

# **Water Conservation Plan**

**City of Douglas  
Douglas Water System  
Groundwater Permit #034-001**

January 24, 2005

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## I. Purpose

The water that we drink is our most valuable natural resource. Not many of us would survive more than two or three days without water. All of the water presently on our planet has always been here. We cannot make more. For this reason, it is necessary that we take steps to guarantee that our current water sources will be available for use by future generations.

In the past, the need for additional water was met by drilling another well or upgrading pumping and supply facilities. This practice was acceptable for many years due to the fact that we are blessed with an excellent water source in our area. However, we now realize that an abundant water supply is not necessarily an infinite water supply. As a result of increased usage and several years of low rainfall, the water levels in our wells were at record lows during the summer of the year 2000.

The federal and state governments realize that something must be done to encourage all of us to use our water resources more efficiently. Many laws have been passed in the last twenty years to help ensure a sufficient quantity of safe, reliable drinking water for everyone for the future.

The secret to the guarantee of long term water supply is the conservation of existing water sources on the local level. Water conservation can help a community make it through short-term water shortages, reduce operating costs and the need for capital expenditures on the discharge end of the system.

The above benefits of a water conservation program reduce many costs associated with the water supply industry. This will result in lower water rates to the consumer. About twenty-five percent of the water we use inside the home is heated. Therefore, if the consumer can find a way to use less water inside the home, then there will be substantial energy cost savings to the consumer. Water conservation benefits everyone.

Although water conservation is a good idea for the community as a whole, not everyone can be expected to participate on a simply voluntary basis. Many consumers will need to be given information regarding activities that can reduce their water use. Other consumers may be hesitant to participate in such activities or to change daily habits that lead to water waste. Therefore, there must be practical guidelines in place to conserve water and penalties for failure to follow these guidelines. The success of a water conservation program is dependent upon public education, involvement of water system employees, and support from local leadership.

## II. Responsibility

The Rules of Georgia Department of Natural Resources, Environmental protection Division, Chapter 391-3-2 includes rules and guidelines for Groundwater Use (Amended F. April 3, 1990; Eff. April 23, 1990). In these rules it is required for all permit holders of new or modified permits to submit to the Director for approval a Water Conservation Plan. Section 391-3-2-.04-(11) lists guidelines and items to be addressed by the Water Conservation Plan.

Permit #034-0001 could require a request for modification. All modifications require that a Water Conservation Plan be submitted to the GA EPD as indicated in the above mentioned rules.

As indicated by the water restrictions imposed statewide on June 14, 2000, there are growing concerns regarding water supply sources in Georgia. Water Conservation is an idea no longer limited to arid regions of the world.

The responsibility of conserving the water resources available to us does not belong to the federal and state governments alone. Conservation can only be accomplished by the participation of each individual consumer. Local governments must begin this process by assessing the needs of the community and encouraging customers to use water wisely.

### III. System Management

Unaccounted for Water (UAW) means the difference between the total amount of water pumped into the water system from the sources(s) and the amount of metered water use by customers of the water system expressed as a percentage of the total water pumped into the system. UAW generally includes system leakage and unmetered uses such as fire fighting, flushing, broken water mains, etc. GA EPD considers ten percent or less UAW to be an acceptable level.

We must learn how much of the UAW is lost in the distribution system due to leakage. A Water Audit needs to be performed to determine how much of the UAW is due to system leakage. All services are metered; therefore we should be able to get sound information to evaluate. The basic steps of a Water Audit include:

1. Testing meters (supply & customer) for accuracy
2. Repair or replace inaccurate meters
3. Determine amount of authorized, unmetered water use
4. Evaluate the need for leak detection and repair program

The amount to be invested in a leak detection program depends on available resources and the amount of water lost as a result of leakage. If the water audit shows a large amount of "lost" water, it may be cost effective to institute aggressive leak detection and repair program.

A leak detection program would require at least two people with maps, pipe and valve locators, and some type of leak detection device. This crew should be responsible for surveying at least 25 percent of the water system each year. This would allow the whole system to be inspected every four years. However, problem areas will probably need to be checked more frequently.

Even if a leak detection program is not found to be necessary, the water audit should be an ongoing process of self-inspection. The water audit will require cooperation from all departments, specific record keeping, updating of information, and regular maintenance schedules. Special care must be taken to ensure that information used in the water audit is accurate.

Customer meters are currently tested on schedules as follows:

- 3" and larger—Annually
- 1" through 2"—Every 5 years
- ¾"—Damaged, No Registration, Customer Request, Inactive

The City of Douglas also operates a meter repair shop. Many meters simply need to be taken apart, cleaned, and put back into service. Several larger meters (3" and larger) have been repaired in the field with little or no interruption of service.

The City of Douglas is currently installing a radio read meter reading system. All meters will be changed or retrofitted in the next five years. This will result in all meters being new or verified for accuracy.

The City of Douglas is currently seeking proposals for a new telemetry SCADA system to be installed at the Water Plant to monitor supply meters, pumps, and tank levels. This SCADA system is equipped with controls and indicators that will prevent tank overflows and/or notify appropriate personnel in the event of an overflow.

Water distribution maps are constantly updated as new projects are completed. As builds and valve cards are supplied and filed after updates to maps are made. Discrepancies are corrected as they are discovered.

The Douglas Fire Department flow tests hydrants twice per year. This is an important function and needs to continue. However, in some parts of the system (especially areas served by old cast iron mains) customers experience problems due to discoloration of water. This often leads to further flushing of water lines. We need to consider possible solutions to this problem such as replacement of mains, chemical addition for corrosion prevention, or changes in procedures.

The City of Douglas currently has an ordinance preventing unauthorized use of fire hydrants and other city water service components. There are penalties for violations including fines for such actions.

#### **IV. Treatment Plant Management**

These meters work by measuring differential pressure between two ports tapped off of the venturi. The supply meters on existing wells are either venturi flow meters or propeller meters equipped with 4/20 milliamp out put by manufactured water specialties.

It is absolutely necessary that all supply meters register accurately to guarantee good information in determining UAW and pump efficiencies. The City of Douglas has these meters tested annually.

As stated earlier, the new SCADA system soon to be completed is equipped with controls and indicators to prevent tank overflows and /or notify appropriate personnel in the event of an overflow.

## V. Water Rates

The City of Douglas of course, generates revenue to operate the water system by Charging fees to customers for water used. These fees influence the city's income, determine patterns of usage, and affect the public's perception of the fairness of system management policies. Water fees are based on a cost per thousand gallons of water used. Perhaps even more important than determining a rate per unit price for water is the selection of suitable price structures. A few examples are listed below:

**Flat Rate.** This structure charges each customer a fixed sum per customer regardless of water used. This sum is usually based on size of service line or class of user. It does not provide any incentive to conserve, and is likely to encourage waste. Flat Rate is usually used in systems where meters are not in place.

**Decreasing Block Rate.** A series of block prices decrease as the quantity of water use increases. The City of Douglas and many other utilities use this structure. It is usually applied in communities have large-volume users (business and industry) to help maintain a stable economic base. Decreasing blocks do not encourage water conservation. Many consumers consider it unfair because low-volume users pay the highest rate.

**Increasing Block Rate.** A series of block prices increase as the quantity of water use increases. It encourages conservation. This structure is considered unfair to large users, because their water-use efficiency is not reflected in lower rates. It is not used often.

**Uniform Block Rate.** All users pay the same rate per unit of water, regardless of the amount used. This structure is being increasingly used by utilities. Both small and large users generally consider this to be a fair practice, and it encourages conservation.

**Seasonal or Summer Surcharge.** Price per unit increases sharply during summer's peak demand period. Peak rates usually apply to amounts exceeding average winter use. Those who cause the peak demand pay for it. This structure is being used increasingly. Both small and large users consider it fair and it encourages conservation.

**Life-Line Rates.** A low price is set for minimum use of necessary water by low- and-fixed-income customers that cannot afford high prices. Even though it is rarely used, life-line rates might help to reduce average use among these customers.

There are other structures for determining how much individual customers should pay for water service. This area of water system management should be examined thoroughly to ensure dependable, affordable water service for the future. Conservation and fair billing practices will guarantee that the water system remains self-supporting while providing uninterrupted service to its customers.

## VI. Emergency Water Shortage Plan

A water shortage can affect any water system at any time. Equipment failure, line breaks in the distribution system, rapid community growth, and drought, are a few examples of problems that can inhibit the flow of water to customers. There must be foresight into these situations. It is necessary to have a plan of action to prevent these situations, minimize the effect of them, or work together to survive them.

It may be necessary to restrict some water uses during water shortages. Therefore, it is necessary to establish water use priorities within the community. The following order is recommended:

1. Emergency facilities for essential life support measures;
2. Domestic and personal uses, including drinking, cooking, washing, sanitary, and health related;
3. Farm uses;
4. Industrial uses (including those industries on public water systems);
5. Other uses such as lawn sprinkling, non commercial car washing, garden watering, etc.;
6. Outdoor recreational uses;

Some situations affecting water availability are more serious than others. Guidelines to determine the severity of each problem or potential difficulty need to be established. Some indicators to use are:

- Well levels
- Percent of permitted water pumped
- Pump or well out of service

These indicators can be used to determine the level of conservation activities necessary. Appropriate management decisions can be made to decide which



categories of usage need to be restricted or prohibited. According to Ordinance No. \_\_\_\_\_, the City Commission has the authority to enact necessary measures in response to supply system conditions. Some examples of indicators and activities are on the following pages:

### **Conduction 1: Water Shortage Watch**

Indicators: Drop in static water levels.  
Water Pumped greater than 80% of permitted withdrawal.  
One or more wells being out of service.  
State issued water restrictions.

In response to any or the above conditions or a combination of any of the above conditions, the City Commission may implement necessary water conservation measures can include one or more of the following sets of guidelines depending upon the number of indicators involved or effectiveness of initial restrictions.

#### **Level 1a: Voluntary Restrictions**

- Be water use conscious.
- Weekends: No use of outside water.
- Weekdays: No use of outside water from 4:00 p.m. to 9:00 p.m.
- Reduction of water use through education of public by press, radio, TV, direct mail, etc.
- Exemptions: Business uses, including golf course greens, and home flower and vegetable gardens.

#### **Level 1b: Voluntary Restrictions**

- Be water use conscious
- Weekends: No use of outside water.
- Weekdays: No use of outside water from 4:00 p.m. to 9:00 p.m. for anyone. No use of outside water at other times except on odd-numbered days by houses with odd-numbered addresses.
- Reduction of water use through education o public by press, radio, TB, direct mail, etc.
- Exemptions: Business uses, including golf course greens, and home flower and vegetable gardens.

#### **Level 2: Mandatory Restrictions**

- Be water use conscious.
- Weekends: No use of outside water.
- Weekdays: No use of outside water from 4:00 p.m. to 9:00 p.m.

- Reduction of water use through education of public by press, radio, TV, direct mail, etc.
- Exemptions: Business uses, including golf course greens, and home flower and vegetable gardens.

**Level 3a: Mandatory Restrictions**

- Be water use conscious.
- Weekends and weekdays: No use of outside water from 4:00 p.m. to 9:00 p.m. for anyone.
- No use of outside water at other times except odd-numbered days by houses with odd-numbered addresses and on even-numbered days by houses with even-numbered addresses.
- Reduction of water use through education of public by press, radio, TV, direct mail, etc.
- Exemptions: Business uses, including golf course greens, and home flower and vegetable gardens.

**Condition 2: Water Shortage Warning**

Indicators:     Significant drop in static water levels (10%)  
                           Water pumped greater than 90% of permitted withdrawal

In response to any one of the above conditions or a combination of any of the above conditions, the City Commission may implement necessary water conservation measures. These measures can include one or more of the following sets of guidelines depending upon the number of indicators involved or effectiveness of initial restrictions.

**Level 3a: Mandatory Restrictions**

- Be water use conscious.
- Weekends and weekdays: No use of outside water from 4:00 p.m. to 9:00 p.m. for anyone
- No use of outside water at other times except odd-numbered days by houses with odd-numbered addresses and on even-numbered days by houses with odd-numbered addresses.
- Reduction of water use through education of public by press, radio, TV, direct mail, etc.
- Exemptions: business uses, including golf course greens, and home flower and vegetable gardens.

### **Level3b: Mandatory Restrictions**

- Be water use conscious.
- Weekends: No use of outside water.
- Weekdays: No use of outside water from 4:00 p.m. to 9:00 p.m. No use of outside water at other times except odd-numbered days by houses with odd-numbered addresses and on even-numbered days by houses with even-numbered addresses.
- Reduction of water use through education of public by press, radio, TV, direct mail, etc.
- Exemptions: Business uses, including golf course greens, and home flower and vegetable gardens.

### **Level 4: Mandatory Restrictions**

- No use of outside water.
- Be water use conscious.
- Reduction of water use through education of public by press, radio, TV, direct mail, etc.
- Exemptions: Business uses including golf course greens, and home flower and vegetable gardens.

### **Condition 3: Water Shortage Emergency**

Indicators: Drastic drop in static water levels (10%)  
Water Pumped is greater than 95% of permitted withdrawal

In response to any one of the above conditions or a combination of any of the above conditions, the City Commission may implement necessary water conservation measures. These measures can include one or more of the following sets of guidelines depending upon the number of indicators involved of effectiveness of initial restrictions.

### **Level 4: Mandatory Restrictions**

- No use of outside water.
- Be water use conscious.
- Reduction of water use through education of public by press, radio, TV, direct mail, etc.
- Exemptions: Business uses, including golf course greens, and home flower and vegetable gardens.

### **Level 5: Mandatory Restrictions**

- No use of outside water.
- Be water use conscious.
- Reduction of water use through education of public by press, radio, TV, direct mail, etc.
- Exemptions: Business uses only for food and drink production and for essential health uses.

### **Level 6: Mandatory Restrictions**

- No use of outside water.
- Be water use conscious.
- Reduction of water use through education of public by press, radio, TV, direct mail, etc.
- Exemptions: Essential health uses only.

Enforcement shall be by the City police personnel and water department personnel, and may consist of warnings, fines of not less than one hundred dollars (\$100.00) to not more than two hundred fifty dollars (\$250.00) for each offense, or discontinuance of water service by removal of water meter and payment and reinstallation of meter charges of one hundred dollars (\$100.00) or any combination of the foregoing.

## VII. Plumbing

The City of Douglas has adopted and enforces the International Plumbing Code which includes the following maximum flow rates for plumbing fixtures:

- Water Closets—1.6 gallons per flushing cycle
- Urinals—1.0 gallons per flushing cycle
- Shower Heads—2.5 gallons per minute
- Lavatories—2.2 gallons per minute
- Sink Faucets—2.2 gallons per minute

## VIII. Education Programs

The City of Douglas conducts an open house at the Water Treatment Facility during Water Week. Literature regarding water conservation is distributed to and discussed with visitors. Tours for school groups are conducted at various times during the year. Conservation literature is also distributed and discussed during these tours.

Other tools available to educate the public are the media, bill inserts, newsletters, bumper stickers, public meetings, and public workshops. Seminars could be conducted enlisting volunteers such as plumbers, lawn care professionals, or other specialists to share information with people regarding water uses. Visits to school classrooms could be used to educate a new generation of “