

# Report to the Consumer on Water Quality

January 1, 2005 - December 31, 2005

Este informe contiene información muy importante sobre su agua beber. Tradúzcalo ó hable con alguien que lo entienda bien.

Díí kwe'é naaltsoos hasht'eelyaayí 'éí nit haz'ánígi tó baa 'áháyáá dóó yá'át'éeéh óolzinígíí yaa halne'. Doo bik'i'dinitíhghóó da, t'áá háida ta' níká'doolwot dóó hazhó'ó yee nit ch'íhadoo'áát.



## From the Utilities Director

Dear Water Consumer,

*The winter of 2005 brought us a welcome reprieve from the grips of a sustained drought by filling our surface water lakes. But once again we are facing the uncertainty of weather patterns and water conservation is prudent and to everyone's best interest.*

### Water Acquisition

The citizens of Flagstaff approved a Water Bond in 2004 authorizing 15 million dollars for future water acquisition. The City of Flagstaff Utilities Department has since then negotiated the purchase of **Red Gap Ranch** (located approximately 40 miles east of Flagstaff adjacent to I-40).

The land purchase closed in December for \$7.9 million and provides an estimated potential groundwater resource of 10,000 acre feet (one acre-foot is the volume of water which will cover one acre to a depth of one foot and is equal to 325,851 gallons). The city currently uses 8200 acre feet per year, or about 7.3 million gallons per day.

The Department is continuing to research opportunities for securing future sources of water supply.

View from Red Gap Ranch



### Water Conservation

Last Fall, the Water Conservation Program in cooperation with the Arizona Department of Water Resources and the Flagstaff Unified School District hosted a community supported "Project WET - Water Festival" at Foxglenn Park.

This water education endeavor was attended by all fourth grade students within FUSD including charter and home school students. The City of Flagstaff extends their appreciation to the businesses and volunteers and teachers who contributed to the overall success of this event.



The Arizona Water Festivals are coordinated through the University of Arizona Water Resources Research Center Arizona Project WET program. Project WET, USA, with support of Nestle Waters, sponsors the "National Make a Splash with Project WET" effort with water festivals reaching over 52,000 students across the U.S., celebrating National Water Education Day.

Visit the Make a Splash with Project WET

website to learn more:

<http://www.projectwetuse.org/makeasplash.html>

### Arizona Rinse Smart

Another water conservation innovation being implemented in Flagstaff is a new water efficiency program for the restaurant industry.

The Arizona Rinse Smart project focuses on the replacement of high water use, low pressure pre-rinse spray valves with lower water use, higher pressure valves.

Pre-rinse spray valves are used to remove food particles from dishes and trays before they are placed within industrial dishwashers. The newer valves use half as much water and clean more efficiently than standard spray valves.



This water conservation partnership was developed to make water efficient technologies available to local businesses in cooperation with the Arizona Department of Water Resources, the U. S. Bureau of Reclamation and the City of Flagstaff – Utilities Department Water Conservation Program.

### Reclaim Water System

During 2005 the Reclaim Water Distribution system was expanded to include a pipeline east of Highway 89 to serve the Flagstaff Mall, extending to Railhead Avenue and reaching the Wildcat Hill WWTP.

The City of Flagstaff Water Conservation Office also successfully nominated SCA Tissue North America, for the 2005 Governor's Arizona Clean & Beautiful Award.

The nomination was based on the company's demonstration of environmental stewardship through the implementation of an innovative water conservation project using reclaimed water. The recycled paper manufacturing facility has been Flagstaff's second largest potable water user for many years before being converted to 100% reclaimed water 2005.

This conversion effort is now the City's largest industrial water conservation project resulting in a potable water savings of more than 100 million gallons per year. An additional benefit is achieved through the wastewater treatment process. Wastewater from the paper mill is treated by the Rio de Flag WRP and then sent back to the paper mill fulfilling almost 70% of the mill's reclaimed water demand.

This impressive closed loop system is an excellent example of an "Industrial Conservation Innovator" and a water conservation effort that the City of Flagstaff is very proud of.

### Water Production

Currently Upper Lake Mary is near 50% capacity. During 2005 a full reservoir (Upper Lake Mary) facilitated the reduction of ground water pumping from the Lake Mary and Woody Mountain wellfields to allow for aquifer recharge.

Your water utility continues to strive for excellence and promote wise water usage through education, awareness and resource conservation.

Water Quality is always of paramount importance and I am pleased to present you the 2005 City of Flagstaff *Report to the Consumer on Water Quality*. This annual report outlines where your drinking water comes from, how it is treated, and the results of tests performed on the quality of Flagstaff drinking water. Additionally, as mandated by the U.S. Environmental Protection Agency, this report informs you of contaminant levels in your drinking water, as well as violations incurred last year, among other important health information.

Thank you.

**Ron Doba**

Director, Utilities Department



## Water Production

Water Production Source	Water Production (MG) 2005	Water Production (MG) 2004	% Of Last Year
Lake Mary Surface Water	1195.976 Million Gallons	290.281 Million Gallons	Up 412%
Lake Mary Wellfields	361.190 Million Gallons	721.185 Million Gallons	Down 50%
Woody Mountain Wellfields	578.582 Million Gallons	1181.494 Million Gallons	Down 48%
Inner Basin North RFP	214.535 Million Gallons	65.363 Million Gallons	Up 328%
Local Wells	308.084 Million Gallons	426.376 Million Gallons	Down 72%
<b>Total Production</b>	<b>2658.367 MG</b>	<b>2687.997 MG</b>	<b>98%</b>
<b>Population Base</b>	<b>62,718</b>	<b>Per Capita (Gallons Per Day)</b>	<b>117 GPD</b>

## Flagstaff Watering Schedule

*Water customers are reminded of the year-'round "water conservation strategies" which require alternating watering schedules.*

Even Addresses	Odd Addresses
Addresses ending in 0, 2, 4, 6, 8	Addresses ending in 1, 3, 5, 7, 9
<u>Please Water on</u> Wednesday Friday Saturday	<u>Please Water on</u> Tuesday Thursday Saturday

## Consumer Confidence Report – 2005

### Do I Need to Take Special Precautions?

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 from infections.

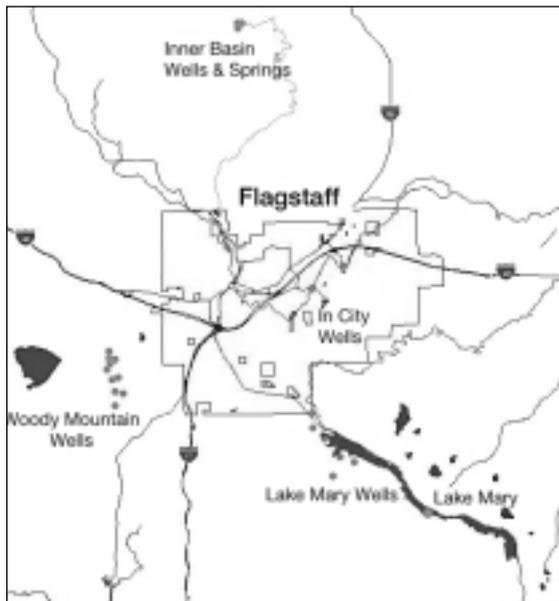
People with these conditions should seek advice about drinking water from their health care providers. EPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Water Drinking Hotline (800-426-4791).

### Where Does My Water Come From?

In 2005 the Utilities Department distributed approximately 2.658 billion gallons of water to Flagstaff water customers. Total water production was down .10 % over last year.

The Department finds that conservation programs have been effective with reducing summer peak demands, and year around watering restrictions are complied with by the community. The citizens of Flagstaff are to be commended for their compliance with our water use restrictions.

The City of Flagstaff is supplied by surface water from Upper Lake Mary and the Inner Basin of the San Francisco Peaks. We also pump groundwater from the Woody Mountain Wellfield, Lake Mary Wellfield, and



other Local Wells, which tap the Coconino and Supai Aquifers.

These sources blend in the water distribution system and the amount of water coming from each source varies throughout the year.

## Source Water Assessment and Its Availability

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 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:** Viruses, bacteria, and protozoan, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife. Microbial contaminants can cause short-term effects such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with compromised immune systems.

**Inorganic Contaminants:** Salts and metals, which can be naturally occurring or result from urban storm runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming. Certain inorganic contaminants consumed at levels in excess of the maximum contaminate level (MCL) may result in skin damage, circulatory problems, liver problems, kidney damage, and increased risk of cancer.

**Pesticides and Herbicides:** Which may come from a variety of sources such as agriculture, stormwater runoff, and residential uses. Pesticides and Herbicides consumed at levels greater than the required MCL may result in increased risk of blood problems, reproductive difficulties, kidney and liver damage, and increased risk of cancer.

**Synthetic and Volatile Organic Chemical Contaminants:** Which are by-products of industrial processes and petroleum production, and can also

come from gas stations, urban storm-water runoff and septic systems.

**Radioactive Contaminants:** Which can be naturally occurring or be the result of oil and gas production and mining activities. Radioactive contaminants may result in an increased risk of getting cancer.

In order to ensure that tap water is safe to drink, the Environmental Protection Agency prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

## ADEQ - Source Water Assessments:

Based on a mandate set forth in the 1996 amendments to the Safe Drinking Water Act, ADEQ evaluated each water source used by public water systems in Arizona.

These evaluations assessed the hydrogeology of drinking water sources to determine the quality of groundwater being drawn into wells, evaluated the watersheds supplying surface water, and surveyed land use activities occurring near drinking water sources.

This information is now used to determine the degree to which a public drinking water source is protected from, or at risk of, contamination. It is also used to assist local communities in implementing source water protection measures.

Adjacent land uses within a specified proximity to a drinking water source, or the designated source water assessment area, can now be evaluated by ADEQ to determine if they are in fact posing a contamination risk.

ADEQ has compliance information (occurrence data) on all public water systems in Arizona as well as many of the land uses found within drinking water source water assessment areas.

Because of this customized approach in studying each individual system, the source water assessment reports allow for better protection of drinking water and allow ADEQ to tailor monitoring requirements specific to each system where appropriate.

For example, if a water system has no history of contamination by a particular chemical, as well as no potential for future contamination (based on land use practices and the risk they might pose to water sources), then monitoring relief or reduced monitoring for that chemical may be granted for that system.

Another water system with a history of problems or the potential for contamination with the same chemical would still be required to monitor for that substance.

ADEQ is confident that these assessments and the related source water protection activities are instrumental in preserving drinking water safety.

Arizona's Source Water Assessment Plan  
<http://www.azdeq.gov/envirom/water/dw/download/swapplan.pdf>

To review Source Water Assessment Reports for public water systems visit:  
<http://www.azdeq.gov/envirom/water/dw/swap.html>

## Why Are There Contaminants In My Drinking Water?

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 water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's (EPA) Safe Drinking Water Hotline (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: 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, which 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 by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems; and radioactive contaminants, which 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, EPA prescribes regulations that limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water which must provide the same protection for public health.

## Monitoring and Reporting of Compliance Violations

The city is required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards.

During the following time periods continuous monitoring of individual filters was compromised by technical data transmission and equipment problems and therefore we cannot be sure of the quality of your drinking water during that time. However, received data from the combined filter turbidimeters indicated turbidity readings within acceptable limits.

Turbidity is a continuously monitored water quality parameter and is a measure of the cloudiness of the water. We are required to monitor individual and combined filter effluents for turbidity.

There were four monitoring violations in 2005.

These four violations were for turbidity monitoring.

<u>Date</u>	<u>Filter Number</u>	<u>Location</u>
1/31/2005	Filter No. 4	Lake Mary WTP
4/11/2005	Filter No. 1, 2, 3, 4	Lake Mary WTP
8/13/2005 through 8/17/2005	Filter No. 1 Filter No. 2	North Reservoirs Filtration Plant

The maximum time elapsed for an individual occurrence was 92 hours, 43 minutes.

The Water Production Division's supervisory control and data acquisition (SCADA) system is used to automatically store and retrieve turbidity readings from individual filters and the combined filter effluent.

In all three incidents our automatic trending system within our Supervisory Control and Data Acquisition (SCADA) failed to trend the data. The Water Production Division is implementing operational procedures and a "call out alarm system" so that "manual testing" will be performed in the event of future occurrences. The January 31, 2005, monitoring violation was inadvertently not reported within the 12 month time requirement.

There are several safeguards, which provide additional levels of protection to predict water quality beyond the filters. These include an ultra violet disinfection process and chlorine disinfection and contact time within the plant clearwells.

## Additional Information for Arsenic

While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. 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.

## Drinking Water Regulations

**Haloacetic Acids:** Haloacetic acids are disinfection by-products that are formed when chlorine is used as the disinfectant. These compounds can increase the risk of cancer, and became regulated as of January 1, 2002 with a MCL of 0.060 mg/L.

**Maximum Residual Disinfection Level (MRDL):** Regulations for Maximum Residual Disinfection Level set a maximum limit for the running annual average MRDL at 4.0mg/L for chlorine.

**TOC Removal Requirements:** Total organic carbon (TOC) removal is accomplished through enhanced coagulation or enhanced softening.

Regulations require a 50% TOC removal when the raw water TOC concentration is >8mg/L and alkalinity is <60mg/L. Violations occur when the ratio of the amount of actual TOC removal divided by the required amount of TOC removal is <1.

**Turbidity:** The Individual Filter effluent shall not exceed 1 NTU in two consecutive measurements 15 minutes apart, and shall not exceed 0.5 NTU in two consecutive measurements 15 minutes apart after 4 hours of continuous operation.

## How Do I Get Involved?

It is the obligation of the Utilities Department to provide a safe and adequate supply of drinking water. To help please our customers and meet our obligation, the Utilities Department strongly encourages public input and community participation on decisions affecting your water resources.

Regular Flagstaff Water Commission meetings are held the third Thursday of each month. Meeting locations are posted on the official City bulletin board at City Hall. Meetings begin at 4:00 PM and you are always welcome.

**Drinking Water, Continued on page 19.**

## City of Flagstaff 2005 Water Quality Table

### What Does the Water Quality Table Mean?

The table shows the results of our water-quality analyses. Every regulated contaminant that we detected in the water, even in minute traces, is listed here.

**The Utilities Department conducted 1590 tests for 117 contaminants in 2005.**

The information in the following table only addresses detected contaminants. We have chosen not to report information for contaminants tested for and not detected (except for mercury due to public interest).

The table contains the name of each substance, the highest level allowed by regulation (MCL), the ideal goals for public health, the amount detected, the usual sources of such contamination, footnotes explaining our findings, and a key to units of measurement.

### Water Quality Table Unit Descriptions

<u>Term</u>	<u>Definition</u>
ppm	parts per million, or milligrams per liter (mg/L)
ppb	parts per billion, or micrograms per liter (µg/L)
pCi/L	picocuries per liter (a measure of radioactivity)
NTU	Nephelometric Turbidity Units. Turbidity is a measure of the cloudiness of the water. We monitor it because it is a good indicator of the effectiveness of our filtration system.
NA	not applicable
ND	Not detected
NR	Monitoring not required, but recommended.
% positive samples/month	Percent of samples taken monthly that were positive

### Important Drinking Water Definitions

<u>Term</u>	<u>Definition</u>
MCLG	Maximum Contaminant Level Goal: 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.
MCL	Maximum Contaminant Level: 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.
TT	Treatment Technique: A required process intended to reduce the level of a contaminant in drinking water.
AL	Action Level: The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
MRDLG	Maximum residual disinfection level goal. 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.
MRDL	Maximum residual disinfectant level. 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.
MNR	Monitored Not Regulated
MPL	State Assigned Maximum Permissible Level

**Variations and Exemptions:** State or EPA permission not to meet an MCL or a treatment technique under certain conditions.

### For more information please contact:

John Davison  
211 W. Aspen  
Flagstaff, AZ 86001  
928-779-7685 x4838

# Water Quality Data Table

The table below lists all of the drinking water contaminants we detected that are applicable for the calendar year of this report. The presence of contaminants in the water does not necessarily indicate that the water poses a health risk. Unless otherwise noted, the data presented in this table is from testing done in the calendar year of the report. The EPA or the State requires us to monitor for certain contaminants less than once per year because the concentrations of these contaminants do not change frequently.

Contaminants	MCLG or MRDLG	MCL TT or MRDL	Your Water	Range		Sample Date	Violation	Typical Source
				Low	High			
<b>Disinfectants &amp; Disinfection By-Products</b>								
Chlorine (asCl <sub>2</sub> ) (ppm)	4	4	0.59	0.02	1.32	2005	NO	Water additive used to control microbes
Haloacetic Acids (HAA5) (ppb)	NA	60	54.12	<0.002	120	2005	NO	By-product of drinking water chlorination
Total Organic Carbon (% Removal)	NA	TT	50	NA		2005	NO	Naturally present in the environment
TTHMs [Total Trihalomethanes] (ppb)	NA	80	49.32	<0.0005	120	2005	NO	By-product of drinking water disinfection
<b>Inorganic Contaminant</b>								
Arsenic (ppb)	0	50	5.6	1.1	5.6	2003	NO	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes.
Barium (ppm)	2	2	0.91	0.0044	0.91	2003	NO	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits.
Chromium (ppb)	100	100	3.1	<1	3.1	2003	NO	Discharge from steel and pulp mills; Erosion of natural deposits.
Copper - source water (ppm)		MPL	0.0089(MPL)		0.0089	2005	NO	Corrosion of household plumbing systems; Erosion of natural deposits.
Flouride (ppm)	4	4	0.12		0.12	2003	NO	Erosion of natural deposits; Water additive which promotes strong teeth; Discharge from fertilizer and aluminum factories.
Lead - source water (ppm)		MPL	0.0008(MPL)	0.0061	0.00083	2005	NO	Corrosion of household plumbing systems; Erosion of natural deposits
Nitrate [measured as Nitrogen] (ppm)	10	10	2.3	<0.100	2.3	2005	NO	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits.
Sodium (optional) (ppm)		MPL	16	2.5	16	2003	NO	Erosion of natural deposits; Leaching.
<b>Microbiological Contaminants</b>								
Total Coliform (% positive samples/month)	0	5	1.4	NA		2005	NO	Naturally present in the environment.
Turbidity (NTU) 98% of the samples were below the TT value of 0.3. A value less than 95% constitutes a TT violation. The highest single measurement was 0.99. Any measurement in excess of 1 is a violation unless otherwise approved by the state.						2005	NO	Soil Runoff
<b>Radioactive Contaminants</b>								
Alpha emitters (pCi/L)	0	15	3.6	1	3.6	2005	NO	Erosion of natural deposits
Radium (combined 226/228) (pCi/L)	0	5	0.3	1	0.5	2005	NO	Erosion of natural deposits
<b>Contaminants</b>								
Contaminants	MCLG	AL	Your Water	Sample Date	# Samples Exceeding AL	Exceeds	Typical Source	
<b>Inorganic Contaminants</b>								
Copper - action level at consumer taps	1.3	1.3	0.11	2004	0	NO	Corrosion of household plumbing systems; Erosion of natural	
Lead - action level consumer taps (ppb)	0	15	2.5	2004	0	NO	Corrosion of household plumbing systems; Erosion of natural	
<b>Undetected Contaminants</b> The following contaminants were monitored for, but not detected in your water.								
Contaminants	MCLG or MRDLG	MCL or MRDL	Your Water	Violation	Typical Source			
<b>Inorganic Contaminants</b>								
Mercury [Inorganic] (ppb)	2	2	ND	NO	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland			

Drinking Water, Continued from page 21.

Copies of this report are available at the  
**Utilities Administration Office**  
**City Hall, 211 West Aspen Avenue**  
**Flagstaff, AZ 86001**  
 or on our web site at:  
[www.flagstaff.az.gov](http://www.flagstaff.az.gov)

Water quality data for community water systems throughout the United States is also available at:

Environmental Protection Agency Website -  
 Local Drinking Water Information

<http://www.epa.gov/safewater/dwinfo/index.html>

**Thank you for reading this important information on your water's quality.**

**We'll be happy to answer your questions about the City of Flagstaff's water supply.**

#### Water Quality Information

Jack Rathjen, Water Production Supervisor  
 Lake Mary Water Treatment Plant  
 (928) 774 - 0262

#### Consumer Confidence Report Information

John Davison, Program Assistant  
 Utilities Administration  
 (928) 779 - 7685 x4838

## Bureau of Reclamation Presents Water Conservation Award To City



*Left to right: Mayor Donaldson, Water Conservation Manager Adam Miller, and Utilities Director Ron Doba, receive the 2005 Lower Colorado Region Water Conservation Field Services Program Award from Robert Michaels, Chief of the Program Development Division, Phoenix Area Office, Bureau of Reclamation.*

The Bureau of Reclamation has presented the 2005 Lower Colorado Region Water Conservation Field Services Program Award to the City of Flagstaff.

Robert Michaels of the Phoenix Area Office presented the award to Flagstaff Mayor Joseph C. Donaldson and to Adam Miller, head of the Water Conservation Office, during a brief ceremony in City Hall's council chamber on February 13.

"Your city's proactive approach to water conservation and willingness to try new and innovative programs is making your city a leader in water conservation in Arizona," Michaels said. "Your and your council's support of water conservation programs is greatly appreciated."

Flagstaff's water conservation program has been active since 2003 and includes water reuse, rebates for xeriscape conversions and other low

water use products, an inverted rate structure, and a strict water conservation ordinance.

This past year, Flagstaff volunteered as one of the pilot areas for the new Arizona Rinse Smart program. Older model pre-rinse spray heads will be replaced at local food service establishments by new units, each of which will save up to 50,000 gallons of water per year.

Reclamation also recognized Ron Doba, Utilities Director, for his vision and foresight in creating Flagstaff's water conservation program as well as being instrumental in the creation of the reclaimed water program.

The Water Conservation Field Services Program Award recognizes federal water users and partners for their innovative and effective water conservation programs.

— Source: Bureau of Reclamation  
<http://www.usbr.gov/>

