

October 27, 2016

The Villas at Cheney Estates

Maricopa County, Arizona

Water Service Impact Statement

Prepared for:

Geoffrey H. Edmunds & Associates, Inc

7070 E Foothills Drive

Paradise Valley, AZ 85253

Contact: Geoffrey Edmunds

480.315.6700

Prepared by:

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4550 N. 12th Street

Phoenix, AZ 85014

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602.285.4768



Expires: 6/30/18

Job # 1.01.0288101



WATER SERVICE IMPACT STUDY

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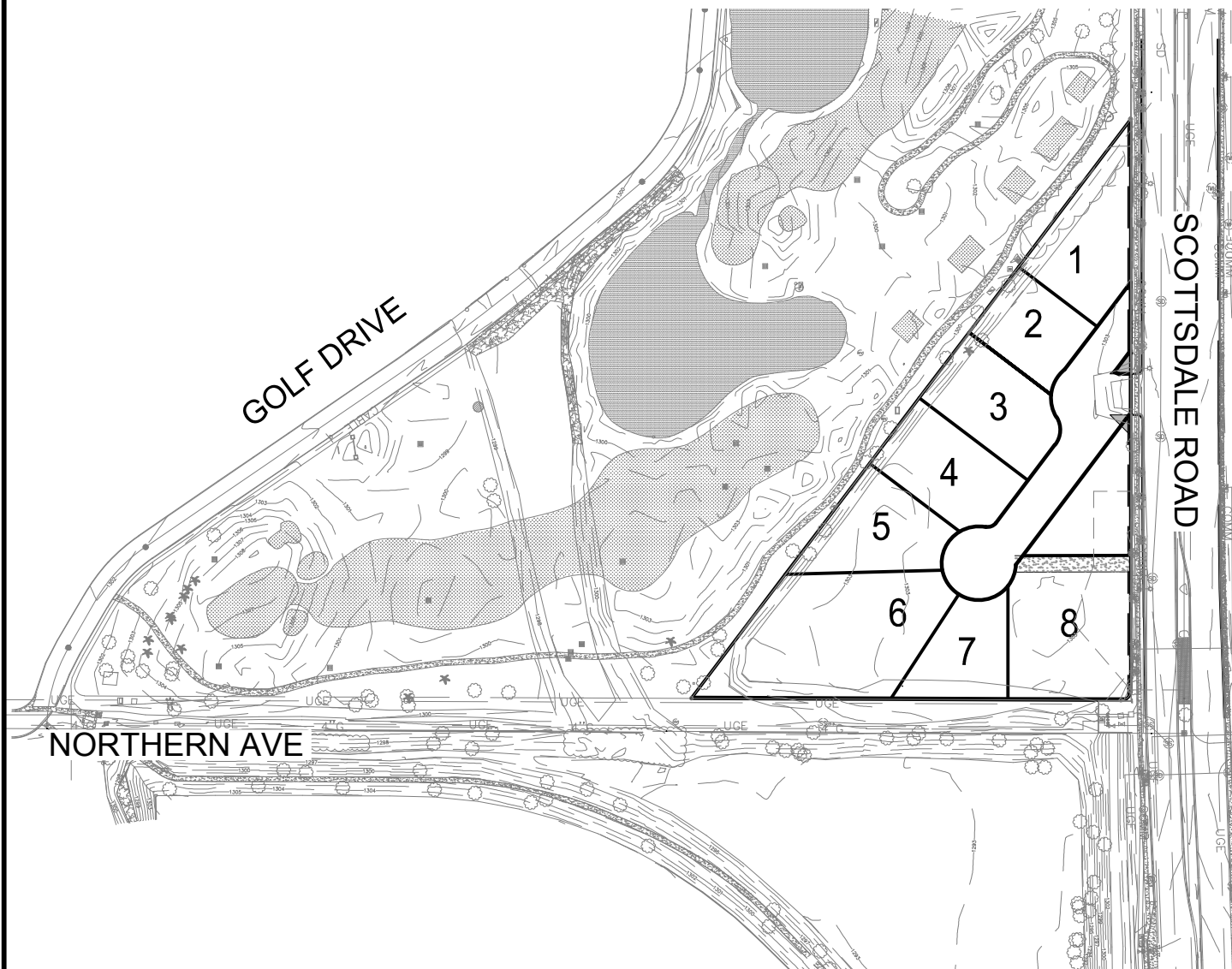
1.0 INTRODUCTION

1.1 General Description

The Villas at Cheney Estates is a proposed 4.3 acre planned Development located in Paradise Valley, Arizona. A total of 8 residential dwelling units (DU) are planned. This report addresses the water distribution system and fire protection for the proposed development. Berneil Water Company will provide water service to the development. The proposed water distribution system will be owned and operated by the Berneil Water Company. City of Scottsdale design requirements and guidelines in the City of Scottsdale's *Design Standards & Policies Manual*, 2010 were used as supplemental material to determine water demands for the development.

1.2 Project Location

The Villas at Cheney Estates is located in Section 34 of Township 4 North, Range 4 East of the Gila and Salt River Base and Meridian. It is bordered by Scottsdale Road to the east, Northern Avenue to the south, and Cheney Estates Golf Course to the northwest. See Figure 1.



SCALE 1" = 200'

FIGURE 1

4550 North 12th Street
Phoenix, Arizona 85014
Phone 602-264-6831
<http://www.cvlci.com>

SITE MAP

THE VILLAS AT CHENEY ESTATES



1.01.0288101

2.0 WATER SYSTEM DESIGN CRITERIA

The following criteria will be used in developing the water report.

2.1 Design Criteria

This water report is based on criteria from the Town of Paradise Valley and City of Scottsdale's *Design Standards & Policies Manual*, dated January, 2010. The following criteria were used in developing this plan:

- o Demand factors
 - Single family residential demand factor = 485.6 gpd/DU
 - Maximum day factor = 2 x Average Day Demand
 - Peak hour factor = 3.5 x Average Day Demand
- o Pressure requirements
 - Minimum
 - 20 psi at the meter
 - Maximum = 120 psi
- o Velocity
 - Maximum
 - 5 fps for maximum day demand
 - 7 fps for peak hour demand
 - 10 fps for maximum day demand plus fire flow
- o Unit friction headloss
 - Maximum = 10ft/1,000 ft of distribution lines
- o Hazen-Williams Coefficient = 130
- o Fire Flows = 1,500 gpm

3.0 EXISTING INFRASTRUCTURE

3.1 Existing Waterlines

There are no existing waterlines within the proposed development. Adjacent existing waterlines include an existing 6" waterline in Golf Drive. This existing 6" waterline continues north in Golf Drive to the Camelback Country Club Estates 3 Development and east in Northern Avenue to 68th Street where it heads north to serve the Camelback Country Club Estates Development.

See Appendix A for a map of the existing Berneil Water Company system.

3.2 Berneil Water System Fire Protection

The Berneil Water Company has entered into an agreement with the City of Scottsdale to provide emergency water service during times when the Berneil Water System is inoperative or during fire emergencies. See Appendix B for a copy of the Agreement. The emergency interconnection is located at 9000 N. Scottsdale Road and consists of a 4-inch water meter, a PR/PSV control valve, a backflow device and associated 6-inch interconnecting pipe. See Appendix C for a copy of the O + M Instructions for operating this emergency interconnection.

3.3 Water Quality

Appendix G contains a copy of the 2015 Annual Water Quality Report. No violations were reported.

4.0 PROPOSED INFRASTRUCTURE

4.1 Water Demands

The water demands for The Villas at Cheney Estates may be seen below in Table 1.

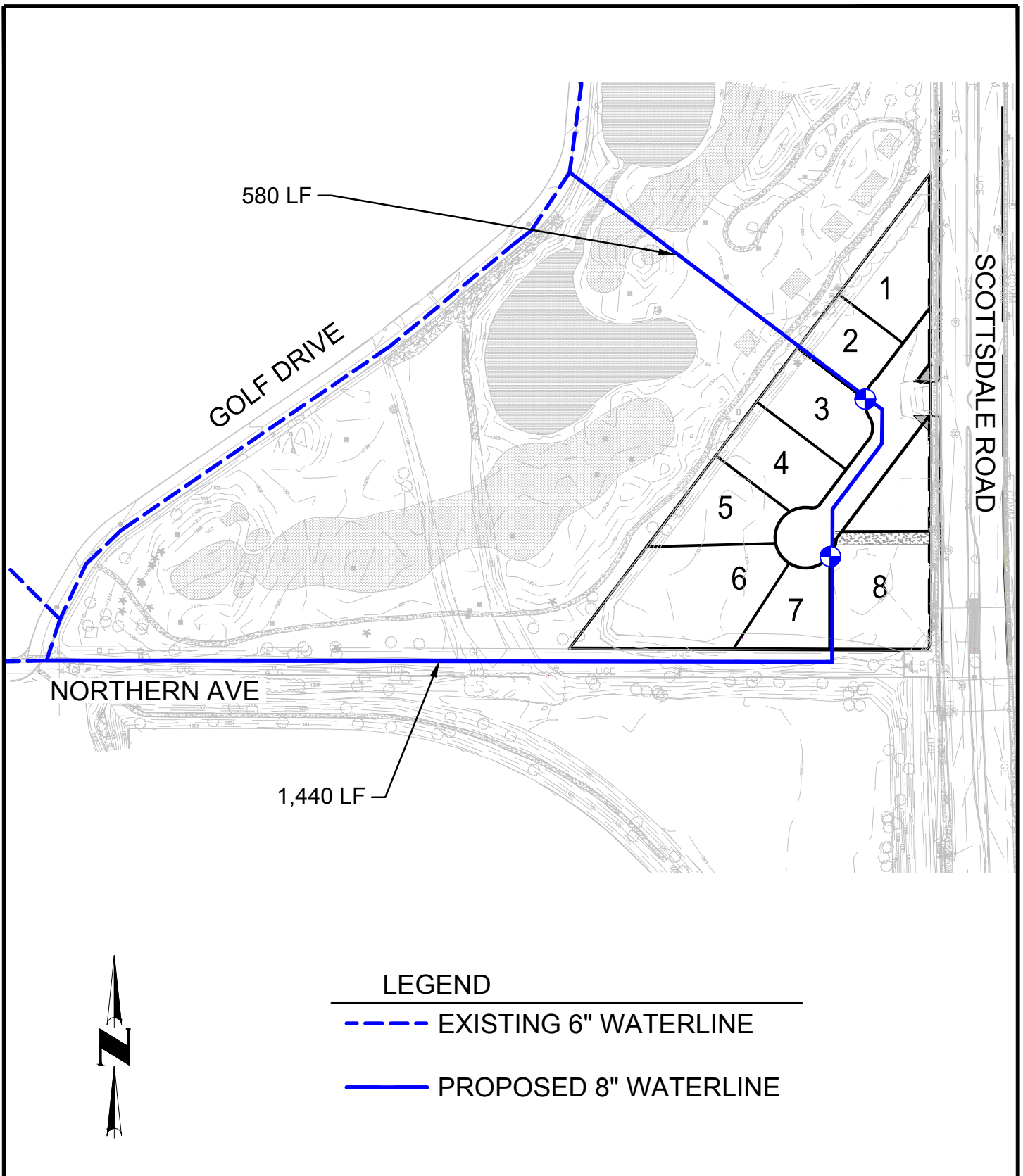
Table 1 – The Villas at Cheney Estates Water Demands

Number of DU	Unit Factor (gpd/unit)	ADD (gpd)	MDF	MDD (gpd)	PHF	PHD (gpd)
8	485.6	3,884.8	2	7,769.6	3.5	13,596.8

Fire flow demands of 1,500 gpm will be modeled.

4.2 Proposed On-Site Infrastructure

A distribution system of 8” waterlines was designed to provide water to The Villas at Cheney Estates. This design may be seen in Figure 2. The proposed design includes two connections to the existing Berneil Water Company System. The first connection will take place approximately 1,700 ft north of Northern Avenue in Gold Drive. This connection includes approximately 580 LF of waterline extension. Second connection will take place at the intersection of Golf Drive and Northern Avenue. This connection includes approximately 1,440 LF of waterline connection.



SCALE 1" = 200'	WATER SYSTEM LAYOUT	
FIGURE 2		
4550 North 12th Street Phoenix, Arizona 85014 Phone 602-264-6831 http://www.cvlci.com	THE VILLAS AT CHENEY ESTATES	1.01.0288101

5.0 WATER SYSTEM MODELING

5.1 Network Analysis Domestic Demands

The network analysis for the proposed development's distribution system was completed using WaterCAD V8i. A model was created and modified as necessary to demonstrate that the existing and proposed water infrastructure meets the water system design criteria. All networks were analyzed for average day, maximum day and peak hour demand conditions. The existing conditions were determined by a fire flow test completed on October 10th, 2016. Results from this fire flow test may be seen in Appendix D.

The pipes were sized based on pressure requirements for average day, maximum day, and peak hour as described in Section 2.0.

Input parameters of the water distribution system modeling include:

- o Pipe Diameters (inches)
- o Elevations of Nodes/Junctions (feet)
- o System Water Demands (gpm)
- o Hazen-Williams, C=130

Output parameters include but are not limited to:

- o Velocities (fps)
- o Pressure (psi)
- o Head Loss (feet)
- o Flow Rates (gpm)

5.2 Modeling Results Domestic Demands

The detailed results of the WaterCAD analysis for the domestic demands are presented in Appendix E. Table 2 summarizes the results. We note that the system modeled did not include the emerging connection to the Scottsdale Water System.

Table 2 – Water Model Results Summary for Domestic Demands

Scenario	Flow (gpm)	Pressure (psi)				Maximum Velocity (fps)	Pipe ID
		Minimum	Node	Maximum	Node		
Average Day	2.70	68	J-19	79	J-7	0.03	P-22
Maximum Day	5.40	68	J-19	79	J-7	0.06	P-22
Peak Hour	9.44	68	J-19	79	J-7	0.411	P-22

5.3 Network Analysis Fire Flows

The network analysis was performed as described in subsection 5.1 above with the following modifications

- o The water system was expanded to include the emergency water connection with the City of Scottsdale located at 9000 N. Scottsdale Road. It was assumed to be delivering water to the Berneil Water Company system.
- o The system conditions were determined by a fire flow test performed on October 10th, 2016 with the emergency interconnection OPEN. See Appendix D for results.

5.4 Modeling Results Fire Flows

The detailed results of the Water CAD analysis for the fire flow scenario are shown in Appendix E. Table 3 summarizes the results.

Table 3 – Water Model Results Summary for Fire Flow Demands

Nodes	Flow (gpm)	Pressure (psi)				Maximum Velocity (fps)	Pipe ID
		Minimum	Node	Maximum	Node		
J-5	1,500	20	J-5	58	J-26	10.55	P-25
J-6	1,500	21	J-5	58	J-26	10.62	P-25

The nodes identified correspond to the proposed fire hydrant locations within the new development.

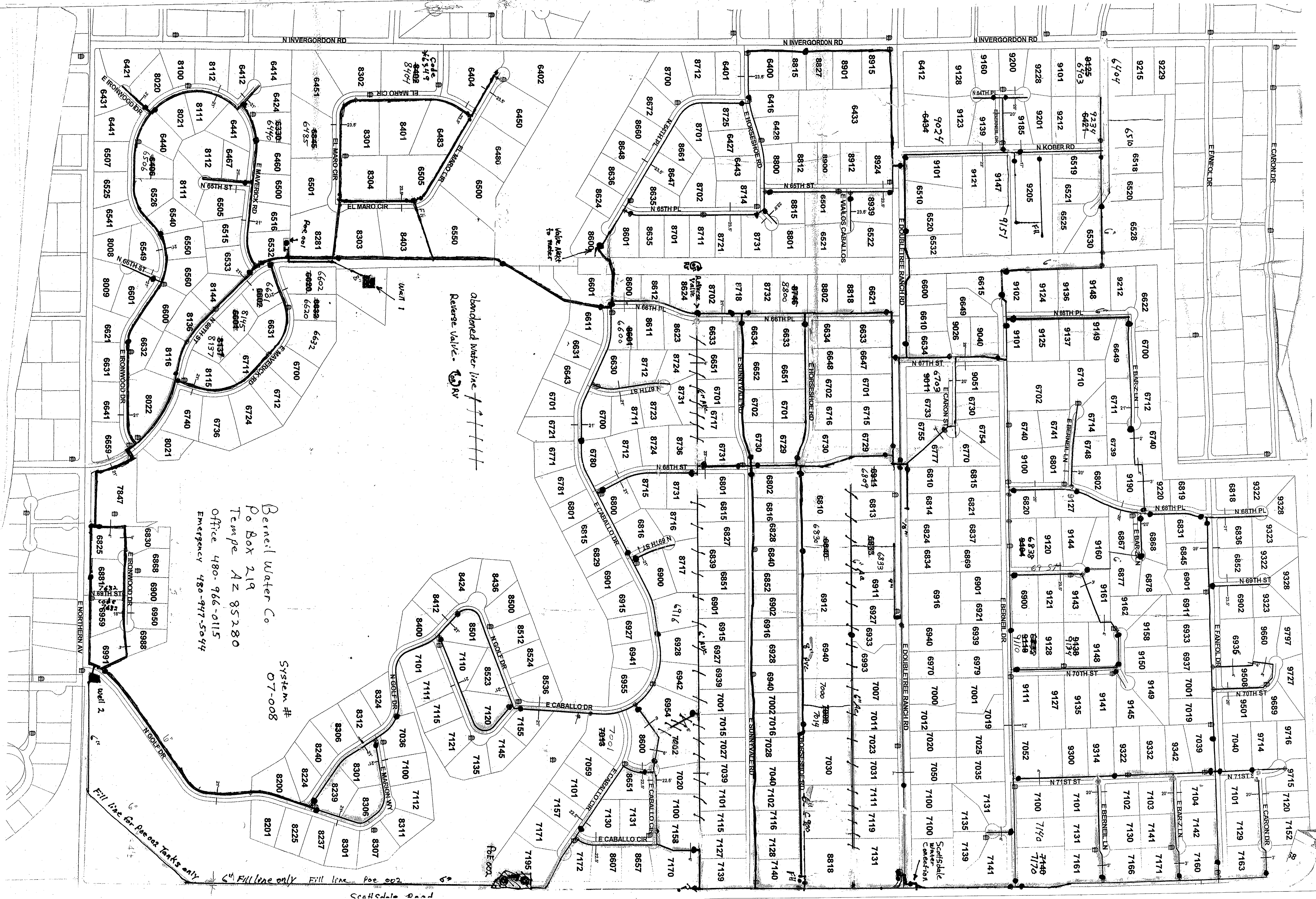
6.0 SUMMARY

This Water Service Impact Study presents the proposed water system design, and an overview of existing infrastructure surrounding the project site. The following summarizes CVL's findings of the proposed water system to serve The Villas at Cheney Estates.

- o The water system will be owned and operated by Berneil Water Company.
- o A Water Quality Report for the Berneil Water System may be found in Appendix G of this report.
- o Distribution lines for The Villas at Cheney Estates will consist of 8" waterlines. Distribution mains are sized to accommodate all demand requirements.
- o Pressures at the property line within the proposed development are approximately 78 psi for all domestic demand scenarios which exceeds the Town of Paradise Valley's minimum requirement of 20 psi.
- o Fire flows of 1,500 gpm at Node J-5 and Node J-6 result in pressures above 20 psi and meet Town of Paradise Valley standards.

APPENDIX A

Berneil Water System Map



Berneil Water Co
P.O. Box 219
Tempe AZ 85280
Office 480-966-0115
Emergency 480-947-5044

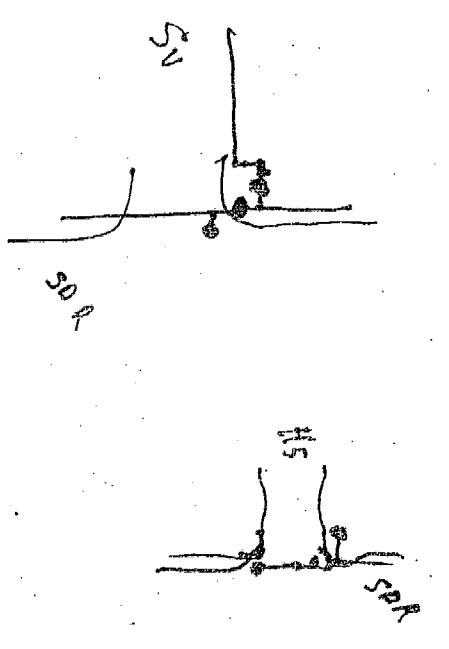
System #
07-008

Abandoned Water line
Reverse Valve

Fill line for P.O. Tanks only

Fill line only

Scottsdale Road



APPENDIX B

Agreement for Emergency Water Service with Scottsdale

AGREEMENT BETWEEN THE CITY OF SCOTTSDALE
AND
BERNEIL WATER COMPANY
FOR EMERGENCY WATER SERVICE

FIRE

1. Parties. The parties to this Agreement are the City of Scottsdale, an Arizona municipal corporation (hereinafter "Scottsdale"), and the Berneil Water Company, an Arizona corporation (hereinafter "Berneil").

2. Recitals. This Agreement is made with reference to the following facts among others:

2.1. Berneil, from time to time, has problems with its water distribution system which prevent delivery of water to its customers.

2.2. Berneil desires to enter into an agreement with Scottsdale for emergency back-up water service during times when Berneil's system is inoperable.

2.3. Berneil has executed a contract for Central Arizona Project ("CAP") water entitled, "Subcontract Among the United States, the Central Arizona Water Conservation District, and the Berneil Water Company Providing for Water Service", dated March 21, 1985, entitling Berneil to four hundred thirty two (432) acre feet of CAP water annually.

NOW, THEREFORE, in consideration of the respective right, privileges and obligations of the parties hereinafter set forth, it is agreed as follows:

3. Definition of Emergency. "Emergency" shall mean a circumstance wherein Berneil is unable to provide water to meet the water demand from its customers due to a failure of equipment or a loss of system pressure and Berneil's employees have attempted unsuccessfully to restore the operation of the system. It is acknowledged that this "Emergency" should only occur when both existing Berneil wells are out of production at the same time. An "Emergency" does not include an inability to serve water due to water quality, insufficient water supply, or system capacity to serve an expanded customer base or any financial difficulties of Berneil.

4. Emergency Water Service. In the case of an Emergency in Berneil's system, Scottsdale shall provide potable water to Berneil through a connection described in Section 7.0 of this Agreement. The maximum duration of any occurrence requiring water service pursuant to this Agreement shall be two (2) weeks. The maximum amount of water that Scottsdale is required to provide pursuant to this Agreement in any one (1) calendar year is thirty two (32) acre feet. The maximum flow rate Scottsdale is required to

provide is five hundred twenty five (525) gallons per minute. Bemeil shall pay Scottsdale \$23,232 and convey the well sites to Scottsdale as provided in Section 9.0 of this Agreement as consideration for the City agreeing to provide system capacity for emergency service. Scottsdale's obligation to provide water under this Agreement is conditional upon:

- 4.1. The availability of water to serve both the needs of Scottsdale customers and Bemeil's emergency needs. In the event of an emergency within the Scottsdale system that results in reduced or interrupted flow to certain Scottsdale customers those same restrictions shall apply to Bemeil customers (i.e. golf course irrigation).
- 4.2. Such deliveries not causing the system pressure in Scottsdale's distribution system to drop below the level necessary to serve Scottsdale customers. Scottsdale does not guarantee that the water delivered under this Agreement will be at a particular system pressure. The system pressure of the water delivered, pursuant to this Agreement, will be controlled by a pressure reducing/pressure sustaining valve (PR/PSV) at the connection between Scottsdale's and Bemeil's systems. Scottsdale shall have no liability for damage to Bemeil's distribution system or customers systems from water delivered pursuant to this Agreement.
- 4.3. Bemeil shall pay Scottsdale for water used at then current standard potable water rates.
5. Initiation of Service. Bemeil shall initiate emergency service by notifying the Water Production Manager in Scottsdale's Water and Wastewater Operations Department of the need for service. Scottsdale shall turn on service to Bemeil's system within one hour (1) of notification.
6. Termination of Service. Bemeil shall notify Scottsdale's Water and Wastewater Operations Department of the date that emergency service may be terminated. In the event that service has been provided for the maximum two (2) week limit, Scottsdale may terminate the service after giving twenty four (24) hours notice to Bemeil.
7. Connection With Scottsdale System. Scottsdale shall install a pipeline connecting Scottsdale's and Bemeil's systems, at a location to be determined jointly, and shall furnish and install a four inch (4") water meter, a PR/PSV control valve, and a backflow device (together referred to herein as "the connection"). The connection will be constructed concurrent with either 1) construction of Scottsdale's sewer pump station or 2) the Scottsdale Road widening project. The connection will be constructed no later than December 31, 1999. Scottsdale grants Bemeil a license to continue to operate the existing well facility at the northwest corner of Doubletree Road and Scottsdale Road, beginning after conveyance of that well site to Scottsdale pursuant to Section 9 hereof, and prior to construction of the connection. If the connection is to be constructed concurrent with the Scottsdale Road widening project, Scottsdale will give Bemeil sufficient advance notice of the commencement of the road widening project

to allow Berneil to replace its water main in Scottsdale Road. In no event shall such notice be less than six months prior to commencement of the road widening project. Upon completion of the connection, Scottsdale shall be responsible for abandonment and dismantling of the well facilities on the northwest corner of Doubletree Road and Scottsdale Road. Abandonment and dismantling may not occur until the connection is complete. Berneil may salvage any equipment that it chooses to when the facility is taken out of service. Upon cessation of Berneil's operation of the well facility, the license to use the well site shall terminate. Scottsdale and Berneil shall coordinate all pipe connections and rerouting in order to assure the most efficient transition to the emergency backup connection.

8. Compliance With State Law. Berneil shall comply with the provisions of A.R.S. Title 45, Title 49, and any other relevant local, state or federal law relating to the water delivered to Berneil pursuant to this Agreement. Berneil shall be responsible for paying any applicable groundwater withdrawal fees, taxes or assessments, except that Scottsdale shall pay any capital and operations and maintenance charges due to CAWCD for any CAP water delivered to Berneil. Berneil shall include such deliveries in its annual report to the Arizona Department of Water Resources ("ADWR") as required by Arizona Revised Statutes, Title 45. Scottsdale shall also include the deliveries to Berneil in its annual report to ADWR. ADWR shall not count Scottsdale's withdrawals of any groundwater for delivery to Berneil as withdrawals by Scottsdale and shall treat such groundwater as having been withdrawn by Berneil. ADWR's agreement to treat groundwater withdrawn by Scottsdale and delivered to Berneil as groundwater withdrawn by Berneil is evidenced by the Approval which is attached to this Agreement pursuant to A.R.S. §45-492 and is an essential consideration for Scottsdale entering into this Agreement. Any change in ADWR's position shall be cause for Scottsdale to unilaterally terminate this Agreement.

9. Well Sites. Within five days of the execution by all parties of this Agreement, the Assignment of the CAP Subcontract (Exhibit "D" hereto), and Amendment No. 9 to Scottsdale's CAP Subcontract (Exhibit "E" hereto), Berneil shall convey to Scottsdale fee simple title to the Berneil facility at the northwest corner of Doubletree Ranch Road and Scottsdale Road, described as parcel No. 1 in the diagram and legal description attached hereto as Exhibits "A" and "B". This parcel will be conveyed by the form of special warranty deed attached hereto as Exhibit "C". Simultaneously with execution by Berneil of this Agreement, Berneil shall convey to Scottsdale fee simple title to one (1) undeveloped well site located on the west side of Scottsdale Road between Doubletree Ranch Road and Mountain View Road, described as parcel No. 2 on Exhibits "A" and "B" hereto. This parcel will be conveyed by the form of Special Warranty Deed attached hereto as Exhibit "C-1." If this Agreement does not become effective within 365 days, Scottsdale shall reconvey the well sites to Berneil. At the time of each conveyance, Scottsdale shall be credited with an amount equal to prorated property taxes accrued as of the date of the conveyance based on 1995 taxes, together with a like credit for any other existing, future or potential charge or claim of any description upon the parcels, all sufficient to protect Scottsdale and its parcels

from all taxes, charges or claims. Berneil's obligations with respect to all conveyances survive delivery of the deeds and do not merge into the deeds.

10. Title Insurance. Scottsdale shall, at its own expense, cause to be issued a single combined extended coverage owner's policy of title insurance in the amount of Thirty Thousand Dollars (\$30,000) insuring that fee simple title to the well sites is vested in Scottsdale.

11. Assignment of CAP Subcontract. Berneil shall assign to Scottsdale 200 acre feet of its CAP water rights. Scottsdale shall pay Berneil \$23,232.00 for the CAP water, pursuant to the "CAWCD Policy Regarding the Relinquishment and Transfer of CAP M&I Subcontract Allocations within the CAP Service Area." Within twenty (20) days of execution of this Agreement by both parties, Berneil shall execute the Partial Assignment of Rights and Assumption of Obligations of the Central Arizona Project Municipal and Industrial Water Service Subcontract, attached hereto as Exhibit "D", and Scottsdale shall execute Amendment No. 9 to Scottsdale's CAP Water Service Subcontract, attached hereto as Exhibit "E". Berneil and Scottsdale shall obtain the approval of the Central Arizona Water Conservation District ("CAWCD"), and the United States Bureau of Reclamation ("USBR") of the transfer of the CAP water. Scottsdale shall then submit Amendment No. 9 to its CAP Subcontract to a court of competent jurisdiction for validation. Scottsdale shall notify CAWCD and ADWR of the filing of the petition for validation and of receipt of the validation order.

12. Effective Date. Except as to the conveyance of the undeveloped well site as provided in Section 9, this Agreement shall be effective upon execution by all parties, approval by ADWR for compliance with A.R.S. § 45-492 execution of the Partial Assignment of CAP Subcontract by all parties thereto, and the execution of Amendment No. 9 to Scottsdale's CAP Water Service Subcontract by City of Scottsdale, the CAWCD and the Bureau of Reclamation.

13. Term of Agreement. The provisions of this Agreement relating to backup water service shall be for a term of five (5) years and will automatically renew every five (5) years. This contract can be terminated at any time during the term of the Agreement upon thirty (30) days notice if both parties agree to the termination, except that agreement of Berneil is not required if ADWR changes its position on accounting for groundwater pumping, as provided in Section 8.0 of this Agreement. In the event of a termination, title to the CAP water and the well sites shall remain with Scottsdale.

14. Notices. All notices, claims, request and demands under this Agreement are to be in writing and served in person or via certified (return receipt requested) United States mail, postage pre-paid, addressed as follows:

To Bemil: Neil R. Folkman
Bemil Water Company
Box 60082
Phoenix, Arizona 85082
Phone: (602) 966-5804
Fax: (602) 967-7857

To Scottsdale: Robert C. Berlese
Water Resource Operations Director
North 94th Street
Scottsdale, Arizona 85258
Phone: (602) 391-5650
Fax: (602) 391-5663

To CAWCD: David S. "Sid" Wilson, Jr., General Manager
Central Arizona Water Conservation District
North 7th Street
Phoenix, Arizona 85024
Phone: (602) 870-2333
Fax: (602) 870-2412

To ADWR: Rita Pearson, Director
Arizona Department of Water Resources
North 3rd Street
Phoenix, Arizona 85004-3903
Phone: (602) 417-2410
Fax: (602) 417-2415

15. Successors and Assigns. This Agreement shall be binding upon the parties and upon their successors. Neither party may assign its rights or obligations under this Agreement.

16. Modification. Any amendment or modification of this Agreement shall be in writing and shall be effective only after signature of the parties hereto. ADWR shall be notified and given an opportunity to review any modifications to this Agreement.

17. Conflict of Interest. The parties acknowledge that this Agreement is subject to cancellation pursuant to the provisions A.R.S. § 38-511.

18. Counterparts. This Agreement may be signed in counterparts and all signed copies, taken together, shall constitute the executed Agreement.

IN WITNESS WHEREOF, THE CITY OF SCOTTSDALE by its Mayor and City Clerk have hereunto
subscribed their names this 13 day of June, 1997.

CITY OF SCOTTSDALE

By:

Sam Kathryn Campana
Sam Kathryn Campana, Mayor

ATTEST:

By:

Sonia Robertson
Sonia Robertson, City Clerk

By:

Myron J. Kuklok
Myron J. Kuklok
Risk Management Director

APPROVED AS TO FORM:

By:

Fredda J. Bismar
for Fredda J. Bismar
City Attorney

BERNEIL WATER COMPANY

By:

Neil R. Folkman
Neil R. Folkman
Vice President

STATE OF ARIZONA)

County of Maricopa)

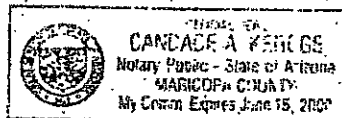
SS.

The foregoing instrument was acknowledged before me this 12 day of JUNE
1997, by Neil Folkman, VICE PRESIDENT of the Bernell Water
Company, an Arizona corporation.

Candace A. Venigs
Notary Public

My Commission Expires:

6/15/2000



STATE OF ARIZONA)
) SS.
County of Maricopa)

The foregoing instrument was acknowledged before me this 13 day of June, 19 97
by Sam Kathryn Campana, Mayor of the City of Scottsdale, an Arizona municipal corporation.

Francis J Soto

Notary Public

My commission expires

11-27-99



APPROVAL

This Agreement has been reviewed and approved by the Arizona Department of Water Resources pursuant to A.R.S. § 45-492.

ARIZONA DEPARTMENT OF WATER RESOURCES

By

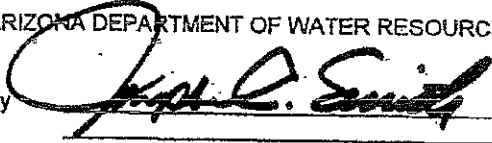


Table of Exhibits
Berneil Water Company Agreement

Exhibit "A", Diagram showing two well sites as referenced in Section 9 of the Agreement.

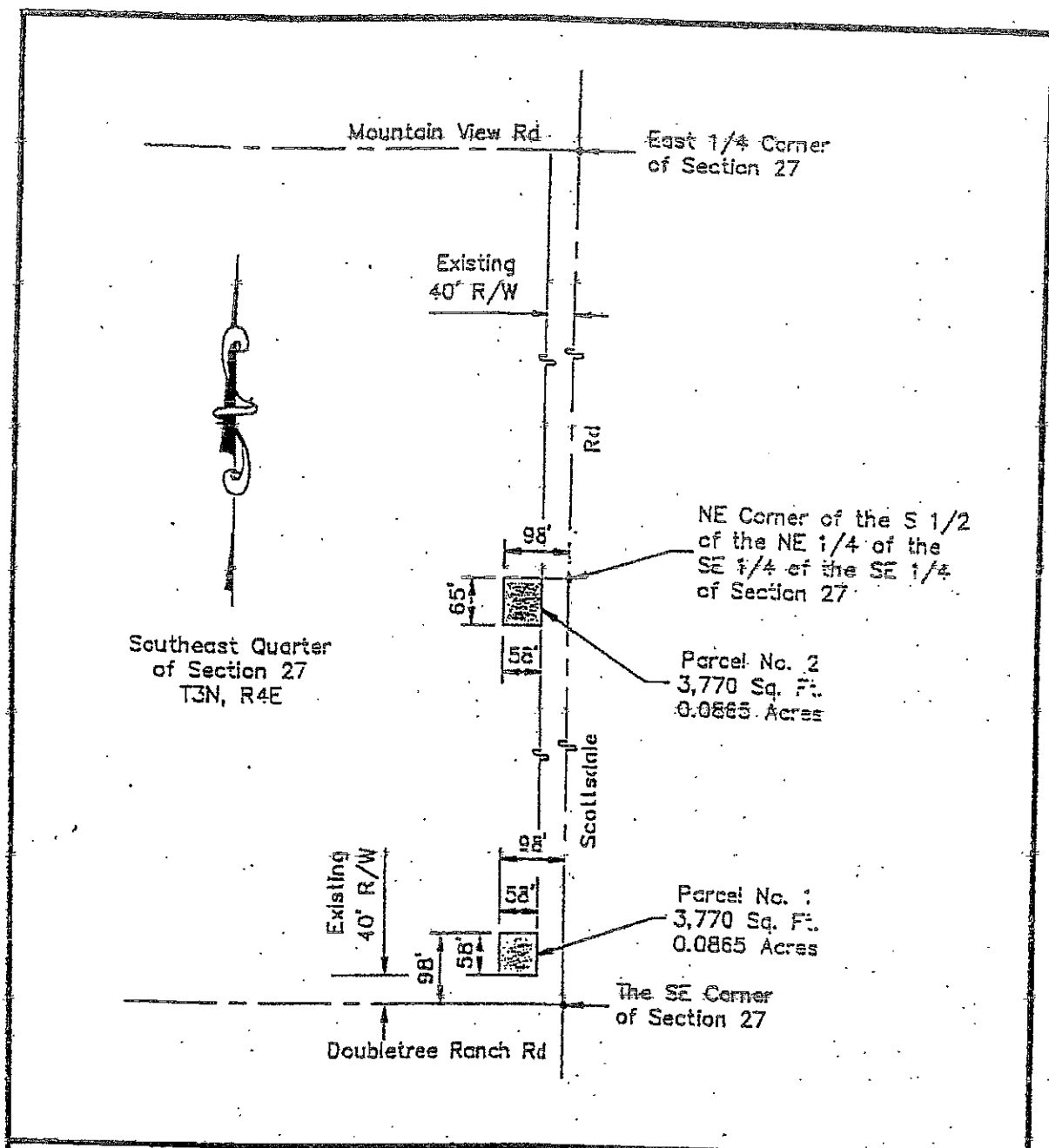
Exhibit "B", Legal descriptions of the two well sites as referenced in Section 9 of the Agreement.

Exhibit "C", Form of the special warranty deed, conveying title from Berneil Water Company to the City of Scottsdale as referenced in Section 9 of the Agreement.

Exhibit "C1", Form of the special warranty deed, conveying title from Berneil Water Company to the City of Scottsdale as referenced in Section 9 of the Agreement.

Exhibit "D", Assignment of Rights and Assumption of Obligations of Central Arizona Project Municipal and Industrial Water Service Subcontract..

Exhibit "E", Amendment No. 9 to Scottsdale's CAP Water Service Subcontract.



ACQUISITIONS	PROJECT
☒ Fee Simple Title	Scottsdale Road - Indian Bend Road To Gold Dust Avenue
☐ Temp Constr Easement	PROJECT NO. S 2707
☐ Drainage Easement	TAX PARCEL # 175-61-46 & 47
☐ Public Utility Easement	OWNER Berneil Water Company
☐ Other	BY: DRM DATE 10/4/96 SH- OF

Parcel No. 1:

The South 98 feet of the East 98 feet of the Southeast quarter of the Southeast quarter of the Southeast quarter of Section Twenty-seven (27), Township Three (3) North, Range Four (4) East of the Gila and Salt River Meridian, Maricopa County, Arizona.
EXCEPT THE SOUTH AND EAST 40 FEET THEREOF.

Parcel No. 2:

The West 65 feet of the East 98 feet of the North 65 feet of the South half of the Northeast quarter of the Southeast quarter of the Southeast quarter of Section Twenty-seven (27), Township Three (3) North, Range Four (4) East of the Gila and Salt River Meridian, Maricopa County Arizona.
EXCEPT THE EAST 40 FEET THEREOF.

EXHIBIT "B"

When recorded return to:
City of Scottsdale
CPM-Bill Johnsen
E. Indian School Road #205
Scottsdale, AZ 85251

SPECIAL WARRANTY DEED

EXEMPT FROM AFFIDAVIT, RE ARS 42-1614 A-3

Project No. _____
Parcel No. _____

For the consideration of One Dollar and other valuable considerations, I or we, BERNEIL WATER COMPANY, an Arizona Corporation, ("Grantor"), hereby conveys to the City of Scottsdale, an Arizona Municipal Corporation, ("Grantee"), the following real property situated in Maricopa County, Arizona:

The South 98 feet of the East 98 feet of the Southeast quarter of the Southeast quarter of the Southeast quarter of Section Twenty-seven, Township Three (3) North, Range Four (4) East of the Gila and Salt river Meridian, Maricopa County, Arizona.
EXCEPT THE SOUTH AND EAST 40 FEET THEREOF.

Grantor hereby binds itself and its successors to warrant and defend the title as against all acts of the Grantor herein and no others.

Dated this ____ day of _____, 19____

BERNEIL WATER COMPANY, an Arizona Corporation

By: _____
Its: _____

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

Before me, _____, Notary Public in and for said County, State of Arizona, on this day personally appeared _____ known to me to be the person whose name is subscribed to the foregoing instrument as _____ of the Corporation described in the foregoing instrument, and as such he/she acknowledged to me the he/she executed the same for said Corporation, for the purpose and consideration therein expressed, as its free act and deed and by each of them voluntarily executed.

Given under my hand and seal of office, this ____ day of _____, 19____

Notary Public
My Commission Expires

SEAL:

EXHIBIT "C"

When recorded return to:
City of Scottsdale
CPM-Bill Johnsen
E. Indian School Road #205
Scottsdale, AZ 85251

SPECIAL WARRANTY DEED

EXEMPT FROM AFFIDAVIT, RE ARS 42-1614 A-3

Project No. _____
Parcel No. _____

For the consideration of One Dollar and other valuable considerations, I or we, BERNEIL WATER COMPANY, an Arizona Corporation, ("Grantor"), hereby conveys to the City of Scottsdale, an Arizona Municipal Corporation, ("Grantee"), the following real property situated in Maricopa County, Arizona:

The West 65 feet of the East 98 feet of the North 65 feet of the South half of the Northeast quarter of the Southeast quarter of the Southeast quarter of Section Twenty-seven (27), Township Three (3) North, Range Four (4) East of the Gila and Salt river Meridian, Maricopa County, Arizona.
EXCEPT THE EAST 40 FEET THEREOF.

Grantor hereby binds itself and its successors to warrant and defend the title as against all acts of the Grantor herein and no others.

Dated this ____ day of _____, 19____.

BERNEIL WATER COMPANY, an Arizona Corporation

By: _____
Its: _____

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

Before me, _____, Notary Public in and for said County, State of Arizona, on this day personally appeared _____ known to me to be the person whose name is subscribed to the foregoing instrument as _____ of the Corporation described in the foregoing instrument, and as such he/she acknowledged to me the he/she executed the same for said Corporation, for the purpose and consideration therein expressed, as its free act and deed and by each of them voluntarily executed.

Given under my hand and seal of office, this ____ day of _____, 19____.

Notary Public
My Commission Expires _____

SEAL:

EXHIBIT "C1"

**PARTIAL ASSIGNMENT OF RIGHTS AND ASSUMPTION
OF OBLIGATIONS OF CENTRAL ARIZONA PROJECT
MUNICIPAL AND INDUSTRIAL WATER SERVICE SUBCONTRACT**

THIS PARTIAL ASSIGNMENT is made and entered into this _____ day of _____, 19 _____, by and between Bemeil Water Company, an Arizona corporation ("Bemeil") and the City of Scottsdale, an Arizona municipal corporation of the State of Arizona ("Scottsdale").

RECITALS

WHEREAS, Bemeil, the United States of America (the "United States"), acting through the Secretary of the Interior, and the Central Arizona Water Conservation District ("CAWCD"), have entered into a Central Arizona Project ("CAP") water service subcontract for the annual delivery of 432 acre-feet of CAP Municipal & Industrial ("M&I") water, entitled "Subcontract Among the United States, the Central Arizona Water Conservation District, and the Bemeil Water Company Providing for Water Service", Subcontract No. 5-07-30-W-0080 (the "Bemeil Subcontract"); and

WHEREAS, the United States, the CAWCD, and Scottsdale have entered into a "Subcontract Among the United States, the Central Arizona Water Conservation District, and the City of Scottsdale, Provided for Water Service, Central Arizona Project," Subcontract No. 5-07-30-20063 (the "Scottsdale Subcontract").

WHEREAS, Bemeil has agreed to assign to Scottsdale its right, title and interest to 200 acre-feet of CAP M&I water under the Subcontract pursuant to a written agreement dated _____ between Bemeil and Scottsdale.

WHEREAS, Article 6.7 of the Bemeil Subcontract provides that the provisions of the subcontract shall apply to and bind the successors and assigns of the parties to the subcontract, but that no assignment of any portion of, or interest in, the subcontract will be valid until approved by the United States.

NOW, THEREFORE, in consideration of the foregoing, the parties hereto agree as follows:

Bemeil hereby assigns, transfers and conveys to the City all of its rights and obligations with respect to 200 acre-feet of CAP M&I water under the Bemeil Subcontract.

The City agrees to execute an amendment to the Scottsdale Subcontract increasing its annual entitlement to CAP M&I water by 200 acre-feet.

Scottsdale shall pay to CAWCD \$23,232.00 and CAWCD shall pay Bemeil \$23,232.00 for the assignment of the CAP water.

This Agreement shall not become effective until it has been fully executed by all parties and until the City has executed an amendment to the Scottsdale Subcontract increasing its annual entitlement to CAP M&I water by 200 acre-feet and the amendment of the Scottsdale CAP subcontract has been validated by a court of competent jurisdiction and the court has entered a final validation order and no further appeal of this order is possible.

Upon this Agreement becoming effective, the Berneil Subcontract shall be amended to reduce Berneil's entitlement to CAP M&I water by the amount hereby assigned.

The parties have complied with A.R.S. § 45-107.D.

IN WITNESS WHEREOF, the parties hereto have executed this Assignment the day and year first above written.

BERNEIL WATER COMPANY

By: _____
Neil R. Folkman
Its: Vice President

CITY OF SCOTTSDALE

By: _____
Sam Kathryn Campana,
Mayor

ATTEST:

Sonia Robertson, City Clerk

APPROVED AS TO FORM:

Fredda J. Bisman, City Attorney

APPROVAL

The undersigned, pursuant to Article 6.7 of the Subcontract, on behalf of the United States of America, acting through the Secretary of the Interior, and the Central Arizona Water Conservation District, hereby approve the foregoing Assignment in accordance with its terms.

THE UNITED STATES OF AMERICA

By _____
Field Solicitor
Lower Colorado Region
Bureau of Reclamation

By _____
Regional Director

Attest _____
Secretary

CENTRAL ARIZONA WATER
CONSERVATION DISTRICT

By _____
President

AGREEMENT AMONG THE UNITED STATES,
THE CENTRAL ARIZONA WATER CONSERVATION DISTRICT,
AND THE CITY OF SCOTTSDALE

AMENDMENT NO. 9 TO WATER SERVICE SUBCONTRACT

THIS AGREEMENT is made and entered into this _____ day of _____, 1997, by and among the United States of America, hereinafter referred to as the "United States", acting through the Secretary of Interior, the Central Arizona Water Conservation District (the "Contractor"), and the City of Scottsdale (the "Subcontractor").

Recitals

WHEREAS, the United States, the Contractor, and the Subcontractor have entered into a "Subcontract Among the United States, the Central Arizona Water Conservation District, and the City of Scottsdale, Provided for Water Service, Central Arizona Project," Subcontract No. 5-07-30-20063 (the "Water Service Subcontract"); and

WHEREAS, Berneil Water Company ("Berneil") entered into a "Subcontract Among the United States, the Central Arizona Water Conservation District and Berneil Water Company, Provided for Water Service, Central Arizona Project," Subcontract No. 5-07-30-W0080 (the "Berneil Subcontract"); and

WHEREAS, pursuant to an agreement among Berneil and Subcontractor, Berneil has agreed to assign all right, title and interest in 200 acre feet of the Berneil Subcontract to the Subcontractor, and Berneil and the Subcontractor have executed a Partial Assignment of Rights and Assumption of Obligations of the Berneil Subcontract.

NOW, THEREFORE, the parties hereto agree as follows:

1. Amendment No. 8 to Water Service Subcontract No. 5-07-30-W0063 is superseded by this Amendment No. 9 to Water Service Subcontract.
2. Definitions. The definitions used in the Water Service Subcontract shall also be applicable to this Agreement.
3. Amendment of Subarticle 4.12(a). Subarticle 4.12(a) of the Water Service Subcontract is hereby amended to read as follows:

EXHIBIT E

"4.12 Entitlement to Project Water.

(a) For the Year in which the Secretary issues the Notice of Completion of the Water Supply System, the Subcontractor's entitlement to Project Water for M&I uses shall be determined by the Contractor after consultation with the Subcontractor and the Contracting Officer. Commencing with the Year following that in which the Secretary issues the Notice of Completion of the Water Supply System, the Subcontractor is entitled to take a maximum of 41,897 acre-feet of Project Water for M&I uses including but not limited to ground water recharge."

4. Amendment of Subarticle 5.2(a). Subarticle 5.2(a) of the Water Service

Subcontract is hereby amended to read as follows:

"5.2 M&I Water Service Charges

(a) Subject to the provisions of Article 5.4 hereof and in addition to the OM&R payments required in Article 5.1 hereof, the Subcontractor shall, in advance of the delivery of Project M&I Water by the United State or the Operating Agency, make payment to the Contractor in equal semiannual installments of an M&I water service capital charge based on a maximum entitlement of 41,397 acre-free per year multiplied by the rates set forth in the following schedule."

Payment for the
calendar year of

Payment due for each acre-
foot of purchased capacity

1988-1993	\$ 5
1994	6
1995	8
1996	10
1997	12
1998	14
1999	15
2000	16
2001	17
2002	18
2003	19
2004	20
2005	21
2006	22
2007	23
2008	24
2009	25
2010	26
2011	27
2012	28
2013	29
2014	30
2015	31
2016	32

2017	33
2018	34
2019	35
2020	36
2021	37
2022	38
2023	39
2024	40
2025 - through the end of the term of the subcontract	40

5. Amendment of Subarticle 5.2(c). Subarticle 5.2(c) of the Water Service Subcontract is hereby amended to read as follows:

(a) "On or before the first anniversary date of execution of this subcontract (October 25) and on or before each succeeding anniversary, the Subcontractor shall pay, in addition to all other payments required herein, an M&I subcontract charge. The subcontract charge shall be \$2.00 per acre-foot for 41,397 acre-feet of M&I water. Prior to the date of issuance of the Notice of Completion of the Water Supply System, the subcontract charge shall be paid each Year by the Subcontractor to the United States. The Contracting Officer shall advise the Contractor of the amounts and dates of the Subcontractor's payments. After the date of issuance of the Notice of Completion of the Water Supply System, the subcontract charge shall be paid each Year to the Contractor by the Subcontractor and the Contractor shall credit the revenues obtained from the subcontract charge against the Subcontractor's water service charges payable to the Contract that Year."

6. Within twenty days of the execution of this Agreement by all parties hereto, the Subcontractor shall seek a final decree of the proper court of the State of Arizona decreeing and adjudging this Agreement to be valid and binding upon and enforceable against the Subcontractor. The Subcontractor shall furnish the United States and the Contractor a certified copy of such decree and of all pertinent supporting records. This Agreement shall not become effective until such final decree has been entered and no further appeal of that decree is possible, and until the Contractor has received payment of all amounts owed under the Bemeil Subcontract.

7. Except as amended herein, all terms, conditions, and provisions of the Water Service Subcontract shall remain unchanged and in full force and effect.

IN WITNESS WHEREOF, the parties hereto have executed this Amendment No. 9 to Subcontract No. 5-07-30-W-0063 the day and year first above-written.

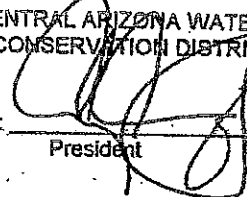
Legal Review and Approval

THE UNITED STATES OF AMERICA

By: _____
Field Solicitor
Phoenix, Arizona

By: _____
Regional Director
Lower Colorado Region
Bureau of Reclamation

Attest: 
Secretary

CENTRAL ARIZONA WATER
CONSERVATION DISTRICT
By: 
President

CITY OF SCOTTSDALE

Attest: _____
City Clerk

By: _____
Mayor

APPROVED AS TO FORM:

Barbara R. Goldberg
City Attorney

APPENDIX C

Fire Department Procedures and Manuals – O + M Introduction

Operation & Maintenance Instructions

Fire Department Procedure and Manuals (RDC Electrical)

Project Name: Berneil Water to Scottsdale Connection
Project Location: Paradise Valley, AZ
Supplier: RDC Electrical

TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>
1	Operating Procedure
2	Dialer Instruction Manual
3	Quick Reference Card

Section 1

Operating Procedure

Background:

There is a 6 inch valve located at 9000 North Scottsdale Road (NW corner) that can be activated to supply water to Paradise Valley Via Berneil Water in the event of system failure or emergency. The valve can be operated in three ways, through dialer, manually or through telemetry.

Dialer Operation:

1. Dial 480-483-2799
2. Wait for four rings (you will hear three beeps)
3. Dial Security code 3473 (FIRE)
(You should hear two beeps. If you hear one long beep re-enter code)
4. Press 1
5. Press * (you should hear one long beep)
 - One long beep means valve is closed
 - two short beeps means valve is open
6. Press #0 (this will end the call)

Manual Operation:

To manually operate the valve: Scottsdale Fire, Phoenix Fire, Scottsdale PD, or Scottsdale Technology personnel can unlock the 8x8 box on the north side of the control cabinet (there are 3 small Knox box units on the parapet wall (East side) with the necessary key will activate the valve. As soon as the valve is activated, a dialer alarm will be generated alerting COS staff. The COS SCADA display will indicate that the valve has been activated "on site". Depending on system pressure on Scottsdale's side, the valve will open and will remain open sustaining feature of the valve, it will begin to close to try to maintain 50 PSI set point. In the event COS staff receives this alarm, the following personnel are to be notified immediately:

Telemetry: 602-223-0481 (Pager)
480-294-8165 (Cell)
Technology Supervisor: 480-789-2064 (Cell)
480-312-8742 (Office)

Telemetry Operation:

Upon receiving a request to activate the valve, COS staff should do the following:

1. If the request is made to COS non telemetry staff, immediately notify telemetry and the technology supervisor or manager. Log the time and date, and the person making the request. (IE. March 16 2011 9:45am Captain Smith Scottsdale Fire)
2. Telemetry or technology staff will activate the valve remotely, again logging the appropriate information

After activation of valve, staff should notify the technology supervisor or manager and monitor the system as necessary. When the request comes in to close the valve, staff will shut it down remotely and confirm flow has stopped. All pertinent information should be logged.

Note: in the event that the valve is active for longer than 4 hours, either manually or remotely, a second dialer alarm will be generated. This is to ensure that there is continuous monitoring and that the valve is not inadvertently left open.

Section 2

Dialer Instruction Manual



CT241 Telephone Controller

Installation Instructions and User Manual

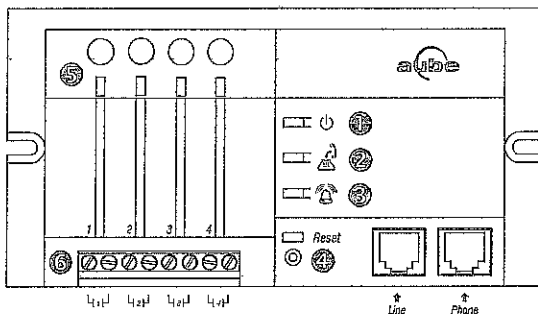
1. Introduction

The CT241 telephone controller is designed to remotely control up to four independent loads.

For example, you could connect a sprinkler system, a water heater, etc. Another example would be to connect an output to the thermostat's phone interface (which requires a dry contact) to switch from Comfort mode to Vacation mode and vice versa.

Loads can be activated or deactivated remotely (by telephone) or manually (on-site).

Figure 1: Product Overview



- 1 **Power Indicator.** Indicates the CT241 is powered on. To turn it off, unplug the power transformer.
- 2 **Communication Indicator.** Indicates the CT241 has answered and is awaiting a command.
- 3 **Ring Indicator.** This indicator flashes when the phone rings.
- 4 **Reset.** This button can be used to reset the CT241 to its default values. See section 3.2.
- 5 **Manual Output Activation Button.** Can be used to manually activate or deactivate a relay.
- 6 **Terminal Board.** See section 2.

2. Installation

Any device connected to a telephone line must conform to the country's standards. The CT241 telephone controller meets:

- FCC68 standards for installation on the North American network.
- FDTBR21 standards for installation on the European network.

2.1 Included Parts

- One CT241 telephone controller)
- One power transformer 120 V (North America) or 250 V (Europe)
- One 5 m (16 foot) telephone cable

2.2 Installation Procedure

NOTE: If you are using an answering machine, position the answering machine switch to ON before installing the CT241. Make sure that your answering machine answers after a minimum of 4 rings.

Figure 2: Answering Machine Switch

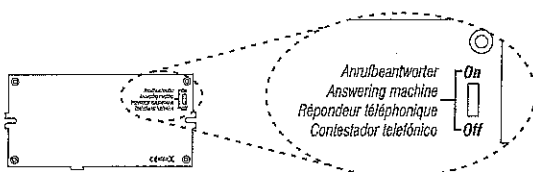
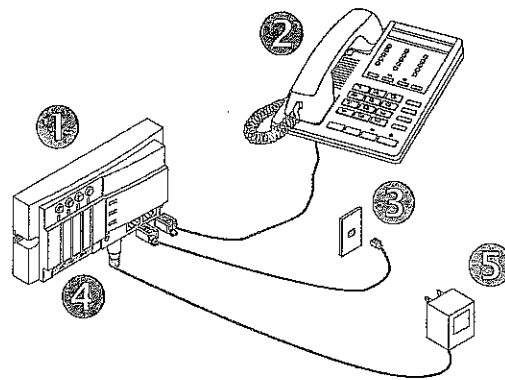


Figure 3: Typical Installation

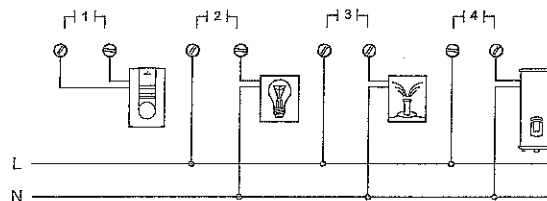


- ① Mount the CT241 near a telephone outlet.

NOTE: If you plan to connect a load having more than 30 volts on the auxiliary outputs, the CT241 must be installed inside a certified electrical box.

- ② **OPTIONAL.** Connect your phone (or answering machine) to the PHONE connector of the CT241.
- ③ Connect one end of the telephone cable to the LINE connector of the CT241 and the other end to the telephone outlet in your home.
- ④ Connect the loads.
The four outputs of the CT241 allow you, for example, to activate or deactivate the lighting system, the sprinkler system, the water heater, etc.
You can also connect a thermostat's telephone interface (which requires a dry contact) to automatically switch from Comfort mode to Vacation mode and vice versa.

NOTE: The capacity per output is 10 A @ 240 VAC. However, to avoid electrical shocks, the direct connection of a load exceeding 30 VAC is not permitted unless the CT241 is installed inside a certified electrical box.



- ⑤ When all connections have been made, connect the power transformer to the 9 V outlet of the CT241 and the other end to the wall electrical outlet.
The power indicator light ① is ON when the circuit is powered.

3. Operation

NOTE: The CT241 will automatically hang up if no key is pressed during the 30 seconds following the CT241 answering a call.

Default values: access code (1234), number of rings (4)

1 BEGIN A SESSION (without answering machine)

Dial your phone number

Wait for the number of rings...

CT241 answers

Beep - Beep - Beep

2 BEGIN A SESSION (with an answering machine)

Dial your phone number

Let it ring once and hang up

Wait 10 seconds...

Dial your phone number again within the next 30 seconds

CT241 answers (1st ring)

Beep - Beep - Beep

2 ENTER YOUR ACCESS CODE

Enter your 4-digit access code
(default: 1234)

Beep - Beep

Accepted

Beep

Error

3 OUTPUT STATUS/MODIFY STATUS

Press the output's corresponding
number 1, 2, 3, 4 for status

Beep

Deactivated
(open)

Press * to change its status

Beep - Beep

Activated
(closed)

3 MODIFY THE ACCESS CODE

Press # 8

Beep - Beep

Enter your new 4-digit access code

Beep - Beep

Enter the access code again

Beep - Beep

Accepted

Beep

Error

3 MODIFY THE NUMBER OF RINGS (phone only)

Press # 9

Beep - Beep

Enter the number of rings after
which the CT241 will answer
(between 1 and 9)

Beep

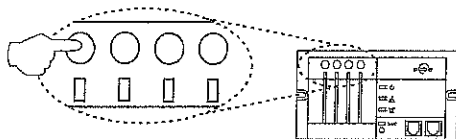
x the number of
selected rings

4 END SESSION

Press # 0 to end the session

3.1 Manual Output Activation Buttons

You can switch a relay status by pressing the corresponding input's button directly on the CT241.

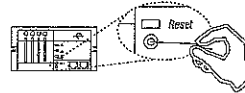


This function is not accessible while the CT241 is answering a telephone call.

3.2 Reset Operation

Insert a pointed object (e.g. paper clip) in the hole located under the Reset light. The light will flash 3 times to indicate that the CT241 has been reset:

- number of rings: 4
- access code: 1234
- relays' status: open



4. Technical Specifications

Power supply: 9 VAC / 60 Hz (50 Hz Europe)

Outputs: Four SPST with the following capacity:

- 5 A / 30 VAC inductive / Power Factor: 0.4
- 10 A / 30 VAC resistive (if installed in a certified electrical box)
- 10 A / 240 VAC resistive (if installed in a certified electrical box)
- 1/2 HP / 120 VAC motor (if installed in a certified electrical box)
- 1 HP / 240 VAC motor (if installed in a certified electrical box)

Protection: Class II

Access code (default): 1234

Number of rings (default): 4 rings

Memory protection: In case of power failure, access code and output status are protected.

Phone certification standard:

- FDTBR21: European telephone network
- FCC68: North American telephone network

Approvals:

- c UL us (North America)
- CE (Europe)

Dimensions (H W D): 2.7 x 5.4 x 1.2 in. (69 x 137 x 31 mm)

5. Warranty

AUBE TECHNOLOGIES INC. THREE (3) YEAR LIMITED WARRANTY

This product is guaranteed against workmanship defects for a three-year period following the initial date of purchase. During this period, AUBE Technologies Inc. will repair or replace, at our option and without charge, any defective product which has been used under normal conditions.

The warranty does not cover delivery costs and does not apply to products poorly installed or randomly damaged following installation.

This warranty cancels and replaces any other manufacturer's express or implied warranty as well as any other company commitment. AUBE Technologies Inc. cannot be held liable for related or random damages following the installation of this product.

The defective product as well as the purchase invoice must be returned to the place of purchase or mailed, prepaid and insured, to the nearest shipping address.



705 Montrichard
Saint-Jean-sur-Richelieu
Quebec, Canada J2X 5K8
Tel.: 1 (450) 358-4600
Toll Free: 1-800-831-AUBE
Fax: 1 (450) 358-4650
service@aubetech.com



10 Ampère Street
95500 Gonesse
France
Tel.: 1 34 07 99 00
33 (0) 1 34 07 99 19
advaupe@comintes.com

For more information on our products, visit us
at: www.aubetech.com

Section 3

Quick Reference Card

1. Dial 480-483-2799
2. Wait for four rings (you will hear three beeps)
3. Dial Security code 3473 (FIRE)
(You should hear two beeps. If you hear one long beep re-enter code)
4. Press 1
5. Press * (you should hear one long beep)
 - ⊖ One long beep means valve is closed
 - ⊕ two short beeps means valve is open
6. Press #0 (this will end the call)

APPENDIX D

Fire Flow Test Results



Flow Test Summary

Project Name: EJFT 16167-1
Project Address: 8047 N Golf Dr, Paradise Valley, AZ 85253
Date of Flow Test: 2016-10-10
Time of Flow Test: 1:23 PM
Data Reliable Until: 2017-04-10
Conducted By: Austin Gourley & Eder Cueva (EJ Flow Tests) 602.999.7637
Witnessed By: Don Ross (Berneil Water Company) 928.713.1959
City Forces Contacted: Berneil Water Company (480.966.0115)

Raw Flow Test Data

Static Pressure: 74.0 PSI
Residual Pressure: 40.0 PSI
Flowing GPM: 1,009
GPM @ 20 PSI: 1,295

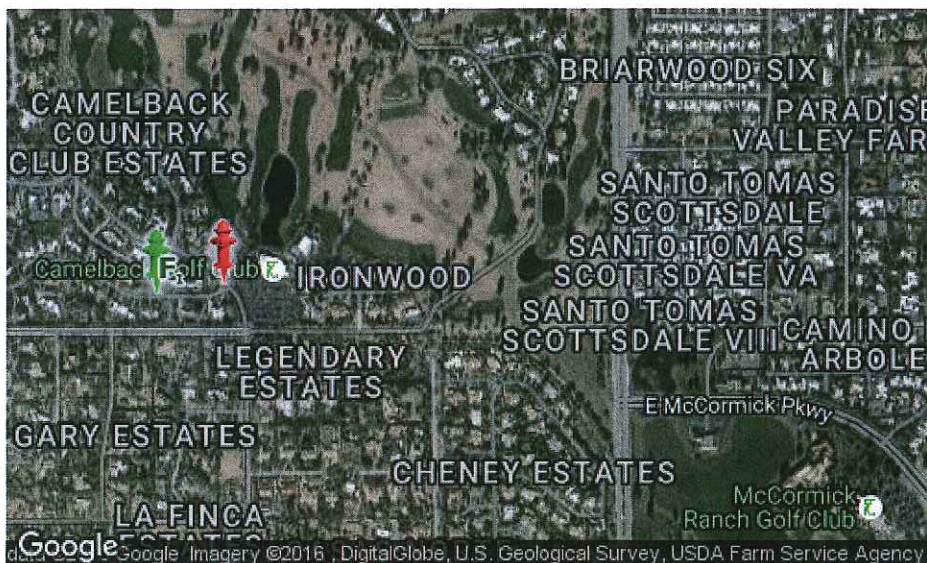
Data With A 10 PSI Safety Factor

Static Pressure: 64.0 PSI
Residual Pressure: 30.0 PSI
Flowing GPM: 1,009
GPM @ 20 PSI: 1,159

Hydrant F₁

Pitot Pressure (1): 8 PSI
Coefficient of Discharge (1): 0.9
Hydrant Orifice Diameter (1): 4.0 inches

Additional coefficient: 0.83 on orifice #1



 Static-Residual Hydrant

 Flow Hydrant

Distance Between F₁ and R
472 ft (measured linearly)

Static-Residual Elevation
1314 ft (above sea level)

Flow Hydrant (F₁) Elevation
1319 ft (above sea level)

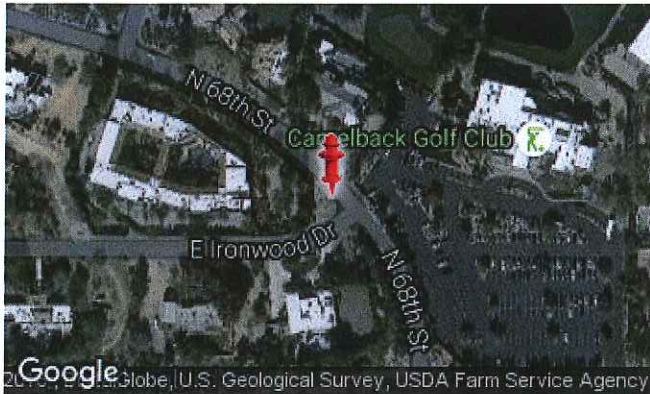
Elevation & distance values are approximate

EJ Flow Tests, LLC

21505 North 78th Ave. | Suite 125 | Peoria, Arizona 85382 | (602) 999-7637 | www.ejengineering.com
John L. Echeverri | NICET Level IV 078493 SME | C-16 FP Contractor ROC 271705 AZ | NFPA CFPS 1915

E·J | Flow Test Summary

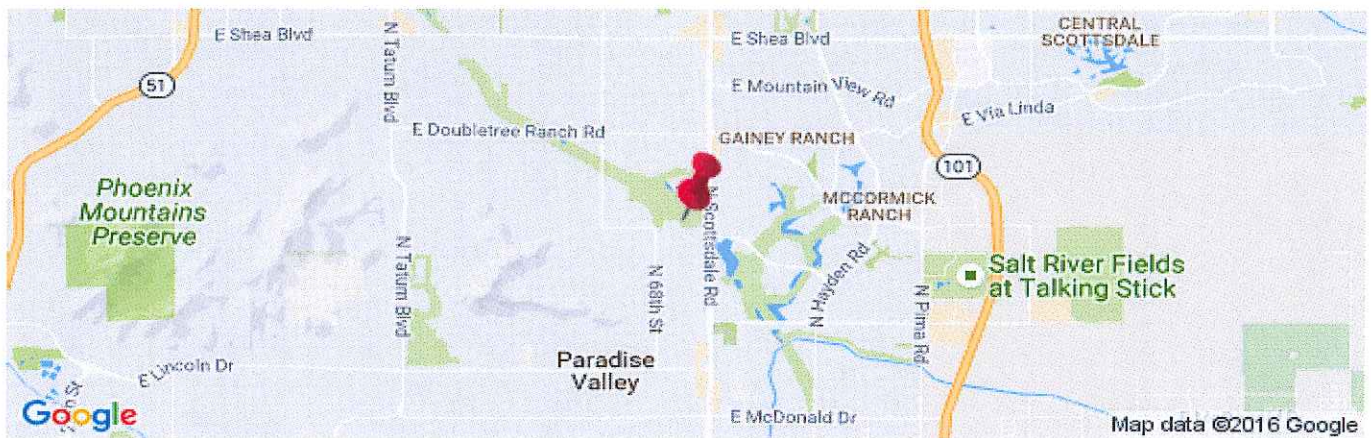
Static-Residual Hydrant



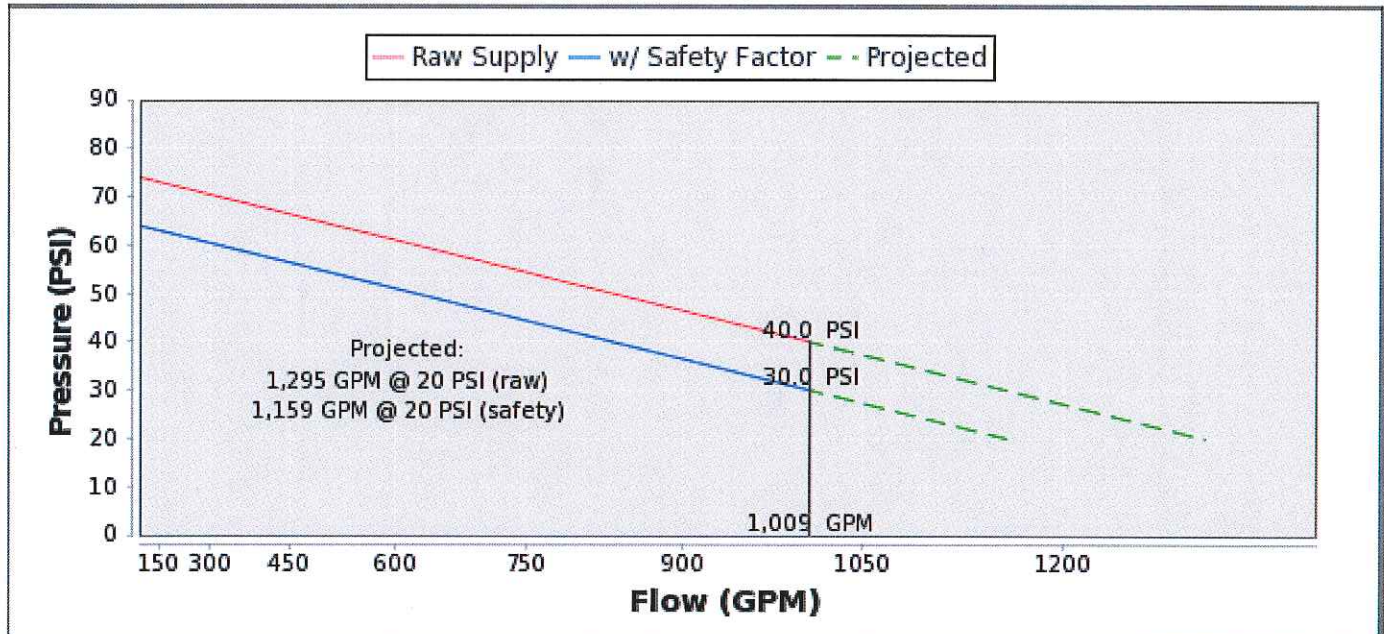
Flow Hydrant (only hydrant F1 shown for clarity)



Approximate Project Site



Water Supply Curve - $N^{1.85}$ Graph



EJ Flow Tests, LLC

21505 North 78th Ave. | Suite 125 | Peoria, Arizona 85382 | (602) 999-7637 | www.ejengineering.com
John L. Echeverri | NICET Level IV 078493 SME | C-16 FP Contractor ROC 271705 AZ | NFPA CFPS 1915



Flow Test Summary

Project Name: EJFT 16167-2
 Project Address: 8001-8045 N Golf Dr, Paradise Valley, AZ 85253
 Date of Flow Test: 2016-10-10
 Time of Flow Test: 1:40 PM MST
 Data Reliable Until: 2017-04-10
 Conducted By: Austin Gourley & Eder Cueva (EJ Flow Tests) 602.999.7637
 Witnessed By: Don Ross (Berneil Water Company) 928.713.1959
 City Forces Contacted: Berneil Water Company (480.966.0115)

Raw Flow Test Data

Static Pressure: 76.0 PSI
 Residual Pressure: 45.0 PSI
 Flowing GPM: 1,128
 GPM @ 20 PSI: 1,552

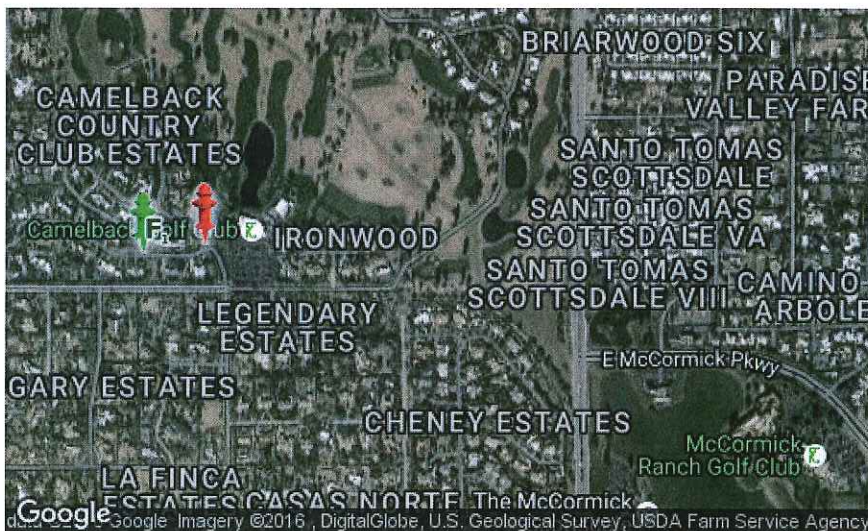
Data With A 10 PSI Safety Factor

Static Pressure: 66.0 PSI
 Residual Pressure: 35.0 PSI
 Flowing GPM: 1,128
 GPM @ 20 PSI: 1,396

Hydrant F₁

Pitot Pressure (1): 10 PSI
 Coefficient of Discharge (1): 0.9
 Hydrant Orifice Diameter (1): 4.0 inches

Additional coefficient: 0.83 on orifice #1



Static-Residual Hydrant
 Flow Hydrant

Distance Between F₁ and R
 469 ft (measured linearly)

Static-Residual Elevation
 1314 ft (above sea level)

Flow Hydrant (F₁) Elevation
 1319 ft (above sea level)

Elevation & distance values are approximate

EJ | Flow Test Summary

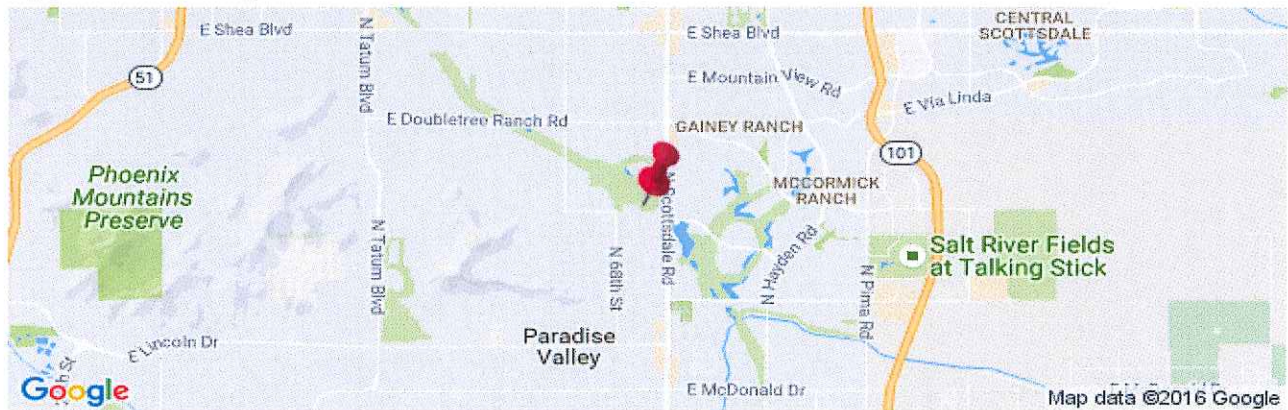
Static-Residual Hydrant



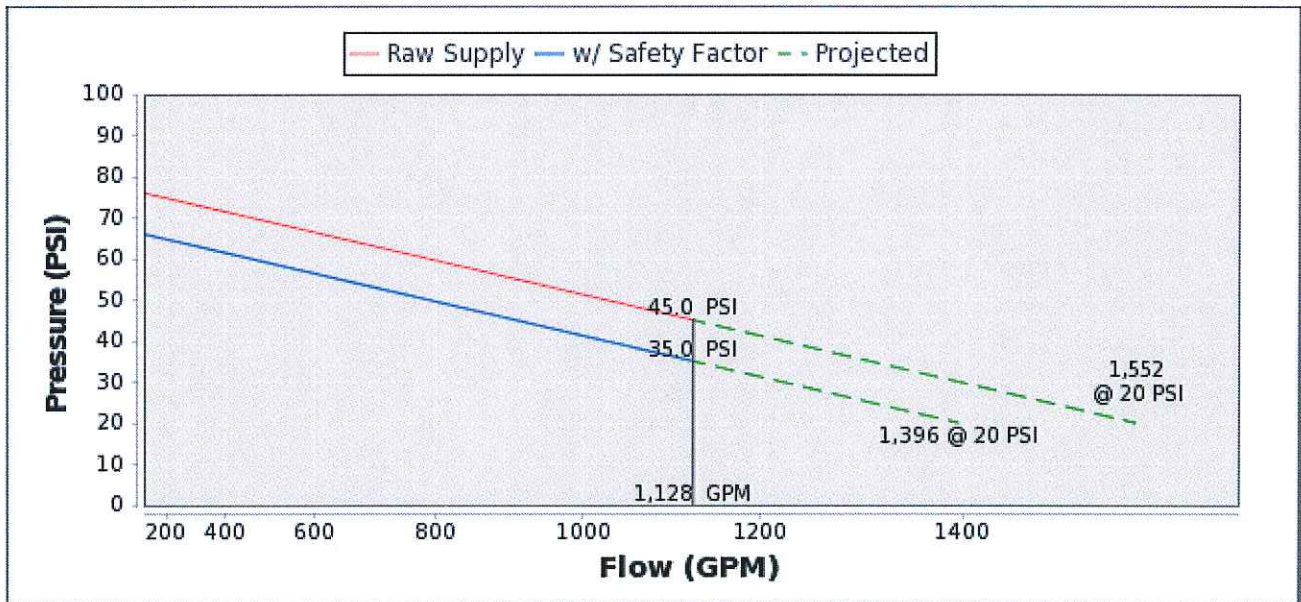
Flow Hydrant (only hydrant F1 shown for clarity)



Approximate Project Site



Water Supply Curve - $N^{1.85}$ Graph



EJ Flow Tests, LLC

21505 North 78th Ave. | Suite 125 | Peoria, Arizona 85382 | (602) 999-7637 | www.ejengineering.com
 John L. Echeverri | NICET Level IV 078493 SME | C-16 FP Contractor ROC 271705 AZ | NFPA CFPS 1915

APPENDIX E

Water CAD Results (Domestic)

FlexTable: Reservoir Table

Active Scenario: Average Day Demand

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,315.00	3	1,315.00
R-2	1,330.00	0	1,330.00

FlexTable: Junction Table

Active Scenario: Average Day Demand

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-19	1,329.00	0	1,485.94	68
J-26	1,329.00	0	1,485.94	68
J-20	1,327.00	0	1,485.94	69
J-18	1,325.00	0	1,485.94	70
J-25	1,325.00	0	1,485.94	70
J-17	1,323.00	0	1,485.94	70
J-21	1,323.00	0	1,485.94	70
J-24	1,322.00	0	1,485.94	71
J-10	1,321.00	0	1,485.94	71
J-22	1,321.00	0	1,485.94	71
J-9	1,321.00	0	1,485.94	71
J-8	1,320.00	0	1,485.94	72
J-23	1,318.88	0	1,485.94	72
J-28	1,318.00	0	1,485.94	73
J-11	1,317.00	0	1,485.94	73
J-27	1,317.00	0	1,485.94	73
J-1	1,317.00	0	1,485.94	73
J-29	1,315.75	0	1,485.94	74
J-12	1,313.00	0	1,485.94	75
J-13	1,313.00	0	1,485.94	75
J-16	1,312.68	0	1,485.94	75
J-14	1,311.00	0	1,485.94	76
J-2	1,310.00	0	1,485.94	76
J-15	1,308.00	0	1,485.94	77
J-5	1,306.00	1	1,485.94	78
J-6	1,305.00	1	1,485.94	78
J-4	1,304.00	0	1,485.94	79
J-3	1,304.00	0	1,485.94	79
J-7	1,304.00	0	1,485.94	79

FlexTable: Pipe Table

Active Scenario: Average Day Demand

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-47	450	R-2	PMP-2	10.0	130.0	0	0.00	0.000
P-50	371	PMP-2	J-26	10.0	130.0	0	0.00	0.000
P-30	627	J-20	J-21	6.0	130.0	0	0.00	0.000
P-33	314	J-22	J-21	6.0	130.0	0	0.00	0.000
P-41	2,921	J-26	J-20	10.0	130.0	0	0.00	0.000
P-6	402	J-5	J-6	8.0	130.0	0	0.00	0.000
P-36	1,091	J-22	J-23	6.0	130.0	0	0.00	0.000
P-39	2,769	J-25	J-21	8.0	130.0	0	0.00	0.000
P-28	576	J-18	J-19	6.0	130.0	0	0.00	0.000
P-29	934	J-19	J-20	6.0	130.0	0	0.00	0.000
P-37	2,765	J-22	J-24	6.0	130.0	0	0.00	0.000
P-40	663	J-25	J-26	6.0	130.0	0	0.00	0.000
P-31	1,003	J-21	J-18	6.0	130.0	0	0.00	0.000
P-32	1,003	J-17	J-22	6.0	130.0	0	0.00	0.000
P-27	405	J-17	J-18	6.0	130.0	0	0.00	0.000
P-38	318	J-24	J-25	6.0	130.0	0	0.00	0.000
P-19	984	J-15	J-14	6.0	130.0	0	0.00	0.000
P-42	908	J-24	J-27	6.0	130.0	0	0.00	0.000
P-43	472	J-27	J-28	6.0	130.0	0	0.00	0.000
P-46	501	J-28	J-29	6.0	130.0	0	0.00	0.000
P-23	1,375	J-1	J-8	6.0	130.0	0	0.00	0.000
P-34	1,287	J-10	J-23	6.0	130.0	0	0.00	0.000
P-8	78	J-7	J-3	6.0	130.0	0	0.00	0.000
P-15	982	J-12	J-13	6.0	130.0	0	0.00	0.000
P-16	959	J-13	J-12	6.0	130.0	0	0.00	0.000
P-26	857	J-10	J-17	6.0	130.0	0	0.00	0.000
P-10	1,016	J-1	J-8	6.0	130.0	0	0.00	0.000
P-35	1,141	J-23	J-11	6.0	130.0	0	0.00	0.000
P-44	377	J-11	J-29	6.0	130.0	0	0.00	0.000
P-18	626	J-14	J-15	6.0	130.0	0	0.00	0.000
P-4	1,024	J-3	J-4	6.0	130.0	1	0.01	0.000
P-17	895	J-13	J-14	6.0	130.0	1	0.01	0.000
P-20	759	J-15	J-4	6.0	130.0	1	0.01	0.000
P-45	827	J-29	J-12	6.0	130.0	1	0.01	0.000
P-11	1,489	J-8	J-9	6.0	130.0	1	0.01	0.000
P-12	834	J-9	J-10	6.0	130.0	1	0.01	0.000
P-24	584	J-1	J-16	6.0	130.0	-1	0.01	0.000
P-5	614	J-4	J-5	8.0	130.0	1	0.01	0.000
P-7	1,233	J-6	J-7	8.0	130.0	-1	0.01	0.000
P-9	1,245	J-2	J-3	6.0	130.0	1	0.01	0.000
P-3	963	J-2	J-7	6.0	130.0	1	0.01	0.000
P-25	676	J-16	J-2	6.0	130.0	2	0.02	0.000
P-21	418	R-1	PMP-1	6.0	130.0	3	0.03	0.000
P-22	493	PMP-1	J-16	6.0	130.0	3	0.03	0.000

FlexTable: Pump Table

Active Scenario: Average Day Demand

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,314.00	Pump Def 1	On	1,315.00	1,485.94	3	170.94
PMP-2	1,329.00	Scottsdale Connection Open	Off	1,330.00	1,485.94	0	0.00

FlexTable: Reservoir Table
Active Scenario: Max Day Demand

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,315.00	5	1,315.00
R-2	1,330.00	0	1,330.00

FlexTable: Junction Table
Active Scenario: Max Day Demand

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-19	1,329.00	0	1,485.93	68
J-26	1,329.00	0	1,485.93	68
J-20	1,327.00	0	1,485.93	69
J-18	1,325.00	0	1,485.93	70
J-25	1,325.00	0	1,485.93	70
J-17	1,323.00	0	1,485.93	70
J-21	1,323.00	0	1,485.93	70
J-24	1,322.00	0	1,485.93	71
J-10	1,321.00	0	1,485.93	71
J-22	1,321.00	0	1,485.93	71
J-9	1,321.00	0	1,485.93	71
J-8	1,320.00	0	1,485.93	72
J-23	1,318.88	0	1,485.93	72
J-28	1,318.00	0	1,485.93	73
J-11	1,317.00	0	1,485.93	73
J-27	1,317.00	0	1,485.93	73
J-1	1,317.00	0	1,485.93	73
J-29	1,315.75	0	1,485.93	74
J-12	1,313.00	0	1,485.93	75
J-13	1,313.00	0	1,485.93	75
J-16	1,312.68	0	1,485.93	75
J-14	1,311.00	0	1,485.93	76
J-2	1,310.00	0	1,485.93	76
J-15	1,308.00	0	1,485.93	77
J-5	1,306.00	3	1,485.93	78
J-6	1,305.00	3	1,485.93	78
J-4	1,304.00	0	1,485.93	79
J-3	1,304.00	0	1,485.93	79
J-7	1,304.00	0	1,485.93	79

FlexTable: Pipe Table

Active Scenario: Max Day Demand

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-47	450	R-2	PMP-2	10.0	130.0	0	0.00	0.000
P-50	371	PMP-2	J-26	10.0	130.0	0	0.00	0.000
P-30	627	J-20	J-21	6.0	130.0	0	0.00	0.000
P-33	314	J-22	J-21	6.0	130.0	0	0.00	0.000
P-41	2,921	J-26	J-20	10.0	130.0	0	0.00	0.000
P-6	402	J-5	J-6	8.0	130.0	0	0.00	0.000
P-36	1,091	J-22	J-23	6.0	130.0	0	0.00	0.000
P-39	2,769	J-25	J-21	8.0	130.0	0	0.00	0.000
P-28	576	J-18	J-19	6.0	130.0	0	0.00	0.000
P-29	934	J-19	J-20	6.0	130.0	0	0.00	0.000
P-37	2,765	J-22	J-24	6.0	130.0	0	0.00	0.000
P-40	663	J-25	J-26	6.0	130.0	0	0.00	0.000
P-31	1,003	J-21	J-18	6.0	130.0	0	0.00	0.000
P-32	1,003	J-17	J-22	6.0	130.0	0	0.00	0.000
P-27	405	J-17	J-18	6.0	130.0	0	0.00	0.000
P-38	318	J-24	J-25	6.0	130.0	0	0.01	0.000
P-19	984	J-15	J-14	6.0	130.0	-1	0.01	0.000
P-42	908	J-24	J-27	6.0	130.0	1	0.01	0.000
P-43	472	J-27	J-28	6.0	130.0	1	0.01	0.000
P-46	501	J-28	J-29	6.0	130.0	1	0.01	0.000
P-23	1,375	J-1	J-8	6.0	130.0	1	0.01	0.000
P-34	1,287	J-10	J-23	6.0	130.0	1	0.01	0.000
P-8	78	J-7	J-3	6.0	130.0	-1	0.01	0.000
P-15	982	J-12	J-13	6.0	130.0	1	0.01	0.000
P-16	959	J-13	J-12	6.0	130.0	-1	0.01	0.000
P-26	857	J-10	J-17	6.0	130.0	1	0.01	0.000
P-10	1,016	J-1	J-8	6.0	130.0	1	0.01	0.000
P-35	1,141	J-23	J-11	6.0	130.0	1	0.01	0.000
P-44	377	J-11	J-29	6.0	130.0	1	0.01	0.000
P-18	626	J-14	J-15	6.0	130.0	1	0.01	0.000
P-4	1,024	J-3	J-4	6.0	130.0	1	0.01	0.000
P-17	895	J-13	J-14	6.0	130.0	1	0.02	0.000
P-20	759	J-15	J-4	6.0	130.0	1	0.02	0.000
P-45	827	J-29	J-12	6.0	130.0	1	0.02	0.000
P-11	1,489	J-8	J-9	6.0	130.0	1	0.02	0.000
P-12	834	J-9	J-10	6.0	130.0	1	0.02	0.000
P-24	584	J-1	J-16	6.0	130.0	-1	0.02	0.000
P-5	614	J-4	J-5	8.0	130.0	3	0.02	0.000
P-7	1,233	J-6	J-7	8.0	130.0	-3	0.02	0.000
P-9	1,245	J-2	J-3	6.0	130.0	2	0.02	0.000
P-3	963	J-2	J-7	6.0	130.0	2	0.02	0.000
P-25	676	J-16	J-2	6.0	130.0	4	0.04	0.000
P-21	418	R-1	PMP-1	6.0	130.0	5	0.06	0.000
P-22	493	PMP-1	J-16	6.0	130.0	5	0.06	0.000

FlexTable: Pump Table

Active Scenario: Max Day Demand

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,314.00	Pump Def 1	On	1,315.00	1,485.93	5	170.94
PMP-2	1,329.00	Scottsdale Connection Open	Off	1,330.00	1,485.93	0	0.00

FlexTable: Reservoir Table

Active Scenario: Peak Hour Demand

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,315.00	9	1,315.00
R-2	1,330.00	0	1,330.00

FlexTable: Junction Table

Active Scenario: Peak Hour Demand

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-19	1,329.00	0	1,485.91	68
J-26	1,329.00	0	1,485.91	68
J-20	1,327.00	0	1,485.91	69
J-18	1,325.00	0	1,485.91	70
J-25	1,325.00	0	1,485.91	70
J-17	1,323.00	0	1,485.91	70
J-21	1,323.00	0	1,485.91	70
J-24	1,322.00	0	1,485.91	71
J-10	1,321.00	0	1,485.91	71
J-22	1,321.00	0	1,485.91	71
J-9	1,321.00	0	1,485.91	71
J-8	1,320.00	0	1,485.91	72
J-23	1,318.88	0	1,485.91	72
J-28	1,318.00	0	1,485.91	73
J-11	1,317.00	0	1,485.91	73
J-27	1,317.00	0	1,485.91	73
J-1	1,317.00	0	1,485.91	73
J-29	1,315.75	0	1,485.91	74
J-12	1,313.00	0	1,485.91	75
J-13	1,313.00	0	1,485.91	75
J-16	1,312.68	0	1,485.91	75
J-14	1,311.00	0	1,485.91	76
J-2	1,310.00	0	1,485.91	76
J-15	1,308.00	0	1,485.91	77
J-5	1,306.00	5	1,485.91	78
J-6	1,305.00	5	1,485.91	78
J-4	1,304.00	0	1,485.91	79
J-3	1,304.00	0	1,485.91	79
J-7	1,304.00	0	1,485.91	79

FlexTable: Pipe Table

Active Scenario: Peak Hour Demand

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-47	450	R-2	PMP-2	10.0	130.0	0	0.00	0.000
P-50	371	PMP-2	J-26	10.0	130.0	0	0.00	0.000
P-30	627	J-20	J-21	6.0	130.0	0	0.00	0.000
P-33	314	J-22	J-21	6.0	130.0	0	0.00	0.000
P-41	2,921	J-26	J-20	10.0	130.0	0	0.00	0.000
P-6	402	J-5	J-6	8.0	130.0	0	0.00	0.000
P-36	1,091	J-22	J-23	6.0	130.0	0	0.00	0.000
P-39	2,769	J-25	J-21	8.0	130.0	0	0.00	0.000
P-28	576	J-18	J-19	6.0	130.0	0	0.00	0.000
P-29	934	J-19	J-20	6.0	130.0	0	0.00	0.000
P-37	2,765	J-22	J-24	6.0	130.0	0	0.00	0.000
P-40	663	J-25	J-26	6.0	130.0	0	0.00	0.000
P-31	1,003	J-21	J-18	6.0	130.0	0	0.00	0.000
P-32	1,003	J-17	J-22	6.0	130.0	1	0.01	0.000
P-27	405	J-17	J-18	6.0	130.0	1	0.01	0.000
P-38	318	J-24	J-25	6.0	130.0	-1	0.01	0.000
P-19	984	J-15	J-14	6.0	130.0	-1	0.01	0.000
P-42	908	J-24	J-27	6.0	130.0	1	0.01	0.000
P-43	472	J-27	J-28	6.0	130.0	1	0.01	0.000
P-46	501	J-28	J-29	6.0	130.0	1	0.01	0.000
P-23	1,375	J-1	J-8	6.0	130.0	1	0.01	0.000
P-34	1,287	J-10	J-23	6.0	130.0	1	0.01	0.000
P-8	78	J-7	J-3	6.0	130.0	-1	0.01	0.000
P-15	982	J-12	J-13	6.0	130.0	1	0.01	0.000
P-16	959	J-13	J-12	6.0	130.0	-1	0.01	0.000
P-26	857	J-10	J-17	6.0	130.0	1	0.01	0.000
P-10	1,016	J-1	J-8	6.0	130.0	1	0.02	0.000
P-35	1,141	J-23	J-11	6.0	130.0	1	0.02	0.000
P-44	377	J-11	J-29	6.0	130.0	1	0.02	0.000
P-18	626	J-14	J-15	6.0	130.0	1	0.02	0.000
P-4	1,024	J-3	J-4	6.0	130.0	2	0.02	0.000
P-17	895	J-13	J-14	6.0	130.0	3	0.03	0.000
P-20	759	J-15	J-4	6.0	130.0	3	0.03	0.000
P-45	827	J-29	J-12	6.0	130.0	3	0.03	0.000
P-11	1,489	J-8	J-9	6.0	130.0	3	0.03	0.000
P-12	834	J-9	J-10	6.0	130.0	3	0.03	0.000
P-24	584	J-1	J-16	6.0	130.0	-3	0.03	0.000
P-5	614	J-4	J-5	8.0	130.0	4	0.03	0.000
P-7	1,233	J-6	J-7	8.0	130.0	-5	0.03	0.000
P-9	1,245	J-2	J-3	6.0	130.0	3	0.04	0.000
P-3	963	J-2	J-7	6.0	130.0	4	0.04	0.000
P-25	676	J-16	J-2	6.0	130.0	7	0.08	0.000
P-21	418	R-1	PMP-1	6.0	130.0	9	0.11	0.000
P-22	493	PMP-1	J-16	6.0	130.0	9	0.11	0.000

FlexTable: Pump Table

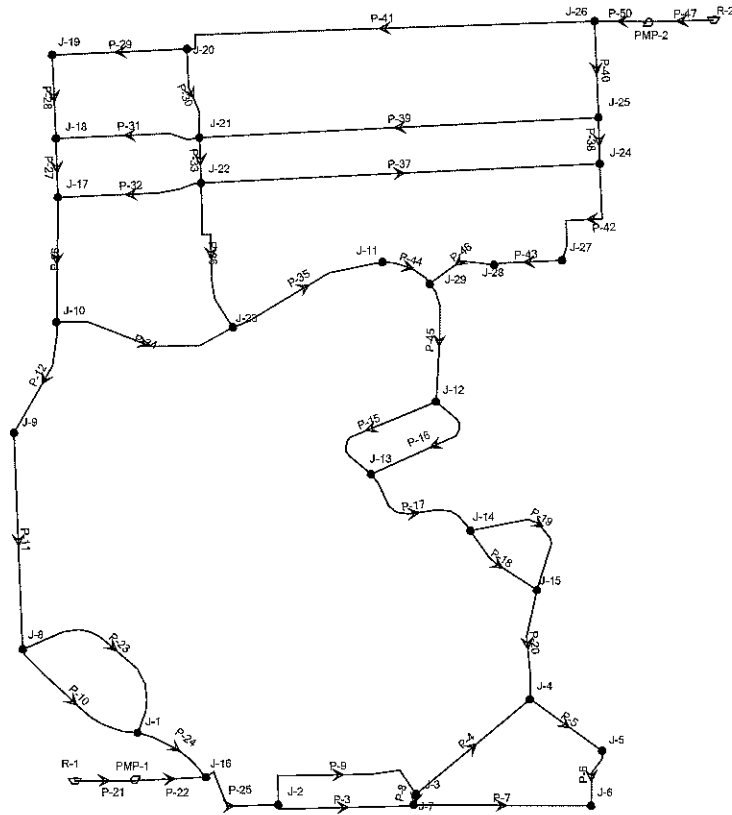
Active Scenario: Peak Hour Demand

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,314.00	Pump Def 1	On	1,314.99	1,485.92	9	170.93
PMP-2	1,329.00	Scottsdale Connection Open	Off	1,330.00	1,485.91	0	0.00

APPENDIX F

Water CAD Results (Fire Flow)

Scenario: Fire Flow J-6
Active Scenario: Fire Flow J-6



FlexTable: Reservoir Table
Active Scenario: Fire Flow J-5

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,315.00	684	1,315.00
R-2	1,330.00	816	1,330.00

FlexTable: Junction Table
Active Scenario: Fire Flow J-5

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-5	1,306.00	1,500	1,351.21	20
J-6	1,305.00	0	1,354.69	21
J-4	1,304.00	0	1,359.20	24
J-7	1,304.00	0	1,365.34	27
J-3	1,304.00	0	1,365.56	27
J-15	1,308.00	0	1,379.10	31
J-14	1,311.00	0	1,384.72	32
J-2	1,310.00	0	1,385.01	32
J-13	1,313.00	0	1,408.18	41
J-12	1,313.00	0	1,415.23	44
J-8	1,320.00	0	1,433.83	49
J-1	1,317.00	0	1,432.03	50
J-16	1,312.68	0	1,428.81	50
J-9	1,321.00	0	1,442.05	52
J-29	1,315.75	0	1,436.92	52
J-11	1,317.00	0	1,439.31	53
J-28	1,318.00	0	1,441.04	53
J-10	1,321.00	0	1,446.65	54
J-19	1,329.00	0	1,455.97	55
J-23	1,318.88	0	1,446.56	55
J-27	1,317.00	0	1,444.93	55
J-17	1,323.00	0	1,452.24	56
J-18	1,325.00	0	1,454.26	56
J-25	1,325.00	0	1,454.97	56
J-24	1,322.00	0	1,452.40	56
J-22	1,321.00	0	1,452.40	57
J-21	1,323.00	0	1,454.62	57
J-20	1,327.00	0	1,458.74	57
J-26	1,329.00	0	1,462.78	58

FlexTable: Pipe Table

Active Scenario: Fire Flow J-5

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-37	2,765	J-22	J-24	6.0	130.0	3	0.03	0.000
P-34	1,287	J-10	J-23	6.0	130.0	23	0.26	0.000
P-32	1,003	J-17	J-22	6.0	130.0	-36	0.41	0.000
P-39	2,769	J-25	J-21	8.0	130.0	68	0.43	0.000
P-31	1,003	J-21	J-18	6.0	130.0	57	0.64	0.000
P-23	1,375	J-1	J-8	6.0	130.0	-113	1.28	0.001
P-10	1,016	J-1	J-8	6.0	130.0	-133	1.51	0.002
P-41	2,921	J-26	J-20	10.0	130.0	446	1.82	0.001
P-8	78	J-7	J-3	6.0	130.0	-169	1.92	0.003
P-28	576	J-18	J-19	6.0	130.0	-176	2.00	0.003
P-29	934	J-19	J-20	6.0	130.0	-176	2.00	0.003
P-27	405	J-17	J-18	6.0	130.0	-233	2.64	0.005
P-36	1,091	J-22	J-23	6.0	130.0	242	2.75	0.005
P-11	1,489	J-8	J-9	6.0	130.0	-246	2.79	0.006
P-12	834	J-9	J-10	6.0	130.0	-246	2.79	0.006
P-24	584	J-1	J-16	6.0	130.0	246	2.79	0.006
P-19	984	J-15	J-14	6.0	130.0	-251	2.84	0.006
P-4	1,024	J-3	J-4	6.0	130.0	262	2.97	0.006
P-35	1,141	J-23	J-11	6.0	130.0	265	3.01	0.006
P-44	377	J-11	J-29	6.0	130.0	265	3.01	0.006
P-26	857	J-10	J-17	6.0	130.0	-269	3.05	0.007
P-30	627	J-20	J-21	6.0	130.0	270	3.06	0.007
P-33	314	J-22	J-21	6.0	130.0	-281	3.19	0.007
P-15	982	J-12	J-13	6.0	130.0	283	3.22	0.007
P-16	959	J-13	J-12	6.0	130.0	-287	3.26	0.007
P-47	450	R-2	PMP-2	10.0	130.0	816	3.33	0.004
P-50	371	PMP-2	J-26	10.0	130.0	816	3.33	0.004
P-38	318	J-24	J-25	6.0	130.0	-302	3.43	0.008
P-42	908	J-24	J-27	6.0	130.0	305	3.46	0.008
P-43	472	J-27	J-28	6.0	130.0	305	3.46	0.008
P-46	501	J-28	J-29	6.0	130.0	305	3.46	0.008
P-18	626	J-14	J-15	6.0	130.0	320	3.63	0.009
P-40	663	J-25	J-26	6.0	130.0	-370	4.20	0.012
P-6	402	J-5	J-6	8.0	130.0	-668	4.26	0.009
P-7	1,233	J-6	J-7	8.0	130.0	-668	4.26	0.009
P-9	1,245	J-2	J-3	6.0	130.0	431	4.89	0.016
P-5	614	J-4	J-5	8.0	130.0	832	5.31	0.013
P-3	963	J-2	J-7	6.0	130.0	498	5.66	0.020
P-45	827	J-29	J-12	6.0	130.0	570	6.47	0.026
P-17	895	J-13	J-14	6.0	130.0	570	6.47	0.026
P-20	759	J-15	J-4	6.0	130.0	570	6.47	0.026
P-21	418	R-1	PMP-1	6.0	130.0	684	7.76	0.037
P-22	493	PMP-1	J-16	6.0	130.0	684	7.76	0.037
P-25	676	J-16	J-2	6.0	130.0	930	10.55	0.065

FlexTable: Pump Table

Active Scenario: Fire Flow J-5

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,314.00	Scottsdale Connection Open	On	1,299.66	1,446.90	684	147.24
PMP-2	1,329.00	Scottsdale Connection Open	On	1,328.10	1,464.34	816	136.25

FlexTable: Reservoir Table
Active Scenario: Fire Flow J-6

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-1	1,315.00	686	1,315.00
R-2	1,330.00	814	1,330.00

FlexTable: Junction Table
Active Scenario: Fire Flow J-6

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-5	1,306.00	0	1,354.87	21
J-6	1,305.00	1,500	1,350.62	20
J-4	1,304.00	0	1,361.34	25
J-7	1,304.00	0	1,364.05	26
J-3	1,304.00	0	1,364.51	26
J-15	1,308.00	0	1,380.83	32
J-14	1,311.00	0	1,386.33	33
J-2	1,310.00	0	1,384.08	32
J-13	1,313.00	0	1,409.30	42
J-12	1,313.00	0	1,416.20	45
J-8	1,320.00	0	1,433.64	49
J-1	1,317.00	0	1,431.78	50
J-16	1,312.68	0	1,428.45	50
J-9	1,321.00	0	1,442.13	52
J-29	1,315.75	0	1,437.43	53
J-11	1,317.00	0	1,439.76	53
J-28	1,318.00	0	1,441.49	53
J-10	1,321.00	0	1,446.88	54
J-19	1,329.00	0	1,456.21	55
J-23	1,318.88	0	1,446.81	55
J-27	1,317.00	0	1,445.31	56
J-17	1,323.00	0	1,452.49	56
J-18	1,325.00	0	1,454.50	56
J-25	1,325.00	0	1,455.22	56
J-24	1,322.00	0	1,452.66	57
J-22	1,321.00	0	1,452.66	57
J-21	1,323.00	0	1,454.87	57
J-20	1,327.00	0	1,458.97	57
J-26	1,329.00	0	1,462.98	58

FlexTable: Pipe Table
Active Scenario: Fire Flow J-6

Label	Length (Scaled) (ft)	Start Node	Stop Node	Diameter (in)	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss Gradient (ft/ft)
P-37	2,765	J-22	J-24	6.0	130.0	1	0.01	0.000
P-34	1,287	J-10	J-23	6.0	130.0	19	0.22	0.000
P-32	1,003	J-17	J-22	6.0	130.0	-37	0.42	0.000
P-39	2,769	J-25	J-21	8.0	130.0	68	0.43	0.000
P-31	1,003	J-21	J-18	6.0	130.0	57	0.64	0.000
P-23	1,375	J-1	J-8	6.0	130.0	-115	1.30	0.001
P-10	1,016	J-1	J-8	6.0	130.0	-135	1.54	0.002
P-41	2,921	J-26	J-20	10.0	130.0	445	1.82	0.001
P-8	78	J-7	J-3	6.0	130.0	-253	2.87	0.006
P-28	576	J-18	J-19	6.0	130.0	-176	1.99	0.003
P-29	934	J-19	J-20	6.0	130.0	-176	1.99	0.003
P-27	405	J-17	J-18	6.0	130.0	-232	2.64	0.005
P-36	1,091	J-22	J-23	6.0	130.0	242	2.75	0.005
P-11	1,489	J-8	J-9	6.0	130.0	-250	2.84	0.006
P-12	834	J-9	J-10	6.0	130.0	-250	2.84	0.006
P-24	584	J-1	J-16	6.0	130.0	250	2.84	0.006
P-19	984	J-15	J-14	6.0	130.0	-248	2.81	0.006
P-4	1,024	J-3	J-4	6.0	130.0	180	2.04	0.003
P-35	1,141	J-23	J-11	6.0	130.0	261	2.97	0.006
P-44	377	J-11	J-29	6.0	130.0	261	2.97	0.006
P-26	857	J-10	J-17	6.0	130.0	-270	3.06	0.007
P-30	627	J-20	J-21	6.0	130.0	269	3.06	0.007
P-33	314	J-22	J-21	6.0	130.0	-281	3.18	0.007
P-15	982	J-12	J-13	6.0	130.0	280	3.18	0.007
P-16	959	J-13	J-12	6.0	130.0	-284	3.22	0.007
P-47	450	R-2	PMP-2	10.0	130.0	814	3.33	0.004
P-50	371	PMP-2	J-26	10.0	130.0	814	3.33	0.004
P-38	318	J-24	J-25	6.0	130.0	-301	3.42	0.008
P-42	908	J-24	J-27	6.0	130.0	302	3.43	0.008
P-43	472	J-27	J-28	6.0	130.0	302	3.43	0.008
P-46	501	J-28	J-29	6.0	130.0	302	3.43	0.008
P-18	626	J-14	J-15	6.0	130.0	316	3.59	0.009
P-40	663	J-25	J-26	6.0	130.0	-369	4.19	0.012
P-6	402	J-5	J-6	8.0	130.0	744	4.75	0.011
P-7	1,233	J-6	J-7	8.0	130.0	-756	4.83	0.011
P-9	1,245	J-2	J-3	6.0	130.0	433	4.91	0.016
P-5	614	J-4	J-5	8.0	130.0	744	4.75	0.011
P-3	963	J-2	J-7	6.0	130.0	503	5.71	0.021
P-45	827	J-29	J-12	6.0	130.0	564	6.40	0.026
P-17	895	J-13	J-14	6.0	130.0	564	6.40	0.026
P-20	759	J-15	J-4	6.0	130.0	564	6.40	0.026
P-21	418	R-1	PMP-1	6.0	130.0	686	7.78	0.037
P-22	493	PMP-1	J-16	6.0	130.0	686	7.78	0.037
P-25	676	J-16	J-2	6.0	130.0	936	10.62	0.066

FlexTable: Pump Table

Active Scenario: Fire Flow J-6

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-1	1,314.00	Scottsdale Connection Open	On	1,299.57	1,446.65	686	147.07
PMP-2	1,329.00	Scottsdale Connection Open	On	1,328.11	1,464.54	814	136.44

APPENDIX G

Water Quality Report

Calendar Year Jan 1, 2015 to Dec 31, 2015
Annual Drinking Water Quality Report For
Public Water System Name: BERNEIL WATER COMPANY
Public Water System Number: 07-008

We are pleased to present to you this year's water quality report. Our constant goal is to provide you with a safe and dependable supply of drinking water.

General Information About Drinking Water

All drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV-AIDS or other immune system disorders, some elderly, and infants can be particularly at risk of infections. These people should seek advice about drinking water from their health care providers. For more information about contaminants and potential health effects, or to receive a copy of the U.S. Environmental Protection Agency (EPA) and the U.S. Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and microbiological contaminants, call the EPA Safe Drinking Water Hotline at 1-800-426-4791.

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Contaminants that may be present in source water include

- **Microbial contaminants**, such as viruses and bacteria that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- **Inorganic contaminants**, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- **Pesticides and herbicides** that may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.
- **Organic chemical contaminants**, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and also may come from gas stations, urban stormwater runoff, and septic systems.

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- **Radioactive contaminants**, that can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the Arizona Department of Environmental Quality prescribes regulations limiting the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration regulations establish limits for contaminants in bottled water.

Our Water Source(s)

The system's sources of water are listed below;

- Two wells, both over 800 feet deep and located on or near the Camelback Golf Course

Source Water Assessments on file with the Arizona Department of Environmental Quality are available for public review. You may obtain copies by contacting the Arizona Source Water Coordinator at (602) 771-4641.

Potential sources of contamination in our source water area come from: agricultural runoff or flooding. The source Water Assessment Report provides a screening-level evaluation of potential contamination that could occur. It does not mean that the contamination has or will occur. We can use this information to evaluate the need to improve our current water treatment capabilities and prepare for future contamination threats. This can help us ensure that quality finished water is delivered to your homes. In addition, the source water assessment results provide a starting point for developing a source water protection plan. The State has assigned a low risk to our source water.

Please contact Bradley Folkman at (480) 966-5804 to learn more about what you can do to help protect your drinking water sources, any questions about the annual drinking water quality report, to learn more about our system, or to attend scheduled public meetings. We want you, our valued customers, to be informed about the services we provide and the quality of water we deliver to you every day.

Terms and Abbreviations

To help you understand the terms and abbreviations used in this report, we have provided the following definitions:

- **Parts per million (ppm) or Milligrams per liter (mg/L)** - one part per million corresponds to one minute in two years or a single penny in \$10,000.
- **Parts per billion (ppb) or Micrograms per liter (µg/L)** - one part per billion corresponds to one minute in 2,000 years, or a single penny in \$10,000,000.
- **Parts per trillion (ppt) or Nanograms per liter (nanograms/L)** - one part per trillion corresponds to one minute in 2,000,000 years, or a single penny in \$10,000,000,000.
- **Parts per quadrillion (ppq) or Picograms per liter (picograms/L)** - one part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in \$10,000,000,000,000.
- **Picocuries per liter (pCi/L)** - picocuries per liter is a measure of the radioactivity in water.
- **Action Level (AL)** - the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

- **Action Level Goal (ALG)** - The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. The ALG allows for a margin of safety
- **Treatment Technique (TT)** - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.
- **Maximum Contaminant Level Goal (MCLG)** - The "Goal" is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- **Maximum Contaminant Level (MCL)** - The "Maximum Allowed" is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
- **Maximum Residual Disinfectant Level Goal (MRDLG)**: The level of a drinking water disinfectant, below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.
- **Maximum Residual Disinfectant Level (MRDL)**: The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Water Quality Data

We routinely monitor for contaminants in your drinking water according to Federal and State laws. The State of Arizona requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year, or the system is not considered vulnerable to this type of contamination. Some of our data, though representative, may be more than one year old.

These tables show the results of our monitoring for the period of January 1 to December 31, 2014 unless otherwise noted.

Microbiological Contaminants

Contaminant	MCL	MCLG	Unit	Result	Violation (Yes or No)	Sample Date	Likely Source of Contamination
Total Coliform Bacteria for Systems that collect <40 samples per month	No more than 1 positive monthly sample	0	Absent or Present	0	No	Monthly	Naturally present in the environment
Fecal coliform and E. Coli	A routine sample & a repeat sample are total coliform positive, & one is also fecal coliform or <i>E. coli</i> positive	0	Absent or Present	0	No	Monthly	Human and animal fecal waste

Radionuclides

Contaminant	MCL	MCLG	Units	Level Detected & Range	Violation (Yes or No)	Sample Date	Likely Source of Contamination
Alpha emitters	15	0	pCi/l	2.9-4.3	No	2013	Erosion of natural deposits

Lead and Copper

Contaminant	AL	ALG	Units	90 th Percentile	Number of Sites over AL	Violation (Yes or No)	Sample Date/Year	Likely Source of Contamination
Copper	1.3	.13	mg/L	0.0017	0	No	2013	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead	15	0	mg/L	0.23	0	No	2013	Corrosion of household plumbing systems, erosion of natural deposits

Disinfectants

	MRDL	MRDLG	Units	Level Detected & Range	Violation (Yes or No)	Sample Date/Year	Source
Chlorine	4	4	ppm	.30	No	2013	Water additive used to control microbes

Disinfection Byproducts

Contaminant	MCL	MCLG	Units	Average	Range	Violation (Yes or No)	Sample Date/Year	Likely Source of Contamination
Haloacetic Acids (HAA5)	60	N/A	ppm	0.0020	0.0020	No	07/15	By-product of drinking water disinfection
Total Trihalomethanes (TTHM)	80	N/A	ppm	0.0020	0.0020	No	07/15	By-product of drinking water disinfection

Inorganic Contaminants

Contaminant	MCL	MCLG	Units	Level Detected/ Range	Violation (Yes or No)	Sample Date	Likely Source of Contamination
Arsenic	10	0	Mg/L	0.0093-0.0099	No	01/15 04/15 07/15 10/15	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Barium	2	2	Mg/L	.0022-0.024	No	8/13	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Fluoride	4	4	Mg/L	.032-0.32	No	8/13	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Chromium	100	100	Mg/L	0.012-0.013	No	8/13	Discharge from steel and pulp mills. Erosion of natural deposits
Nitrate (as Nitrogen)	10	10	Mg/L	4.2-4.3	No	8/13	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits

Health Effects Information About the Above Tables

Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may rise quickly for short periods-of-time because of rainfall or agricultural activity. If you are caring for an infant, and detected nitrate levels are above 5 ppm, you should ask advice from your health care provider.

If arsenic is less than the MCL, your drinking water meets EPA's standards. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems.

Infants and young children are typically more vulnerable to lead in drinking water than the general population. It is possible that lead levels at your home may be higher than at other homes in the community as a result of materials used in your home's plumbing. If you are concerned about elevated lead levels in your home's water, you may wish to have your water tested. Flush your tap for 30 seconds to 2 minutes before using tap water. Additional information is available from the EPA *Safe Drinking Water Hotline* at 1-800-426-4791.

In 2013, both our wells were tested by an independent agent for large numbers of chemicals, organic and inorganic, including arsenic. The test results for one well exceeded the federal limit for arsenic on the original test by 1-part per billion. Upon retest by the same independent agent, the arsenic level was under the limit by 1-part per billion. Our second well was tested at the same time as the first well and was under the federal established limit, so no additional samples were taken. It is our intention to sample the well for arsenic on a continuing basis until a pattern is established. We will re-investigate the treatment to remove the excess arsenic if sampling proves that the level remains over the government level of 10 ppb.

During 2015, the company has tested the well for arsenic 4 times. All tests have met the EPA limit. Because the limit is so small, parts per billion, and we are so close to the limit we will continue to run quarterly tests.

Some people who drink water containing arsenic above the MCL over many years could experience skin damage or problems with circulatory system, and may have an increased risk for getting cancer. If you have specific health concerns, consult your doctor.

Violations

NONE