The City of Jacksonville

WATER CONSERVATION

AND

DROUGHT CONTINGENCY

PLAN

2019

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CITY OF JACKSONVILLE
WATER CONSERVATION - DROUGHT CONTINGENCY PLAN

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CITY OF JACKSONVILLE
WATER CONSERVATION - DROUGHT CONTINGENCY PLAN

I. INTRODUCTION

A. PLANNING AREA

The City of Jacksonville is located in central Cherokee County in East Texas. A map of the region is included as Exhibit No. 1. In addition, a planning area map is shown in Exhibit No. 2. The City is approximately 30 miles south of Tyler, 110 miles southeast of Dallas and just northeast of Lake Jacksonville. Lake Jacksonville and five water wells are the primary source of water for the city. The city's five water wells are; Well No. 1 located on James St., Well No. 2 located on Burleson St., Well No. 3 located on Tena St., Well No. 4 located on Canada St. and Well No. 5 located on Bailey Lane. The city's water wells and Lake Jacksonville can provide the needed capacity during periods of peak demand and for emergencies.

The City of Jacksonville provides water service for all city residents, a population of 14,858, with 5,390 retail connections using approximately 703 MG of water per year. The City also has four Co-Op (wholesale) customers; Craft Turney, Afton Grove, Gum Creek and North Cherokee. These water supply corporations total 4529 connections, serving a population of 13587, using approximately 158 MG of water per year. A copy of the Co-Op Water Contract is shown in Exhibit No. 5.

The City's current population is served by one wastewater treatment plant; The Double Creek Waste Water Treatment Plant. The Double Creek plant is an activated sludge plant operated in the extended aeration mode with a permitted design flow of 2.9 MGD. The plant is permitted to operate under TPDES Permit No. WQ0010693003. The Double Creek WWTP permitted effluent limitations are: CBODs 10 mg/l, TSS 15 mg/l and Ammonia Nitrogen 2 mg/l (March - October) and 5 mg/l (November-February) through August 1, 2021. These limits are subject to change pending permit renewal.

In Cherokee County, there is manufacturing, mineral production (oil and gas), agriculture and retail sales. The County's topography consists of rolling hills with the elevation ranging from 300 to 700 feet above sea level. Ragsdale Creek is the receiving stream for the wastewater treatment plant effluent from the Double Creek plant. From Ragsdale Creek, the effluent flows to Keyes Creek, then to Mud Creek and finally to the Angelina River.

B. UTILITY PROFILE & RECORD MANAGEMENT SYSTEM

A utility profile is provided in Exhibit No. 12.

A record management system is in place that currently classifies water sales and uses into three main groups; residential (combining single family and multi-family), commercial

(combining commercial, industrial and institutional), and wholesale. The City has no significant agricultural sales at this time. Any new billing system purchased by the City will be able to report detailed water use data as described in 30 TAC 288.20(a)(1)(B)(i)-(vi).

C. NEED FOR AND GOALS OF THE PROGRAM

The requirement for the Water Conservation Program is contained in House Bill No. 2 and House Joint Resolution No. 6, 69th Texas Legislature, 1985.

This program is required for all communities receiving new state, or state administered, loans of more than $500,000 for water, sewer, or flood control projects.

The two main divisions of the program are (1) a water conservation plan to reduce water usage on a year-round basis and (2) an emergency water demand management plan to minimize hardship during a water shortage. State guidelines prescribe eleven elements of the water conservation plan and seven elements of the demand management plan to be considered in designing the program. All of these elements will be covered in following sections.

The total reduction in water usage is expected to be less than the reduction for an average community. Since Cherokee County receives one of the higher amounts of annual rainfall in the state, outdoor watering is not as prevalent as in arid areas. Indoor usage appears to be low. This is estimated from water usage in winter when outdoor water use, including lawn watering, is typically at its lowest. Total water usage in winter months, including industry and commercial usage is approximately 134 gallons per capita per day (gpcd) considering the total of 14,910 residents as of 2017 on the water system.

The water conservation program is expected to become more effective in the future if ground water should become scarce or more expensive. By the time the need arises, local residents will have become better educated in regard to water conservation, and the necessary control mechanisms will already be in place.

The emergency water demand management plan applies to various events which could disrupt the water supply, such as extended drought, aquifer pollution, system failure, or storm damage. The local water supply is not presently sensitive to any anticipated drought conditions, but it could become applicable in the future.

D. PROJECTED 5 AND 10 YEAR GOALS FOR WATER SAVINGS

The chart provides projected goals for water savings.

Projected 5 and 10 Year Goals For Water Savings

Year	Total GPCD	Residential GPCD	Water Loss GPCD	Water Loss%
2019	175	120	36	20
2024	165	115	11	16
2029	151	111	9	12

GPCD - Gallons per capita per day

II. LONG TERM WATER CONSERVATION - DROUGHT CONTINGENCY PLAN

A. PLAN ELEMENTS

1. EDUCATION AND INFORMATION

a. General

Education and information alone would probably have little effect on residential water consumption. Although utility bills are of major concern to local residents, electric bills which run up to several hundred dollars per month in the summer receive much more attention than a water/sewer bill of $50 to $100.

Water conservation is encouraged by a uniform rate of $1.94 up to 2000 gallons. For water usage 2001 - 10,000 gallons per month 2.59 per 1000 gallons for those customers on sewer service. The education and information program may reduce water usage by several percentage points, provided it includes an emphasjs on economic incentives.
The proposed method of education and providing information consists of the annual water quality report, flyers, City of Jacksonville Website, a new Customer Portal and Social Media plus press releases in the local newspaper. Flyers, included as

Exhibit No. 7 will vary from time to time. They contain items such as excerpts from earlier state guidelines, information on incremental water and sewer rates, and a copy of the press release shown as Exhibit No. 8. The flyer will be mailed or distributed at City Hall.

b. First Year, Long Term, and New Customers

The water quality reports are provided annually just prior to high usage periods. The water quality report will be accompanied by a press release shown in Exhibit No. 8, plus any supplementary information needed at that time.

New customers will be supplied with fact sheets and water quality report information, to the extent necessary to make them aware of the program.

2. WATER RATE STRUCTURES

Jacksonville has a uniform rate structure for water and sewer as follows

1) Water rates for residential customers within the corporate limits of the City of Jacksonville, Texas without any free service and without any discounts:

a. The minimum for administration, billingand collecting per month based on water meter size:

¾ inch or less	$13.76
1 inch	$16.31
1 1/2 inch	$20.55
2inch	$24.04

b. For allwater used the following rates apply:

0-2,000 gallons	$1.94
2,001-10,000 gallons	$2.59
10,001 + gallons	$2.85
*price per 1000 gallons	

(2) Water rates for commercial or industrial customers within the corporate limits of the City of Jacksonville, Texas, without any free service and without any discounts:

a. The minimum for administration, collecting and delivery based on water meter size:

¾ inch or less	$18.39
1 inch	$21.80
1½ inch	$27.47
2inch	$32.13
3inch	$39.62
4inch	$46.97
6inch	$59.18
8inch	$70.17
10inch	$88.41

b. For all water used the following rates apply:

0-2,000 gallons	$1.94
2,001-10,000 gallons	$2.59
10,001 + gallons	$2.85
*price per 1000 gallons	

(3) Current water customers located outside the corporate limits, excluding rural water supply corporations, will be billed at one hundred fifty (150) per cent of the rates in subsection (a)(1) and (2) above. There will be no new water customers located outside the corporate limits.

(4) Notwithstanding anything set forth above, after June 1, 2019, the following rates shall apply for billing for water services to rural water supply corporations:

a. The minimum for administration, collecting and delivery based on water meter size:

¾ inch or less	$18.39
1 inch	$21.80
1½ inch	$27.47
2inch	$32.13
3inch	$39.62
4inch	$46.97
6inch	$59.18
8inch	$70.17
10 inch	$88.41

b. For allwater used .....$ 2.75 per thousand (1,000) gallons.

c. Contracted Water Sales - There may exist individual contracts/agreements between the City of Jacksonville and large volume customers who resell water and/or use for commercial use, who may require a guaranteed volume of water. These contracts/agreements shall be developed after negotiations, but the agreement shall not waiver from established rates, fees, and penalties associated with this ordinance.

d. Any meter over 1" willbe considered a commercial meter.

(Usage through more than one (1) water meter to be combined for billingpurposes at customer's request.)

(5) Notwithstanding anything set forth above, after June 1, 2019, the following rates shall apply for billingfor water services to bulk customers:

a. For allwater used ....$8.55 per thousand (1,000) gallons.

(b) Effective with June 1, 2019 billings,the following rates for monthly usage, based on water consumption, shall apply within the corporate limitsof the City of Jacksonville, Texas:

(1) Residential rates- meters smaller than one (1) inch:

a. Base charge of $14.06 per month per customer

b. Volumetric Charge up to 10,000 gallons per month:

0-2,000	$2.89
2,001-10,000	$2.89
*per 1,000 gallons	

All multiple family residences or apartments having four (4) or fewer units, which are served by one (1) water meter will be billed a $14.06- minimum per month for each residential unit plus two dollars and eighty-nine cents ($2.89) for each one thousand (1,000) gallons of water used. Not to exceed one hundred seventy-one dollars and seventy-four cents ($171.74).

(2) Commercial, industrial sewer customers and/or multiple family residences having more than four (4) units which are served by one (1) water meter- water meters larger than one (1) inch:

a. Base charge of $15.50 per month per customer.

b. Volumetric Charge:

0-2,000	$2.89
2,001-300,000	$2.89
300,001 +	$2.89
*per 1,000 Qallons	

(3) Current wastewater serv.ice outside the corporate limits shall be provided at one hundred fifty(150) per cent of the rates for wastewater service within the corporate limits of the City of Jacksonville, Texas, as set forth in subsection (b) (1) and (2) above. There will be no new wastewater services installed outside all the corporate limits.

The water and sewer rate structure will change as needed in order to finance the project. The rates will be reviewed periodically and adjusted if additional revenues are needed. The incremental water and sewer rates appear to be satisfactory for water conservation purposes, especially for East Texas where the need for conservation is less crucial than for arid portions of the state. The City's water, sewer and solid waste ordinances are included in Exhibit No. 9.

3. UNIVERSAL METERING

The City maintains master meters at the water treatment plant and at all five existing water wells. In addition, all private water usage (excluding routine flushing, firefighting and related drills) is metered. There are master meters serving the wholesale water supply companies and also serving multiple apartment units at the same address.

Meters are to be within an accuracy of plus or minus 5% in order to measure and account for the amount of water diverted from the source of supply. Reviews are made of the meter reading data to look for discrepancies and identify potentially defective meters. A city-wide water meter replacement program has been completed.

The City proposes to require individual meters for all new multi-family construction. In the event of future water shortages, the City may also require individual meters for multiple users (apartment, etc.) in lieu of existing master meters where practical. Meter testing will be conducted in accordance with state guidelines.

4. LEAK DETECTION AND REPAIR

The City discovers leaks in the distribution system by at least two methods:

a. Customers call to complain of lack of water or unusually low pressure.

b. Leaking line results in water appearing on ground surface.

c. Periodic comparison of water billing records with water production records.

d. Electronic meter monitoring Sensus analytics software.

Line repairs are performed by City personnel using whatever adapters are necessary for similar or dissimilar materials. Repairs are performed in accordance with *Rules and Regulations for Public Water Systems,* Texas Water Commission, 31 TAC 290.46(9), including disinfection.

The City's distribution system is laid out in loops where possible with valves on most segments. Repairs can be made, therefore, by isolating short segments without affecting large parts of the system. However, several portions of the system are still unlooped, particularly in fringe areas.

Leaks apparently account for a significant amount of water loss. Approximately 65% of water supplied to the distribution system was sold through meters. Line flushing, fire department usage, including hydrant testing and fire fighting, and City use also account for some of the difference. The large percentage of water not accounted for is discussed more fully in Volume I.

The Community and Public Services Director prepares monthly and annual reports. These reports are accessible via the City's Website, https://www.jacksonvilletx.org. An annual report is included as Exhibit 12.

5. IMPLEMENTATION AND ENFORCEMENT

a. Education and Information: City personnel under supervision of the Community and Public Services Director with possible assistance from City's consulting engineer.

b. Water Rate Structure: The City Council has an ordinance codifying the water rate structure and setting the appropriate rate schedules. Enforcement powers include termination of water service.

c. Universal Metering and Leak Detection: City personnel under supervision of Director of Public Works. Some of the requirements may be included in Item j below.

d. Leak Detection: City personnel under supervision of Community and Public Services Director.

e. Review and Evaluation: Community and Public Services Director, with possible assistance of consulting engineer and/or City Manager; his findings will be presented to City Council for review and approval. Along with review and evaluation, Community and Public Services Director will submit required reports to Texas Water Development Board.

f. Water Conserving Landscaping: Encouraged, but not mandated at this time.

g. Pressure Control: The water system control schematic is included as Exhibit 4. Improvements to the monitoring and control procedures have been made and are discussed more fully in Volume I.

h. Recycling and Reuse: Currently implemented at Double Creek WWTP; A small portion of the treated effluent is currently used at the wastewater treatment plant to wash down the final clarifiers and belt filter press.

i. Retrofit Programs: Any mandatory retrofitting would be required under Item j below.

j. Plumbing Codes: The City Council will enact the necessary City plumbing codes, with enforcement by the City plumbing inspector. Enforcement powers could include termination of water service.

6. REVIEW AND EVALUATION

The City will review and evaluate the Water Conservation and Drought Contingency Plan at least annually for various areas of concern. The City will need to review the program for the following parameters.

a. Summary of education and information activities conducted by the City over the past year, and whether they met minimum requirements of the approved program.

b. Status of City plumbing code, including its coverage of water conservation requirements and the amount of plumbing work performed which was subject to those requirements.

c. Status of retrofit program, including the amount of retrofit work performed, if any.

d. Water and wastewater rate structures, including sufficiency of revenue and, if applicable, adequacy for encouragement of water conservation.

e. Status of metering programs, including universal metering and amount of testing, repairs, and replacement of meters.

f. Any water audits or leak detection employed by City.

g. Status of water conserving landscaping, if applicable.

h. Any recycling or reuse practiced by City or at recommendation of City.

i. Activation of drought contingency plan, if any, and associated reduction in water use.

j. Public response to program, if any.

k. General effectiveness of program.

l. Frequency of conservation program review by operations staff.

m. Any problems in implementing program.

n. Expense of conducting program.

o. Savings in water and/or operating expense.

p. Estimate of how much water accountability has improved over last year.

In addition to the topics covered in the annual report, the City will review the following matters:

q. Any changes in water supply and/or demand which require more stringent implementation of the program. This includes both actual and imminent changes, such as an impending shortage of water.

r. Any changes in state regulations which could require modification or more extensive implementation of the program.

7. WATER CONSERVING LANDSCAPING

Because of the high rainfall no special landscaping requirements are proposed. In fact, many water conserving plants may not be adapted for the local soils and climate. Customers will be made aware of potential restrictions on lawn watering, however.

8. PRESSURE CONTROL

A SCADA system enables the City staff to more effectively monitor water produced to water demand. This is accomplished by changing high service pump controls to demand-based rather than supply-based and by adding provisions for remote monitoring and control.

The City has two pressure planes. The upper plane is effectively controlled by pressure switches at the N. Bolton St. booster station and a 1 MG elevated storage tank Additional elevated storage has been recommended for the lower plane.

9. RECYCLING AND REUSE

Recycling by commercial users does not appear feasible, except in a few cases such as car washes. The small amount of water savings would not make it worthwhile for the City to push for recycling under present circumstances. Most industries have explored recycling opportunities and have put them in use where feasible. However, if any large commercial or industrial users suited for recycling should locate in the community in the future, the City would encourage or require recycling as appropriate.

Reuse of treated effluent is not feasible for various reasons. The water supply from the City of Jacksonville's wells and Lake Jacksonville should be adequate to serve the City for many years. Existing supplies can be produced, transported, and treated much more economically than treatment and reuse of effluent. Domestic reuse of treated effluent would be unacceptable to local residents considering the abundance of conventional supplies.

Irrigation, as a wastewater disposal method, is not a feasible use for treated effluent. This disposal method would require hundreds of acres of land because of low soil permeability and high annual rainfall. Much of the land in the area is too hilly for irrigation to be practical without extensive terracing. Also, there are no local crops adaptable to extensive year-round irrigation.

The recharging of aquifers under the Jacksonville area is basically accomplished by the high annual rainfall in their outcrop areas within Cherokee and surrounding counties. Of these aquifers, the Carrizo-Wilcox is most useful as a domestic water source.

10. RETROFIT PROGRAM

Retrofitting in existing structures simply for water conservation is unlikely to be accepted by local residents, especially considering the abundant supply of ground water and the substantial cost involved. Therefore, mandatory retrofitting is recommended only for the following cases:

a. Replacement of plumbing due to wear, damage, remodeling, or modernization.

b. Displacement devices in toilet tanks (where practical).

c. Low flow shower heads (where they can be readily installed).

d. Insulation for hot water pipes (where pipes are accessible without breaking out concrete).

The last three cases represent low cost measures which are easily implemented. However, the City proposes to employ these measures only during severe or prolonged water shortages.

11. PLUMBING CODES

The City of Jacksonville has adopted the International Plumbing Code. This plumbing code should be consistent with legislation regarding water conservation. A limited amount of retrofitting could be required in the future in the event of a prolonged water shortage.

Population growth over the planning period is projected at approximately 7% for water and 7% for sewer. In addition, many older homes may be abandoned or demolished within the planning period and will be replaced by new residential construction within the City. Also, many existing homes may undergo modernization or replacement of fixtures within the design period. Therefore, conservation measures in new construction could save a fairly significant amount of water after 20 years.

B. ANNUAL REPORTING

The City will submit annual reports to the TWDB and TCEQ, covering all elements prescribed annually by these agencies. The resolution adopting annual reporting is included as Exhibit No. 14.

C. CONTRACTS WITH OTHER ENTITIES

The City has formal contracts to provide water service to four co-ops. The City presently has four wholesale master meters with 4529 wholesale service connections. Any future contracts for wholesale water service will require the recipients to adopt either their own water conservation programs or relevant provisions of the City's program.

III. DROUGHT CONTINGENCY PLAN

A. GENERAL

Jacksonville currently obtains its water supply from Lake Jacksonville and five water wells
located in the City. The wells draw water from the Carrizo-Wilcox aquifer. Well No. 1 is 720 feet deep. Well No 2 is 720 feet deep and Well No. 3 is 720 feet deep. Well No. 4 is 630 feet deep and Well No. 5 is 720 feet deep. The combined capacity of all five City wells, is 2,625 gpm. The City reports no water quality problems with the existing wells.

Local water supplies could be interrupted for a number of reasons. The most likely event is power failure, which could easily affect the wells and raw water pumps, sewer, transfer and booster pumps. Other possibilities include equipment failure, transmission line breakage, storage tank failure, severe storm damage, severe freezing conditions, aquifer contamination and drought.

Exhibit 4 also shows a schematic of the City's water supply and distribution system, and Exhibit 3 shows the location of water system facilities.

Any water supply emergency, whether acute or protracted, requires a responsible agency to manager the situation. Such crisis management includes maintenance of the existing supply if possible, controlling or restricting usage in order to conserve water, and obtaining alternate sources of supply if necessary. In most cases, the City, as the water purveyors, will assume this responsibility. In the event of disasters such as major storms, riots, or acts of war, some of the City's functions may be overridden by emergency management authorities.

B. TRIGGER CONDITIONS

1. Goal of Policy

The trigger conditions listed below are intended as guidelines to help the City determine

(a) when it is necessary to implement preliminary or emergency measures,
(b) which measures should be implemented, and
(c) the extent of such measures.

The guidelines can also be used to help decide whether to upgrade, continue, downgrade, or terminate the measures which have already been taken in a given situation.

These guidelines are not intended to be followed automatically and blindly. An automatic approach might be preferable for communities with a recurring problem of a fixed nature, such as limited transportation/treatment capacity or a surface reservoir subject to depletion during a drought. However, in the case of Jacksonville, no current problems are anticipated in the foreseeable future. In any event, the City needs to be prepared for the unexpected.

In any water supply emergency, the City must rely chiefly on the judgement of the Chief Operator/Water Treatment Superintendent and his assistants, along with any specialized advice which they might obtain. These guidelines are intended to help the City assess a situation and make necessary decisions more easily. In no event are they meant to replace the sound judgment of City personnel.

2. Focus of Emergency Measures

In the event of a water supply emergency, the City will act toward one or more of the following goals:

a. Keeping existing supply and/or distribution system operative.

b. Preventing further loss or contamination of water.

c. Controlling or restricting usage in order to conserve water.

d. Preventing public health problems which could result from a contaminated water supply.

e. Obtaining alternate sources of water.

3. Basis for Trigger Conditions - General

Most trigger conditions for Jacksonville will be qualitative rather than quantitative. Particular attention, however, must be devoted to several measurable parameters: the rate of total water usage and the levels of water in the ground and elevated storage tanks, along with the duration of critical values for these parameters.

A number of factors can govern system capacity including supply from Lake Jacksonville capacity, well size and depth, well pumping capacity, treatment capacity, and distribution capacity. Since Lake Jacksonville offers the largest potential supply of the City's water, loss or curtailment of this source will have the largest potential impact in the availability of the City's water.

4. Sources of Supply

As stated earlier, the City's water supply comes from Lake Jacksonville and five water Wells. The raw water pumps at Lake Jacksonville pump 4,200 gpm each. The total capacity of the five water wells is 2,625 gpm. All of the water wells draw water from the Carrizo-Wilcox aquifer.

5. Storage and Pressure Maintenance

Storage facilities for the City water system consist of five well ground storage tanks with a total capacity of 1.250 MG. There is a 2.0 MG capacity hi-level ground storage tank and a 1.0 MG elevated storage tank and two clearwell storage tanks at the water treatment plant with a total capacity of 1.0 MG.

6. Distribution

Existing water distribution lines are generally adequate with few complaints of low pressure.

7. Standby Power

The City has a standby generator at the water treatment plant and at the N. Bolton St. Booster Station for supplying water to the upper pressure plane, elevated tank, to the north. However, no standby power is currently available for the wells or raw water pumps. Service during power failures is provided only by the elevated tank and Dorothy St. tank.

8. General Considerations

In establishing trigger conditions, it is necessary to consider the various events which could disrupt or impair water service to one or more parts of the system. Most events would cause only localized problems or slight reductions in the level of service. Severe curtailment of service for the entire system is not expected to occur except in the event of a widespread, prolonged power failure involving wells and/or pumping stations or in the event of a severe and prolonged drought.

Various events which could result in water shortages or reduction in service include the following:

a. Water Supply

Power failure involving wells and/or service pumps: pump or other equipment failures; contamination of ground water; severe lowering of water level in aquifer or Lake Jacksonville due to drought; major growth in demand by other ground water users.

b. **Water Transmission**
N/A

c. **Storage**
Structural failure or contamination in ground storage or elevated tanks.

d. **Chlorination**
Failure of chlorination system at any of the water treatment plants.

e. **Service and Booster Pumping**
Power or equipment failure; contamination

f. **Distribution System**
Major line breaks; heavy demands for fire fighting; contamination

9. **Mild Conditions**

a.* Water demand is approaching the safe capacity of the system on a sustained basis.

Sustained water usage over 85% of safe capacity, or 7.04 mgd (five consecutive days) should be taken as a trigger condition for mild conditions.

b.* Mild contamination is noted in the water supply, but water can still be treated
by existing facilities by means such as increasing chlorine dosage; or contamination is reported in updip portions of aquifer.

c.* Additional well drilling in the vicinity threatens interference with water wells.

d.** Water levels in tanks are consistently below ¾ full (five days uninterrupted).

e.** Local power failures are imminent as a result of power station failures, storms,
transmission problems, or excessive power demand in the area.

f.** Performance of well water pumps, high service pumps, or other equipment indicates imminent failure.

g.** Transmission line from surface water plant to Dorothy St. tank is in danger of
failure.

h.*** Water supply emergencies in outlying communities served by City or interconnected with City, could require diversion of local water supplies.

i.*** Severe freezing conditions are forecast and widespread breakage of home plumbing, water treatment units, and/or distribution lines is anticipated.

j.*** The Jacksonville area is under a severe storm warning and falls in the path of the storm.

10. **Moderate Conditions**

a.* Water demand occasionally reaches safe limit of system (two days within a 30 day period), and failure of any pump or chlorine feeder could reduce the level of service to the system.

Safe limit is 8.38 mgd as discussed above.

b.* Contamination of supply water is approaching limit of treatability with existing facilities; or brackish water is very near the well.

c.* Additional wells in vicinity are drawing water at a rate which interferes with production rate of City's wells.

d.** Over 20% of storage tank capacity is out of service due to structural failure, leakage, maintenance, or contamination.

e.** Water level in tanks is consistently below half full (three days uninterrupted).

f.** Water emergencies in adjacent communities require diversion of so much water that the level of service to any part of the Jacksonville system is threatened.

g.*** Severe freezing conditions have resulted in widespread damage to home plumbing or distribution lines.

h.*** One of the major service pumps has failed due to mechanical problems, but several pumps remain operable.

11. **Severe Conditions**

a.* Water demand is exceeding safe capacity (8.38 mgd) on a regular basis (more than five consecutive days).

b.** Supply water is so contaminated that it cannot be treated with existing facilities or such contamination is imminent because of nearby aquifer pollution.

c.*** Rupture of transmission lines from the raw water pumps or from the water treatment plant.

d.*** An immediate health or safety hazard could result from actual or imminent failure of system components.

e.*** Water levels in elevated tanks are too low to provide adequate fire protection (generally less than ¼ full).

f.*** Over half of storage tank capacity is out of service.

h.*** All service pumps are out of service.

i.*** Water emergencies in adjacent communities require so much water diversion that service to portions of the Jacksonville system is severely disrupted.

* Initiated by Council
** Initiated by Community and Public Services Director
*** Initiated by Chief water system operator or delegated personnel

12. Termination of Emergencies

Trigger conditions for termination or downgrading of an emergency are not broken down by severity of crisis but are listed as one group. City officials and/or City Council must use judgement as to whether to upgrade, continue, downgrade, or discontinue an emergency.

The decision to terminate or downgrade an emergency will normally be made at the level, either City Council or official, at which the emergency was declared.

a) Water demand has been reduced to safe levels and is expected to remain stable.

b) Actual contamination of water supplies is ended or is under control; or threat of contamination has subsided; or alternate supply has been obtained on temporary or permanent basis.

c) Interference from neighboring wells is under control; or existing wells have been upgraded or supplemented.

d) Power has been restored and no additional power failures are anticipated. Failure of system components has been averted or repaired; or, temporary units have been substituted; or, alternate supplies have been obtained.

e) Water emergency in adjacent communities is ended or mitigated.

f) Water levels in elevated or ground storage tanks have been restored to normal.

g) Freezing conditions have ended without damaging the water system; or damage has been repaired.

h) The storm has passed without damaging the water system or damage has been repaired.

C. EMERGENCY WATER DEMAND MANAGEMENT MEASURES

1. General

The City ordinance adopting the Water Conservation Drought Contingency Plan, included as Exhibit No. 19, contains measures such as prohibition or restriction of outdoor water use; a pricing structure with uniform rates; flow restricting devices; and a standby rationing plan with penalties for metered usage in excess of a preset limit. The ordinance provides for certain actions to be taken by the City Council, and/or by the Community and Public Services Director in the event of water shortages.

The water supply from Lake Jacksonville will seldom be out of service for any length of time. Only an extraordinary event such as a severe storm, riots, an act of war, a major fire (or chain of fires), extended drought or severe pollution would put the City in a severe water crisis. In such an event, drinking water would be hauled in until the crisis passed.

2. Mild Conditions Measures

a. Inform all customers that a low-level emergency has been reached. In the case of a slowly developing crisis, notice could be through Code Red phone communication, news media or through brochures in conjunction with mailing. For a more imminent crisis, Code Red and/or the news media should be used along with flyers passed out from door to door. Flyers should contain a date and signature along with the message to make it plain that they represent current developments.

b. Some situations such as failure of a single piece of equipment could be handled by City personnel without notifying the public.

c. Warn customers to start reducing water use; protect pipes against freezing; and/or store water for emergency use, as appropriate.

d. Recommend a voluntary lawn watering schedule, if appropriate.

e. Look into possibility of interconnecting with other neighboring systems, if appropriate.

f. Make or arrange for repairs, if appropriate.

g. Take action against drilling of neighboring wells, if appropriate.

h. Take steps toward increasing system capacity, if usage is nearing safe capacity. This could include repair wells not in use now.

i. Take steps toward providing additional treatment if deterioration of raw water quality is the problem.

j. Keep customers updated as appropriate.

3. Moderate Conditions Measures

a. Notify customers of intermediate level emergency by appropriate means.

b.* Impose mandatory lawn watering schedule, if appropriate (in dry weather conditions), under authority of ordinance shown as Exhibit No. 18.

c.* Prohibit wasteful uses, mainly outdoor, as defined under "Water Waste" in ordinance shown as Exhibit No. 18.

d. In the event of contamination, notify customers so that they can seek bottled drinking water supply or be prepared to purify City water if needed.

e. Seek reduced usage from commercial users and industries if appropriate.

f. Take steps toward interconnecting with other neighboring system, if appropriate.

g.* Impose surcharge system, if appropriate.

h. Make or arrange for repairs, if appropriate.

i. Take action against drilling of neighboring wells, if appropriate.

j. Take measures toward increasing system capacity, if appropriate.

k. Take steps toward providing additional treatment, if deterioration or raw water quality is the problem.

l. Keep customers updated as appropriate.

* See ordinance, Exhibit No. 18, for various procedures for businesses dependent on outdoor water usage.

\# Some measures may apply only to outlying service areas for situations affecting only those areas, such as distribution line problems.

4. Severe Conditions Measures

a. Notify customers of emergency by appropriate means.

b.* Prohibit all outdoor use and all wasteful use as defined in Exhibit No. 18.

c.* Impose surcharge system, if appropriate and not already done.

d.* Impose rationing, if appropriate.

e. In the case of contamination, warn customers to use bottled water for drinking and cooking or to purify City water before use, if appropriate.

f. Require commercial and industrial users to stop using City water for processes, for cooling, or for recreation.

g. Place city and neighboring fire departments on alert that pumper units may be needed, if appropriate.

h. Make or arrange for repairs, if appropriate.

i. Take action against drilling of neighboring wells, if appropriate.

j. Act as fast as possible toward expanding system capacity, providing additional treatment and/or interconnecting with another neighboring system, if appropriate.

k. Keep customers updated as appropriate.

* See ordinance in Exhibit No. 18 for various procedures for businesses dependent on outdoor water usage.

\# Some measures may apply only to outlying service areas for situations affecting only those areas.

D. INFORMATION AND EDUCATION

One or more of several measures should be taken to inform customers of crisis conditions and to keep them updated. These measures include:

1. Code Red phone, radio and television announcements: television stations in Jacksonville and other cities in the region; the cable company in Jacksonville, various radio stations in Jacksonville, and other neighboring cities.

2. Press releases in Tri County Leader, Daily Progress and other major newspapers in Jacksonville or other neighboring cities.

3. Letters or flyers mailed to customers alone or with monthly bills.
4. Letters or flyers hand delivered to customers in course of meter reading.

5. Letters or flyers hand delivered to customers in emergency.

6. Telephone calls in cases where emergency notice must be given at night, or when only a small neighborhood is involved.

7. Vehicles with loud speakers in emergencies when telephone service is out and when unusually fast notification is necessary.

Selection of notification methods depends on the nature and urgency of the crisis. The notifications would state the nature of the crisis, the actions requested of customers and the anticipated duration if known. Customers should be warned through brochures, well in advance of any emergency, what might be required during an emergency. See Exhibit 19 for one proposed brochure or flyer.

E. INITITATION PROCEDURES

1. Responsibility for Monitoring

The Community and Public Services Director has responsibility for monitoring the performance of City facilities. The Director will monitor the specified quantitative parameters for mild, moderate, and severe conditions. Monitoring frequency for each parameter will be consistent with the description of that parameter.

The Director will also be on the alert for various non-quantitative trigger conditions. Many of these conditions will be noted in the course of normal operating duties.

Information as to whether these parameters are reached, or close to being reached, will be added to the monthly operating report. See Exhibit No. 11 for

example. If a trigger condition requiring prompt action is noted, the Director will take immediate action and/or notify the City Manager, as appropriate.

2. Authority for Action

Except in catastrophes where actions are governed by emergency management authorities, actions should be taken by the Community and Public Services Director and/or the City Manager as authorized in the proposed Ordinance Controlling Water usage in Emergencies. The City Attorney should be notified in advance of any Council action related to water conservation.

The responsibility for declaring a water supply emergency depends on the nature and urgency of the situation. For slowly developing situations, a resolution can be passed by the City Council at a regular meeting. As the urgency increases, action may occur at a special meeting, at an emergency meeting, by the Community and Public Services Director, Community and Public Services Director or by a designated subordinate acting on his own. In situations such as hurricanes or riots, action by emergency management authorities may be the overriding factor.

Each action listed in preceding sections is noted as to whether it should be implemented by the staff or by the Council.

In Section III. B above, the various trigger conditions are classified with respect to who should declare the emergency, as follows:

* City Council (in regular, special or emergency meeting as appropriate).

** City Council if appropriate under circumstances. City Manager should first look at the situation and decide whether to initiate the action on his own or to call for a special Council Meeting for that purpose

*** Community and Public Services Director (or designated subordinate) on his own.

Even though the City Manager has declared an emergency without prior Council approval, certain actions dealing with the crisis must be taken by the Council. These actions include restricting or prohibiting outdoor water use; imposing a surcharge or rationing plans; and taking legal action against activities which could reduce or contaminate the City's water supply.

3. Procedures for Implementation

a. Repair of lines or equipment

Community and Public Services Director and staff perform minor repairs or equipment replacement; Community and Public Services Director arranges for minor contract repairs, Community and Public Services Director and/or City Manager arrange for major repairs as appropriate. Community and Public

Services Director acts on his own, or obtains authority from Community and Public Services Director and/or Council, according to magnitude of repairs.

b. Obtaining alternate supply

City Manager reports to City Council that alternate supply may be needed on a long term or emergency basis. In an emergency, contact with neighboring water systems is made by City Manager or designated subordinate. For long term alternate supply, an improbable situation, City Manager reports situation to City Council for further action.

c. Expanding system capacity or providing additional treatment

City Council has initiated action on its own or at recommendation of City Manager. Initial action consists of discussion with consultants.

d. Activation or deactivation of existing wells

City Manager instructs Community and Public Services Director to take necessary measures.

4. Advance Planning

The City should prepare a list of all radio stations, television stations and newspapers which may be called on to assist in public notification. Each station or newspaper should be contacted in advance regarding the possible need for emergency assistance of this nature. For each station or newspaper, one or more contact persons should be designated, together with telephone number for 24 hour use if possible.

Lists of potential repair contractors for vital system components should be maintained.

Lists of agencies such as neighboring water departments, neighboring fire departments, police and sheriff departments and many offices performing emergency management functions should also be kept ready for emergency use.

Although many potential crisis situations cannot be foreseen, the City should prepare lists of those situations most likely to occur. At least a rough draft of flyers, letters, press releases, and broadcast messages should be prepared for the most probable situations.

If the need should become apparent, the City should make arrangements with owners of neighboring water systems for an alternate supply for emergencies.

In an extreme situation requiring water to be hauled in for the City's sole supply, severe rationing would be needed. Water would in that event be distributed in bottled form.

F. TERMINATION NOTIFICATION

Council action is mandatory to rescind specific actions taken by the Council to deal with a crisis. Several examples include restricting or prohibiting outdoor water use, imposing surcharge and imposing rationing. Council action is normally needed to downgrade or terminate an emergency if the Council (1) declared the emergency, and/or (2) took specific action to deal with the emergency.

EXCEPTION: Cases where the Council set a specific time limit for the crisis or authorized a City official to end the crisis at his discretion.

The City Manager, or his designated subordinate, can announce the end of the crisis if no Council action was involved. The Manager should also take any appropriate action in connection with the termination.

Once the termination decision has been made, notification should be prompt. If customers are kept under a crisis notice unnecessarily, they will tend to relax vigilance and will also tend to disregard future notices.

Notification procedures and methods should be similar to those for the onset of a crisis. The Council and/or City Manager should use discretion in selecting the appropriate procedure(s).

G. IMPLEMENTATION

1. Ordinance
   The basis for future changes in rates will be by a City ordinance, presented as Exhibit No. 10. The basis for emergency surcharges and rationing will be by a City ordinance, which is included as Exhibit No. 15.

2. Changes in Plumbing Codes
   The City adopted the International Plumbing Code that requires certain water conserving measures in home plumbing. Any change in this Code regarding water conservation measures would be incorporated by the City.

3. The City will, if necessary in the future, approach owners of other water systems regarding alternate water supplies in emergencies. Agreements for such supplies would probably be by contract. Under present circumstances, only a limited level of service could be provided by outside sources.

4. The City must adopt specific resolutions at the beginning and ending of emergencies to initiate or terminate restrictions on lawn watering, prohibition of lawn watering, surcharge rates, and/or rationing. In an extreme emergency, these resolutions can be passed by simple motion and still be valid.

5. The City attorney will be notified prior to any Council action related to conservation in order to review or recommend proposed action as appropriate.

6. If the City should in the future provide water and/or wastewater service to additional wholesale entities, such as water districts and water supply corporations, the service contracts will make those entities subject to provisions of the City's Drought Contingency Plan.

7. Contract Provisions
The City of Jacksonville will include a provision in every wholesale water contract entered into or renewed after the adoption of the plan, including contract extensions, that in case of a shortage of water resulting from drought, water to be distributed shall be divided in accordance with Texas Water Code, 11.039.
8. Pro Rata Water Allocation
In the event that the triggering criteria specified in Section VII of the Plan for stage 3 - Severe Water Shortage Conditions have been met, the City manager or his designee is hereby authorized to initiate allocation of water supplies on a pro rata basis in accordance with Texas Water Code, 11.039.

H. VARIANCES

The City Manager, or his/her designee, may, in writing, grant temporary variance for existing water uses otherwise prohibited under this plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation or fire protection for the public or the person requesting such variance and if one or more of the following conditions are met:

a) Compliance with this plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the plan is in effect.
b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

Persons requesting an exemption from the provisions of this plan shall file a petition for variance with the City after the plan or a particular drought response stage has been invoked. All petitions for variance shall be reviewed by the City Manager, or his/her designee, and shall include the following:

a) Name and address of the petitioner(s).
b) Purpose of water use.
c) Specific provision(s) of the plan from which the petitioner is requesting relief.

d) Detailed statement as to how the specific provision of the plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with the plan.
e) Description of the relief requested.
f) Period of time for which the variance is sought.
g) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this plan and the compliance date.
h) Other pertinent information.

I. SPECIFIC QUANTIFIED TARGETS FOR WATER USE RESTRICTIONS

Emergency Water Demand Management Measures *	Targeted Water Use Restrictions
Mild Conditions Example: Voluntary Lawn Watering Schedule	10-15%
Moderate Conditions Example: Mandatory Lawn Watering Schedule	25-30%
Severe Conditions Example: Prohibition of Lawn Watering	45-50%

*See Page 18 C.

J. COORDINATION WITH REGIONAL WATER PLANNING GROUP

When the City's plan has been updated and submitted to TCEQ and/or TWDB and found to be administratively complete, the completed plan shall be presented to and officially adopted by
the City Council. Upon adoption, the plan shall be submitted to TCEQ and/or TWDB and to the East Texas Regional Water Planning Group (Region I) through the chairman and/or the group's consultant engineer.

IV. ADOPTION OF PROGRAM

See the following ordinances and resolutions:

1. Ordinance adopting Water Conservation and Drought Contingency Plan: Exhibit No. 19.
2. Water Rate System Ordinance: Exhibit No. 9.
3. Water Rate Ordinance: Exhibit No. 10.
4. Ordinance adopting Plumbing Code: Exhibit No. 13.
5. Resolution for Annual Reporting: Exhibit No. 14.
6. Ordinance Controlling Water Usage in Emergencies: Exhibit No. 15.
7. Resolution for Information/Education Program: Exhibit No. 17.
8. Resolution for Monitoring for Trigger Conditions: Exhibit No. 18.