Drainage Reports

Abbreveated Water & Sewer Need Reports

Water Study

Wastewater Study

Stormwater Waiver Application

INTEGRA CONSULTING, INC.

Civil Engineering - Development Consultant - Expert Witness

James D. Lemon, P.E.,R.L.S.

Water and Wastewater Study Basis of Design Report

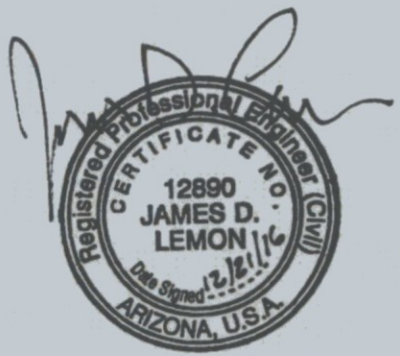
For

Rancho Paraiso

40-DR-2016

Southeast corner of 68th Place and Cactus Road

Scottsdale, Arizona



EXPIRES 6/30/18

December 21, 2016

Prepared for

RANCHO PARAISO, LLC,
3200 EAST CAMELBACK ROAD
NO. 295
PHOENIX, ARIZONA, 85018

11562 E. Juan Tabo Rd. · SCOTTSDALE, AZ 85255 · 602.695.0713

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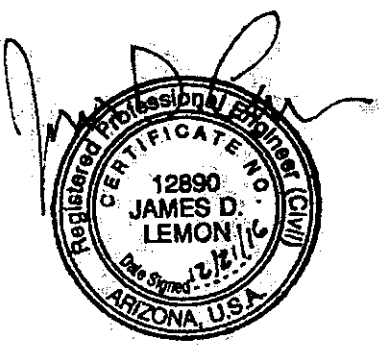


EXPIRES 6/30/18

1.0 INTRODUCTION/LOCATION

The purpose of this report is to satisfy the City of Scottsdale requirement regarding the basis of water and wastewater design for the proposed development and to document water and sewer calculations for review and approval by the City of Scottsdale and Maricopa County Environmental Services.

The Rancho Paraiso project is a proposed 6-acre ± residential development with associated equestrian facilities located northeast of the intersection of 68th Place and Paradise Lane in Scottsdale, Arizona. The development will consist of remodeling the existing residential home, new horse barns, a new tack barn, a new aqua tread, a new covered arena, a new euroxciser, a new hay barn, and new horse pens. For additional detail the Concept Utility Plan has been included at the back of this report in Appendix C.

The site lies within a portion of the NE1/4 of Section 22, Township 3 North, Range 4 East of the Gila and Salt River Base and Meridian. Refer to the Vicinity Map in Appendix A.

The site is bounded by existing residential development to the east, Cactus Road on the north, 68th Place to the west, and Paradise Drive on the south.

This Basis of Design report will document existing utility infrastructure, proposed water and wastewater utility conditions for the 6.255 +\- acre development. Refer to the Concept Utility Plan and site plan exhibit for building and structure locations located in the back of this report for existing and proposed utility lines.

2.0 WATER BASIS OF DESIGN

EXISTING CONDTIONS

There is an existing 6" ACP water line in 68th Place that services the existing home. The water main is approximately 22' east of the centerline of 68th Place. There is currently an existing fire hydrant located at the northwest corner of the project at the intersection of Cactus Road and 68th Place. The fire hydrant is fed from an existing 8" DIP waterline in 68th Place that reduces the 6" ACP line approximately 240' south of the intersection. Existing 5/8th inch meters currently provide service to the houses at 6912 E. Paradise and 12011 N. 68th Place.

PROPOSED CONDITIONS

The proposed water improvements for this development consist of a new fire hydrants, fire riser service feeding the proposed sprinkler system for the horse barns, a new meter to replace the existing meter currently serving the house at 12011 N. 68th Place, and an extension therefrom to provide service to the two new restroom facilities that will be constructed within the Tack Barn. All of the other water needs for the horse facilities will be serviced via the existing on-site private well. The meters that service the both the existing residences will be abandoned and returned to the City.

A proposed 4" fire line tap will be installed on the existing 6" line in 68th Place. A 4" line will extend to service the fire riser located within the proposed Tack Barn. A 4" backflow preventer will be installed near the right of way of 68th Place on the new fire service.

Two new hydrants will be installed. One public hydrant on 68th Place approximately 200 feet north of Paradise Drive and a private hydrant onsite to fulfill the requirements of DSPM 6-1.502 to provide a minimum 350 foot coverage radius (see attached Concept Utility Plan for location).

All water line construction and design will conform to M.A.G. standards and specifications and the latest revision of the City of Scottsdale Design Standards and Policies Manual. All water demands are based on Figure 4.1-3, Average Day Water Demand per Dwelling Unit of the City of Scottsdale Design Standards and Policies Manual.

The existing well is expected to service all the needs of the horse facilities. In 2008 the well was evaluated for capacity and storage (See attached Appendix C). The pump and storage equipment will be relocated in the area of the Hay Barn after further evaluation and re-design during the construction document phase of the project.

WATER ANALYSIS

The new domestic service proposed for this project is anticipated to be a new meter in place of an existing meter and a landscape meter.

Existing Service Evaluation: Figure 6.1-2 City of Scottsdale Design Standards and Policies Manual

Residential Demand 3-7.9 ac/unit

Average Daily Demand: 248.2 gpd/unit
1 unit = 248.2 gpd

Maximum Daily Demand: Average Daily Demand x 2
248.2gpd*2=496.4gpd = **0.345 gpm**

Peak Demand: Maximum Daily Demand x 3.5
496.4gpd*3.5 = 1,737.4gpd = **1.21gpm**

Fire Flow Demand : (Per Table B105.1 Appendix B IFC)
Largest proposed building - 7,930 sf with Type VB construction
2,500 gpm (50% reduction for fully sprinklered building) = 1,**250 gpm** with 20 psi residual

Max Daily Demand + Fire Flow = **1,252 gpm**

A fire flow test has been completed the results of which are attached to the end of this report as Appendix B. The test has indicated that the existing fire flow system exceeds the fire demand needs and is adequate per the City of Scottsdale Standards.

3.0 WASTEWATER BASIS OF DESIGN

EXISTING CONDITIONS

There is an existing 10" VCP City of Phoenix sewer main located along the south side of Cactus Road. It has been determined that it is NOT possible to reach the public sewer main via gravity from the sewer existing the existing residence, thus the existing septic system shall remain to service the residence. The existing septic system service the house that will be demolished shall be abandoned in place per ADEQ standard procedures.

PROPOSED CONDITIONS

The proposed project will utilize the existing septic system. There will be a new seepage pit drilled as well as a reserve seepage pit for the existing septic tank. The existing tank will be inspected for condition and capacity. Pending the inspection, the existing tank will be utilized for the entire project. If a lack of capacity or poor condition of the existing tank is determined a second or new septic system will be added as a part of these improvements.

The private sewer line construction and design will conform to Uniform Plumbing Code. The septic system will be designed per Maricopa County Environmental Services requirements.

WASTEWATER ANALYSIS

Existing 5 Bedroom House Evaluation:
Estimated average daily flow:
5 bedrooms *150 = **750 gpd**
Estimated max daily flow (peaking factor of 4) is 3,000 gpd.

Proposed Barns Treatment System Design:
Estimated average daily flow:
Fixture units:

2-sinks =	2 FU
2-toiles =	8FU
1-Washer =	2FU
2-Horse Washes=	6FU
TOTAL=	18FU

Average Daily Flow= 18FU*25 = **450gpd**

Estimated max daily flow (peaking factor of 4) is 1,800gpd.

The onsite wastewater treatment facility will be designed for the average daily flow
750 + 450= **1,200gpd**.

Septic Tank size:
Septic tank size is 2.1 * 1,200 gpd (design flow)=2,520 gallons, use **2,500 gallon** tank.
(Maricopa County OSWTF Design Guide Septic Sizing Charts)

Seepage Pit size:
Once percolation tests are acquired the seepage pits will be designed based on the SAR and per Maricopa County Environmental design Guidelines.

4.0 CONCLUSIONS

WASTEWATER

Based on existing elevations the City of Phoenix sewer within Cactus Road is not reachable via a new gravity sewer service. Thus, the existing home and existing septic tank will remain as is. The existing tank will be inspected to ensure the condition and size is acceptable based on the calculations above. A new seepage pit will be constructed and the existing tank will connect to the new pit. The new pit will be designed per MCESD guidelines. A reserve pit will also be drilled in the same area. A second septic system may be required based upon inspection of the existing system. A revised report will be submitted once we reach that stage of the project.

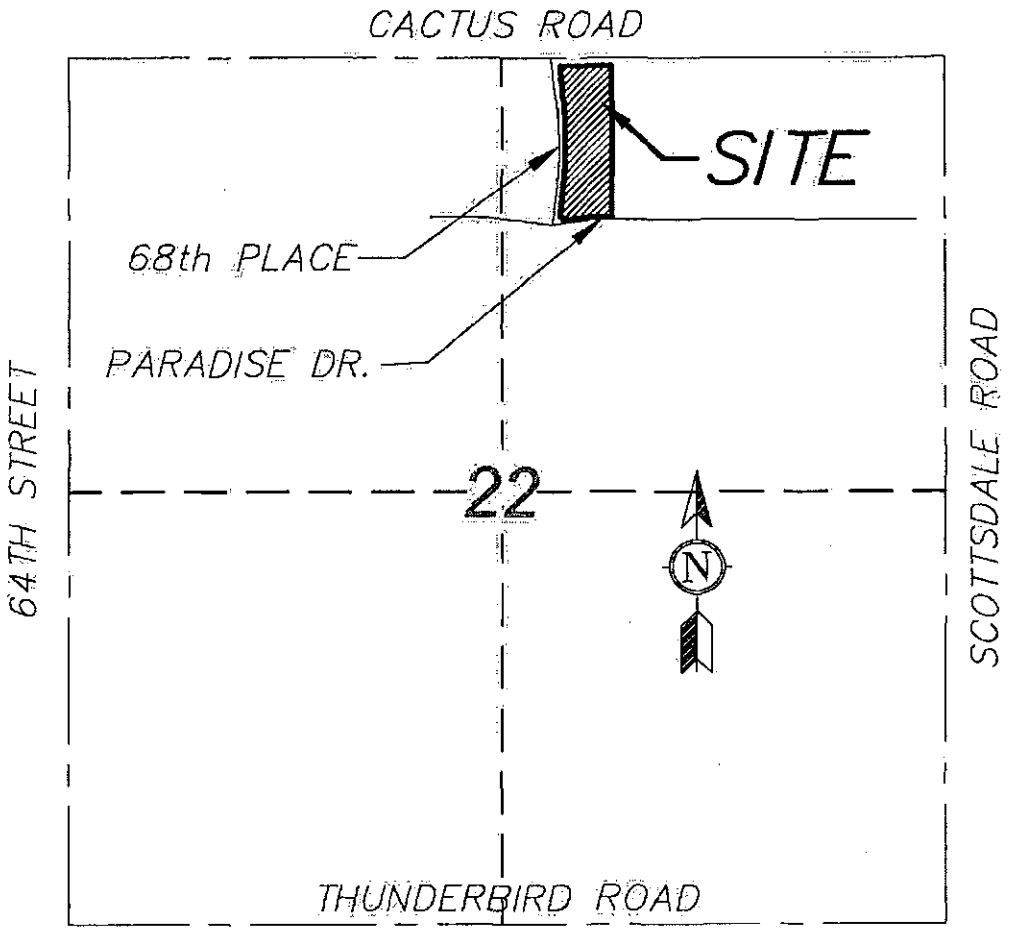
WATER

The existing home will be serviced from a new water meter off of the 6" ACP main within 68th Place. Two existing water meters servicing the existing residences will be abandoned and returned to the City of Scottsdale. All water needs for the horse facilities will be serviced via the existing onsite private well.

A new fire line service will be installed to service the sprinkler system for the proposed barns. The service will be 4" coming off of the 6" line within 68th Place. A new public fire hydrant will be installed in 68th Place and a private fire hydrant will be installed onsite to provide required fire coverage. A flow test has been completed and shows sufficient capacity to support fire flow for this project.

Appendix A

VICINITY MAP



VICINITY MAP

TOWNSHIP 3 NORTH RANGE 4 EAST
N.T.S.

Appendix B

FIREFLOW TEST RESULTS

E·J | Flow Test Summary

Project Name:	16113
Project Address:	N 68th Place & E Cactus Road, Scottsdale, AZ 85254
Date of Flow Test:	2016-07-19
Time of Flow Test:	7:25 AM
Data Reliable Until:	2017-01-19
Conducted By:	Eric Sandmann (EJ Flow Test) & Eder Cueva (EJ Flow Test) 602.999.7637
Witnessed By:	Phil Cipolla (City of Scottsdale) 602.828.0847
City Forces Contacted:	City of Scottsdale (602.828.0847)

City of Scottsdale requires a Maximum Static Pressure of 72 PSI for use as a Safety Factor.

Raw Flow Test Data

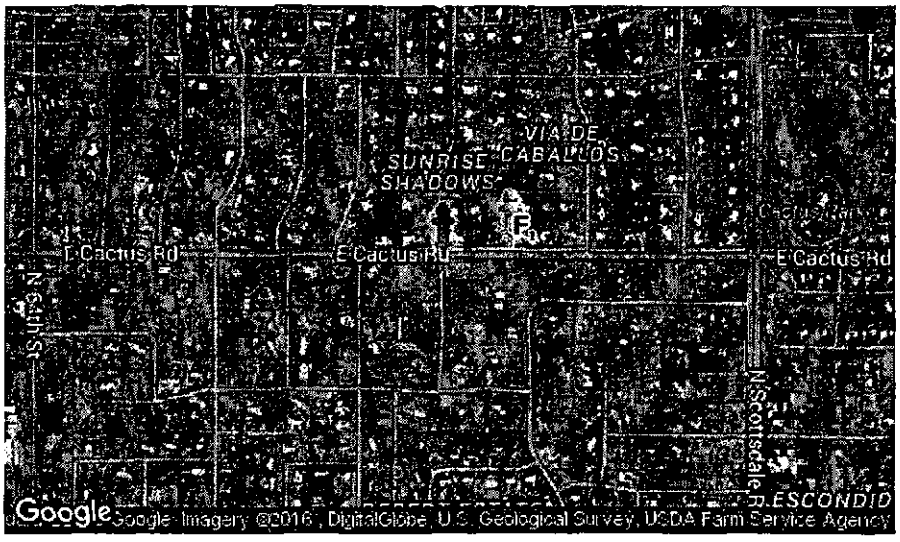
Static Pressure:	82.0	PSI
Residual Pressure:	76.0	PSI
Flowing GPM:	2,123	
GPM @ 20 PSI:	7,493	

Data With A 10 PSI Safety Factor

Static Pressure:	72.0	PSI
Residual Pressure:	66.0	PSI
Flowing GPM:	2,123	
GPM @ 20 PSI:	6,814	

Hydrant F_1

Pitot Pressure (1):	40	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	2.5	inches
Pitot Pressure (2):	40	PSI
Coefficient of Discharge (2):	0.9	
Hydrant Orifice Diameter (2):	2.5	inches



Static-Residual Hydrant

Flow Hydrant

Main Size
20 inches

Distance Between F_1 and R
505 ft (measured linearly)

Static-Residual Elevation
1387 ft (above sea level)

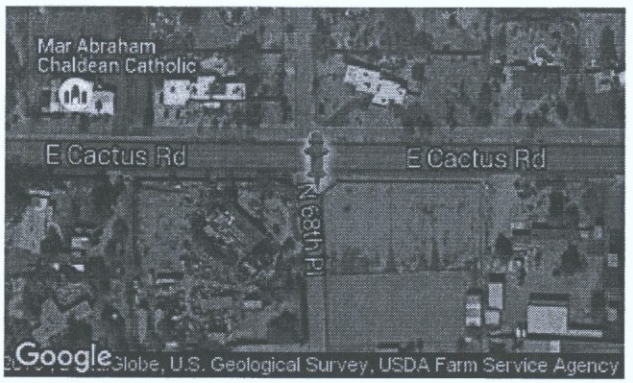
Flow Hydrant (F_1) Elevation
1386 ft (above sea level)

Elevation & distance values are approximate

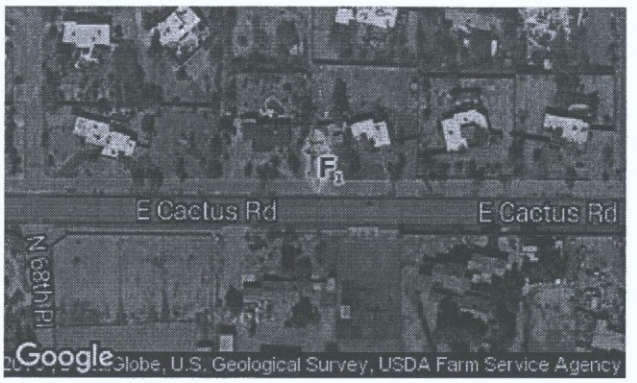
EJ Flow Tests, LLC
21505 North 78th Ave. | Suite 125 | Peoria, Arizona 85382 | (602) 999-7637 | www.ejengineering.com
John L. Echeverri | NICET Level IV 078493 SME | C-16 FP CONTRACTOR ROC 271705 AZ | NFPA CFPS 1915

E·J | Flow Test Summary

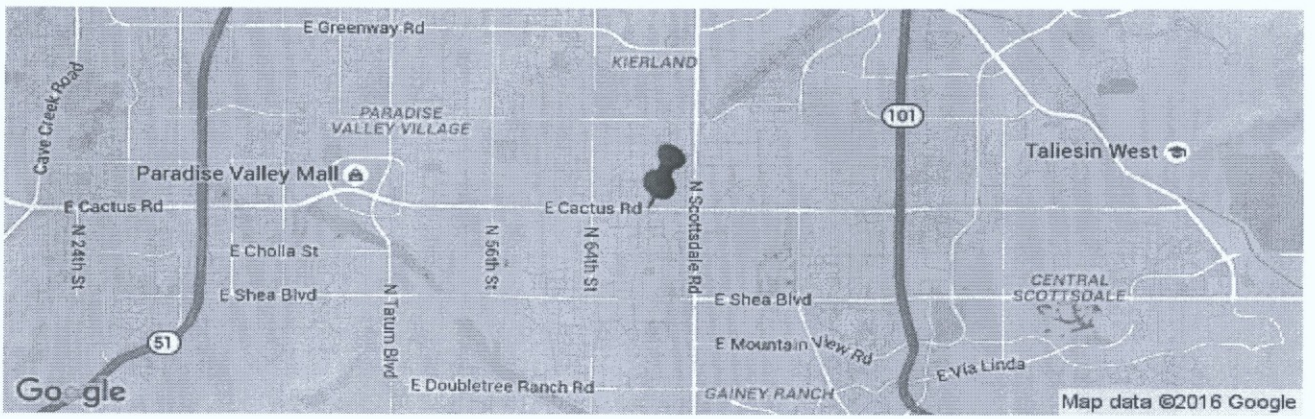
Static-Residual Hydrant



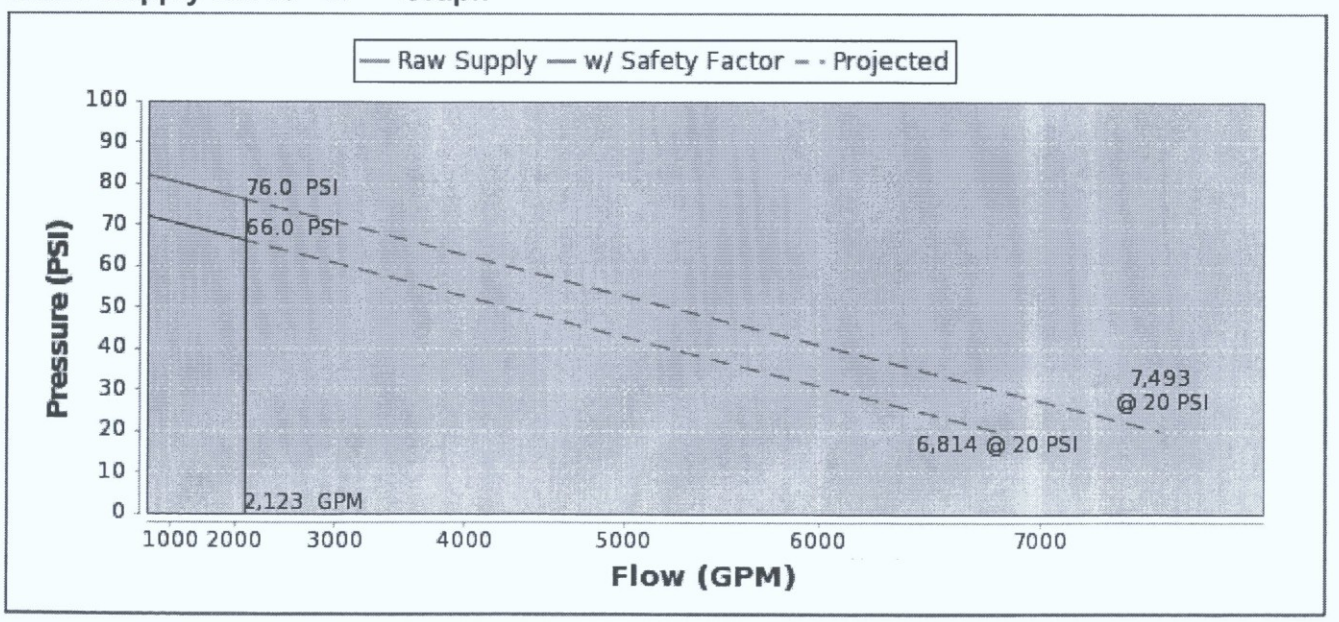
Flow Hydrant (only flow hydrant 1 shown for clarity)



Approximate Project Site



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



Appendix C

WATER WELL EVALUATION STUDY (2008)

Central Arizona Pump

15:55 November 20, 2012

Brandon 928-978-0209

12011 N. 68th Place Scottsdale

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Central Arizona Pump

Definitions

NOTE: All definitions listed below refer to the property or item listed as inspected on this report at the time of inspection

A	Acceptable	Functional with no obvious signs of defect.
NP	Not Present	Item not present or not found.
NI	Not Inspected	Item was unable to be inspected for safety reasons or due to lack of power, inaccessible, or disconnected at time of inspection.
M	Marginal	Item is not fully functional and requires repair or servicing.
D	Defective	Item needs immediate repair or replacement. It is unable to perform its intended function.

General Information

Property Information

Property Address 12011 N. 68th Place
City Scottsdale State AZ Zip
Contact
Phone
Fax

Client Information

Client Name
Client Address
City State Zip
Phone
Fax

Inspection Company

Inspector Name Brandon Moore
Company Name Central Arizona Pump
Address 141 S Oldham Rd
City Payson State AZ Zip 85541
Phone Central Arizona Pump, LLC.
Fax 928-468-2353
E-Mail centralazpump@hotmail.com

Conditions

Inspection Date 11/16/2012
Electric On ◉ Yes ○ No ○ Not Applicable
Water On ◉ Yes ○ No ○ Not Applicable
Building Type Garage
Water Source Well How Verified
Sewage Disposal How Verified

Central Arizona Pump

15:55 November 20, 2012

12011 N. 68th Place Scottsdale

Well Information

	A	NP	NI	M	D	
1.	☒	☐	☐	☐	☐	Well head: Not visible
2.	☒	☐	☐	☐	☐	Pressure tank location outside
3.	☒	☐	☐	☐	☐	Estimated Depth of well: Estimated depth 400-500
4.	☒	☐	☐	☐	☐	Current status: Operational
5.	☒	☐	☐	☐	☐	Septic system on property: unknown

Well Placement Diagram

Pump Information

	A	NP	NI	M	D	
1.	☒	☐	☐	☐	☐	Pressure Tank Size 750 gallon Steel Pressure Tank
2.	Pump size ☐ 1/2 HP Submersible pump ☐ 3/4 HP Submersible pump ☐ 1 HP Submersible pump ☐ 1 1/2 HP Submersible pump ☐ 2 HP submersible pump					
3.	jet/booster pump ☐ 3 HP Centrifical pump ☐ 3/4 HP jet pump ☐ 1 HP jet pump ☐ 1 1/2 HP jet pump ☐ 2 HP jet pump 5 HP Submersible pump					
4.	☒	☐	☐	☐	☐	Storage tank Approx. 3500 gallon steel storage tank Float working
5.	☒	☐	☐	☐	☐	Gallons Per Minute Estimated 20 Gallons Per Minute
6.	☐	☐	☐	☐	☒	Booster Pump Goulds vertical booster 30 Amp fuses 5 HP Single Phase Bad Barring; may go out
7.	☒	☐	☐	☐	☐	Control Box New 5 HP
8.	☒	☐	☐	☐	☐	Amps 11.5R 17.1Y 12.4B

9. Good working conditon

Central Arizona Pump

15:55 November 20, 2012

12011 N. 68th Place Scottsdale

Defective Summary

This summary is not the entire report. The complete report may include additional information of concern to the client. It is recommended that the client read the complete report.

Pump Information

1. **Booster Pump** Goulds vertical booster 30 Amp fuses 5 HP Single Phase Bad Barring; may go out

Arizona Depa[illegible]ent of Water Resources
PERMISSION AUTHORIZATION FOR WATER LEVEL MEASUREMENT

I grant permission to ADWR to conduct water level measurements at the following well(s) described below.

David G. Williams — David G. Williams
Signature — Printed Name

Well ID	Location	Well ID	Location	Well ID	Location
556241	A-03-04 22ABB				

RECEIVED
DEC 2 08

I am no longer the owner or lessee of the well(s) described above. The current owner or lessee may be contacted at:

Name: David G. Williams
Address: 12011 N. 69th Place
City, State, Zip: Scottsdale AZ 85254

DALE BAKER

Appendix D

CONCEPT WATER AND WASTEWATER PLAN