Kathleen M. Reidhead
14406 S. Cholla Canyon Dr.
Phoenix, AZ 85044
Telephone: 480-704-0261

ORIGINAL

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF PAYSON WATER CO., INC., AN ARIZONA CORPORATION, FOR A DETERMINATION OF THE FAIR VALUE OF ITS UTILITY PLANTS AND PROPERTY AND FOR INCREASES IN ITS WATER RATES AND CHARGES FOR UTILITY SERVICE BASED THEREON.	DOCKET NO: W-03514A-13-0111
IN THE MATTER OF THE APPLICATION OF PAYSON WATER CO., INC., AN ARIZONA CORPORATION, FOR AUTHORITY TO: (1) ISSUE EVIDENCE OF INDEBTEDNESS IN AN AMOUNT NOT TO EXCEED $1,238,000 IN CONNECTION WITH INFRASTRUCTURE IMPROVEMENTS TO THE UTILITY SYSTEM; AND (2) ENCUMBER REAL PROPERTY AND PLANT AS SECURITY FOR SUCH INDEBTEDNESS.	DOCKET NO: W-03514A-13-0142

SUPPLEMENT TO PRE-FILED TESTIMONY
PHASE 2

Kathleen M. Reidhead, "KMR", is an Intervener in the above-captioned matter. KMR submits the attached Exhibits, labeled as Exhibits KMR-A, KMR-B, KMR-C, KMR-D, KMR-E and KMR-F as evidence related to groundwater supplies in and around Mesa del Caballo, "MdC".

Exhibit KMR-A is part of a report from the Arizona Department of Water Resources website, located at this link: http://www.azwater.gov/azdwr/StatewidePlanning/WaterAtlas/CentralHighlands/PlanningAreaOverview/HydrologyHighlandBasins.htm which describes the Hydrology for the Central Highlands Planning Area.

Exhibit KMR-B describes two wells owned by the Town of Payson, "Town", each physically located less than one mile from the community of MdC. These two Town wells are used specifically for the purpose of monitoring the level of groundwater in the area, and have reported data several times each year since 2008. This data documents the level of groundwater in these wells since 2008. The fluctuations noted appear to be consistent with the data in Exhibit KMR-A that states, "the shallow

water-bearing zones around Payson depend on winter recharge and are therefore very sensitive to drought." The report goes on to say, "Water in deeper fracture systems in the area may be fed from the Mogollon Rim and less affected by drought."

Per the analysis by Southwest Water Consultants dated March 30, 2010, entered into evidence by PWC on October 1, 2013, Document #148688, Exhibit C, MdC is strongly believed to sit on a fractured granite zone. In the letter written by Stephen D. Noel, President of Southwest Groundwater Consultants, Mr. Noel states, "Based on the local hydrogeologic conditions supported by the geophysical cross-sections, the yield of wells designed to be production wells completed to depths up to 500 feet will be in the 10 to 25 gpm range."

Exhibit KMR-C is a portion of the Payson Water Company, "PWC", original rate application filing of 04/22/13, Document #145511, Exhibit A, which lists the 7 PWC-owned wells in MdC by ADWR ID Number. In this filing, PWC reports the pump yield for each of these wells FAR below the tested capacity of each well, per the ADWR database, shown on Exhibit KMR-D. The PWC wells appear to be significantly underperforming from what they have been tested to yield. There is no evidence that other wells in MdC are similarly underperforming from their tested capabilities. Several new private wells have been drilled in MdC in the last 2 years, and those wells have tested to yield between 15 gpm and 5 gpm, with groundwater depth reported between 234 and 276 feet, see Exhibit KMR-E. The PWC wells in MdC are between 565 feet deep and 200 feet deep, as evidenced on Exhibit KMR-D. Deepening of the 3 PWC wells that are currently shallower than 250 feet would very likely yield additional water production for that community. The other 4 low-yielding wells should be evaluated for other potential problems, as described in Exhibit KMR-F .

Respectfully submitted this 6th day of January, 2014.

By Kathleen M. Reidhead

Kathleen M. Reidhead, Intervener
14406 S. Cholla Canyon Dr.
Phoenix, AZ 85044

ORIGINAL and thirteen (13) copies of the foregoing were filed this 6th day of January, 2014 with:

Docket Control
Arizona Corporation Commission
1200 W. Washington Street
Phoenix, AZ 85007

COPY of the foregoing was mailed
this 6th day of January, 2014 to:

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Payson, AZ 85541

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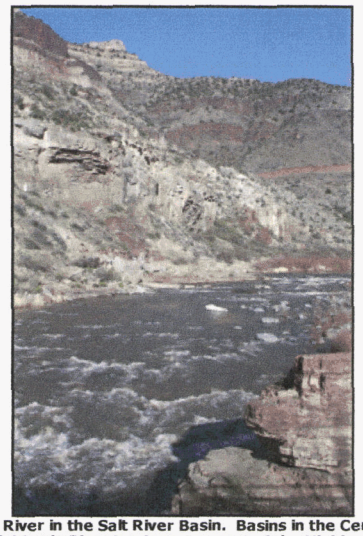
2051 E. Aspen Dr.
Tempe, AZ 85282

Kathleen M. Reidhead

EXHIBIT KMR-A

Central Highlands Planning Area Hydrology - Groundwater (Highland Basins, Cont)

Anderson, Freethey and Tucci (1992) divided the alluvial basins in south-central Arizona into five categories based on similar hydrologic and geologic characteristics. One of these, the "Highland Basins", covers most of the planning area with the exception of the **Upper Hassayampa Basin**, categorized as a "West Basin", and the southern half of the **Agua Fria Basin**, categorized as a "Central Basin". Highland Basins include: **Agua Fria** (northern half), **Salt River Basin** (**Salt River Lakes Sub-basin**, **Salt River Canyon Sub-basin**, **White River Sub-basin** and **Black River Sub-basin**), **Tonto Creek Basin** and the **Verde River Basin** (**Big Chino Sub-basin**, **Verde Valley Sub-basin** and **Verde Canyon Sub-basin**).



Salt River in the Salt River Basin. Basins in the Central Highlands Planning Area are part of the Highland, West or Central Basins cateogrized by Anderson, Freethey and Tucci (1992)

Highland Basins

The Highland Basins include the Salt River, Tonto Creek and Verde River basins, and the northern half of the Agua Fria Basin. Basin-fill aquifers in the highlands are limited in areal extent and are hydrologically connected with stream alluvium. Consolidated rock aquifers surround and underlie the basin-fill aquifers and contribute underflow. Basin-fill aquifers also receive inflow from stream infiltration and mountain front recharge. Where the basin-fill aquifers are discontinuous, underflow between them may be restricted (Anderson, et al., 1992).

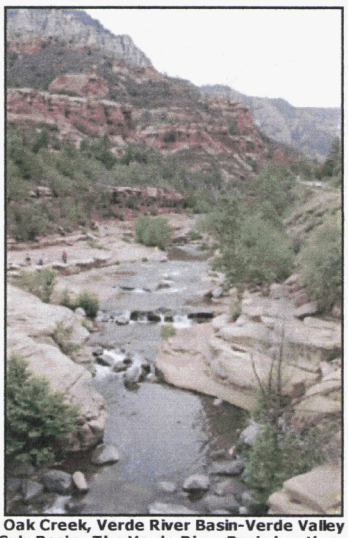
Tonto Creek Basin

In the Tonto Creek Basin groundwater is found in stream alluvium, basin-fill sand and gravel, Paleozoic sedimentary rocks and Precambrian igneous, metamorphic and sedimentary rocks. The primary aquifer occurs in basin fill, which underlies a large portion of the basin, from near Rye to the southern basin boundary. The basin fill consists of coarse-grained conglomerate in the lower part of the basin and along the basin margins and locally is overlain by fine-grained mudstone in the center of the basin. The conglomerate may be up to 500 feet thick. Groundwater is also found in the floodplain alluvium, which may be as much as 65 feet thick along Tonto Creek. Along this Creek, the basin fill and alluvial aquifers are recharged primarily by stream infiltration.

A limestone aquifer is utilized along the Mogollon Rim where groundwater movement and well yield are dependent on faults, fractures and solution cavities. Wells in the limestone aquifer generally yield less than 100 gpm. Fractured bedrock also yields small volumes of water to wells east of Payson (ADWR, 1992). These and other sedimentary-rock aquifers are recharged from precipitation on the southern edge of the Colorado Plateau (USGS, 2005a).

Groundwater flow directions are from the Mogollon Rim to the south in the C-aquifer and from north to south along the Rye Creek and Tonto Creek drainages in the alluvial aquifer (**Figure 5.3-7**). Natural recharge for the basin has been estimated at 17,000 to 37,000 AFA. Estimates of groundwater in storage range from 2.0 to 9.4 maf. With one exception, all wells measured in 2003-'04 had a water level below 100 feet. Water levels in wells measured between 1990-'91 and 2003-'04 were either slightly declining or slightly rising (**Figure 5.3-7**). The median well yield reported on registration forms for large (>10-inch) diameter wells was 120 gpm. Since most of the basin is National Forest land, there has been little basin-wide groundwater development and aquifer characteristics are not well defined. Groundwater quality is generally good, although drinking water standards for arsenic, radionuclides, nitrate and organics have been equaled or exceeded in some wells.

Top



Oak Creek, Verde River Basin-Verde Valley Sub-Basin. The Verde River Basin has three sub-basins: Big Chino, Verde Valley and Verde Canyon.

Verde River Basin

The Verde River Basin is a relatively large basin that encompasses part of the Coconino Plateau in its northern portion with the Mogollon Rim defining its eastern boundary. It is characterized by steep canyons, rugged mountains and by broad alluvial valleys in the north and west-central portions of the basin. The basin is divided into the Big Chino, Verde Valley and Verde Canyon sub-basins as shown in **Figure 5.5-6** and **Figure 5.5-8**.

Natural recharge and groundwater in storage estimates for the basin, sub-basins and local areas are listed in Table 5.5-6. Groundwater recharge estimates for the entire basin range from 107,000 AFA to more than 138,000 AFA. Groundwater in storage is estimated to range from 13 maf to more than 22 maf for the entire basin. Few water level measurements were taken in the basin in both 1990-'91 and 2003-'04 (**Figure 5.5-6**). Water level change measurements taken during different time periods are shown for the Big Chino Sub-basin (**Figure 5.5-6A**) and the Verde Valley Sub-basin (**Figure 5.5-6B**) and are discussed in the sub-basin sections below. Well yield varies throughout the basin with the most productive wells located in the Big Chino Sub-basin (**Figure 5.5-8**). The median well yield for the entire basin is 260 gpm reported on registration forms for 262 large (>10-inch) diameter wells.

A number of hydrogeologic studies of the Big Chino and Verde Valley sub-basins, and to a lesser extent the Verde Canyon Sub-basin, have been conducted and are briefly referenced here. These studies, many of them recent, contain detailed information about the groundwater and surface water systems in the basin and are referenced in this section and in the Verde River Basin references and supplemental reading. Each sub-basin is discussed below from north to south across the basin.

Big Chino Sub-basin

The Big Chino Sub-basin has an area of about 1,850 square miles. The principal aquifer consists of basin-fill sediments interbedded with volcanic rocks of Cenozoic age that fill the sub-basin. This basin-fill aquifer is commonly referred to as the Chino Valley Unit and is the major source of water for irrigation and domestic purposes. Chino Valley runs northwest to southeast from Seligman to Paulden. Well yields in Chino Valley wells are commonly greater than 1,000 gpm to greater than 2,000 gpm. A carbonate aquifer comprised of Paleozoic rocks underlies most of the Big Chino Valley Sub-basin and the area north of the Verde River near Paulden. It is assumed that there is a hydraulic connection between the two aquifers in the Big Chino Valley and the Williamson Valley, which runs north-south along the southeastern sub-basin boundary. The general location of aquifers and other features are shown in the graphic from Wirt, 2005.

Groundwater occurs under unconfined and confined (artesian) conditions in the basin-fill aquifer. Artesian conditions occur primarily where buried lava flows and coarse-grained sediments are interbedded with clays and volcanic ash. In the northwesternmost part of the sub-basin, basin-fill deposits may be as much as 2,500 feet thick. Further south and

General location of Big Chino aquifers. (Figure modified from Wirt, 2005)

west of Paulden in the Williamson Valley, the thickness of the alluvium is estimated at 2,000 feet. In the eastern part of the Big Chino Sub-basin, the carbonate aquifer is the primary regional aquifer. This aquifer is dry west of the Mesa Butte Fault, which occurs north of Drake and runs northeastward, and between Williams and the Big Chino Valley (USGS, 2006). Alluvial sands and gravels along the major washes also yield water to wells and are utilized as a local water supply in the sub-basin.

Groundwater flow in the basin-fill aquifer is toward the Big Chino Wash drainage and then south. Groundwater flow in the carbonate aquifer is toward the north (**Figure 5.5-6**). Recharge occurs from mountain front recharge along the Juniper and Santa Maria Mountains on the west side of the sub-basin, from Granite Mountain on the south and from Big Black Mesa and Bill Williams Mountain on the east side and from runoff in major washes. Recharge also occurs via groundwater inflow from the Little Chino Sub-basin (Prescott AMA) north of Del Rio Springs. In 1999, this groundwater inflow was estimated at 1,800 AFA (Nelson, 2002). The Williamson Valley and Paulden areas are the most arid regions in the Verde River Basin.

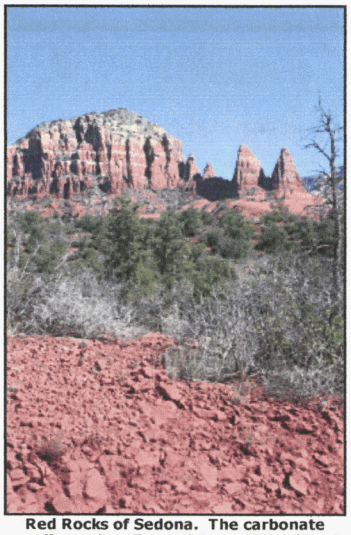
Groundwater outflow from the Big Chino Sub-basin occurs as base flow in the Verde River and is currently estimated at about 17,700 AFA. Base flow at the Verde River near Paulden (gage number 9503700, see **Figure 5.5-4**) has declined at an annual rate of about 380 AFA since the mid-1990s (USGS, 2006). The average annual recharge volume for the sub-basin was estimated at 30,300 AFA for the period 1990-2003 (Blasch and others, 2006). McGavock (2003) estimated that there was 10 maf of groundwater in storage in the sub-basin to a depth of 1,200 feet bls.

Figure 5.5-6A shows water level changes in the sub-basin from 1992 to 2003-'04 and water level elevation during 2003-'04. More than half the wells measured showed some decline although water level increases of more than 15 feet were measured in wells south of Seligman. Well yields exceeding 2,000 gpm are found along the Big Chino Wash drainage (**Figure 5.5-8**). Water quality is generally good in the sub-basin with some occurrence of arsenic at levels that equal or exceed the drinking water standard in wells in the Paulden area.

Top

Verde Valley Sub-basin

The Verde Valley Sub-basin is the largest sub-basin in the Verde River Basin with an area of about 2,500 square miles. The principal aquifer is the Verde Formation, which consists of a thick sequence of tertiary limestones and sandstones. The estimated depth of the formation reaches 4,200 feet based on aeromagnetic and gravity data (USGS, 2006). The formation flanks the Verde River for some distance from the Camp Verde area to north of Cottonwood. Other aquifers include the carbonate aquifer and an alluvial aquifer located along the Verde River. The carbonate aquifer, primarily sandstone of the Supai Formation and the underlying Redwall and Martin limestones is the main groundwater supply for Sedona. Locally perched groundwater in fractured or decomposed granite and in volcanic rocks provide small amounts of water in many locations. Groundwater occurs primarily under unconfined conditions although confined conditions occur locally within the Verde Formation. All three aquifers are hydraulically connected.



Red Rocks of Sedona. The carbonate aquifer, primarily sandstone of the Supai Formation and the underlying Redwall and martin limestones is the main groundwater supply for Sedona.

Most groundwater enters the sub-basin from the Coconino Plateau. Groundwater moves through the carbonate aquifer and discharges at springs and seeps along tributaries of the Verde River, or flows into the Verde Formation and stream-channel alluvium (USGS, 2006). The Oak Creek Fault system is an important influence on the transmission of water between aquifers and to the surface, as evidenced by the large number of major springs along Oak Creek (see **Figure 5.5-5**). Groundwater primarily flows toward the Verde River

drainage and exits the sub-basin in the southeast through alluvium and volcanic rocks along the river (**Figure 5.5-6**).

Groundwater recharge to the Verde Formation aquifer is from high elevation precipitation along the Mogollon Rim and on the Coconino Plateau with additional contributions from stream infiltration. The carbonate aquifer also receives recharge from high altitudes along the Mogollon Rim, and from an area between the San Francisco Peaks and Bill Williams Mountain (USGS, 2006). Most recharge comes from winter precipitation. Groundwater recharge was estimated at 167,470 AFA on average during the period 1990-2003 (Blasch and others, 2006). An estimate of groundwater in storage is not available for the sub-basin. **Figure 5.5-6B** shows water level changes in the sub-basin from 1994 to 2003-'04 and water level elevation during 2003-'04. More than half the wells measured showed some decline although water level increases of more than 30 feet were measured at a few scattered locations. Reported well yields generally range from less than 100 gpm to 1,000 gpm in the sub-basin (**Figure 5.5-8**). Groundwater is generally of good quality at most locations, although the drinking water standard for arsenic has been equaled or exceeded in a number of wells (see **Table 5.5-7**).

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Verde Canyon Sub-basin

There is relatively little groundwater development in the Verde Canyon Sub-basin with the exception of the Payson area. Basalt flows, conglomerates and semi-consolidated silt units cover a large part of the sub-basin. The groundwater system is complex, with disconnected recharge areas and multiple water-bearing zones. Because of its complexity, knowledge of the groundwater system is often limited to local analysis of spring and well data. Groundwater recharge originates primarily along the crest of the Mogollon Rim, where precipitation and snowmelt percolate through permeable volcanic, limestone or sandstone units (USGS 2005a). Spring discharge and stream base flow appear to be the largest components of aquifer outflow.

PAYSON area

In Payson groundwater is withdrawn primarily from fractured and faulted granite. Most wells are shallow, although the Town of Payson has conducted exploratory drilling north of the town where deep water-bearing zones were found. A recent study suggests that a segment of the Diamond Rim fault system northeast of Payson may have groundwater supply potential (Gæaorama, 2006). The shallow water-bearing zones around Payson depend on winter recharge and are therefore very sensitive to drought. Water in deeper fracture systems in the area may be fed from the Mogollon Rim and less affected by drought. Water levels in wells measured in the Payson area in 2003-'04 varied from 115 feet to 339 feet bls. Water levels in most of these wells declined by more than 30 feet between 1990-'91 and 2003-'04 (**Figure 5.5-6**). Well yields in the area are typically less than 500 gpm.

In Strawberry, most wells are completed in the Schnebly Hill Formation, a sandstone unit that is the major component of the "Red Rocks" of Sedona. Well yields in the area typically range from 20 to 80 gpm. An exploratory well drilled near Strawberry in 2000 encountered water in the Redwall Limestone at about 1,380 feet (Corkhill, 2000). At nearby Pine most wells are completed in the Supai Formation, which is composed of sandstone, siltstone and mudstone with some interbedded limestone. Well yields in Pine are typically lower than Strawberry and range from 10 to 30 gpm. These relatively low well yields suggest a more localized groundwater system (USGS, 2005a). Little water level change data are available with one well near Pine showing a modest water level increase between 1990-'91 and 2003-'04. However, a nearby domestic well experienced a decline of about 160 feet between 1993 and 2003-'04 (**Figure 5.5-7**, hydrograph V). There is little water use in the southern half of the sub-basin where unconsolidated sediments are found.

Water quality is generally good in the sub-basin although the drinking water standards for arsenic, beryllium, cadmium, lead, selenium and organics have been equaled or exceeded in wells in the Payson area and for arsenic in Pine.

Top

For more information on Groundwater see the menu to the right.

Click here to continue to **Section 5.0.2 Hydrology - Groundwater (West and Central Basins)**

Arizona Water Atlas Home | Central Highlands Planning Area Home | Download pdf of entire Central Highlands Planning Area | Download pdf of the Central Highlands Planning Area Overview | References and Supplemental Reading for the Central Highlands Planning Area Overview

EXHIBIT KMR-B

Town of Payson Well

Director
Sandra A. Fabritz-Whitney

ADWR
Arizona Department of Water Resources

AZ.GOV
Arizona's Official Web Site

Well Registry Information

Registration Number 55- **565428**

General | Construction | Status | Owner | Driller | Pump Data

Well Information

Site Type W - WELL Well Type N - NON-EXEMPT Replaces Well 55-

Location Information

Cadastral A11010026DAB Book Map Parcel Latitude 34 15 58.26 Longitude 111 17 35.53

Basin and County Information

Basin TONTO CREEK Sub Basin 73 - TONTO CREEK Watershed 07 - SALT RIVER

AMA/INA 0 - NOT WITHIN ANY AMA OR INA County 4 - GILA

Site Uses	Water Uses
Site Use 1 WATER PRODUCTION	Water Use 1 MUNICIPAL USES
Site Use 2 OBSERVATION	Water Use 2 MONITORING
Site Use 3	Water Use 3

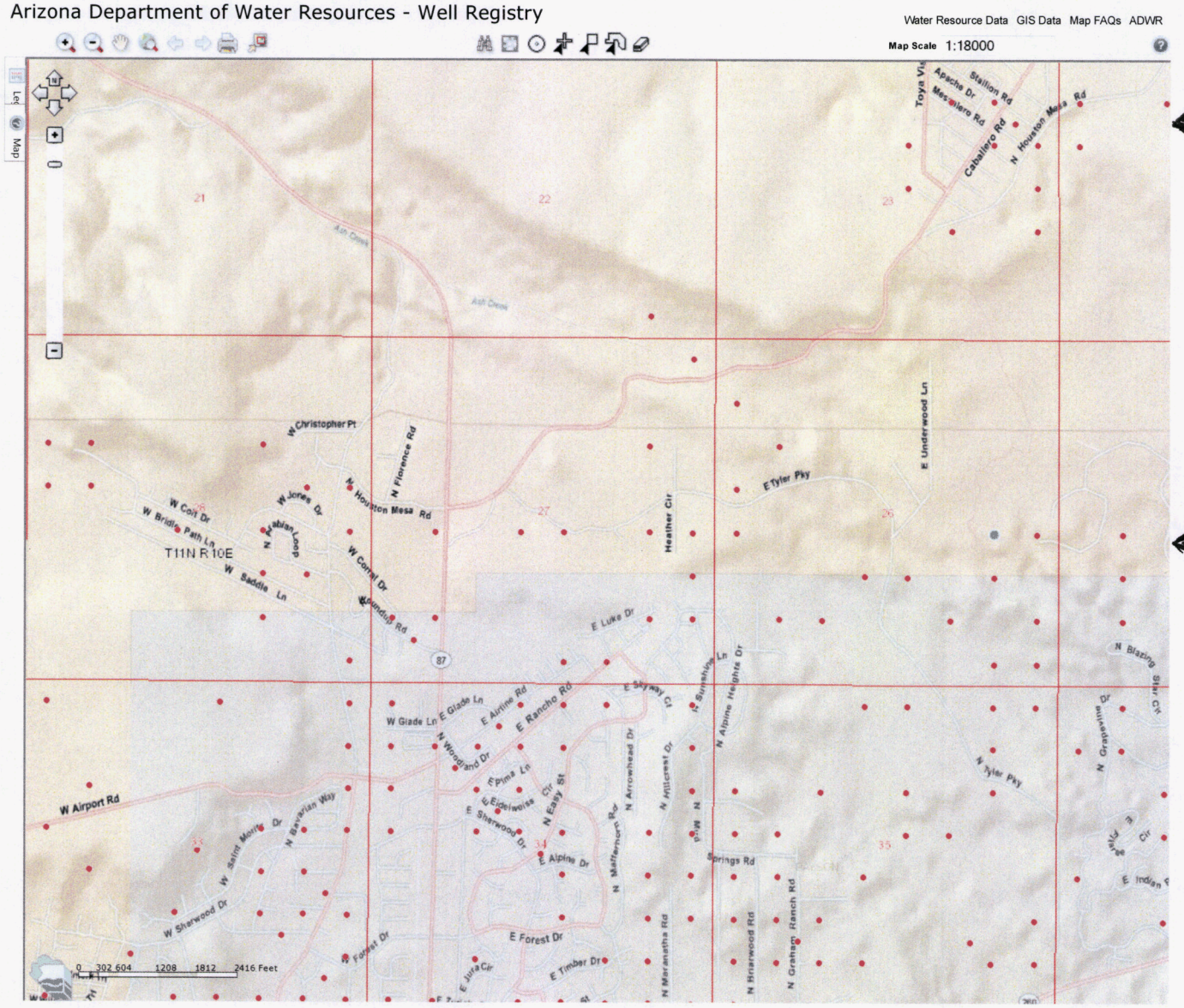
GWSI Well Information **What is this?**

GWSI Site ID 341558111173301 GWSI Local ID A-11-10 26DAB

Well Registry is ADWR's well database containing reported information on well status, location and construction.

e:

Location is Goat Camp #2
Underwood Lane East of Tyler Parkway
less than 1 mile south of Mesa del Caballo



Blue dot near center right side of map is Town of Payson Well # 55-565428

Arrow at top right shows Mesa del Caballo

Well 55-565428 Depth Report 010314

Date	Depth to Water ft.	Measurement Method	Meas. Code	Remark	Rem. Code	Source	Src. Code	Altitude ft amsl
7/30/2008	85	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4887
8/12/2008	86	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4886
12/9/2008	95	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4877
5/14/2009	81	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4890
11/24/2009	101	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4871
8/18/2010	86	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4886
3/8/2011	93	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4879
6/21/2011	92	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4879
9/20/2011	98	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4874
2/7/2012	103	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4869
6/5/2012	106	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4866
6/21/2012	106	STEEL TAPE	S			ADWR	A	4866
10/2/2012	110	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4862
1/30/2013	113	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4859
5/31/2013	96	CALIBRATED ELECTRIC TAPE (ADWR SOURCED ONLY)	VT			ADWR	A	4876

Well Info | Map | Reset Graph | Auto Site Hydrograph | Email | Help

Set x-axis | Set y-axis | Measurement Remarks

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia.(in)	Drill Date	Latest WL Date	DTW (ft)	WL Elv. (ft)
A-11-10 26DAB	341558111173301	565428	34° 15' 58.1"	111° 17' 33.0"	4971.9	UNUSED	500	6	7/17/1998	5/31/2013	96.05	4875.85

GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 1/3/2014

Arizona Department of Water Resources - Groundwater Data

Water Resource Data | GIS Data | Map FAQs | ADWR | Feedback

Map Scale 1:18000

Blue dot near center right side of map is Town of Payson Well # 55-565428

Director
Sandra A. Fabritz-Whitney

ADWR eGovernment
Arizona Department of Water Resources

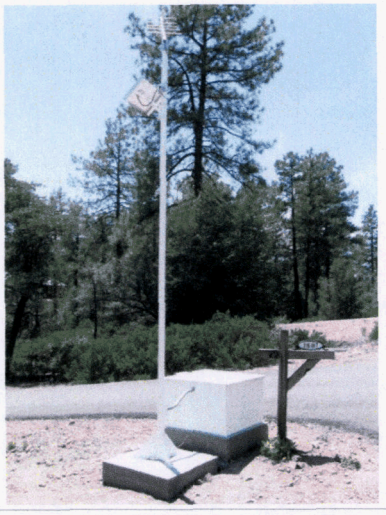
AZ.GOV Arizona's Official Web Site

GWSI Well Information

Site ID **341558111173301** Local ID **A-11-10 26DAB** 55 Registration No. **565428**

General | Water Levels* | Construction | Remark | Owner | Pump | Water Quality | Spring | Photo

Photos



Picture 1 of 2

Previous Next

*Automated Groundwater Site GWSI is ADWR's technical database of well locations, construction data, and water levels.

exportwls

Director
Sandra A. Fabritz-Whitney

ADWR eGovernment
Arizona Department of Water Resources

AZ.GOV Arizona's Official Web Site

GWSI Well Information

Site ID **341558111173301** Local ID **A-11-10 26DAB** 55 Registration No. **565428**

General | Water Levels* | Construction | Remark | Owner | Pump | Water Quality | Spring | Photo

Photos

Picture 2 of 2

Previous Next

*Automated Groundwater Site GWSI is ADWR's technical database of well locations, construction data, and water levels.

exportwls

Town of Payson Well

Arizona Department of Water Resources

AZ.GOV

Well Registry Information

Registration Number 55- 577330

General Construction Status Owner Driller Pump Data

Well Information

Site Type W - WELL Well Type N - NON-EXEMPT Replaces Well 55-

Location Information

Cadastral A11010026BBC Book Map Parcel Latitude 34 16 22.74 Longitude 111 18 26.03

Basin and County Information

Basin TONTO CREEK Sub Basin 73 - TONTO CREEK Watershed 07 - SALT RIVER

AMA/INA 0 - NOT WITHIN ANY AMA OR INA County 4 - GILA

Site Uses	Water Uses
Site Use 1 WATER PRODUCTION	Water Use 1 MUNICIPAL USES
Site Use 2 OBSERVATION	Water Use 2 MONITORING
Site Use 3	Water Use 3

GWSI Well Information What is this?

GWSI Site ID 341623111182401 GWSI Local ID A-11-10 26BBC

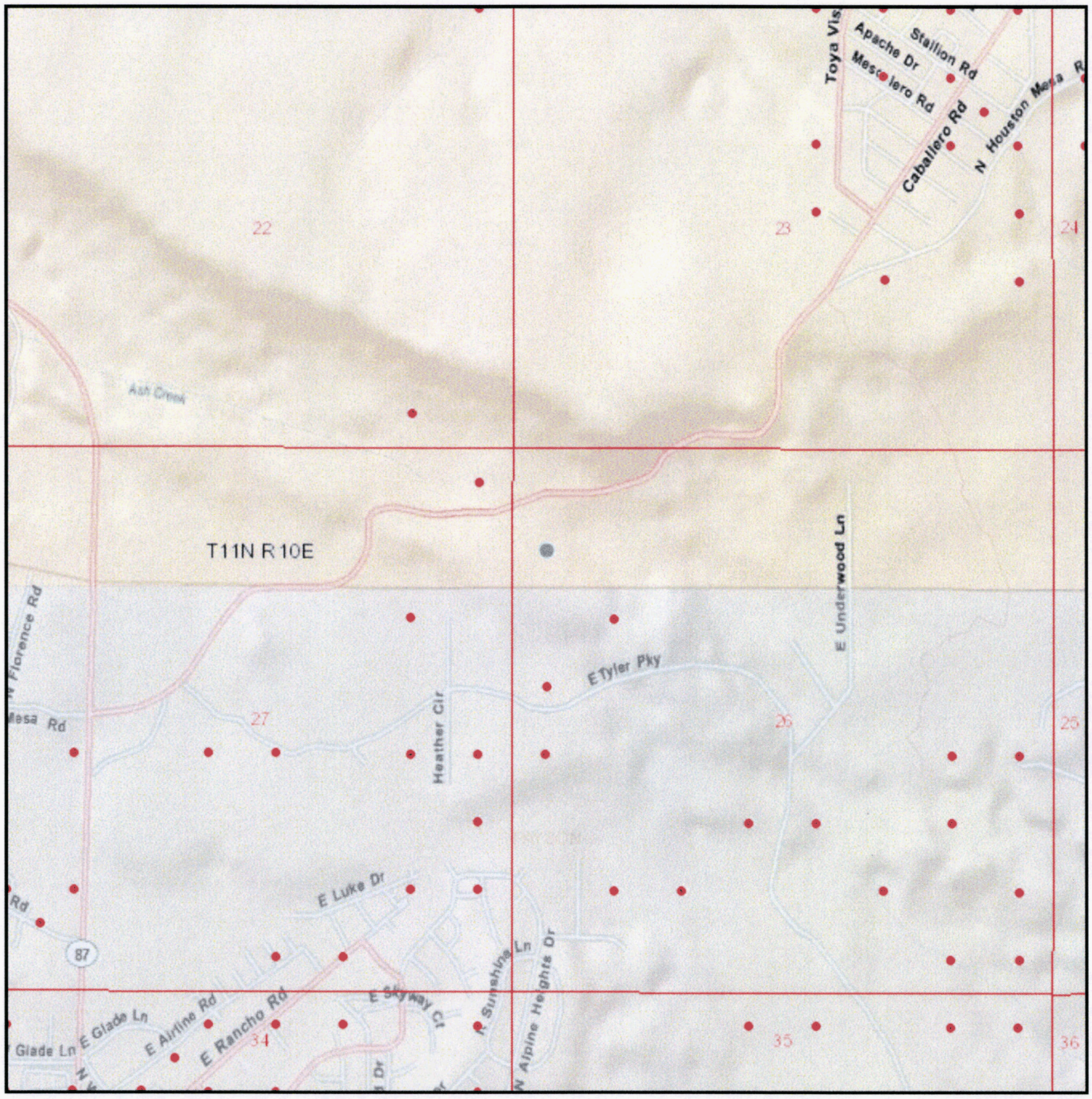
Well Registry is ADWR's well database containing reported information on well status, location and construction.

e:

Location is along Houston Mesa Rd., East of Rt. 87
less than 1 mile before Mesa del Caballo

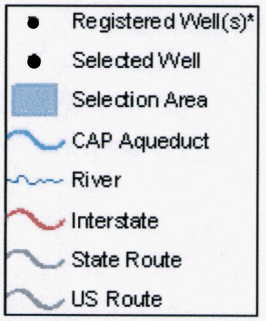
Town of Payson Well 55-577330

Well Registry Map

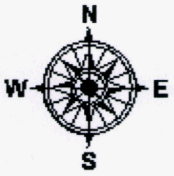


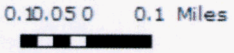
Blue dot near center of map is
Town of Payson well #55-577330

Arrow at top right shows Mesa del Caballo



*Locations are approximate and based on the well's legal description





For more information about this map contact:
Arizona Department of Water Resources
3550 N Central Avenue
Phoenix, AZ 85012
Phone: (602)771-8500 or 1-800-352-8488

Map created on 1/3/2014

Well 55-577330 Depth Report 010214

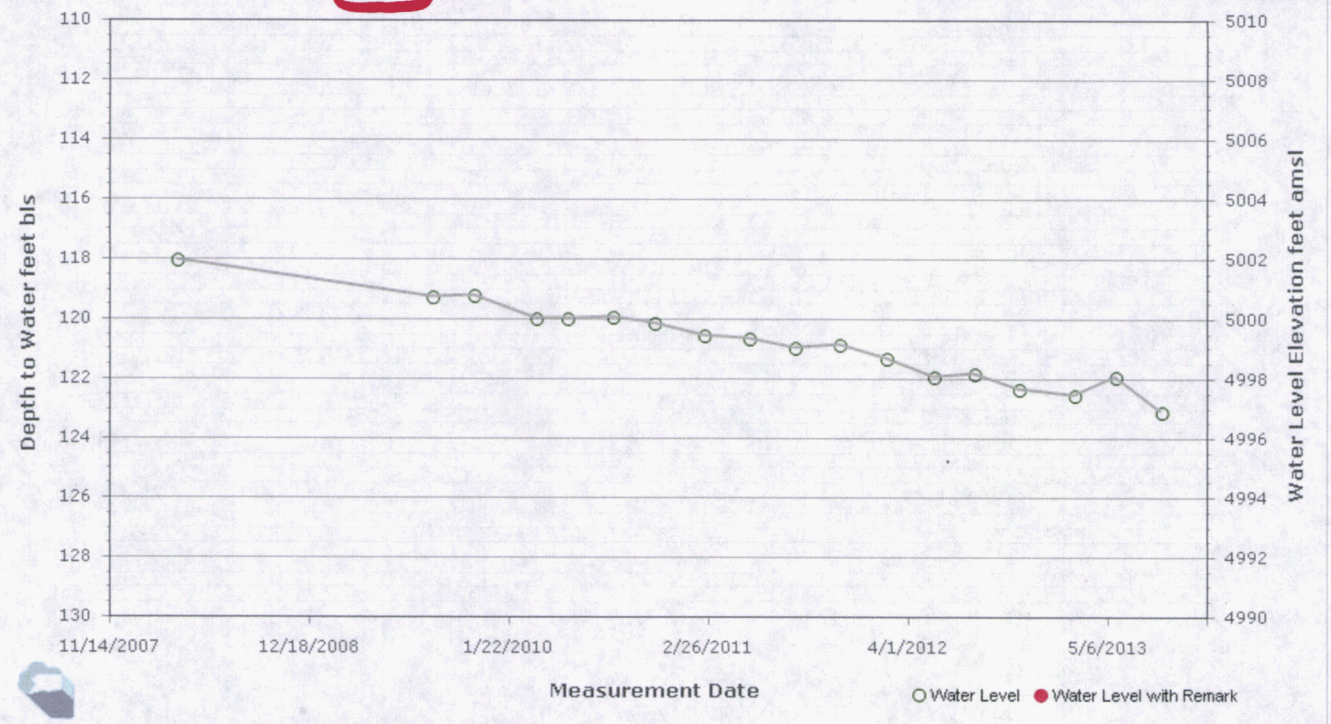
Date	Depth to Water ft.	Measurement Method	Meas. Code	Rema	Rem. Code	Source	Src. Code	Altitude ft amsl
3/26/2008	118	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	5002
8/20/2009	119	STEEL TAPE	S			ADWR	A	5001
11/11/2009	119	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	5001
3/16/2010	120	STEEL TAPE	S			ADWR	A	5000
5/18/2010	120	STEEL TAPE	S			ADWR	A	5000
8/17/2010	120	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	5000
11/8/2010	120	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	5000
2/16/2011	121	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	5000
5/17/2011	121	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4999
8/16/2011	121	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4999
11/14/2011	121	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4999
2/16/2012	121	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4999
5/21/2012	122	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4998
8/10/2012	122	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4998
11/8/2012	122	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4998
2/27/2013	123	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4998
5/20/2013	122	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4998
8/21/2013	123	CALIBRATED ELECTRIC SOUNDER/TAPE (TAPE NON-ADWR SOURCED)	V			ADWR	A	4997

Well Info | Map | Reset Graph | Email | Help

Set x-axis | Set y-axis | Measurement Remarks

Arizona GroundWater Monitoring Site Hydrograph

Local ID	Site ID	Registry ID	Latitude NAD27	Longitude NAD27	Alt. (ft amsl)	Water Use	Well Depth (ft)	Case Dia.(in)	Drill Date	Latest WL Date	DTW (ft)	WL Elv. (ft)
A-11-10 26BBC	341623111182401	577330	34° 16' 22.7"	111° 18' 23.6"	5120	UNUSED	43	6	8/20/2000	8/21/2013	123.1	4996.9

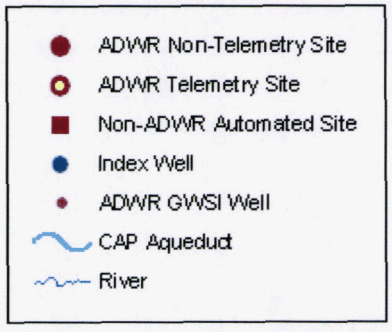


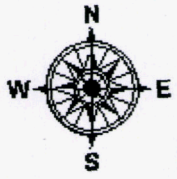
GWSI is ADWR's technical database of well locations, construction data, and water levels.

Created on 1/2/2014

GWSI Map

Blue dot near center of map is
Town of Payson Well #55-577330





0.10.05 0 0.1 Miles

ARIZONA DEPARTMENT OF WATER RESOURCES

For more information about this map contact:
Arizona Department of Water Resources
3550 N Central Avenue
Phoenix, AZ 85012
Phone: (602)771-8500 or 1-800-352-8488

Map created on 1/3/2014

Director
Sandra A. Fabritz-Whitney

ADWR eGovernment
Arizona Department of Water Resources

AZ.GOV Arizona's Official Web Site

GWSI Well Information

Site ID **341623111182401** Local ID **A-11-10 26BBC** 55 Registration No. **577330**

General | Water Levels | Construction | Remark | Owner | Pump | Water Quality | Spring | Photo

Photos

Picture 1 of 2

Previous Next

GWSI is ADWR's technical database of well locations, construction data, and water levels.

exportwls

GWSI Well Information

Site ID **341623111182401** Local ID **A-11-10 26BBC** 55 Registration No. **577330**

General Water Levels Construction Remark Owner Pump Water Quality Spring Photo

Photos

Picture 2 of 2

Previous Next

GWSI is ADWR's technical database of well locations, construction data, and water levels.

exportwls

EXHIBIT KMR-C

From Exhibit A of
original rate application
filed on 04/22/13
Document # 145511
Pgs. 41-45 / 279

Mesa del Caballo

COMPANY NAME	Payson Water Co., Inc.		
Name of System:	Mesa del Caballo	ADEQ Public Water System Number:	PWS 04-030

WATER COMPANY PLANT DESCRIPTION

WELLS

ADWR ID Number*	Pump Horsepower	Pump Yield (gpm)	Casing Depth (Feet)	Casing Diameter (Inches)	Meter Size (inches)	Year Drilled
55-631113	5	4	104	6	5/8X3/4	1977
55-500270	3	2.2	450	6	5/8X3/4	1981
55-801698	2	0	100	6	5/8X3/4	1984
55-513409	1	3	395	6	5/8X3/4	1986
55-556148	2	8.5	400	6	1	1996
55-801699	1	0	80	6	5/8X3/4	1984
55-631112	0	0	80	6	5/8X3/4	1985

* Arizona Department of Water Resources Identification Number

OTHER WATER SOURCES

Name or Description	Capacity (gpm)	Gallons Purchased or Obtained (in thousands)
55-588967, 55-560398, 55-585747	4,11,9	see attached
Town of Payson	unknown	see attached

BOOSTER PUMPS		FIRE HYDRANTS	
Horsepower	Quantity	Quantity Standard	Quantity Other
7.5	1	none	
5	1		
10	1		
20	1		

STORAGE TANKS		PRESSURE TANKS	
Capacity	Quantity	Capacity	Quantity
40,000	1		
20,000	1	80	2
15,000	3	2000	4

Note: If you are filing for more than one system, please provide separate sheets for each system.

COMPANY NAME	Payson Water Co., Inc.		
Name of System: Mesa del Caballo		ADEQ Public Water System Number:	PWS 04-030

WATER COMPANY PLANT DESCRIPTION (CONTINUED)

MAINS

Size (in inches)	Material	Length (in feet)
2	PVC	738
3	PVC	1422
4	ACP	22,455
5		
6		
8		
10		
12		

CUSTOMER METERS

Size (in inches)	Quantity
5/8 X ¾	363
3/4	
1	1
1 1/2	
2	
Comp. 3	
Turbo 3	
Comp. 4	
Turbo 4	
Comp. 6	
Turbo 6	

For the following three items, list the utility owned assets in each category for each system.

TREATMENT EQUIPMENT:

2- pelley chlorinator

STRUCTURES:

785 ft. of 6 ft. chain link security fence

1- 6X6 wood structure

7- 8X8 concrete block buildings

OTHER:

4- T100GS remote tank monitoring devices

Note: If you are filing for more than one system, please provide separate sheets for each system.

COMPANY NAME: Payson Water Co., Inc.		
Name of System: Mesa del Caballo	ADEQ Public Water System Number:	PWS 04-030

WATER USE DATA SHEET BY MONTH FOR CALENDAR YEAR 2012

MONTH	NUMBER OF CUSTOMERS	GALLONS SOLD (Thousands)	GALLONS PUMPED (Thousands)	GALLONS PURCHASED (Thousands)
JANUARY	364	1001	1005	
FEBRUARY	361	1010	1170	
MARCH	364	940	977	
APRIL	364	1093	1192	
MAY	361	1125	1187	508
JUNE	362	1279	1226	
JULY	365	1292	1298	
AUGUST	360	1129	1163	
SEPTEMBER	362	1072	1243	2874
OCTOBER	363	1022	1105	12
NOVEMBER	363	951	1003	
DECEMBER	364	1029	1066	10
	TOTALS →	12948	13441	3404

What is the level of arsenic for each well on your system? .003 mg/l
(If more than one well, please list each separately.)

If system has fire hydrants, what is the fire flow requirement? ____GPM for ____hrs

If system has chlorination treatment, does this treatment system chlorinate continuously?
(X) Yes ( ) No

Is the Water Utility located in an ADWR Active Management Area (AMA)?
( ) Yes (X) No

Does the Company have an ADWR Gallons Per Capita Per Day (GPCPD) requirement?
( ) Yes (X) No

If yes, provide the GPCPD amount: n/a

Note: If you are filing for more than one system, please provide separate data sheets for each system.

	2012 Gallons						
	MdC Water Purchased TOP	MdC Water Purchased WSA	MdC Water Purchased Total	EVP Water Purchased TOP	EVP Water Purchased WSA	EVP Water Purchased Total	Water Purchased Total
January	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0
May	51,000	508,000	559,000	0	0	0	559,000
June	286,000	0	286,000	74,000	0	74,000	360,000
July	163,000	0	163,000	74,000	0	74,000	237,000
August	47,000	0	47,000	15,000	0	15,000	62,000
September	0	2,874,000	2,874,000	0	0	0	2,874,000
October	42,000	12,470	54,470	26,000	0	26,000	80,470
November	0	0	0	18,000	0	18,000	18,000
December	0	10,110	10,110	0	0	0	10,110
Total	589,000	3,404,580	3,993,580	207,000	0	207,000	4,200,580

EXHIBIT KMR-D

Director
Sandra A. Fabritz-Whitney

Arizona Department of Water Resources

AZ.GOV Arizona's Official Web Site

Well Registry Information

Registration Number 55- **631113**

General Construction Status Owner Driller Pump Data

Well Construction Information

Well Depth (ft)	565	Water Level (ft bls)	120		
Casing Depth (ft)	104	Casing Diameter (in)	6	Casing Type	P - STEEL - PERFORATED OR SLOTTED CASING

Well Data

No. of Holes		Irrigated Acres	0	Acre Ft Annum	Intended Capacity (GPM) 0

Pump Completion Report

Tested Capacity(GPM)	22	Pump Capacity(GPM)	22	Draw Down (ft)	0
Pump Type	0 - NO PUMP CODE LISTED	Power Type	0 - NO POWER CODE LISTED	Method of Discharge	X - NONE

Place of Use

Township	N/S	1/2 T	Range	E/W	1/2 R	Section	160 Acre	40 Acre	10 Acre	Cadastral

No records to display.

Well Registry is ADWR's well database containing reported information on well status, location and construction.

e:

Well Registry Information

Registration Number 55- **500270**

General Construction Status Owner Driller Pump Data

Well Construction Information

Well Depth (ft)	450	Water Level (ft bls)	146		
Casing Depth (ft)	98	Casing Diameter (in)	6	Casing Type	P - STEEL - PERFORATED OR SLOTTED CASING

Well Data

No. of Holes		Irrigated Acres	0	Acre Ft Annum	Intended Capacity (GPM) 0

Pump Completion Report

Tested Capacity(GPM)	18	Pump Capacity(GPM)	0	Draw Down (ft)	0
Pump Type	S - SUBMERSIBLE	Power Type	T - ELECTRIC MOTOR 1 - 5 HP	Method of Discharge	1 - BUCKET - BARREL - STOPWATCH

Place of Use

Township	N/S	1/2 T	Range	E/W	1/2 R	Section	160 Acre	40 Acre	10 Acre	Cadastral

No records to display.

Well Registry is ADWR's well database containing reported information on well status, location and construction.

e:

Director
Sandra A. Fabritz-Whitney

ADWR
Arizona Department of Water Resources

AZ.GOV
Arizona's Official Web Site

Well Registry Information

Registration Number 55- **801698**

General Construction Status Owner Driller Pump Data

Well Construction Information

Well Depth (ft)	250	Water Level (ft bls)	120		
Casing Depth (ft)	100	Casing Diameter (in)	6	Casing Type	P - STEEL - PERFORATED OR SLOTTED CASING

Well Data

No. of Holes		Irrigated Acres	0	Acre Ft Annum	Intended Capacity (GPM) 0

Pump Completion Report

Tested Capacity(GPM)	7	Pump Capacity(GPM)	7	Draw Down (ft)	0
Pump Type	0 - NO PUMP CODE LISTED	Power Type	0 - NO POWER CODE LISTED	Method of Discharge	X - NONE

Place of Use

Township	N/S	1/2 T	Range	E/W	1/2 R	Section	160 Acre	40 Acre	10 Acre	Cadastral

No records to display.

Well Registry is ADWR's well database containing reported information on well status, location and construction.

e;

Well Registry Information

Registration Number 55- **513409**

General Construction Status Owner Driller Pump Data

Well Construction Information

Well Depth (ft)	395	Water Level (ft bls)	150		
Casing Depth (ft)	395	Casing Diameter (in)	6	Casing Type	P - STEEL - PERFORATED OR SLOTTED CASING

Well Data

No. of Holes		Irrigated Acres	0	Acre Ft Annum	Intended Capacity (GPM) 35

Pump Completion Report

Tested Capacity(GPM)	20	Pump Capacity(GPM)	20	Draw Down (ft)	254
Pump Type	S - SUBMERSIBLE	Power Type	T - ELECTRIC MOTOR 1 - 5 HP	Method of Discharge	2 - METER

Place of Use

Township	N/S	1/2 T	Range	E/W	1/2 R	Section	160 Acre	40 Acre	10 Acre	Cadastral
11	N	0	10	E	0	23				A11010023000

Well Registry is ADWR's well database containing reported information on well status, location and construction.

Well Registry Information

Registration Number 55- **556148**

General Construction Status Owner Driller Pump Data

Well Construction Information

Well Depth (ft)	400	Water Level (ft bls)	190		
Casing Depth (ft)	400	Casing Diameter (in)	6	Casing Type	P - STEEL - PERFORATED OR SLOTTED CASING

Well Data

No. of Holes		Irrigated Acres	0	Acre Ft Annum	Intended Capacity (GPM) 50

Pump Completion Report

Tested Capacity(GPM)	25	Pump Capacity(GPM)	18	Draw Down (ft)	110
Pump Type	S - SUBMERSIBLE	Power Type	T - ELECTRIC MOTOR 1 - 5 HP	Method of Discharge	2 - METER

Place of Use

Township	N/S	1/2 T	Range	E/W	1/2 R	Section	160 Acre	40 Acre	10 Acre	Cadastral

No records to display.

Well Registry is ADWR's well database containing reported information on well status, location and construction.

e:

Well Registry Information

Registration Number 55- **801699**

General Construction Status Owner Driller Pump Data

Well Construction Information

Well Depth (ft)	200	Water Level (ft bls)	124		
Casing Depth (ft)	80	Casing Diameter (in)	6	Casing Type	P - STEEL - PERFORATED OR SLOTTED CASING

Well Data

No. of Holes		Irrigated Acres	0	Acre Ft Annum	Intended Capacity (GPM) 0

Pump Completion Report

Tested Capacity(GPM)	7	Pump Capacity(GPM)	7	Draw Down (ft)	0
Pump Type	0 - NO PUMP CODE LISTED	Power Type	0 - NO POWER CODE LISTED	Method of Discharge	X - NONE

Place of Use

Township	N/S	1/2 T	Range	E/W	1/2 R	Section	160 Acre	40 Acre	10 Acre	Cadastral

No records to display.

Well Registry is ADWR's well database containing reported information on well status, location and construction.

e:

Well Registry Information

Registration Number 55- **631112**

General Construction Status Owner Driller Pump Data

Well Construction Information

Well Depth (ft)	220	Water Level (ft bls)	124		
Casing Depth (ft)	80	Casing Diameter (in)	5	Casing Type	P - STEEL - PERFORATED OR SLOTTED CASING

Well Data

No. of Holes		Irrigated Acres	0	Acre Ft Annum	Intended Capacity (GPM) 0

Pump Completion Report

Tested Capacity(GPM)	7	Pump Capacity(GPM)	7	Draw Down (ft)	0
Pump Type	0 - NO PUMP CODE LISTED	Power Type	0 - NO POWER CODE LISTED	Method of Discharge	X - NONE

Place of Use

Township	N/S	1/2 T	Range	E/W	1/2 R	Section	160 Acre	40 Acre	10 Acre	Cadastral

No records to display.

Well Registry is ADWR's well database containing reported information on well status, location and construction.

e:

EXHIBIT KMR-E

Pump capacity 15 gpm

ARIZONA DEPARTMENT OF WATER RESOURCES
Information Management Unit
P.O. Box 36020, Phoenix, Arizona 85067-3589
(602) 771-8527 * (800) 352-8488
www.water.az.gov

Pump Installation Completion Report

- Review instructions prior to completing form
- The registered well owner should file this report with the Department within 30 days following installation of pump equipment

** PLEASE PRINT CLEARLY **

RECEIVED
APR 03 2013
ARIZONA DEPARTMENT OF WATER RESOURCES

FILE NUMBER: A(11-10) 23 ADD
WELL REGISTRATION NUMBER: 55-220768

SECTION 1. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION OR INDIVIDUAL: RANDALL COOK

MAILING ADDRESS: 8071 W. SEPIA ROAD

CITY / STATE / ZIP: PAYSON, AZ 85541

CONTACT PERSON NAME AND TITLE:

TELEPHONE NUMBER: 928-474-9640

FAX:

Location of Well

WELL LOCATION ADDRESS (IF KNOWN): 8071 W. SEPIA ROAD

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
11N	10E	23	NE 1/4	SE 1/4	SE 1/4

COUNTY ASSESSOR'S PARCEL ID NUMBER (MOST RECENT)

BOOK	MAP	PARCEL
302	34	003D

COUNTY WHERE WELL IS LOCATED: GILA

SECTION 2. EQUIPMENT INSTALLED

DATE PUMP INSTALLED: 9-4-12

Pump Type

CHECK ONE

- ☐ Air Lift
- ☐ Bucket
- ☐ Centrifugal
- ☐ Jet
- ☐ Piston
- ☐ Rotary
- ☒ Submersible
- ☐ Turbine
- ☐ Other (please specify)

RATED PUMP CAPACITY: 15 Gallons Per Minute

Pitless Adaptor

CHECK ONE (SEE INSTRUCTIONS FOR DEFINITION)

Was a pitless adaptor installed? ☐ Yes ☒ No

IF YES, DEPTH BELOW GROUND LEVEL THE DEVICE WAS INSTALLED: Feet

Power Type

CHECK ONE

- ☐ Diesel Engine
- ☒ Electric Motor
- ☐ Gasoline Engine
- ☐ Hand
- ☐ Natural Gas
- ☐ Windmill
- ☐ Other (please specify)

HORSE POWER RATING OF MOTOR: 1.5

SECTION 3. WELL TEST

Pump Test Data

DATE WELL TESTED: 9/4/12

STATIC WATER LEVEL (A): 276 Feet Below Land Surface

PUMPING WATER LEVEL (B): 281 Feet Below Land Surface

DRAWDOWN [(B) - (A)]: ~~X~~ 5

TEST PUMPING RATE: 15 Gallons Per Minute

DURATION OF PUMP TEST (Minimum 4 Hours): 4 HR. Hours

TOTAL PUMPING LIFT: 281 Feet

FOR FLOWING WELL, MEASURED SHUT IN HEAD: N/A ☐ FT ☐ PSI

Method of Discharge Measurement

CHECK ONE

- ☐ Bailer
- ☒ Bucket - Barrel - Stopwatch
- ☐ Current
- ☐ Estimated - Air Lift
- ☐ Gauge
- ☐ Meter
- ☐ Orifice
- ☐ Volume
- ☐ Weir - Flume
- ☐ Other (please specify)

Method of Measuring Water Level

CHECK ONE

- ☐ Air Line
- ☒ Electric Measuring Line (Sounder)
- ☐ Steel Tape
- ☐ Other (please specify)

SYM

I HEREBY CERTIFY *that the above statements are true to the best of my knowledge and belief according to* A.R.S § 45-600(B)

SIGNATURE OF WELL OWNER: Randall Cook, Frances C Cook — DATE: 9-4-12

DWR-55-56 (Rev. 02/06/06)

Pump capacity 12 gpm

ARIZONA DEPARTMENT OF WATER RESOURCES
Information Management Unit
P.O. Box 36020, Phoenix, Arizona 85067-3589
(602) 771-8527 * (800) 352-8488
www.water.az.gov

Pump Installation Completion Report

RECEIVED
APR 04 2013
ARIZONA DEPARTMENT OF WATER RESOURCES

- Review instructions prior to completing form
- The registered well owner should file this report with the Department within 30 days following installation of pump equipment

** PLEASE PRINT CLEARLY **

FILE NUMBER: A(11-10) 23 ADD
WELL REGISTRATION NUMBER: 55-220767

SECTION 1. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION OR INDIVIDUAL: WESLEY COOK

MAILING ADDRESS: 8058 W. HALLWAY DR.

CITY / STATE / ZIP: PAYSON, AZ 85541

CONTACT PERSON NAME AND TITLE:

TELEPHONE NUMBER: 928-474-7805

FAX:

Location of Well

WELL LOCATION ADDRESS (IF KNOWN): 8058 W. HALLWAY DR.

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
11N	10E	23	NE 1/4	SE 1/4	SE 1/4

COUNTY ASSESSOR'S PARCEL ID NUMBER (MOST RECENT)

BOOK	MAP	PARCEL
302	34	005A

COUNTY WHERE WELL IS LOCATED: GILA

SECTION 2. EQUIPMENT INSTALLED

DATE PUMP INSTALLED: 9/10/12

Pump Type

CHECK ONE

- ☐ Air Lift
- ☐ Bucket
- ☐ Centrifugal
- ☐ Jet
- ☐ Piston
- ☐ Rotary
- ☒ Submersible
- ☐ Turbine
- ☐ Other (please specify)

RATED PUMP CAPACITY: 12 Gallons Per Minute

Pitless Adaptor

CHECK ONE (SEE INSTRUCTIONS FOR DEFINITION)

Was a pitless adaptor installed? ☒ Yes ☐ No

IF YES, DEPTH BELOW GROUND LEVEL THE DEVICE WAS INSTALLED: 2 Feet

Power Type

CHECK ONE

- ☐ Diesel Engine
- ☒ Electric Motor
- ☐ Gasoline Engine
- ☐ Hand
- ☐ Natural Gas
- ☐ Windmill
- ☐ Other (please specify)

HORSE POWER RATING OF MOTOR: 1

SECTION 3. WELL TEST

Pump Test Data

DATE WELL TESTED: 9/10/12

STATIC WATER LEVEL (A): 234 Feet Below Land Surface

PUMPING WATER LEVEL (B): 256 Feet Below Land Surface

DRAWDOWN [(B) - (A)]: 22

TEST PUMPING RATE: 12 Gallons Per Minute

DURATION OF PUMP TEST (Minimum 4 Hours): 4 Hours

TOTAL PUMPING LIFT: 256 Feet

FOR FLOWING WELL, MEASURED SHUT IN HEAD: N/A ☐ FT ☐ PSI

Method of Discharge Measurement

CHECK ONE

- ☐ Bailer
- ☒ Bucket - Barrel - Stopwatch
- ☐ Current
- ☐ Estimated - Air Lift
- ☐ Gauge
- ☐ Meter
- ☐ Orifice
- ☐ Volume
- ☐ Weir - Flume
- ☐ Other (please specify)

Method of Measuring Water Level

CHECK ONE

- ☐ Air Line
- ☒ Electric Measuring Line (Sounder)
- ☐ Steel Tape
- ☐ Other (please specify)

SYM

I HEREBY CERTIFY *that the above statements are true to the best of my knowledge and belief according to* A.R.S § 45-600(B)

SIGNATURE OF WELL OWNER: Wesley Cook

DATE: 9/10/12

DWR-55-56 (Rev. 02/06/06)

Pump capacity 5 gpm 5/21/13 SYM

Arizona Department of Water Resources
Water Management Division
P.O. Box 36020, Phoenix, AZ 85067-6020
(602) 771-8627 • (602) 771-8690 fax

Pump Installation Completion Report

- Review instructions prior to completing form in black or blue ink.
- The registered well owner should file this report with the Department within 30 days following installation of pump equipment.

RECEIVED MAY 29 2013

FILE NUMBER: A(11-10)23 DBB
WELL REGISTRATION NUMBER: 55-221514

** PLEASE PRINT CLEARLY **

SECTION 1. REGISTRY INFORMATION

Well Owner

FULL NAME OF COMPANY, ORGANIZATION, OR INDIVIDUAL: Frank Kemp
MAILING ADDRESS: 426 N. Toya Vista Rd.
CITY / STATE / ZIP CODE: Payson, AZ 85541
CONTACT PERSON NAME AND TITLE: Frank Kemp/ Owner
TELEPHONE NUMBER: 928-587-5266
FAX:

Location of Well

WELL LOCATION ADDRESS (IF ANY): 7426 N. Toya Vista Rd.

TOWNSHIP (N/S)	RANGE (E/W)	SECTION	160 ACRE	40 ACRE	10 ACRE
11N	10E	23	SE ¼	NW ¼	NW ¼

COUNTY ASSESSOR'S PARCEL ID NUMBER (MOST RECENT)

BOOK	MAP	PARCEL
302	34	383

COUNTY WHERE WELL IS LOCATED: Gila

SECTION 2. EQUIPMENT INSTALLED

DATE PUMP INSTALLED: 3/18/13

Pump Type

CHECK ONE

- [ ] Air Lift
- [ ] Bucket
- [ ] Centrifugal
- [ ] Jet
- [ ] Piston
- [ ] Rotary
- [X] Submersible
- [ ] Turbine
- [ ] Other (*please specify*):

RATED PUMP CAPACITY: 5 Gallons Per Minute

Pitless Adaptor

CHECK ONE (*SEE INSTRUCTIONS FOR DEFINITION*)

Was a pitless adaptor installed? [ ] Yes [X] No

IF YES, DEPTH BELOW GROUND LEVEL THE DEVICE WAS INSTALLED: Feet

Power Type

CHECK ONE

- [ ] Diesel Engine
- [X] Electric Motor
- [ ] Gasoline Engine
- [ ] Hand
- [ ] Natural Gas
- [ ] Windmill
- [ ] Other (*please specify*):

HORSE POWER RATING OF MOTOR: 3/4

SECTION 3. PUMP TEST

Pump Test Data

DATE WELL TESTED: 3/18/13
STATIC WATER LEVEL (A): 236 Feet Below Land Surface
PUMPING WATER LEVEL (B): 373 Feet Below Land Surface
DRAWDOWN [(B) – (A)]: 137 Feet Below Land Surface
TEST PUMPING RATE: 5 Gallons Per Minute
DURATION OF PUMP TEST (Minimum 4 Hours): 4 Hours
TOTAL PUMPING LIFT: 373 Feet
FOR FLOWING WELL, MEASURED SHUT IN HEAD: [ ] FT [ ] PSI

Method of Discharge Measurement

CHECK ONE

- [ ] Bailer
- [X] Bucket – Barrel – Stopwatch
- [ ] Current
- [ ] Estimated – Air Lift
- [ ] Gauge
- [ ] Meter
- [ ] Orifice
- [ ] Volume
- [ ] Weir – Flume
- [ ] Other (*please specify*):

Method of Measuring Water Level

CHECK ONE

- [ ] Air Line
- [X] Electric Measuring Line (Sounder)
- [ ] Steel Tape
- [ ] Other (*please specify*):

I HEREBY CERTIFY that the above statements are true to the best of my knowledge and belief according to A.R.S. § 45-600(B).

SIGNATURE OF WELL OWNER: Frank Kemp
DATE: 5/28/13

EXHIBIT KMR-F

Drinking Water Quantity-Low Yielding Domestic Water Wells

Drinking Water and Human Health - January 04, 2011

Contents

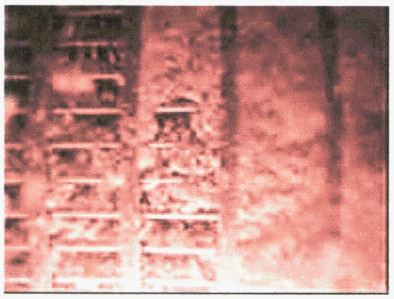
Low-yielding domestic water wells

The objective of groundwater resource development is to design and construct a well capable of yielding a pumping rate compatible with the needs of the well owner's intended use. Well yield is generally defined as the rate at which a well can be pumped while ensuring that the water level does not drop below the pump intake. It is reported as gallons per minute (gpm). Well yield is highly dependent on the characteristics of the aquifer, the construction of the well, and the maintenance of the well to assure long-term sustainability of yield.

Aquifer characteristics can vary between highly porous and transmissive sands to low-yielding clays and hard rock. Wells completed in more porous, saturated geologic materials routinely result in high-yielding wells. Wells completed in less porous clays and bedrock can retard groundwater flow to less than 5 gpm.

Well construction is important when optimizing yield. The screened portion of the well allows for the movement of water into the well while reducing the transport of silt and sands. An improperly sized screen (slots in the screen too large or too small) could allow sediment to clog the well and grit to damage the pump. A submersible pump that is too shallow could draw down water levels too quickly. This requires the pump to cycle on and off repeatedly as the water table rises and falls, often damaging the pump. If water table elevations drop after initial well construction, well yield will decline.

The development of scale within the well and screen is the most common cause of a reduction in well yield. Similar to the deposits found inside a tea kettle, scale is the hard residue that coats the inside of pipes and well screens as the result of precipitation of minerals composed of calcium and magnesium carbonates. Naturally occurring iron bacteria (/pages/31555/drinking-water-contaminant-iron-and-manganese-bacteria) can plug the pores in the aquifer and the opening of the well screen. The bacteria produce accumulations of bioslime within the well and increase the rate of scale precipitation, not unlike plaque buildup on your teeth. The combined effect of the growth of slime and precipitated minerals has been reported to reduce well yield by 75 percent within a year of well operation in some locations (Johnson Division, 1972).



A clogged well screen

Potential health effects associated with low-yielding wells

Low-yielding wells are likely to cycle on and off to meet water needs. Rapid and repeated water level changes in the area of the well screen allow for the introduction of oxygen in the aquifer. Changes in aquifer geochemistry can occur when water-saturated geologic materials are exposed to oxygen, and this can result in naturally occurring minerals dissolving into the groundwater. If the aquifer material includes arsenic (/pages/31544/drinking-water-contaminant-

arsenic) minerals, an increase in dissolved arsenic may occur (Uhlman, 2008).

In addition to the potential for loss of well yield, bioslime accumulation may allow for the growth of bacteria that can become a serious health concern. *E. coli* bacteria is the most common bacteria (/pages/31551/drinking-water-contaminant-bacteria) encountered in domestic wells and can originate from naturally occurring bacteria found in the soils. But the most common source of fecal *E. coli* in water well systems is an adjacent septic system. In regions of warm groundwater (southwestern United States) an overgrowth of bacteria in a domestic well can become a food source for other organisms, such as the amoeba *N. fowleri* (Artiola & Uhlman, 2009). Domestic wells should be tested annually for *E. coli* to assure drinking water standards are met.

Options for correcting low yield

Wells constructed in low-yielding aquifers are candidates for well deepening and pump lowering if water table elevations have dropped. Open-borehole wells, such as those constructed in bedrock, may exhibit increased yield if fractured or *fracked. Hydro-fracking* consists of sealing portions of the well and increasing the pressure sufficiently within the borehole to fracture the rock. Increasing the number and frequency of fractures around the borehole allows for the interception of a greater number of water-bearing fractures and may increase yield.

Shock chlorination (/pages/31573/drinking-water-treatment-chlorination) of a well exhibiting elevated bacterial contamination removes bioslime that may be plugging the well. Care should be taken to adequately flush the well system after shock chlorination because the introduction of chlorine can change the geochemisty of the aquifer and induce mobilization of naturally occurring minerals, such as arsenic and lead.

Anecdotal reports of well owners have suggested limited success with the introduction of dry ice into the well. As the carbon dioxide (CO_2) off-gases from the dry ice, the water becomes more acid, which dissolves some of the carbonate-based scale and lowers the bacterial count. The agitation of the bubbling dry ice in the borehole is also assumed to remove some particulate scale. Larger municipal wells are beginning to design large-capacity water well systems to use pressurized CO_2 gas to sanitize well systems. The downside of the use of CO_2 is the acidification of the water, which increases pipe corrosion.

Surging and scrubbing the interior of the well piping and screen is the most efficient means by which to increase well yield after scale formation. A licensed pump installer mobilizes a pump rig over the well, removes the pump and any interior plumbing, and scrubs the well with equipment similar to a large bottle brush. It is recommended that any pump maintenance activity that allows for open access to the well should include well surging and scrubbing to remove scale, slime, and other particulates from the domestic well.

References

Most of this text was adapted from: Artiola, J. & Uhlman, K. (2009). *Arizona Well Owners' Guide to Water Supply.* Access online: http://www.wellownerhelp.org/intro.html (http://www.wellownerhelp.org/intro.html)

Johnson Division. (1972). *Groundwater and Wells.* Second Printing. Edward E. Johnson Inc. Universal Oil Products Co., Saint Paul, Minnesota.

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