====

Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1646880.630000
Minimum Y Coordinate = 11610596.830000

Maximum X Coordinate = 1650501.760000
Maximum Y Coordinate = 11613071.270000

Minimum Head = -14.532557
Maximum Head = -4.304557

Well No. 19R Well Impact Analysis

 Well No. 19R

 Image Well

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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by

James O. Rumbaugh, III

Douglas B. Rumbaugh

(c) 1995 Environmental Simulations, Inc.

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Date: 10/29/107
Time: 09:41:06.00

Input File: SWC19R.WFL
Map File :

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=====

Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1

x1: 1639451.375000 y1: 11604817.000000
x2: 1642206.125000 y2: 11601294.000000
Discharge per length = 0.000000
Head in Center of Linesink = -3.102571
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1

Center of Well -- x: 1648693.000000 y: 11609592.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -20.792963

Well #2

Center of Well -- x: 1632588.000000 y: 11597000.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -20.793083

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

=====
=====

Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -570.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

=====
=====

Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1647282.980000
Minimum Y Coordinate = 11608504.620000

Maximum X Coordinate = 1650723.050000
Maximum Y Coordinate = 11610757.770000

Minimum Head = -14.997571
Maximum Head = -4.831864

Well No. 21 Well Impact Analysis

Well No. 21
400 feet

Image Well

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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by

James O. Rumbaugh, III

Douglas B. Rumbaugh

(c) 1995 Environmental Simulations, Inc.

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Date: 10/29/107
Time: 09:43:34.00

Input File: SWC21.WFL
Map File :

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=====

Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1
x1: 1639451.375000 y1: 11604817.000000
x2: 1642206.125000 y2: 11601294.000000
Discharge per length = 0.000000
Head in Center of Linesink = -3.131058
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1
Center of Well -- x: 1648594.000000 y: 11607541.000000
Radius = 0.750000
Pumping Rate = 86511.000000
Head at Well Radius = -26.067978
Well #2
Center of Well -- x: 1634602.000000 y: 11596601.000000
Radius = 0.750000
Pumping Rate = 86511.000000
Head at Well Radius = -26.068115

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

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=====

Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -290.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

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Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1647624.970000
Minimum Y Coordinate = 11606271.600000

Maximum X Coordinate = 1650421.290000
Maximum Y Coordinate = 11608544.860000

Minimum Head = -18.631055
Maximum Head = -5.405009

Well No. 23 Well Impact Analysis

Well No. 23
350 Feet

Image Well

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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by
James O. Rumbaugh, III
Douglas B. Rumbaugh

(c) 1995 Environmental Simulations, Inc.

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Date: 10/29/107
Time: 09:45:41.00

Input File: SWC23.WFL
Map File :

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Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1
x1: 1639451.375000 y1: 11604817.000000
x2: 1642206.125000 y2: 11601294.000000
Discharge per length = 0.000000
Head in Center of Linesink = -6.145582
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1
Center of Well -- x: 1644385.000000 y: 11606013.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -22.029911
Well #2
Center of Well -- x: 1637101.000000 y: 11600318.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -22.030329

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

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Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -570.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

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Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1639398.480000
Minimum Y Coordinate = 11602412.560000

Maximum X Coordinate = 1648477.300000
Maximum Y Coordinate = 11609044.600000

Minimum Head = -14.249449
Maximum Head = -3.864223

Well No. 24B Well Impact Analysis

Image Well

Well No. 24B
400 feet

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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by

James O. Rumbaugh, III

Douglas B. Rumbaugh

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Date: 10/29/107
Time: 09:57:11.00

Input File: SWC24B.WFL
Map File :

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Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1

x1: 1640500.375000 y1: 11603535.000000
x2: 1640500.000000 y2: 11598040.000000
Discharge per length = 0.000000
Head in Center of Linesink = -6.296631
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1

Center of Well -- x: 1644305.000000 y: 11603102.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -22.393927

Well #2

Center of Well -- x: 1636695.000000 y: 11603103.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -22.394300

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

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Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -570.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

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Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1642776.690000
Minimum Y Coordinate = 11601503.780000

Maximum X Coordinate = 1646438.050000
Maximum Y Coordinate = 11604662.210000

Minimum Head = -16.368509
Maximum Head = -5.801896

Well No. 25 Well Impact Analysis

Image Well



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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by

James O. Rumbaugh, III

Douglas B. Rumbaugh

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Date: 10/29/107
Time: 09:59:52.00

Input File: SWC25.WFL
Map File :

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Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1
x1: 1640500.375000 y1: 11603535.000000
x2: 1640500.000000 y2: 11598040.000000
Discharge per length = 0.000000
Head in Center of Linesink = -6.808351
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1
Center of Well -- x: 1645484.000000 y: 11600563.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -27.159061
Well #2
Center of Well -- x: 1635516.000000 y: 11600563.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -27.159391

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

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Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -450.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

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Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1644225.140000
Minimum Y Coordinate = 11599230.520000

Maximum X Coordinate = 1647464.030000
Maximum Y Coordinate = 11601664.720000

Minimum Head = -19.595329
Maximum Head = -6.646089

Well No. 26 Well Impact Analysis

Image Well

Well No. 26
100 feet

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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by
James O. Rumbaugh, III
Douglas B. Rumbaugh

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Date: 10/29/107
Time: 10:15:11.00

Input File: SWC26.WFL
Map File :

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Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1
x1: 1642206.125000 y1: 11601294.000000
x2: 1637018.875000 y2: 11591314.000000
Discharge per length = 0.000000
Head in Center of Linesink = -3.644881
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1
Center of Well -- x: 1646202.000000 y: 11596015.000000
Radius = 0.750000
Pumping Rate = 64886.000000
Head at Well Radius = -22.912327
Well #2
Center of Well -- x: 1635590.000000 y: 11601531.000000
Radius = 0.750000
Pumping Rate = 64886.000000
Head at Well Radius = -22.912407

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

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Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -250.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

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Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1644667.720000
Minimum Y Coordinate = 11593839.060000

Maximum X Coordinate = 1648610.720000
Maximum Y Coordinate = 11597621.130000

Minimum Head = -15.557647
Maximum Head = -3.799701

Well No. 27 Well Impact Analysis

Image Well

10
Well No. 27
00 feet

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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by
James O. Rumbaugh, III
Douglas B. Rumbaugh

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Date: 10/29/107
Time: 10:18:13.00

Input File: SWC27.WFL
Map File :

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Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1

x1: 1642206.125000 y1: 11601294.000000
x2: 1637018.875000 y2: 11591314.000000
Discharge per length = 0.000000
Head in Center of Linesink = -5.834194
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1

Center of Well -- x: 1644956.000000 y: 11593414.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -26.741333

Well #2

Center of Well -- x: 1634177.000000 y: 11599016.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -26.741440

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

=====
=====

Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -450.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

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Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1643510.970000
Minimum Y Coordinate = 11592098.910000

Maximum X Coordinate = 1646850.450000
Maximum Y Coordinate = 11594714.170000

Minimum Head = -21.633819
Maximum Head = -6.381379

Image Well

Well No. 28 Well Impact Analysis

500 Feet Well No. 28

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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by

James O. Rumbaugh, III

Douglas B. Rumbaugh

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Date: 10/29/107
Time: 10:26:11.00

Input File: SWC28.WFL
Map File :

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Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1
x1: 1642206.125000 y1: 11601294.000000
x2: 1637018.875000 y2: 11591314.000000
Discharge per length = 0.000000
Head in Center of Linesink = -4.185965
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1
Center of Well -- x: 1646898.000000 y: 11591753.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -26.119194
Well #2
Center of Well -- x: 1631702.000000 y: 11599651.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -26.119253

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

=====
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Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top....= 0.000000
Elevation of Aquifer Bottom.= -450.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

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Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1645220.940000
Minimum Y Coordinate = 11590046.940000

Maximum X Coordinate = 1649445.590000
Maximum Y Coordinate = 11593627.830000

Minimum Head = -17.903053
Maximum Head = -5.122971

Well No. 30 Well Impact Analysis

Image Well



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WinFlow
Analytical Model of 2D Ground-Water Flow

Developed by

James O. Rumbaugh, III

Douglas B. Rumbaugh

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Date: 10/29/107
Time: 10:29:30.00

Input File: SWC30.WFL
Map File :

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Model Entities

Number of Linesinks Defined by Infiltration Rate = 1

Line Sink #1
x1: 1640500.375000 y1: 11603535.000000
x2: 1640500.000000 y2: 11598040.000000
Discharge per length = 0.000000
Head in Center of Linesink = -6.379215
Total Linesink Discharge = 0.000000 [L3/T]

Number of Linesinks Defined by Head = 0

Number of Ponds = 0

Number of Wells = 2

Well #1
Center of Well -- x: 1645264.000000 y: 11598164.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -27.258942
Well #2
Center of Well -- x: 1635736.000000 y: 11598165.000000
Radius = 0.750000
Pumping Rate = 129773.000000
Head at Well Radius = -27.259293

Reference Head = 0.000000 Defined at -- x: 826068.500000 y:
5806116.500000

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Aquifer Properties

.... Transient Flow Model

Permeability.....= 17.600000 [L/T]
Porosity.....= 0.200000
Storage.....= 0.100000
Leakage factor.....= 0.000000
Elevation of Aquifer Top...= 0.000000
Elevation of Aquifer Bottom.= -450.000000
Uniform Regional Gradient...= 0.000000
Angle of Uniform Gradient...= 0.000000

Model Results Computed at Time = 1825.000000

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Contour Matrix

Number of nodes in the X-direction = 75
Number of nodes in the Y-direction = 75

Minimum X Coordinate = 1643913.310000
Minimum Y Coordinate = 11596746.030000

Maximum X Coordinate = 1647313.150000
Maximum Y Coordinate = 11599481.990000

Minimum Head = -19.300460
Maximum Head = -6.596577

APPENDIX “X”
(Curtailment Plan Tariff)

Sahuarita Water Company, L.L.C.
Docket No. W-03718A-07-_____

WILLIAM A. MUNDELL
CHAIRMAN
JIM IRVIN
COMMISSIONER
MARC SPITZER
COMMISSIONER



BRIAN C. McNEIL
EXECUTIVE SECRETARY

ARIZONA CORPORATION COMMISSION

March 10, 2003

Ms. Diane Marie McKenzie
Rancho Sahuarita Water Company
6339 East Speedway, Suite 102
Tucson, Arizona 85710



RE: RANCHO SAHUARITA WATER COMPANY
DOCKET NO. W-03718A-02-0821
DECISION NO. 65464

Dear Ms. McKenzie:

Enclosed is a stamped copy of the tariffs that were approved pursuant to Decision No. 65464, with an effective date of December 19, 2002.

If you have questions regarding the filing of these tariffs, please contact me at (602) 542-4251.

Sincerely,

A handwritten signature in cursive script that reads "Lori H. Miller".

Lori H. Miller
Programs & Projects Specialist II
Utilities Division

/lhm

Enclosures

ORIGINAL

TARIFF SCHEDULE

Utility: Rancho Salinas de Wilcox Co. LLC Tariff Sheet No.: 1 of 3
 Docket No.: _____ Decision No.: _____
 Phone No.: 520-539-1105 Effective: 12.19.02

CURTAILMENT PLAN FOR: Rancho Salinas de Wilcox Co. LLC

ADEQ Public Water System Number: 10312

Rancho Salinas de Wilcox Co. LLC ("Company"), is authorized to curtail water service to all customers within its certificated area under the terms and conditions listed in this tariff.

This curtailment plan shall become part of the Arizona Department of Environmental Quality Emergency Operations Plan for the Company.

The Company shall notify its customers of this new tariff as part of its next regularly scheduled billing after the effective date of the tariff or no later than sixty (60) days after the effective date of the tariff.

The Company shall provide a copy of the curtailment tariff to any customer, upon request.

Stage 1 Exists When:

Company is able to maintain water storage in the system at 100 percent of capacity and there are no known problems with its well production or water storage in the system.

Restrictions: Under Stage 1, Company is deemed to be operating normally and no curtailment is necessary.

Notice Requirements: Under Stage 1, no notice is necessary.

Stage 2 Exists When:

- a. Company's water storage or well production has been less than 80 percent of capacity for at least 48 consecutive hours, and
- b. Company has identified issues such as a steadily declining water table, increased draw down threatening pump operations, or poor water production, creating a reasonable belief the Company will be unable to meet anticipated water demand on a sustained basis.

Restrictions: Under Stage 2, the Company may request the customers to voluntarily employ water conservation measures to reduce water consumption by approximately 50 percent. Outside watering should be limited to essential water, dividing outside watering on some uniform basis (such as even and odd days) and eliminating outside watering on weekends and holidays.

APPROVED FOR FILING
 DECISION #: 65464

ORIGINAL

TARIFF SCHEDULE

Utility: Pravara Sahakarita Water Co, LLC Tariff Sheet No.: 2 of 3
 Docket No.: _____ Decision No.: _____
 Phone No.: _____ Effective: 12-19-02

Notice Requirements: Under Stage 2, the Company is required to notify customers by delivering written notice door to door at each service address, or by United States first class mail to the billing address or, at the Company's option, both. Such notice shall notify the customers of the general nature of the problem and the need to conserve water.

Stage 3 Exists When:

- a. Company's total water storage or well production has been less than 50 percent of capacity for at least 24 consecutive hours, and
- b. Company has identified issues such as a steadily declining water table, increased draw down threatening pump operations, or poor water production, creating a reasonable belief the Company will be unable to meet anticipated water demand on a sustained basis.

Restrictions: Under Stage 3, Company shall request the customers to voluntarily employ water conservation measures to reduce daily consumption by approximately 50 percent. All outside watering should be eliminated, except livestock, and indoor water conservation techniques should be employed whenever possible.

Notice Requirements:

- 1. Company is required to notify customers by delivering written notice to each service address, or by United States first class mail to the billing address or, at the Company's option, both. Such Notice shall notify the customers of the general nature of the problem and the need to conserve water.
- 2. Beginning with Stage 3, Company shall post at least 8 signs showing the curtailment stage. Signs shall be posted at noticeable locations, like at the well sites and at the entrance to major subdivisions served by the Company.
- 3. Company shall notify the Consumer Services Section of the Utilities Division of the Corporation Commission at least 12 hours prior to entering stage 3.

Once Stage 3 has been reached, the Company must begin to augment the supply of water by either hauling or through an emergency interconnect with an approved water supply in an attempt to maintain the curtailment at a level no higher than Stage 3 until a permanent solution has been implemented.

Stage 4 Exists When:

- a. Company's total water storage or well production has been less than 25 percent of capacity for at least 12 consecutive hours, and

APPROVED FOR FILING
 DECISION # 65464
 REVISED: September 18, 2002

ORIGINAL

TARIFF SCHEDULE

Utility: Rancho Sacramento Water Co, LLC Tariff Sheet No.: 3 of 3
 Docket No.: _____ Decision No.: _____
 Phone No.: _____ Effective: 12.19.02

- b. Company has identified issues such as a steadily declining water table, increased draw down threatening pump operations, or poor water production, creating a reasonable belief the Company will be unable to meet anticipated water demand on a sustained basis.

Restrictions: Under Stage 4, Company shall inform the customers of a mandatory restriction to employ water conservation measures to reduce daily consumption. Failure to comply will result in customer disconnection. The following uses of water shall be prohibited:

- ◆ Irrigation of outdoor lawns, trees, shrubs, or any plant life is prohibited
- ◆ Washing of any vehicle is prohibited
- ◆ The use of water for dust control or any outdoor cleaning uses is prohibited
- ◆ The use of drip or misting systems of any kind is prohibited
- ◆ The filling of any swimming pool, spas, fountains or ornamental pools is prohibited
- ◆ Restaurant patrons shall be served water only upon request
- ◆ Any other water intensive activity is prohibited

Notice Requirements:

1. Company is required to notify customers by delivering written notice to each service address, or by United States first class mail to the billing address or, at the Company's option, both. Such notice shall notify the customers of the general nature of the problem and the need to conserve water.
2. Company shall post at least 25 signs showing curtailment stage. Signs shall be posted at noticeable locations, like at the well sites and at the entrance to major subdivisions served by the Company.
3. Company shall notify the Consumer Services Section of the Utilities Division of the Corporation Commission at least 12 hours prior to entering stage 4.

Customers who fail to comply with the above restrictions will be given a written notice to end all outdoor use. Failure to comply within two (2) working days of receipt of the notice will result in temporary loss of service until an agreement can be made to end unauthorized use of outdoor water. To restore service, the customer shall be required to pay all authorized reconnection fees.

If a customer believes he/she has been disconnected in error, the customer may contact the Commission's Consumer Services Section at 1-800-222-7000 to initiate an investigation. Once Stage 4 has been reached, the Company must augment the supply of water by hauling or through an emergency interconnect from an approved supply or must otherwise provide emergency drinking water for its customers until a permanent solution has been implemented.

APPROVED FOR FILING
 DECISION #: 65464
 REVISED: September 18, 2002