



Water Department

303 N. Beeline Highway  
Payson, AZ 85541  
Phone (928) 474-5242  
Fax (928) 474-7052

Memorandum

Date: April 11<sup>th</sup>, 2007

To: Mr. Fred Carpenter  
Mr. Buzz Walker

From: Mike Ploughe P.G. 

RE: 2007 Status Report

The summary for 2007 Water Resources Status Report is attached. This year the report will consist of several brief discussions concerning the primary water resources topics of interest in the management and planning of our water supplies.

In keeping with the spirit of the 2006 status report's recommendations, this document is purposefully far less complicated and much more understandable for the layperson. The document will be presented as a collection of one-page topics of discussion and/or summary. These pages are undergoing final edits and revision at this moment. However, the summary is complete and is consistent with the topics to be presented.

The topics are as follows:

**Groundwater Levels**  
**Precipitation**  
**Conservation**  
**Water Demand**  
**Safe Yield**  
**Long-Term Outlook and Planning**

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## 2007 PAYSON WATER RESOURCES STATUS SUMMARY

The Town of Payson desires to maintain water usage below what is replaced on a long-term average basis by rain and snowfall within the watersheds that recharge or re-fill the aquifer upon which it relies. Maintaining groundwater usage below this amount is considered "Safe Yield". The amount of groundwater available to the Town of Payson within a Safe Yield state is currently 2,681 ac-ft/yr.

It is the policy of the Town of Payson local government that the Town will make attempts to manage its water supply and take efforts relating to water development and water conservation to achieve and/or maintain a "Safe Yield" condition of its groundwater supplies each year. Currently, Payson's water consumption remains below the long-term state of "Safe Yield". In 2006, Payson residents consumed local groundwater resources in an amount equal to 63% of "Safe Yield". The net per person usage of water for 2006 was only 84gpcd. This value is below the Payson Water Department's target of 89gpcd.

The Town of Payson is committed to utilizing strategies that maintain a low consumption rate of local water supplies via modern and innovative conservation methods while minimizing potential impacts to quality of life. The Town of Payson recognizes that it exists in a desert environment and therefore wishes to encourage water usage habits that reflect this reality. Therefore, each spring, water use limitations are recommended by the Water Department in order to achieve and/or maintain water consumption goals accordingly.

Because, per person water use remains below 89gpcd and groundwater level trends remain well within a manageable state, the **Town of Payson will again implement Water Conservation Level II** water use restrictions for the period of April 2007 to May 2008. This level of conservation includes a ban on washing paved areas such as sidewalks or drives and limiting outside water use to certain days of the week. Complete details are available at the Payson Water Department. These efforts in combination with increased water conservation education, special conservation programs, and the assistance provided to homes and businesses are a meaningful attempt by Town government to achieve the Town's goals of "Safe Yield" in the management of its public water supply. The Level II water use limitations are commensurate with the reality of our environment and current water resources status.

The long-term water resources outlook for Payson is quite good in consideration of the realities of the Town's water resources portfolio and management methods.

**TOWN OF PAYSON  
WATER RESOURCES MANAGEMENT**

**2007 STATUS REPORT**



**APRIL 13<sup>TH</sup>, 2007**

Prepared By:  
Town of Payson Water Department

## 2007 PAYSON WATER RESOURCES STATUS SUMMARY

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## 2007 WATER RESOURCES STATUS

### GROUNDWATER LEVELS

Groundwater levels in the Payson area are ever changing, not only from year to year but also from day to day. It is important to note that changes in groundwater levels either up or down are normal, within the context of a particular areas history. Because the Town of Payson currently obtains all of its potable water supplies from groundwater, variable groundwater levels are indeed expected. This situation is no different than every other community in northern Gila County.

Groundwater level changes are related to many factors. Recharge or re-filling of the aquifer occurs in times of precipitation (rainfall and snowmelt). This results in groundwater level rise. In an opposite way, groundwater levels will drop in response to periods of no recharge or drought. Groundwater levels will also drop and rise in response to well(s) pumping or not pumping. The topic becomes more complicated by the type of aquifer of which the Town and communities in the region depend on. The Payson regional aquifer is in fact a complex system of interconnected cracks and sections of porous (sponge like) earth that yield water to wells. Nearly all of the earthen material beneath Payson and its surrounding area consists of the "Payson Granite". Some areas in the granite have more cracks and porous earth (decomposed granite) than others and some of the cracks or "fractures" are more interconnected than others. Therefore, changes in depth to groundwater can become complicated if not considered in light of the many variables as presented previously and even more.

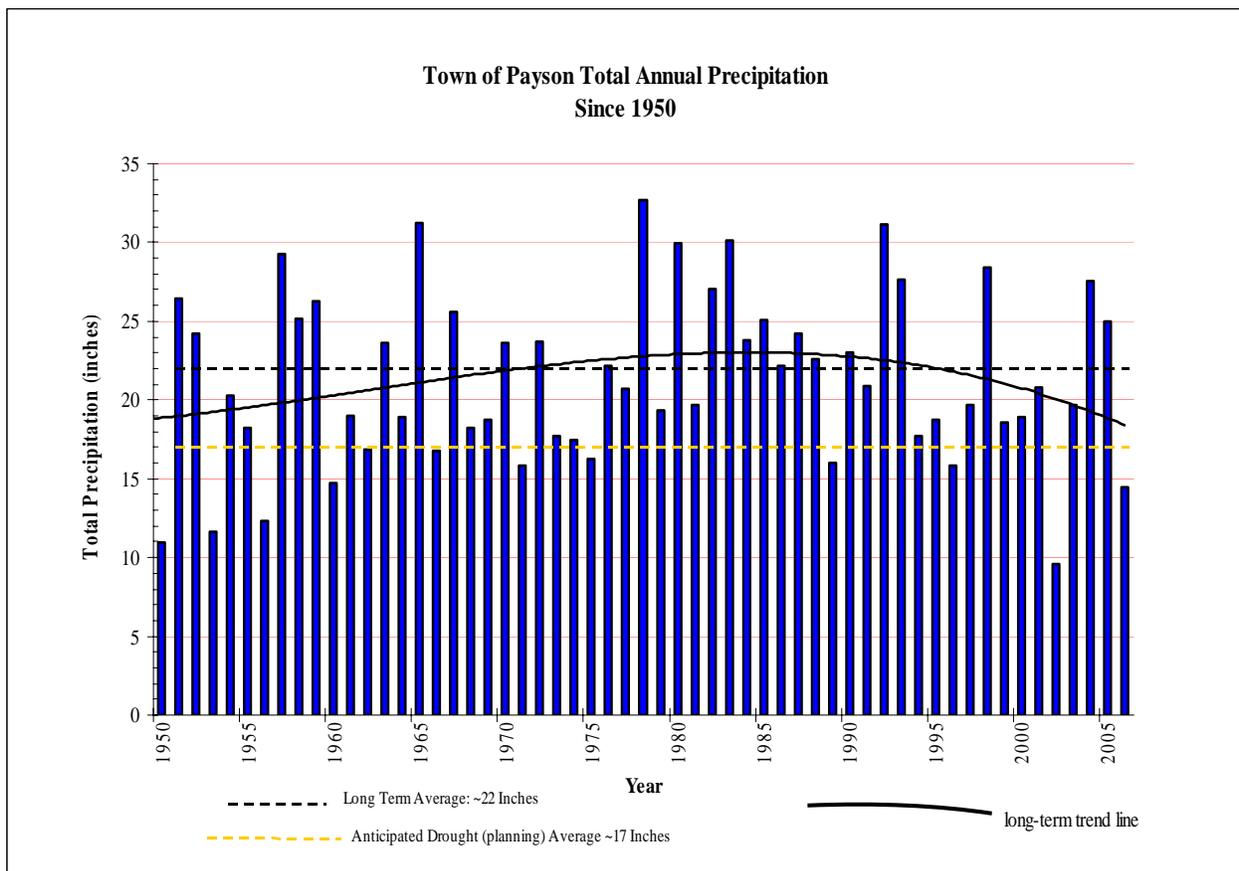
Groundwater levels are measured quarterly from all wells in the Town of Payson's observation network. This network consists of nearly 100 wells in the Payson area. Monthly measurements are collected at all active production wells and also at key observation wells. Some wells have water level monitoring devices installed that collect and record every few hours to even every second, if needed. The water level data is maintained in a database by Water Department staff. By developing and maintaining a water level history from each of the wells in the network the Water Department is able to assess the status of its groundwater resources both on the whole and at specific locations. For example, if water levels exhibit historically un-characteristic decline, staff will typically take actions to determine the cause and, if possible, will take action to mitigate the concern.

In 2006, groundwater levels have been observed to both decline and rise throughout the network. None of the negative changes observed are considered to be cause for alarm. Therefore, the Town's groundwater resources are considered to be in overall good condition.

## 2007 WATER RESOURCES STATUS

### PRECIPITATION

Precipitation, both regionally and within the Payson area, is necessary to sustain the aquifer that the Town of Payson relies on. The local long-term annual precipitation average ranges between 21 and 22 inches per year. The figure below, displays recorded precipitation history from 1950 thru 2006. In the 2006 calendar year, precipitation was below normal at approximately 14.5 inches. The long-term average through such dry spells is anticipated to be above 17 inches per year.



## 2007 WATER RESOURCES STATUS

### CONSERVATION

#### **Conservation Programs**

Through comprehensive water resource management the Town of Payson continues to be a leader in Arizona in the area of water conservation measures. The continuation of Level II restrictions during 2006 and the conscientious efforts of our customers resulted in our lowest rate on record since 1983 for gallons per-capita day (GPCD) at 84, which is less than half the average GPCD or (gallons per person per day) value for Phoenix and the surrounding communities.

During the past year, many of Payson's water customers participated in the "WashSmart" washing machine replacement program. Local restaurants, schools and service cafeterias participated in the commercial kitchen "Pre-Rinse" sprayer replacement program. Both programs were designed to introduce high efficiency products for customer use to help in lowering water consumption.

In the coming year, the Payson Water Department plans to partner with Arizona Project Wet, a program of the University of Arizona's Water Resources Research Center, to offer a "Water Awareness Fair" for our local schools. The Water Department will also continue to offer free water saving devices and water audits. In addition, brochures are available at the Water Department offering information on reading your meter, detecting leaks, low water use landscaping, rainwater harvesting and the use of gray water. These and other information will be available in PDF format on the Town of Payson's website soon ([www.ci.payson.az.us](http://www.ci.payson.az.us)).

#### **Conservation Level**

Water conservation requirements pursuant to Resolution No. 1742 anticipate that Water Conservation Level requirements be enacted according to the deficit or surplus of precipitation that occurred in the twelve month period immediately preceding the annual water report. Additional, factors are also considered when setting the Water Conservation Level requirements for any given year.

Precipitation for Payson's water year of 2006-07 (April 06-March 07) was in the amount of approximately 16.3 inches. This amount is below the long-term average of 22 inches per year as referenced in conservation ordinances. The 16.3 inch value represents mild to moderate drought conditions in consideration of long-term precipitation variability.

In light of Payson's already low per-person (per capita) water use, It is determined that Water Conservation Level II is the appropriate measure to implement for the period of April, 2006 through May, 2007. It is anticipated that implementation of Level II water use limitations will continue to promote responsible water use and maintain water use below the target 89gpcd (per-person) level.

## 2007 WATER RESOURCES STATUS

### WATER DEMAND

Water demand for the 2006 year decreased a total average of 1% over 2005. Demand has remained relatively low for several years due to successful conservation efforts of the Water Department and the overall cooperation of the majority of its customers. However, maintaining conservation awareness remains important to ensure demands stay low as mild to moderate drought conditions still persist.

#### Water Consumption 2006

<b>Month 2004</b>	<b>Monthly Consumption</b>	<b>Percent Change From 2005</b>
Jan	39292400	15%
Feb.	36445200	6%
March	35970500	9%
April	38904600	-3%
May	56231500	16%
June	65082300	3%
July	58599300	-10%
August	55140500	-3%
Sept.	45767800	-22%
Oct.	44302800	-3%
Nov.	39630900	-2%
Dec	35217100	-9%
<b>Total Usage (gal)</b>	<b>550584900</b>	<b>-1%</b>
<b>Total Usage (ac/ft)</b>	<b>1689</b>	<b>-1%</b>
<b>Percent Safe Yield</b>	<b>63</b>	

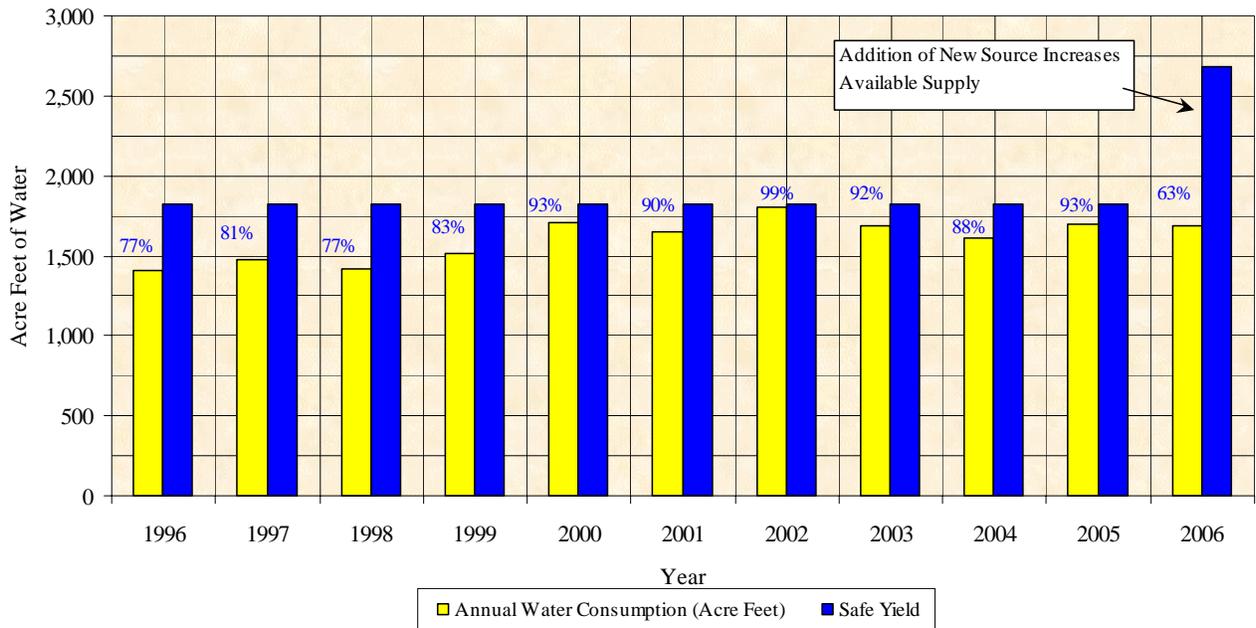
## 2007 WATER RESOURCES STATUS

### SAFE YIELD

#### Safe Yield Status

Safe Yield is a term commonly used to define the amount of groundwater that is naturally and artificially replenished via deep percolation of precipitation into the subject aquifer. In Payson, this value has been estimated to be 2,681ac-ft/yr for its well fields. The water supply has been increased through the expansion of the Town's well field to beyond its bounds. The value does not include artificial recharge or the now confirmed presence of a deep regional groundwater source. The 2,680ac-ft/yr "Safe Yield" is considered quite conservative and serves the Town of Payson well as a "Best Management" tool for its groundwater supplies. Therefore, so long as no more than 2,681ac-ft/yr of groundwater is consumed from within its well fields, the Town of Payson is within its long-term average "Safe Yield" or within its groundwater budget. In the year 2006, groundwater consumption decreased by 1% to 1,689ac-ft and represents 63% of the available groundwater supply.

**Town of Payson Annual Groundwater Consumption  
Since 1996 Relative to % of Safe Yield**



## 2007 WATER RESOURCES STATUS

### LONG-TERM OUTLOOK and PLANNING

#### Long-term Outlook

The Town of Payson Water Department has placed top priority on its efforts at working towards future deliveries of surface water from C.C. Craigin reservoir (Blue Ridge). The addition of surface water to the Town of Payson's water resources portfolio will foster a comprehensive water supply package that will include 1) Groundwater 2) Reclaimed water for groundwater recharge 3) Reclaimed water for non-potable irrigation uses, and 4) Surface water from C.C. Craigin reservoir (Blue Ridge). These resources, when collectively managed alongside sound growth policies, will ensure adequate water resources exist far into Payson's future. For example, assuming the water resources available to the Town of Payson above, the supply available would exceed that required for any reasonable build-out scenario as demonstrated by the long-term plan displayed in the table below. The importance of importing surface water from C.C. Craigin (Blue Ridge) can clearly be observed. With this conservative scenario in hand it is clear that the long-term water resources outlook is quite good assuming the successful completion of the surface water project and the application of best management strategies.

#### Water Resources Planning

