



# WATER CONSERVATION PLAN

Crowley Public Works Department  
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# WATER CONSERVATION PLAN FOR THE CITY OF CROWLEY

## Summary

The City of Crowley Water Department serves more than 12,000 residents in 2013 and this population is expected to grow to more than 30,000 by the year 2050. The Water Department currently purchases treated water from the City of Fort Worth and provides water to Crowley residents through a City maintained water distribution system. Crowley also has 7 wells.

The treated water the City of Crowley purchases from Fort Worth comes from the Tarrant Regional Water District (TRWD). This water is from four major sources:

1. The West Fork of Trinity River via Lake Worth, Eagle Mountain Lake, and Lake Bridgeport;
2. Clear Fork of Trinity River via Lake Benbrook (a pipeline connects Lake Benbrook with Rolling Hills Water Treatment Plant to supplement supply to that plant.);
3. Pumped from Cedar Creek Reservoir located approximately 75 miles southeast of Fort Worth; and,
4. Pumped from Richland Chambers Reservoir located approximately 75 miles southeast of Fort Worth (primary source of the City of Crowley's water).

In order to protect these sources and extend their useful life, it is necessary to examine water use practices and educate the public about ways in which to reduce overall water use. It is also necessary to set goals and outline methodologies with which to achieve those goals.

This Water Conservation Plan identifies water conservation goals and explains conservation practices that will help protect long-term water supplies for the City of Crowley, and its customers. For the benefit of regional governmental constancy this plan is based on the City of Fort Worth's Water Conservation Plan. This Plan includes information required by the Texas Commission on Environmental Quality (TCEQ) for Water Conservation Plans as well as information specific to the City of Crowley water distribution system.

## Section 1: Objectives

In the Texas Water Code, water conservation is defined as follows:

- a. The development of water resources; and,
- b. Those practices, techniques, and technologies that will reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.

Based upon these concepts of water conservation, the City of Crowley's objective is to implement a Water Conservation Plan, which will protect the quality of the raw water supplies and reduce per capita usage. This can be accomplished by increasing water use efficiency, thereby reducing water demands without adversely affecting population and economic growth potentials to its customers. The development of additional water supplies to meet the City's water needs will be done as joint projects with the City of Fort Worth and TRWD. The principal objective of this Plan is to set guidelines for the promotion and publicity of water conservation methods that can be used by retail customers served from the City's water supply system to reduce their daily water use. It also outlines methods within the City's government, which can reduce water losses. If effective and subscribed to by the City and the general population, these methodologies may result in the following:

1. Reduce average daily water demands;
2. Lower peak season water use; and,
3. Delay the time at which additional raw water supplies will be needed.

In reference to emergency demand management, procedures to reduce water use and manage water supplies in the event of severe drought or other emergencies are found in the City's Emergency Water Management Plan.

## Section 2: Conservation Overview

The Crowley Water Conservation Plan recognizes that the City is a participant in a regional water supply system, and that water conservation requires a region-wide approach. The City of Crowley is required through its wholesale water contract with the City of Fort Worth to implement "the same rationing, conservation measures or restrictions to the use of water," and water conservation plans, as those implemented by Fort Worth.

<sup>1</sup>VACT, Section 17.001 (23) (A) and (B).

## Water Use Summary

Water use is typically expressed in gallons per capita/per day (gcpd). This number is generally the average annual water use expressed in a per day total divided by the population of the service area. It is typically greater than the general person actually uses in any given day themselves. Water use statistics include all water use which can be attributed to a population and may include:

Household use (cleaning, cooking etc.)	Commercial outdoor water use
Residential landscaping	Industrial/manufacturing use
Vehicle washing	Schools, churches, institutions
Recreation	Fire protection
Workplace water use	Public area use
Commercial indoor water use	Municipal government use

Efforts at conservation in water use must affect all these areas possible in order to accomplish a measurable and significant reduction over time.

### 2.1 General Methods of Conservation

There are many ways to accomplish conservation and the practices are not new. In fact, some significant conservation efforts have been made throughout the State of Texas through the plumbing fixture modifications. The State Code which affected this change is described below. Other conservation efforts are focused at appliance efficiencies, reduction in landscape use, and the modification of personal behaviors.

### 2.2 Plumbing Code Requirements

The 1991 Texas Legislature passed Senate Bill 587 which established minimum standards for plumbing fixtures sold with in Texas<sup>2</sup>. The Bill, effective January 1, 1992, allowed until January 1993 for wholesalers and retailers to clear existing inventories of pre-standards plumbing fixtures. The standards for all new plumbing fixtures, as specified by Senate Bill 587, are as follows:

<u>Fixture</u>	<u>Standard</u>
Wall Mounted Flush meter Toilets.....	2.00 gallons per flush
All Other Toilets.....	1.60 gallons per flush
Shower Heads.....	2.75 gallons per minute at 80 psi*
Urinals.....	1.00 gallons per flush
Faucet Aerators.....	2.20 gallons per minute at 80 psi*
Drinking Water Fountains.....	Shall be self-closing

\*pounds per square inch

<sup>2</sup>Senate Bill 587, Texas Legislature, Regular Session, 1991 Austin, Texas.

The Texas National Resource Conservation Commission (TNRCC) has promulgated rules requiring the labeling of both plumbing fixtures and water sprinklers, and the amounts of water used per system for clothes washers and dishwashers<sup>3</sup>.

### Section 3: Water Conservation Goals

In 1993, the City's goals were originally established in the water conservation program as:

1. Reduce per capita water consumption by a minimum of 5 percent;
2. Reduce water loss by the repair or replacement of water meters;
3. Use internal programs to find and minimize water loss;
4. Encourage water conservation through water rate structure; and
5. Continue and expand the public education program.

These goals have been generally achieved. The average water use during 1987 through 1996 was 114 gpcd (the last years for which data is available for a non-drought year). This is well below Fort Worth's average gpcd of 198 gpcd. The highest gpcd was 122 gpcd and was at the beginning of the period after the previous water conservation plan was enacted. We did not meet our initial goal of reducing the per capita water consumption by a minimum of 5 percent. I would estimate this goal was not met because of the increase in the number of yard irrigation systems in the City. It is time to reevaluate these goals.

The following goals were identified in the regional water planning groups for Area C and G. The numbers are derived from historical peak year usage in the 1990's with reduction from there. These are listed in the following table.

Description	Units	1990	Projections					
			2005	2010	2020	2030	2040	2050
Population		5,500	8,100	10,000	15,000			30,000
Average Conservation water use	GPCD	123	107	100	88	81	80	79

This table lists those water use reductions which can be expected for the implementation of water saving plumbing fixtures through the plumbing code.

<sup>3</sup>Chapter 290.30 TAC Sections 290.251, 290.253-290.256, 290.266. Water Hygiene. TEXAS REGISTER. December 24, 1993. Page 9935

The City of Crowley has revised its goals for water conservation and renews other goals as follows:

1. Continue water use reductions to achieve the “average conservation water use” levels established in the table above (average 79 gpcd in 2050);
2. Reduce water loss by the repair or replacement of water meters;
3. Use internal programs to find and minimize water loss;
4. Encourage water conservation through water rate structure; and
5. Continue and expand the public education program.

These aggressive goals for water conservation command that the City continue its ongoing programs and coordinate with area cities to develop broad reaching education and public involvement programs.

## Section 4: Water Conservation Methods

The City of Crowley Conservation Plan includes the following water conservation methods:

1. Public information and education;
2. Plumbing Code;
3. Conservation oriented rates;
4. Universal metering, meter testing, repair and replacement;
5. Leak detection and repair;
6. Valve exercising program;
7. Water conserving landscaping;
8. Landscape Water Management;
9. Plumbing retrofit program;
10. Water use auditing; and
11. Water wasting.

Each method is presented and described in the following subsections.

### 4.1 Public Information and Education

The most important part of any City’s conservation program is public education. The City of Crowley’s Public Works Department works to develop education materials for distribution to citizens. The Public Works Department works to educate the public through:

#### City Website

An excellent means to provide information to citizens is the City’s website. The Water Department strives to keep updated information on the website including

water conservation programs and status of the Water Department's Emergency Water Management Plan.

Publish Information in the Crowley Star

The Crowley Star has been willing in the past to publish education information free of charge and write in depth articles on water related issues. The Crowley Star not only reaches Crowley residents, but also many individuals who live outside of the City limits.

## 4.2 Plumbing Code

Chapter 5 of the City Code requires water efficient plumbing fixtures as required by State Law. This Code allows for the implementation on a uniform basis of a system to prevent high water use fixtures from being installed in new residences or other structures.

## 4.3 Conservation Oriented Rates

Conservation of water is considered each year when the water rates are set by City Council.

## 4.4 Universal Metering, Meter Testing, Repair and Replacement

The City of Crowley Water Department attempts to meter all treated water used in the City. This includes all classes of customers, other governmental entities and all divisions of the Water Department. Treated water is used but not metered in filling and flushing new water mains and for free suppressions. This water use is estimated by reporting the length and size of main extensions monthly or, in case of free suppression, estimates of water volume by the Fire Department.

In 2004, the City of Crowley began purchasing a new brand of meter, more commonly referred to as a smart meter or Advanced Metering Infrastructure, for all new meter installations from that point forward. These new meters utilize an AMR reading system. The AMR reading system can capture real time meter readings and can identify leaks or other anomalies in water usage. This has also cut down on the time that it takes to read meters for monthly customer billing. All meters 3 inches and above are tested or replaced at least once every year. Smaller meters are repaired or replaced at least every ten years as needed.

These programs, along with leak detection and repair and the water audits, ensure that water used is metered within an accuracy of 5 percent.

## 4.5 Leak Detection and Repair

All meters installed in the past 10 years have electronic leak detection devices. All water leaks reported to the Water Department are promptly repaired.

#### 4.6 Valve Exercising Program

Because large water valves may leak and large amounts of water may be lost through these connections, the Water Department has an active valve exercising program. A record of each valve will be kept on the Water Department's new computer software which allows for proper operation and record of valve defects. The goal is to exercise all valves on a cycle of once a year.

#### 4.7 Water-Conserving Landscaping

The Water Department encourages the planting of water efficient landscaping. The department distributes the State's periscope information on the benefits of native gardens, which require less water.

#### 4.8 Landscape Water Management

The City of Fort Worth and other regional water providers (North Texas Municipal Water District, Tarrant Regional Water District, Upper Trinity Regional Water District, the Trinity River Authority and the City of Dallas) have collaborated and agreed upon implementing a year round no more than twice per week watering schedule. The City will have a mandatory twice per week water schedule similar to Stage 1 of its drought plan. The schedule is included as Table 4.8-1. The City also prohibits the use of watering with any hose-end sprinkler or irrigation system between the hours of 10:00 am and 6:00 pm seven days per week.

**TABLE 4.8-1: TWICE PER WEEK WATERING SCHEDULE**

<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>	<b>Sunday</b>
No outdoor watering	Non-residential	Residential addresses ending in (0, 2, 4, 6, 8)	Residential addresses ending in (1, 3, 5, 7, 9)	Non-residential	Residential addresses ending in (0, 2, 4, 6, 8)	Residential addresses ending in (1, 3, 5, 7, 9)

#### 4.9 Plumbing Retrofit

Although the Water Department does not have an official plumbing retrofit program, an educational effort is made to teach consumers about the possibilities and benefits of retrofitting older homes with new, more water efficient plumbing fixtures. Included in this education effort is an emphasis on water saving appliances which can save large amounts of water over the course of the year, allowing the purchaser to recoup the cost of new appliances.



#### 4.10 Water Use Auditing

The Water Department regularly compares purchases water totals to metered and known use totals. This program aids in the identification of potential water waste situations and acts as a backup to the other programs.

#### 4.11 Water Wasting

The Water Department will investigate developing an ordinance prohibiting the wasting of water. The City of Fort Worth and many of the other cities in our area charge a fine for wasting water. A water wasting ordinance would prohibit the following: permitting or causing water to flow, spray, or otherwise move or be discharged from the premises to or upon any street, alley or other public right-of-way, ditch or drain, and failing to repair a leak in a private plumbing system or in an irrigation system within five working days of the discovery or notification of the same.

#### 4.12 Other Programs

##### Records Management Program

The City maintains comprehensive records of water purchased, pumped, treated, sold, used for internal operations, and lost.