CITY OF CASTROVILLE
WATER MANAGEMENT PLAN

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

UNIT I:
WATER CONSERVATION PLAN

Introduction

In accordance with the guidelines of the Texas Water Development Board (TWDB) the City of Castroville has adapted a Water Conservation Plan via Ordinance 98-002 and 98-003 (Attachment A). The City Council adopted this ordinance on July 14, 1998, and the Plan was subsequently approved by the TCEQ.

Effective October 7, 2004, the Texas Commission on Environmental Quality (TCEQ) adopted revised rules and regulations pertaining to Water Conservation and Drought Contingency plans requiring inclusion of new elements not previously required in such plans. The City of Castroville's current Plan substantially complies with the revised rules. However, the TCEQ has reviewed the plan and found that a minor update is required. Therefore, this document shall be considered the amendment to the current Water Conservation and Drought Contingency Plans.

In order to meet requirements of the TCEQ, the City is to adapt a water conservation and drought contingency plans entitled "City of Castroville Water Management Plan" by Ordinance 2013-006 (Attachment B). The ordinance the City Council adopts shall authorize the City to implement, enforce, and administer the program outline in this Water Conservation and Drought Contingency Plan.

Utility Profile

Population and Customer Data

The City's Water Services Department manages a water distribution service area of 2.4 square miles and serves a population of over 2960 residents. The City provides drinking water to its customers through a network of nearly 25 miles of transmission and distribution mains that provide service to over 1254 water connections. The information within the utility profile includes the City of Castroville Wells (PWS # 1630005), the Airport Well (PWS # 1630033) and the Medina Valley Well (PWS # 1630036). See Attachment C for the full Utility Profile.

The official U.S. Census population count for the city in 2010 was 2,680, an increase of about 19% from the 1990 Census. Population projections for Castroville, described in the South Central Texas Regional Water Planning Area's 2011 Regional Water Plan and in the City of Castroville's Master Plan 2011, forecast the City's population will reach 3,316 by 2020, and 3,636 by 2030. In comparison, the City's water demand projection is expected to increase to almost 743 ac-ft (0.663 MGD) by 2020 and 802 ac-ft (0.715

MGD) by 2030. References to the South Central Texas Regional Water Planning Area's 2011 Regional Water Plan are in Attachment D.

Water Use Data

Table 1 below summarizes key water use statistics for 2008 to 2011. Average per person usage is given in gallons per capita per day (gpcd). Average peak daily water demand is given in million gallons per day (MGD). The peak day to average day ratio is based on the Texas Commission on Environmental Quality (TCEQ) maximum daily demand (30 TAC §290.38. (41))

> *§290.38. (41)* **Maximum daily demand** -- In the absence of verified historical data or in cases where a public water system has imposed mandatory water use restrictions within the past 36 months, maximum daily demand means 2.4 times the average daily demand of the system.

The maximum daily demand for the City is 1.38 MGD, reached in 2011. During high demand periods when large volumes of water are being pumped from the aquifer, the production capacity of the wells is reduced due to declining water levels of the aquifer. The City's water production and pumping system capacity is currently 2.692 MGD and 2.736 MGD, respectively.

Table 1. Municipal Water Demand 2008-2012

Year	2008	2009	2010	2011
Peak GPCD	362	398	425	468
Annual Average GPCD	151	166	177	195
Peak Day (MGD)	1.26	1.27	1.19	1.38
Average Day (MGD)	0.52	0.53	0.49	.58
Peaking Factor	2.42	2.39	2.42	2.38

Water Production and Delivery System

The City utilizes ground water for its public water supply and has developed its own water production facilities. The City has five wells which withdraw groundwater from the Edwards Aquifer. The distribution system is divided into three separate water systems that are completely isolated from one another shown in Attachment E.

For the *City System*, all three wells pump directly into the distribution system. The ground storage tank, located on a hill, provides water storage to the City System. The City System also contains a separate pressure plane, referred to as the *River Bluff Pressure Plane* that is serviced by a pressure tank and small pump station. The pump station pumps directly into the River Bluff Pressure plane.

The *Airport System* is served by only one well, referred to as the Airport Well. The groundwater is pumped to a small ground storage tank. From the ground storage tank, a pump station pumps water into the airport system and the pressure tank. Some water

from the airport well is used by a local farmer to grow crops. The water at the airport is used for normal airport operations.

The *Medina Valley System* is served by Well #6. Groundwater is pumped into one ground storage tank, and a pressure tank. The water that is pumped from the well is used to supply residential and commercial properties.

Specific, Quantified 5 & 10-Year Targets

Water Loss Goals

Castroville is undertaking a comprehensive effort to reduce unaccounted for water, and to improve the quality of data in water loss estimates. It is expected that water loss percentages will fluctuate annually with weather and demand conditions, and that some fluctuations will occur as a result of improved data collection. Castroville intends to increase its water conservation, and reduce its percentage of lost water as follows:

Table 2. Water Conservation Plan 5- and 10- Yr Goals

Description	Historic 5-yr (Average)	Current (2011)	5-yr Goal (Yr)	10-yr Goal (Yr)
Total GPCD	166	203*	201*	199*
Water Conserved (GPCD)			2	4
Residential GPCD	122	123	122	121
Water Loss (GPCD)	25	39	38	37
Water Loss (%)	14.8	20.1	19.4	18.9

*Total GPCD is based on the 2011 Regional L Water Plan (Attachment D)

Implementation Schedule

The way the city plans on obtaining these water loss goals are described below:

1. Reduce per capita consumption through education by presenting non-wasteful uses of water and techniques that can be employed to conserve water. Information will be distributed in the local newspapers and other media outlets during high-use seasons to expand public awareness.

2. Once a year, the City will review consumption patterns and its income and expense levels and evaluate whether or not the current water rates are effective and appropriate. A progressive water rate structure may be considered by the City and adjustments will be made as needed.

3. The City will provide information regarding the water rate structure to each of its customers once a year. City will also provide customers with historical water use for the previous 12 months upon request.

4. A leak detection and repair program will be maintained as well as a meter testing and repair/replacement program.

5. Replacement of water lines found to be leaking or in generally poor condition will be completed to ensure minimal water loss.

6. Require wholesale customers to adopt and implement the City's water conservation plan. This will be done as part of any new customer contract or renewal of an existing customer contract to purchase water from the City.

Tracking of Water Conservation Plan Effectiveness

The City will keep track of the Water Conservation Plan's progress via the following four processes.

1. In order to track the effectiveness of water conservation measures, and to monitor the water distribution system efficiency, the City already employs a master meter, and a universal metering system. The master meter measures any water diverted from the source into the water distribution system. The universal metering system measures water used by customers and by public sites. These provide the data required to track annual water use, and evaluate progress towards the City's goals.

2. The City will collect information about its programs and the population to evaluate the effectiveness of the program at least once every three years. For literature documents, the number of such documents and topics covered will be recorded. The number of news programs or advertisements will also be recorded and the total population of the service area will be tracked.

3. Guidelines for meter selection based on customer usage, meter replacement policies, and records on each meter in the system will be recorded and maintained.

4. To control water theft, and water loss (both real and apparent), the City has developed schedules for meter inspection and maintenance, and visual line inspection. This schedule will be part of a continuous program of leak detection, repair, and water loss accounting.

    a. These will be done on a monthly basis:
        i. Visual inspection of all distribution lines
        ii. Inspection of all commercial meters to check accuracy

b. A water audit to detect water theft and abandoned services

Continuing Public Education & Information

Through education and information dissemination, the City will continue to inform its water customers of the benefits of water conservation. The City will accomplish this by implementing the following steps:

1. The City will provide information to all new customers describing the water conservation program upon application for service.

2. The City will have available for free distribution pamphlets and tips on water saving fixtures for homes and businesses, use of water conserving landscaping, recycling of water, and reuse of water.

3. On an annual basis the City will request that local newspapers publish water conservation literature.

4. The City Administrator will report annually on the effectiveness of the City's water conservation measures and the per capita water usage. If the Water Conservation Plan is not effective, the City Administrator will make recommendations for modifying the plan to increase its effectiveness. The City Administrator will send a copy of the annual report to the executive administrator of the Texas Water Development Board.

Water Rate Structure

The City currently has adopted a cost-based rate structure which encourages customers to reduce both peak and overall water usage. The water rates for the City are documented in Ordinance No. 2012-15 below as Attachment F. This rate structure will be reviewed on a regular basis to ensure that the rates adequately recover the cost of service and meet the goals of this water conservation plan.

Edwards Aquifer Authority Best Management Practices

The Edwards Aquifer Authority (EAA) requires the implementation of Best Management Practices (BMPs) for Groundwater Conservation. For a community the size served by Castroville, the EAA requires the implementation of Muni 1-7 as outlined in the *Municipal Groundwater Conservation Plan Form* produced by the EAA (See attached Attachment G). The City intends to implement these BMPs by completing the following programs:

Muni-1: System Water Audit, Leak Detection and Repair

1. The City will develop an annual pre-screening water audit program to determine real and apparent water losses.

2. In the event that the City is unable to account for 85% of the system's water use, the City will have a leak detection and repair program implemented to reduce water loss.

3. Upon completion of the leak detection program, the City will provide the EAA with measures to prevent future water loss

Muni-2: Metering of All New Connections and Retrofit of Existing Connections

1. The City will develop a document that outlines how the City is to install meters on new connections.

2. The City will produce a feasibility study showing the benefit of having landscaping irrigation meters on industrial and commercial accounts and determine the best approach to controlling irrigation usage.

3. The City will develop a program and schedule to test and replace meters within the service area.

4. The City will develop a feasibility study to retrofit multi-family and industrial, commercial, and institutional (ICI) accounts with turbo meters or similar technology that accurately reads flows.

Muni-3: Water Waste Prohibition

1. The City will develop a policies and enforcement programs to prohibit water waste from property, landscape watering commercial activities.

Muni-4: Conservation Pricing

1. The City will maintain and update the cost-based water rate structure to encourage customers to reduce both peak and overall water usage.

2. The City will develop a seasonal or excess surcharge to reduce demand during the summer months.

Muni-5: Public Information and School Education Programs

1. The City will continue and improve upon the water conservation education program to all employees and the community that is being served.

2. The City will develop an education program on water conservation in the public school system.

Muni-6: Landscape Conservation Program

1. The City will develop a program for irrigation conservation.

2. The City will develop a program market landscape water-use surveys to ICI and residential accounts.

3. The City will develop and implement a customer inventive program for irrigation conservation.

4. The City will consider developing an ordinance requiring all new homes, apartment complexes and commercial buildings to install a water conserving landscape.

Muni-7: Conservation Coordinator

1. The Public Services director will appoint a City of Castroville's Conservation Coordinator and oversee the Conservation Coordinator.

Enforcement Procedure and Plan Adoption

This water conservation plan has been implemented through the passage of an ordinance by the City of Castroville. The plan will be put into effect by notices being given to water customers through the local newspaper. The City Administrator or his/her duly appointed representative will act as the Administrator of the Water Conservation Plan. The Administrator will oversee the execution and implementation of all elements of the plan and be responsible for overseeing and keeping adequate records for program verification.

Other

Attachment H is provided as documentation that the regional water planning group for the City's service area has been notified of the Water Conservation and Drought Contingency Plan.

UNIT II:
Drought Contingency Plan

Section I Declaration of Policy, Purpose, and Intent

In order to conserve the available water supply and protect the integrity of water supply facilities, with particular regard for domestic water use, sanitation, and fire protection, and to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other water supply emergency conditions, the City of Castroville hereby adopts the following regulations and restrictions on the delivery and consumption of water through an ordinance.

Water uses regulated or prohibited under this Drought Contingency Plan (the Plan) are considered to be non-essential and continuation of such uses during times of water shortage or other emergency water supply condition are deemed to constitute a waste of water which subjects the offender(s) to penalties as defined in Section XI of this Plan.

Section II Public Involvement

Opportunity for the public to provide input into the preparation of the Plan was provided by the City of Castroville, Texas ("City") by means of a public notice of a public meeting, which was held on April 9, 2013. Additionally, the public is always invited to attend the City Council meetings to ask questions about the Plan and its implementation.

Section III Public Education

The City will periodically provide the public with information about the Plan, including information about the conditions under which each stage of the Plan is to be initiated or terminated and the drought response measures to be implemented in each stage. This information will be provided by means of public meetings, press releases to newspapers serving the area, periodic utility bill inserts, monthly newsletter articles, and placement on the City's website.

Section IV Coordination with Regional Water Planning Groups

The service area of the City is located within the South Central Texas Regional Water Planning Area and the City has provided a copy of this Plan to South Central Texas Regional Water Planning Area.

Section V Authorization

The City Administrator, or his/her designee is hereby authorized and directed to implement the applicable provisions of this Plan upon determination that such implementation is necessary to

protect public health, safety, and welfare. The City Administrator or his/her designee shall have the authority to initiate or terminate drought or other water supply emergency response measures as described in this Plan.

Section VI Application

The provisions of this Plan shall apply to all persons, customers, and property utilizing water provided by the City. The terms "person" and "customer" as used in the Plan include individuals, corporations, partnerships, associations, and all other legal entities.

Section VII Definitions

For the purposes of this Plan**,** the following definitions shall apply:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

City: The City of Castroville, Texas.

Commercial and institutional water use: water use which is integral to the operations of commercial and non-profit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

Conservation: those practices, techniques, and technologies that 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 supply is conserved and made available for future or alternative uses.

Customer: any person, company, or organization using water supplied by the City.

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Even number address: street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Industrial water use: the use of water in processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, and rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

(a) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;

(b) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;

(c) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;

(d) use of water to wash down buildings or structures for purposes other than immediate fire protection;

(e) flushing gutters or permitting water to run or accumulate in any gutter or street;

(f) use of water to fill, refill, or add to any indoor or outdoor swimming pools or Jacuzzi-type pools;

(g) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;

(h) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and

Odd numbered address: street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

Section VIII Criteria for Initiation and Termination of Drought

Response Stages

The City Administrator or his/her designee shall monitor water supply and/or demand conditions on a weekly basis and shall determine when conditions warrant initiation or termination of each stage of the Plan, that is, when the specified "triggers" are reached. During especially dry periods, the City Administrator or his/her designee may monitor water supply and/or demand conditions on a daily basis and determine when conditions warrant initiation or termination of a stage of the Plan.

Public notification of the initiation or termination of drought response stages shall be by means of citizens' telephone system communication, publication in a newspaper of general circulation and with signs posted in public places. Further, the notice shall be posted at City Hall and on the City's web page.

The triggering criteria described below are based on guidelines adopted by the San Antonio Water System ("SAWS") and the implementation and termination of the Stages by the Edwards Aquifer Authority ("EAA") based upon reported water levels in the San Antonio Pool.

Year Round

Requirements for initiation

Year round watering restrictions are in effect when the Aquifer level is above 660 feet mean sea level as determined by EAA at the monitored well for 15 consecutive days.

Requirements for termination

Year round water restrictions continue until there is an announcement by EAA that Stage 1 is triggered.

Stage 1 Triggers -- MILD Water Shortage Conditions

Requirements for initiation

Customers shall be requested to voluntarily conserve water and adhere to the prescribed restrictions on certain water uses, defined in Section IX of this Plan, when the 10-day rolling average of the Edwards Aquifer level drops to 660 feet mean sea level at the monitored well.

Requirements for termination

Stage 1 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 15 consecutive days. Upon termination of Stage 1, Year Round becomes operative.

Stage 2 Triggers -- MODERATE Water Shortage Conditions

Requirements for initiation

Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses provided in Section IX of this Plan when the 10-day rolling average of the Edwards Aquifer level reaches 650 feet mean sea level at the monitored well.

Requirements for termination

Stage 2 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 15 consecutive days. Upon termination of Stage 2, Stage 1 becomes operative.

Stage 3 Triggers - SEVERE Water Shortage Conditions

Requirements for initiation

Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 3 provided in Section IX of this Plan when 10-day rolling average of the Edwards Aquifer level drops to 640 feet mean sea level at the monitored well.

Requirements for termination

Stage 3 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 15 consecutive days. Upon termination of Stage 3, Stage 2 becomes operative.

Stage 4 Triggers -- EXTREME Water Shortage Conditions

Requirements for initiation

Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 4 provided in Section IX of this Plan when 10-day rolling average of the Edwards Aquifer level drops to 630 feet mean sea level at the monitored well.

Requirements for termination

Stage 4 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 15 consecutive days. Upon termination of Stage 4, Stage 3 becomes operative.

Stage 5 Triggers -- CRITICAL Water Shortage Conditions

Requirements for initiation

Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 4 provided in Section IX of this Plan when 10-day rolling average of the Edwards Aquifer level drops to 625 feet mean sea level at the monitored well.

Requirements for termination

Stage 5 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 15 consecutive days. Upon termination of Stage 5, Stage 4 becomes operative.

Stage 6 Triggers -- EMERGENCY Water Shortage Conditions

Requirements for initiation

Customers shall be required to comply with the requirements and restrictions for Stage 5 of this Plan when the Mayor or City Administrator, or his/her designee, determines that a water supply emergency exists based on:

1. Major water line breaks, or pump or system failures occur, which cause unprecedented loss of capability to provide water service; **or**

2. Natural or man-made contamination of the water supply source(s).

Requirements for termination

Stage 5 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist and is authorized by the City Administrator or his/her designee after review.

Section IX Drought Response Stages

The City Administrator, or his/her designee, shall monitor water supply and/or demand conditions on a daily basis and, in accordance with the triggering criteria set forth in Section VIII of this Plan, shall determine that a mild, moderate, severe, critical, emergency or water shortage condition exists and shall implement the following notification procedures:

Notification

Notification of the Public:

The City Administrator or his/ her designee shall notify the public by means of the citizen telephone system, publication in a newspaper of general circulation, posting at City Hall and placement of the information on the City's website.

Additional Notification:

The City Administrator or his/ her designee shall notify directly, or cause to be notified directly, the following individuals and entities when required under the Plan:

Mayor / Chairman and members of the City Council - At each declaration

Police Chief/ Fire Chief – At each declaration

County Emergency Management Coordinator(s) – When mandatory restrictions are imposed

County Judge & Commissioner(s) – When mandatory restrictions are imposed

TCEQ – *When mandatory restrictions are imposed*

Critical water users, i.e. hospitals, critical care facilities – When mandatory restrictions are imposed.

Stage 1 Response -- MILD Water Shortage Conditions

Target: Achieve a 20 percent reduction in total water use.

Voluntary Water Use Restrictions for Reducing Demand:

(a) Watering with an irrigation system or sprinkler is allowed only once a week before 10:00 AM or after 8:00 PM on your designated water day. For addresses ending in 0-1 the designated day is Monday. Addresses ending in 2-3 have a designation of Tuesday. Addresses ending in 4-5 have a designation of Wednesday. Addresses ending in 6-7 have a designation of Thursday. Addresses ending in 8-9 have a designation of Friday.

(b) Watering days begin and end at midnight; overnight watering is not allowed.

(c) Hand watering with a hand-held hose, soaker hose, drip irrigation, bucket or water can is permitted any time and any day.

(d) Use of grey water is allowed at any time.

(e) The use of commercial car wash facilities is allowed any day.

(f) Residential car washing allowed during drought once per week on your designated watering day, Saturday or Sunday as long as there is no water waste.

(g) Washing impervious cover such as parking lots, driveways, streets or sidewalks is prohibited. Health and safety exceptions to this rule may be requested from the City of Castroville in writing.

(h) All non-public swimming pools must have a minimum of 25 percent of the surface covered with evaporation screens when not in use. Inflatable pool toys or floating decorations may be used.

(i) Landscape areas on golf courses not directly "in play" are required to follow on-day-per-week watering based on address unless otherwise instructed by the City.

(j) Operators of golf courses, athletic fields and parks must submit a conservation plan to the City. For submittal requirements, operators should contact the City Administrator.

(k) All residential fountains and indoor commercial fountains can operate at any stage of drought. Outdoor commercial fountains must have a City of Castroville variance in order to operate during drought stages 1-6.

(l) Water waste is prohibited at all times. Water waste includes allowing water to run off into gutter, ditch or drain; or failing to repair a controllable leak.

Stage 2 Response -- MODERATE Water Shortage Conditions

Target: Achieve a 30 percent reduction total water usage.

Water Use Restrictions for Demand Reduction:

Under threat of penalty for violation, the following water use restrictions shall apply to all persons:

(a) All restrictions from Stage 1 remain in effect unless added to or replaced by Stage 2.

(b) Landscape watering with an irrigation system, sprinkler or soaker hose is allowed only once a week from 6 – 10 AM and 8 PM to 12:00 AM on your designated water day, as determined by your address.

(c) Watering with a drip irrigation or 5-gallon bucket is permitted any day, but only between 6-10 AM and 8:00 PM to 12:00 AM.

(d) Watering with a hand-held hose is allowed any time on any day.

(e) Use of grey water is allowed at any time.

(f) Hotels, motels and other lodging must offer and clearly notify guests of a “linen/towel change on request only” program.

(g) Use of water from hydrants shall be limited to fire fighting, related activities, or other activities necessary to maintain public health, safety, and welfare, except that use of water from designated fire hydrants for construction purposes may be allowed under special permit from the City.

(h) All restaurants may prohibit the serving of water to patrons except upon request of the patron.

Stage 3 Response -- SEVERE Water Shortage Conditions

Target: Achieve a 35 percent reduction in total water use.

Water Use Restrictions for Demand Reduction:

All restrictions from Stage 1 and Stage 2 remain in effect, unless added to or replaced by Stage 3 rules.

(a) Landscape watering with an irrigation system, sprinkler or soaker hose is allowed only once every other week from 6:00 – 10:00 AM and 8:00 PM – 12:00 AM on your designated watering day, as determined by your address.

(b) Watering with drip irrigation is permitted every Monday, Wednesday, and Friday, but only between 6:00 – 10:00 AM and 8:00 PM – 12:00 AM.

(c) Watering with a hand-held hose, bucket or watering can is allowed any time on any day.

(d) Use of grey water is allowed at any time.

(e) Hotels, motels and other lodging facilities must limit linen/towel changes to once every three (3) nights, except for health and safety.

(f) The use of water for construction purposes from designated fire hydrants under special permit is to be discontinued.

Stage 4 Response -- EXTREME Water Shortage Conditions

Target: Achieve a 40 percent reduction in total water use.

Water Use Restrictions for Reducing Demand:. All requirements of Stage 2 and 3 shall remain in effect during Stage 4 with the following additional restrictions:

(a) No application for new, additional, expanded, or increased-in-size water service connections, meters, service lines, pipeline extensions, mains, or water service facilities of any kind shall be approved for immediate usage. Approval of such applications will be reviewed on an individual basis, but the City shall not be required to approve such application during such time as the drought response stage or higher- numbered stager shall be in effect. Any time limits for approval of such applications are hereby suspended for such time as this drought response stage or higher-numbered stage shall be in effect.

(b) The filling, refilling, or adding of water to swimming pools, wading pools, and Jacuzzi-type pools is prohibited, unless such pool is equipped with a filtration system which requires such pool to maintain a constant level for proper operation.

(c) The use of commercial car wash facilities, including those at commercial service stations shall occur between the hours of 6:00 AM – 10:00 AM and between 6:00 PM – 10:00 PM.

(d) Use of grey water is allowed at any time.

Stage 5 Response -- CRITICAL Water Shortage Conditions

Target: Achieve a 44 percent reduction in total water use.

Water Use Restrictions for Reducing Demand:. All requirements of Stage 2,3, and 4 shall remain in effect during Stage 5 with the following additional restrictions:

(a) The use of commercial car wash facilities, including those at commercial service stations shall occur between the hours of 6:00 AM – 8:00 AM and between 8:00 PM – 10:00 PM.

(b) Landscape watering with an irrigation system, sprinkler or soaker hose is allowed only once every other week from 6:00 – 8:00 AM and 8:00 PM – 10:00 PM on your designated watering day, as determined by your address.

(c) Watering with drip irrigation is permitted every Monday, Wednesday, and Friday, but only between 6:00 – 8:00 AM and 8:00 PM – 10:00 PM.

(d) Use of grey water is allowed at any time.

Stage 6 Response -- EMERGENCY Water Shortage Conditions

Target: Achieve reduction in total water use.

Water Use Restrictions for Reducing Demand. All requirements of Stage 2, 3, 4 and 5 shall remain in effect during Stage 6 with the additional restrictions as follows:

(a) Irrigation of landscaped areas is absolutely prohibited.

(b) The filling, refilling or adding of water to all swimming pools, wading pools and Jacuzzi-type pools is absolutely prohibited.

(c) Use of water to wash any motor vehicle, motorbike, trailer, airplane or other vehicle is absolutely prohibited, including at commercial car wash facilities.

Section X Plan Review and Update

The City will review and update the Plan as appropriate based on an assessment of the five and 10 year goals, as well as whenever the Plans for SAWS and EAA are updated. At a minimum, the Plan will be updated every five (5) years.

Section XI Enforcement

(a) No person shall knowingly or intentionally allow the use of water from the City for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this Plan, or in an amount in excess of that permitted by the drought response stage in effect at the time pursuant to action taken by City Administrator or his/her designee, in accordance with provisions of this Plan.

(b) Any person who violates this Plan is guilty of a misdemeanor and, upon conviction shall be punished by a fine of not less than two hundred dollars ($200.00) and not more than five hundred dollars ($500.00). Each day that one or more of the provisions in this Plan is violated shall constitute a separate offense. If a person is convicted of three or more distinct violations of this Plan, the City Administrator shall, upon due notice to the customer, be authorized to discontinue water service to the premises where such violations occur. Services discontinued under such circumstances shall be restored only upon payment of a re-connection charge, hereby established at fifty dollars ($50.00), and any other costs incurred by the City in discontinuing service. In addition, suitable assurance must be given to the City Administrator that the same action shall not be repeated while the Plan is in effect. Compliance with this plan may also be sought through injunctive relief in the district court.

(c) Any person, including a person classified as a water customer of the City, in apparent control of the property where a violation occurs or originates shall be presumed to be the violator, and proof that the violation occurred on the person=s property shall constitute a rebuttable presumption that the person in apparent control of the property committed the violation, but any such person shall have the right to show that he/she did not commit the violation. Parents shall be presumed to be responsible for violations of their minor children and proof that a violation, committed by a child, occurred on property within the parent’s control shall constitute a rebuttable presumption that the parent committed the violation, but any such parent may be excused if he/she proves that he/she had previously directed the child not to use the water as it was used in violation of this Plan and that the parent could not have reasonably known of the violation.

(d) The City's police officer, code enforcement officer, or other City employee designated by the City Administrator may issue a citation to a person he/she reasonably believes to be in violation of this Ordinance. The citation shall be prepared in duplicate and shall contain the name and address of the alleged violator, if known, the offense charged, and shall direct him/her to appear in the municipal court on the date shown on the citation. The alleged violator shall be served a copy of the citation. Service of the citation shall be complete upon delivery of the citation to the alleged violator, to an agent or employee of a violator, or to a person over 14 years of age who is a member of the violator's immediate family or is a resident of the violator's residence. The alleged violator shall appear in municipal court to enter a plea of guilty or not guilty for the violation of this Plan. If the alleged violator fails to appear in municipal court, a warrant for his/her arrest may be issued. A summons to appear may be issued in lieu of an arrest warrant. These cases shall be expedited and given preferential setting in municipal court before all other cases.

Section XII Variances

The City Administrator, 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 Ordinance shall file a petition for variance with the City within 5 days after the Plan or a particular drought response stage has been invoked. All petitions for variances shall be reviewed by the City Administrator, 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 this Ordinance.

(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.

Variances granted by the City Administrator or his/her designee may be subject to conditions which shall be set forth in the variance. Should the City Administrator or his/her designee deny a variance, the person requesting the variance may appeal such a denial to the City Council.

ATTACHMENT A.
ORDINANCE 98-002 AND 98-003

ORDINANCE NO. 98-002

AN ORDINANCE ADOPTING MANDATORY WATER CONSERVATION AND REDUCTION MEASURES; PROVIDING FOR ENFORCEMENT BY A PENALTY FOR VIOLATION HEREOF; PROVIDING WHEN THIS ORDINANCE SHALL BECOME EFFECTIVE AND PROVIDING FOR A SAVINGS CLAUSE.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CASTROVILLE, TEXAS.

That the Code of Ordinances, City of Castroville, Texas, Chapter 74, Natural Resources, Article II, Water, is hereby amended by adding Division 3, Mandatory Water Conservation and Reduction Measures, with Sections to be numbered 74-45 through 74-49, which Sections read as follows:

Division 3. Mandatory Water Conservation and Reduction Measures

Section 74-45. Scope.

All person who are supplied water by the City of Castroville shall comply with the Demand Reduction Measures, Stage I Restrictions adopted by the Edwards Aquifer Authority in the Critical Period Rules which became effective on April 5, 1998 and which are as follows:

DEMAND REDUCTION MEASURES

1. No person may waste groundwater.

2. No person may use groundwater for landscape watering between the hours of 10:00 a..m. and 8:00 p.m. This subsection does not apply to non-potable water, gray water, and treated effluent.

3. No person may use groundwater to wash an impervious outdoor ground covering such as a parking lot, driveway, street, or sidewalk unless for health or safety reasons.

4. No person may allow irrigation tailwater to escape from that person's land.

5. Restaurants and other eating establishments are prohibited from serving groundwater to customers except upon request of the customer.

6. Every person who owns or has possession of a swimming pool must cover the pool with an effective evaporation cover or screen, or evaporation shields covering at least 25% of the surface of the pool, when the pool is not in active use. Active use includes necessary maintenance that requires removal of the cover, screen, or shields. Active use of public, commercial and apartment pools is whenever the pool is not officially closed.

7. No person may wash an automobile at a residence except on a watering day designated by the Critical Period Management Rules adopted by the Edwards Aquifer Authority, and in no event may a person allow groundwater from automobile washing at a residence escape into the street or otherwise off the person's property.

8. Charity car washes are prohibited except at a commercial car wash that recycles at least 75% of the groundwater it uses or that is certified as a conservation car wash.

Section 74-46. Penalties.

A person who knowingly or intentionally violates the provisions of this Chapter, shall be deemed guilty of a misdemeanor offense and upon conviction be punished by a fine of not less than twenty five dollars ($25.00) and not more than two thousand dollars ($2,000.00). Each day's violation constitutes a separate offense. Compliance may also be sought through injunctive relief in the District Court.

Section 74-47. Enforcement.

When it comes to the attention of the officials of the City of Castroville that a violation has occurred, a notice shall be posted at the location where the violation occurred and a notice shall be forwarded to the landowner at his or her last known address notifying them to appear in Municipal Court. Any person found to have violated or to be in violation of the provisions of this ordinance shall be punished as set forth in Section 74-46.

Section 74.48. Savings Clause.

If for any reason any section, paragraph, subdivision, clause, phrase, or provision of this ordinance shall be held invalid, it shall not affect any valid provision of this or any other ordinance of the City of Castroville.

Section 74-49. Effective Date.

This Ordinance shall take effect immediately from and after its passage and publication as required by law, and it is accordingly so ordained.

PASSED and ADOPTED this 9th day of June, 1998.

DWIGHT M. GREEN, Mayor

ATTEST:

DONNA M. SCHUELING, City Secretary

APPROVED:

MARCIE MORA, City Administrator

VIVIAN TORRES, City Attorney

ORDINANCE NO. 98-003

AN ORDINANCE AMENDING ORDINANCE NO. 98-002, ADOPTING MANDATORY WATER CONSERVATION AND REDUCTION MEASURES; PROVIDING FOR ENFORCEMENT BY A PENALTY FOR VIOLATION HEREOF; PROVIDING WHEN THIS ORDINANCE SHALL BECOME EFFECTIVE AND PROVIDING FOR A SAVINGS CLAUSE.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CASTROVILLE, TEXAS.

That item No. 2 of the DEMAND REDUCTION MEASURES contained in Ordinance No. 98-002 of the Code of Ordinances, City of Castroville, Texas, Chapter 74, Natural Resources, Article II, Water, is hereby amended in its entirety and shall henceforth read as follows:

ARTICLE I

DEMAND REDUCTION MEASURES

2. No person may use groundwater for landscape watering between the hours of 10:00 a..m. and 8:00 p.m., except by means of a bucket (not to exceed five (5) gallons in capacity), hand-held or soaker hose, or properly installed drip irrigation system. This subsection does not apply to non-potable water, gray water, and treated effluent.

ARTICLE 2

Each and every section of said Ordinance 98-002, not specifically amended hereby are reaffirmed and shall be effective as previously passed.

ARTICLE 3

This Ordinance shall take effect immediately from and after its passage and publication as required by law, and it is accordingly so ordained.

PASSED and ADOPTED this 14th day of July, 1998.

DWIGHT M. GREEN, Mayor

ATTEST:

DONNA M. SCHUELING, City Secretary

APPROVED:

MARCIE MORA, City Administrator

VIVIAN TORRES, City Attorney

TORRES, RUSSELL, TSCHIRHART & GAMBLE
ATTORNEYS AT LAW, P.C.

MEMORANDUM

COPY

DATE: June 29, 1998

TO: DONNA SCHUELING

FROM: VIVIAN TORRES

RE: City of Castroville Water Conservation and Reduction Measures Ordinance

As you have discovered by now there is a difference between the Stage I restrictions set forth in the Critical Period Management Rules adopted by the EAA and the City's recently adopted Water Conservation And Reduction Ordinance. During the council meeting where the Ordinance was adopted the council specifically adopted the Stage 1 restrictions set forth on page 19 and the penalty provisions set forth on page 17 of the model EAA ordinance.

When I prepared the ordinance I had to follow the action taken by council. Claudia contacted you in order to verify my notes that the restrictions on page 19 were to be included in the Ordinance. Unfortunately, the EAA's model ordinance does not exactly track the restrictions set forth in §709.19 Critical Period Management Rules. The Stage I restrictions do in fact vary between the EAA rules and the model ordinance. The only variation is that the language in Item 2... "except by means of a bucket (not to exceed 5 gallons in capacity), hand-held or soaker hose or properly installed drip irrigation system" was deleted from the model ordinance.

Marcie and I discussed the need to amend our conservation ordinance in the future to include a variance procedure, designate water days and correct the discrepancy. It was our understanding, however, that the council's intent was in fact to adopt the Stage I restrictions set forth in §790.19 Critical Period Management Rules.

Council very wisely chose to act quickly to adopt the Water Conservation Ordinance. They viewed conservation efforts to be vitally important since the City of Castroville was on the path to exceedence. Everyone agreed if we had to ask for more water the EAA would certainly be more amenable to our request if we had done something to conserve water. As a result of the need for immediate action there was no ordinance already drafted for council to consider. Instead, council considered the Critical Period Management Rules and the model ordinance. Without comparing each document verbatim we could not have discovered the discrepancies between the Critical Period Management Rules and the model ordinance. After all, the EAA authored both documents. We do not believe that council intended for individuals watering a rosebush with a watering can to be issued a citation.

If you have any questions concerning the above, please do not hesitate to contact me.

VIVIAN TORRES

Vivian Torres · Richard Wesley Russell · Bill Tschirhart, Jr. · William J. Gamble · Chris Schuchart
1313 LORENZO, NO. 1 · CASTROVILLE, TX 78009 · FAX (830) 538-3515 · (830) 931-2271

ATTACHMENT B.
ORDINANCE 2013-006

ORDINANCE NO. 2013-006

AN ORDINACE OF THE CITY OF CASTROVILLE, TEXAS, ADOPTING CITY OF CASTROVILLE WATER MANAGEMENT PLAN AMENDING WATER CONSERVATION AND REDUCTION MEASURES VIA ORDINANCE NO. 98-002 ON 9 JUNE 1998 AND ORDINANCE 98-003 ON 14 JULY 1998; AND ORDINANCE 2009-013 DROUGHT CONTINGENCY PLAN

WHEREAS, it is necessary that the Water Conservation Plan and Drought Contingency Plans be amended to incorporate additional Texas Commission on Environmental Quality, Texas Water Develop Board and Edwards Aquifer Authority requirements as provided in Texas Administrative Code – Title 30 - §288, Texas Administrative Code – Title 31 - § 363.15 and Chapter 715 Subchapter C – Groundwater Conservation and Reuse pertaining to Water Conservation and Drought Contingency Plans; and

WHEREAS, the City Council of the City of Castroville believes that it is in the best interest of the City of Castroville to amend its current water conservation plan;

NOW, THEREFORE BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CASTROVILLE, TEXAS,

Section 1: That the City of Castroville Water Management Plan attached hereto and made part hereof for all purposes be, and the same is hereby, adopted as the official policy of the City.

Section 2: That all ordinances of the City in conflict with the provisions of this ordinance are, and the same are hereby, repealed and all other ordinances of the City not in conflict with the provisions of this ordinance shall remain in full force and effect.

Section 3: Should any paragraph, sentence, subdivision, clause, phrase, or section of this ordinance be adjudged or held to be unconstitutional, illegal, or invalid, the same shall not affect the validity of this ordinance as a whole or any part or provision thereof, other than the part so declared to be invalid, illegal, or unconstitutional.

Section 4: This ordinance shall take effect immediately from and after its passage and the publication of the caption, as the law in such cases provide.

PASSED, APPROVED, AND ADOPTED, This the 9th day of April, 2013.

Robert Lee, Mayor

ATTEST:

Debra Howe, City Secretary

ATTACHMENT C.
CITY OF CASTROVILLE UTILITY PROFILE

TEXAS WATER DEVELOPMENT BOARD
UTILITY PROFILE (TWDB - 1965)

(Formerly WRD 264)

The purpose of the Utility Profile is to assist with water conservation plan development and to ensure that important information and data be considered when preparing your water conservation plan and its target and goals. Please complete all questions as completely and objectively as possible. See *Water Conservation Plan Guidance Checklist* (TWDB-1968) for information on other water conservation plan provisions. You may contact the Municipal Water Conservation Unit of the TWDB at 512.463.7955 or wcpteam@twdb.state.tx.us for assistance.

APPLICANT DATA

Name of Utility: City of Castroville

Public Water Supply Identification Number (PWS ID): 1630005

Address: 1209 Fiorella St. City: Castroville

State: TX Zip Code: 78009 Email: dirpublicsvcs@castrovilletx.gov

Telephone Number: (830) 931-4090 Fax: (830) 931-6373

Regional Water Planning Group: L

Groundwater Conservation District: Medina County Groundwater Conservation District

Form Completed By: Kim Davis Title: Director of Public Services

Signature: _____ Date: _____

Contact information for the person or department responsible for implementing the water conservation program:

Name: Kim Davis Phone: (830) 931-4090

Email: dirpublicsvcs@castrovilletx.gov

UTILITY DATA

A. Population and Service Area Data

1. Current population of service area: 2,960

2. Current population served by utility: Water: 2,960

   Wastewater: 2,960

3. Population served by water utility for the previous five years starting with the most recent year:

Year	Population
2011	2,960
2010	2,808
2009	3,215
2008	3,500
2007	3,500

4. Projected population for service area in the following decades:

Year	Population
2010	2,680
2020	3,316
2030	3,912
2040	4,180
2050	4,421

5. List source(s)/method(s) for the calculation of current and projected population:

2011 Regional Water Plan, City of Castroville Municipal Data and from the Texas Water Development Board Web site at https://www.twdb.state.tx.us/apps/db12/defaultReadOnly.asp

B. Active Connections

1. Current number of active connections by user type. If not a separate classification, check whether multi-family service is counted as **Residential** ◯ or **Commercial** ◯

Water User Type*	Metered	Un-metered	Total
Residential Single Family	1,019	0	1,019
Residential Multi-family	32	0	32
Commercial/Institutional	203	0	203
Industrial		0	0
Other (please describe): Unmetered service connections			0

* See Appendix A #1.

2. List the net number of new connections per year for most recent three years:

Water User Type*	2011	2010	2009
Residential Single Family	5	4	4
Residential Multi-family			
Commercial/Institutional			2
Industrial			
Other (please describe):			

* See Appendix A #1.

C. High Volume Customers

List annual water use for the five highest volume retail and wholesale customers. Please indicate if treated or raw water delivery.

Customer	Water User Type*	Annual Water Use (in gallons)	Treated	Raw
City of Castroville	City	9,245	◉	○
MV Health & Rehab	Comm	4,605	◉	○
City of Castroville	City	2,713	◉	○
Sammy's Restaurant	Comm	1,311	◉	○
Decock, Hoffman	Ras	1,232	◉	○

* See Appendix A #1

D. Water Supply System

1. Design daily capacity of system: 2,692,800 **gallons** per day

2. Storage Capacity: Elevated 536,000 **gallons** per day

   Ground 50,000 **gallons** per day

3. If surface water, do you recycle filter backwash to the head of the plant?
   Yes ○ **No** ◉. If yes, approximately _____ **gallons** per day.

E. Water Accounting Data

1. Amount of water use in **gallons** for previous five years.
   Please indicate whether: **Treated Water** ○ or **Raw Water** ◉

YEAR	2011	2010	2009	2008	2007
January	12,056,905	12,540,900	13,359,500	13,579,000	12,650,000
February	11,239,490	10,383,500	13,978,600	14,381,000	11,835,800
March	17,037,000	12,134,600	16,411,400	14,854,000	13,426,500
April	20,871,400	12,952,900	15,999,500	15,276,000	12,478,600
May	20,192,200	15,089,400	17,430,300	18,583,000	13,127,800
June	21,154,400	18,678,900	22,116,100	24,333,000	14,364,500
July	22,315,100	16,328,200	23,793,800	16,511,000	12,395,200
August	23,339,075	24,745,300	21,110,900	15,331,000	15,038,900
September	20,946,538	14,431,800	14,309,300	16,325,000	28,287,000
October	16,824,055	15,323,400	12,009,700	15,922,000	16,961,600
November	12,644,354	14,422,100	11,917,000	14,385,000	14,003,600
December	12,499,994	14,763,900	12,021,100	13,078,000	13,182,500
TOTAL	211,120,511	181,794,900	194,457,200	192,558,000	177,752,000

Please indicate how the above figures were determined (e.g., from a master meter located at the point of a diversion from a stream or located at a point where raw water enters the treatment plant).

Water meters located at the wells

2. Amount of water sold in **gallons** as recorded by Water User Type for the previous five years (See Appendix A #1)

Year	Residential Single Family	Residential Multi Family	Commercial/ Institutional	Industrial	Other	Wholesale	Total Sold
2011	126,640,000	5,720,000	42,851,000				175,211,000
2010	125,521,492	31,460,000	43,273,177				200,254,669
2009	128,504,181	10,725,000	24,697,374				163,926,555
2008	128,255,623	10,725,000	24,697,374				163,677,998
2007	113,590,736	20,020,000	35,040,719				168,651,455

3. GPCD and Seasonal Water Use for the previous five years

					SEASONAL WATER USE***	
Year	Population	Total Water Use	Total gallons per capita per day (GPCD)*	Residential GPCD**	Winter per capita per day	Summer per capita per day
2011	2,960	211,120,511	195	123	134	251
2010	2,808	181,794,900	177	153	149	236
2009	3,215	194,457,200	166	119	136	232
2008	3,500	192,558,000	151	109	130	178
2007	3,500	177,752,000	139	105	120	133
Five Year Average	3,197	191,536,522	166	122	134	206

* Total GPCD (See Appendix A #2):
** Residential GPCD (See Appendix A #3):
*** Seasonal Water Use (See Appendix A #4)

4. Water Loss Data for the previous five years (See Appendix A #5)

Year	Water Loss expressed in gallons	Water Loss expressed in GPCD	Water Loss expressed as a percentage
2011	42,433,600	39	20.10%
2010	41,022,000	40	22.56%
2009	20,674,737	18	10.63%
2008	11,664,098	9	6.06%
2007	26,028,963	20	14.64%
Five Year Average	28,364,680	25	14.80%

5. Peak Day Use (in **gallons**) to Average Daily Use (in **gallons**) Ratio for the previous five years (See Appendix A #6)

Year	Average Daily Use	Peak Day Use	Ratio
2011	578,412	1,388,189	2.40
2010	498,068	1,195,363	2.40
2009	532,759	1,278,622	2.40
2008	527,556	1,266,134	2.40
2007	486,992	1,168,781	2.40

F. Projected Demands

Estimate water supply requirements for at least the next ten years using population trends, historical water use, and economic growth, etc.

Year	Population	Water Demand (in gallons)
2012	3,042	225,685,000
2013	3,077	227,738,000
2014	3,111	229,790,000
2015	3,145	231,843,000
2016	3,179	233,896,000
2017	3,213	235,949,000
2018	3,248	238,002,000
2019	3,282	240,055,000
2020	3,316	242,408,000
2021	3,350	244,160,000

Indicate sources of data and how projected water demands were determined. Attach additional sheets if necessary.

2011 Regional Water Plan, City of Castroville Municipal Data.

G. Wastewater System Data

1. Design capacity of wastewater treatment plant(s): 350,000 **gallons** per day

2. Is treated effluent used for:

Use	Total Annual Volume (in gallons)
On-site irrigation	
Plant wash down	
Chlorination/de-chlorination	
Industrial	
Landscape irrigation (parks, golf courses)	2,073,090
Agricultural	83,510,440
Other (please describe):	

Could treated effluent be substituted for certain potable water now being used? **Yes** ○ **No** ◉

H. Wastewater Data for Service Area

1. Percent of water service area served by wastewater system: 100 %

2. Monthly wastewater volume in **gallons**, treated for previous five years.

YEAR	2011	2010	2009	2008	2007
January	7,143,000	7,276,000	9,677,000	5,674,000	11,271,000
February	6,653,000	7,494,000	5,900,000	5,646,000	6,886,000
March	6,363,000	7,206,000	8,718,000	6,330,000	8,626,000
April	6,137,000	8,058,000	7,162,000	6,483,000	9,045,000
May	6,292,000	8,790,000	7,102,000	7,107,000	8,393,000
June	5,560,000	7,976,000	5,592,000	7,290,000	9,136,000
July	6,172,000	8,743,000	7,081,000	7,967,000	11,370,000
August	6,340,000	7,853,000	11,025,000	8,295,000	15,183,000
September	5,936,000	7,842,000	10,909,000	7,134,000	15,568,000
October	7,298,000	7,627,000	11,524,000	8,968,000	12,314,000
November	6,591,000	6,906,000	11,403,000	8,930,000	10,396,000
December	6,998,000	7,641,000	12,037,000	9,479,000	11,094,000
TOTAL	77,483,000	93,412,000	108,130,000	89,303,000	129,282,000

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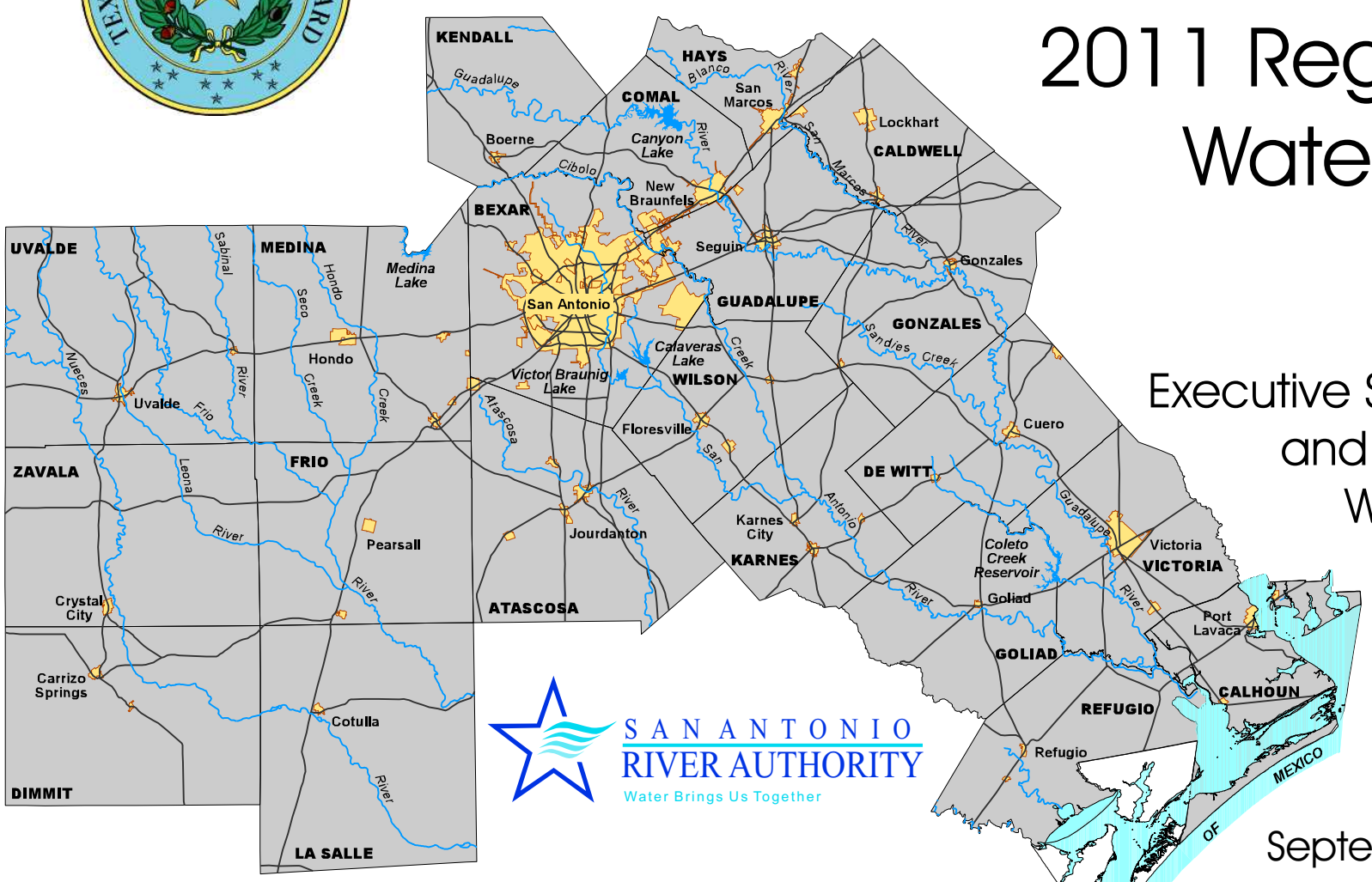
ATTACHMENT D.
South Central Texas Regional Water Planning Area's 2011 Regional Water Plan

South Central Texas Regional Water Planning Area



2011 Regional Water Plan

Volume I Executive Summary and Regional Water Plan

SAN ANTONIO RIVER AUTHORITY
Water Brings Us Together

September 2010

Prepared by:

South Central Texas Regional Water Planning Group

http://www.regionltexas.org

With administration by:

San Antonio River Authority

With technical assistance by:

HDR Engineering, Inc.

Laura Raun Public Relations

Ximenes & Associates

HDR | ONE COMPANY *Many Solutions®*

Table ES-4 (Continued)

County/Water User Group	Demand 2010 (acft)	Demand 2060 (acft)	Need (Shortage) 2010 (acft)	Need (Shortage) 2060 (acft)	Recommended Management Strategies to Meet Needs (Shortages)	Amount from WMS 2010 (acft)	Amount from WMS 2060 (acft)
Rural	1,444	2,584	0	0	Municipal Water Conservation		184
Industrial	212	386	0	0			
Steam-Electric	1,009	3,627	0	0			
Mining	142	163	82	103	Wining Water Conservation	82	103
Irrigation	353	338	0	0			
Livestock	280	280	0	0			
Karnes County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.13**		
El Oso WSC	555	728	0	0	Municipal Water Conservation	41	139
Falls City	113	145	0	0	Municipal Water Conservation	8	23
Karnes City	432	512	182	262	Municipal Water Conservation		11
					Local Carrizo	323	323
Kenedy	763	993	0	118	Municipal Water Conservation	58	268
					Local Gulf Coast Aquifer		161
Runge	195	247	0	0	Municipal Water Conservation	15	37
Rural (TDCJ)	500	500	0	0			
Rural	372	822	0	0	Municipal Water Conservation	68	258
Industrial	118	137	0	0			
Steam-Electric	0	0	0	0			
Mining	106	100	0	0			
Irrigation	1,382	836	0	0			
Livestock	1,185	1,185	0	0			
Kendall County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.14**		
Boerne	1,570	4,282	0	276	Municipal Water Conservation	98	816
					Western Canyon WTP Expansion		276
Rural	2,750	7,460	0	3,514	Municipal Water Conservation		264
					Purchase from WWP (GBRA)		3,140
					Western Canyon WTP Expansion		374
Industrial	0	0	0	0			
Steam-Electric	0	0	0	0			
Mining	6	6	0	0			
Irrigation	714	646	0	0			
Livestock	446	446	0	0			
LaSalle County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.15**		
Cotulla	1,407	1,743	0	0	Municipal Water Conservation	118	745
Encinal	110	107	0	0	Municipal Water Conservation	9	14
Rural	282	500	0	0	Municipal Water Conservation	3	42
Industrial	0	0	0	0			
Steam-Electric	0	0	0	0			
Mining	0	0	0	0			
Irrigation	4,791	4,097	0	0			
Livestock	1,687	1,687	0	0			
Medina County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.16**		
Castroville	680	961	294	575	Municipal Water Conservation	53	302
					Edwards Transfers	294	575
					Drought Management	34	
					Purchase from WWP (BMWD)		
Devine	837	896	0	0	Municipal Water Conservation	63	196
East Medina SUD	881	1,385	0	491	Municipal Water Conservation		54
					Edwards Transfers		491
					Drought Management	44	
Hondo	1,784	2,717	319	1,252	Municipal Water Conservation	125	640
					Edwards Transfers	319	1,252
					Drought Management	89	
La Coste	205	281	92	168	Municipal Water Conservation		11
					Edwards Transfers	92	168
					Drought Management	10	
Natalia	330	519	194	383	Municipal Water Conservation	24	73
					Edwards Transfers	194	383
					Drought Management	17	
Yancey WSC	832	1,603	214	985	Municipal Water Conservation	61	316
					Edwards Transfers	214	985
Rural	1,527	2,949	0	1,296	Municipal Water Conservation		244
					Edwards Transfers		1,296
Industrial	67	103	0	0			
Steam-Electric	0	0	0	0			
Mining	130	143	0	0			
Irrigation	54,450	44,015	7,770	0	Irrigation Water Conservation	7,770	0
Livestock	1,298	1,298	0	0			
Refugio County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.17**		
Refugio	645	777	0	0	Municipal Water Conservation	44	144
Woodsboro	283	293	0	0	Municipal Water Conservation	5	20
Rural	321	232	0	0			
Industrial	0	0	0	0			
Steam-Electric	0	0	0	0			
Mining	7	8	0	0			

Table 1-11 (Concluded)

No.	Utility Name	Population Served	Water Produced (acft)	Water Loss (acft)	Percent Loss (%)	Per Capita Use (gpcd)
80	CITY OF BOERNE	8,900	1,712.56	213.47	12.46	172
81	CITY OF CASTROVILLE	3,500	680.38	143.03	21.02	174
82	CITY OF CIBOLO	8,500	859.91	32.41	3.77	90
83	CITY OF CONVERSE	11,508	1,661.22	262.92	15.83	129
84	CITY OF CUERO	6,571	1,888.44	688.73	36.47	257
85	CITY OF DEVINE	4,140	793.04	12.45	1.57	171
86	CITY OF DILLEY	3,697	647.76	215.69	33.30	156
87	CITY OF GOLIAD	2,018	358.19	22.84	6.38	158
88	CITY OF GONZALES	7,802	2,290.08	803.39	35.08	262
89	CITY OF HONDO	8,481	1,904.69	436.05	22.89	200
90	CITY OF KARNES CITY	3,457	376.51	Not reported		97
91	CITY OF KIRBY	8,673	902.79	135.68	15.03	93
92	CITY OF KYLE	18,500	2,105.04	311.36	14.79	102
93	CITY OF LIVE OAK	7,000	1,255.16	149.02	11.87	160
94	CITY OF NIXON	2,036	817.60	24.23	2.96	358
95	CITY OF PEARSALL	7,257	1,656.79	137.75	8.31	204
96	CITY OF PORT LAVACA	12,000	1,498.25	230.72	15.40	111
97	CITY OF REFUGIO	2,941	604.55	133.38	22.06	184
98	CITY OF SAN MARCOS	49,307	6,228.61	883.64	14.19	113
99	CITY OF SCHERTZ	26,780	3,770.62	169.65	4.50	126
100	CITY OF SHAVANO PARK	1,754	781.16	102.48	13.12	398
101	CITY OF STOCKDALE	2,015	488.38	Not reported		216
102	CITY OF UNIVERSAL CITY	14,849	2,551.51	167.43	6.56	153
103	CITY OF UVALDE	16,233	3,770.85	653.36	17.33	207
104	CITY OF VICTORIA	61,703	10,493.86	1,348.15	12.85	152
105	CITY OF YOAKUM	5,731	1,013.04	110.33	10.89	158
106	EAST MEDINA COUNTY SUD UNIT 1	8,600	767.66	166.64	21.71	80
107	EL OSO WSC	4,242	717.85	190.24	26.50	151
108	FAIR OAKS RANCH UTILITIES	5,602	1,456.17	131.79	9.05	232
109	GONZALES COUNTY WSC	6,555	1,396.28	233.52	16.72	190
110	GREEN VALLEY SUD	27,741	2,860.25	464.79	16.25	92
111	KENDALL COUNTY WCID 1	2,301	306.14	46.08	15.05	119
112	MAXWELL WSC	5,145	383.90	41.73	10.87	67
113	NEW BRAUNFELS UTILITIES	50,805	10,544.86	1,710.35	16.22	185
114	OAK HILLS WSC	4,000	550.16	2.37	0.43	123
115	PORT OCONNOR MUD	3,759	295.50	27.30	9.24	70
116	S S WSC	11,475	1,585.98	41.39	2.61	123
117	SAN ANTONIO WATER SYSTEM	1,239,399	181,035.57	11,797.59	6.52	130
118	SUNKO WSC	3,486	514.48	89.80	17.45	132
119	WIMBERLEY WSC	5,600	652.82	79.78	12.22	104
Subtotal Utilities with More than 280 acft/yr		**1,940,862**	**299,252**	**27,939**	**9.34**	**138**
TOTAL		**1,982,769**	**305,030**	**28,856**	**9.46**	**137**

Table 2-3 (Continued)

Basin/County/City/Rural	Census		Projections					
	1990	2000	2010	2020	2030	2040	2050	2060
Guadalupe (part) - San Antonio								
Cibolo	1,757	3,035	4,497	6,284	8,216	10,146	12,287	14,593
Marion	1,027	1,099	1,213	1,353	1,504	1,655	1,822	2,002
New Berlin			571	698	854	1,045	1,278	1,563
Schertz	14,891	17,333	24,565	33,403	42,957	52,502	63,092	74,497
Selma		50	173	253	334	389	453	523
Green Valley SUD		5,739	7,615	10,004	12,584	15,154	18,003	21,065
Springs Hill WSC		1,676	1,942	2,268	2,620	2,972	3,362	3,782
East Central SUD		747	509	701	896	1,053	1,187	1,292
Water Service Inc. (Apex)		170	217	274	336	398	466	540
Santa Clara		722	1,439	2,316	3,264	4,211	5,261	6,392
County-Other (Rural)	1,385	462	403	322	231	149	80	18
Total	19,060	31,033	43,144	57,876	73,796	89,674	107,291	126,267
Karnes (part) - San Antonio								
Karnes city	2,916	3,457	3,710	4,008	4,322	4,573	4,728	4,812
Kenedy	3,763	3,487	3,585	3,965	4,266	4,522	4,793	4,950
Runge	1,139	1,080	1,099	1,209	1,294	1,367	1,445	1,503
Falls City		591	644	706	772	825	857	875
El Oso WSC		2,419	2,609	2,833	3,069	3,258	3,374	3,437
Sunko WSC		287	316	350	385	413	430	440
County-Other (Rural)	3,977	3,806	4,656	5,303	6,117	6,749	6,991	7,098
Total	11,795	15,127	16,619	18,374	20,225	21,707	22,618	23,115
Kendall (part) - San Antonio								
Boerne	4,274	6,178	8,600	12,208	16,065	19,286	21,925	24,506
Fairoaks Ranch	169	650	1,234	1,282	1,308	1,335	1,362	1,389
Water Service Inc. (Apex)		255	313	383	457	519	570	620
County-Other (Rural)	4,260	6,543	10,043	14,299	18,820	22,601	25,705	28,740
Total	8,703	13,626	20,190	28,172	36,650	43,741	49,562	55,255
Medina (part) - San Antonio								
Castroville	2,159	2,664	2,974	3,316	3,636	3,912	4,180	4,421
La Coste	1,021	1,255	1,399	1,558	1,706	1,834	1,958	2,070
Yancey WSC		3,550	4,531	5,615	6,627	7,502	8,352	9,115
East Medina SUD		327	384	447	506	557	607	651
Bexar Met Water District (BMWD)		115	186	264	337	400	461	516
County-Other (Rural)	2,251	210	269	333	393	445	494	541
Total	5,431	8,121	9,743	11,533	13,205	14,650	16,052	17,314
Refugio (part) - San Antonio								
County-Other (Rural)	86	72	65	60	59	55	53	54
Total	86	72	65	60	59	55	53	54
Victoria (part) - San Antonio								
County-Other (Rural)	273	48	56	64	71	76	80	84
Total	273	48	56	64	71	76	80	84

Table 2-12 (Continued)

Basin/County/City/Rural	Use in 1990 (acft)	Use in 2000 (acft)	Projections 2010 (acft)	2020 (acft)	2030 (acft)	2040 (acft)	2050 (acft)	2060 (acft)
Kendall (part) - San Antonio								
Boerne	785	1,170	1,570	2,188	2,843	3,370	3,831	4,282
Fairoaks Ranch	64	152	286	296	300	305	310	316
Water Service Inc (Apex)		37	43	52	61	69	75	81
County-Other (Rural)	515	748	1,080	1,506	1,939	2,304	2,620	2,930
Municipal Demand	1,364	2,107	2,979	4,042	5,143	6,048	6,836	7,609
Manufacturing Demand	2	0	0	0	0	0	0	0
Steam-Electric Power Demand	0	0	0	0	0	0	0	0
Irrigation Demand	0	107	194	189	185	181	177	174
Mining Demand	0	0	0	0	0	0	0	0
Livestock Demand	70	80	80	80	80	80	80	80
Total Demand	1,436	2,294	3,253	4,311	5,408	6,309	7,093	7,863
Medina (part) - San Antonio								
Castroville	779	621	680	743	802	854	908	961
La Coste	229	190	205	222	239	251	265	281
Yancey Water Supply Corp.		668	832	1,013	1,180	1,328	1,469	1,603
East Medina Special Utility Dist.		42	48	54	60	65	70	75
Bexar Met Water District		15	24	33	41	47	54	60
County-Other (Rural)	258	30	38	46	54	60	67	73
Municipal Demand	1,266	1,566	1,827	2,111	2,376	2,605	2,833	3,053
Manufacturing Demand	0	0	0	0	0	0	0	0
Steam-Electric Power Demand	0	0	0	0	0	0	0	0
Irrigation Demand	24,184	9,422	9,093	8,714	8,351	8,003	7,670	7,350
Mining Demand	53	56	62	64	65	66	67	68
Livestock Demand	224	182	182	182	182	182	182	182
Total Demand	25,727	11,226	11,164	11,071	10,974	10,856	10,752	10,653
Refugio (part) - San Antonio								
County-Other (Rural)	11	8	7	6	6	5	5	5
Municipal Demand	11	8	7	6	6	5	5	5
Manufacturing Demand	0	0	0	0	0	0	0	0
Steam-Electric Power Demand	0	0	0	0	0	0	0	0
Irrigation Demand	0	0	0	0	0	0	0	0
Mining Demand	0	0	0	0	0	0	0	0
Livestock Demand	21	25	25	25	25	25	25	25
Total Demand	32	33	32	31	31	30	30	30
Victoria (part) - San Antonio								
County-Other (Rural)	34	5	5	6	7	7	7	7
Municipal Demand	34	5	5	6	7	7	7	7
Manufacturing Demand	0	0	0	0	0	0	0	0
Steam-Electric Power Demand	0	0	0	0	0	0	0	0
Irrigation Demand	0	0	0	0	0	0	0	0
Mining Demand	0	0	0	0	0	0	0	0
Livestock Demand	70	61	61	61	61	61	61	61
Total Demand	104	66	66	67	68	68	68	68

Table 4A-1 (Continued)

Water User Group	Year					
	2010 (acft)	***2020 (acft)***	***2030 (acft)***	***2040 (acft)***	***2050 (acft)***	***2060 (acft)***
Medina County						
Castroville	294	357	416	468	522	575
Devine	0	0	0	0	0	0
East Medina SUD	0	104	214	303	397	491
Hondo	319	536	740	910	1,083	1,252
La Coste	92	109	126	138	152	168
Natalia	194	238	279	314	349	383
Yancey WSC	214	395	562	710	851	985
County-Other	0	236	528	787	1,055	1,296
Municipal Total	**1,113**	**1,975**	**2,865**	**3,630**	**4,409**	**5,150**
Manufacturing	0	0	0	0	0	0
Steam-Electric Power	0	0	0	0	0	0
Mining	0	0	0	0	0	0
Irrigation	7,770	5,878	4,067	2,332	670	0
Livestock	0	0	0	0	0	0
County Total	**8,883**	**7,853**	**6,932**	**5,962**	**5,079**	**5,150**
Refugio County						
Refugio	0	0	0	0	0	0
Woodsboro	0	0	0	0	0	0
County-Other	0	0	0	0	0	0
Municipal Total	**0**	**0**	**0**	**0**	**0**	**0**
Manufacturing	0	0	0	0	0	0
Steam-Electric Power	0	0	0	0	0	0
Mining	0	0	0	0	0	0
Irrigation	0	0	0	0	0	0
Livestock	0	0	0	0	0	0
County Total	**0**	**0**	**0**	**0**	**0**	**0**
Uvalde County						
Sabinal	127	123	118	113	109	109
Uvalde	3,172	3,209	3,229	3,233	3,235	3,263
County-Other	0	0	0	0	0	0
Municipal Total	**3,299**	**3,332**	**3,347**	**3,346**	**3,344**	**3,372**
Manufacturing	0	0	0	0	0	0
Steam-Electric Power	0	0	0	0	0	0
Mining	0	0	0	0	0	0
Irrigation	0	0	0	0	0	0
Livestock	0	0	0	0	0	0
County Total	**3,299**	**3,332**	**3,347**	**3,346**	**3,344**	**3,372**

4B.2.16 Medina County Water Supply Plan

Table 4B.2.16-1 lists each water user group in Medina County and its corresponding management supply or shortage in years 2010 and 2060. For each water user group with a projected shortage, or need, a water supply plan has been developed and is presented in the following subsections.

Table 4B.2.16-1.
Medina County Management Supply/Shortage by Water User Group

Water User Group	*Management Supply/Shortage*		*Comment*
	2010 (acft/yr)	*2060 (acft/yr)*	
Benton City WSC			See Atascosa County
Bexar Metropolitan Water District			See Bexar County
City of Castroville	-294	-575	Projected shortage (2010 through 2060)
City of Devine	146	87	No projected shortage
East Medina SUD	13	-491	Projected shortage (2020 through 2060)
City of Hondo	-319	-1,252	Projected shortage (2010 through 2060)
City of La Coste	-92	-168	Projected shortage (2010 through 2060)
City of Lytle			See Atascosa County
City of Natalia	-194	-383	Projected shortage (2010 through 2060)
Yancey WSC	-214	-985	Projected shortage (2010 through 2060)
Rural Area Residential and Commercial*	229	-1,193	Projected shortage (2020 through 2060)
Industrial	1,246	1,210	No projected shortage
Steam-Electric Power	0	0	No projected demand
Mining	13	0	No projected shortage
Irrigation*	-4,994	5,441	Projected shortage (2010 through 2030)
Livestock	0	0	No projected shortage

**These values represent the sum of the Surplus/Shortage values for each river basin and/or across the entire county. These values may differ from the Need value reported in other tables because the Need represents only the sum of the shortages.*

4B.2.16.1 City of Castroville

Current water supply for the City of Castroville is obtained from the Edwards Aquifer. Castroville is projected to need additional water supplies prior to 2010. Working within the planning criteria established by the SCTRWPG and the TWDB, it is recommended that Castroville implement the following water supply plan to meet the projected needs for the city (Table 4B.2.16-2).

- Municipal Water Conservation to be implemented or enhanced in the immediate future. This strategy can provide an additional 53 acft/yr by 2010, increasing to 302 acft/yr of supply in 2060 (Volume II, Section 4C.1.1).
- Edwards Transfers to be implemented prior to 2010. This strategy can provide an additional 294 acft/yr by 2010, increasing to 575 acft/yr of supply in 2060.
- Drought Management to be implemented or enhanced in the immediate future. This strategy can provide an additional 34 acft/yr by 2010.
- Facilities Expansions (Systems Interconnect)

Table 4B.2.16-2.
Recommended Water Supply Plan for the City of Castroville

	2010 (acft/yr)	*2020 (acft/yr)*	*2030 (acft/yr)*	*2040 (acft/yr)*	*2050 (acft/yr)*	*2060 (acft/yr)*
Projected Need (Shortage)	294	357	416	468	522	575
Recommended Plan						
Municipal Water Conservation	53	111	176	242	270	302
Edwards Transfers	294	357	416	468	522	575
Drought Management	34	—	—	—	—	—
Facilities Expansions	—	—	—	—	—	—
Total New Supply	**381**	**468**	**592**	**710**	**792**	**877**

Estimated costs of the recommended plan to meet the City of Castroville's projected needs are shown in Table 4B.2.16-3.

Table 4B.2.16-3.
Recommended Plan Costs by Decade for the City of Castroville

Plan Element	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
Municipal Water Conservation						
Annual Cost ($/yr)	$39,208	$67,285	$99,086	$132,169	$146,096	$163,265
Unit Cost ($/acft)	$740	$606	$563	$546	$541	$541
Edwards Transfers						
Annual Cost ($/yr)	$133,476	$162,078	$188,864	$212,472	$236,988	$261,050
Unit Cost ($/acft)	$454	$454	$454	$454	$454	$454
Drought Management						
Annual Cost ($/yr)	$110,122	—	—	—	—	—
Unit Cost ($/acft)	$3,239	—	—	—	—	—
Facilities Expansions						
Annual Cost ($/yr)	$1,033,000	$1,033,000	$70,000	$70,000	$70,000	$70,000
Unit Cost ($/acft)	—	—	—	—	—	—

In addition, City of Castroville is a potential participant with BMWD in the Medina Lake Firm-Up (ASR) water management strategy.

4B.2.16.2 City of Devine

The City of Devine is projected to have adequate water supplies available from the Edwards Aquifer and the Carrizo Aquifer to meet the city's projected demands during the planning period. Working within the planning criteria established by the SCTRWPG and the TWDB, it is recommended that the City of Devine implement the following water supply plan (Table 4B.2.16-4).

- Municipal Water Conservation to be implemented or enhanced in the immediate future. This strategy can provide an additional 63 acft/yr by 2010, increasing to 196 acft/yr of supply in 2060 (Volume II, Section 4C.1.1).

Table 4B.2.16-4.
Recommended Water Supply Plan for the City of Devine

	2010 (acft/yr)	*2020 (acft/yr)*	*2030 (acft/yr)*	*2040 (acft/yr)*	*2050 (acft/yr)*	*2060 (acft/yr)*
Projected Need (Shortage)	0	0	0	0	0	0
Recommended Plan						
Municipal Water Conservation	63	127	152	159	175	196
Total New Supply	**63**	**127**	**152**	**159**	**175**	**196**

Estimated costs of the recommended plan for the City of Devine are shown in Table 4B.2.16-5.

Table 4B.2.16-5.
Recommended Plan Costs by Decade for the City of Devine

Plan Element	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
Municipal Water Conservation						
Annual Cost ($/yr)	$48,304	$79,690	$88,673	$88,210	$95,560	$106,876
Unit Cost ($/acft)	$767	$627	$583	$555	$546	$545

Table C-16
Projected Water Demands, Supplies, and Needs
Medina County
South Central Texas Region

Basin	Source	Total in 2000 (acft)	Projections 2010 (acft)	2020 (acft)	2030 (acft)	2040 (acft)	2050 (acft)	2060 (acft)
Municipal Demand								
Nueces Basin								
Benton City WSC		336	414	504	589	661	737	805
Devine		830	837	850	856	862	878	896
East Medina SUD		735	833	944	1,048	1,132	1,221	1,310
Hondo		1,601	1,784	2,001	2,205	2,375	2,548	2,717
Lytle*		63	62	60	59	58	58	58
Natalia		291	330	374	415	450	485	519
Rural		1,194	1,489	1,816	2,108	2,367	2,635	2,876
	Subtotal	5,050	5,749	6,549	7,280	7,905	8,562	9,181
San Antonio Basin								
Bexar Met Water District*		15	24	33	41	47	54	60
Castroville		621	680	743	802	854	908	961
East Medina SUD		42	48	54	60	65	70	75
La Coste		190	205	222	239	251	265	281
Yancey WSC		668	832	1,013	1,180	1,328	1,469	1,603
Rural		30	38	46	54	60	67	73
	Subtotal	1,566	1,827	2,111	2,376	2,605	2,833	3,053
Total Municipal Demand		6,616	7,576	8,660	9,656	10,510	11,395	12,234
Municipal Existing Supply								
Nueces Basin								
Benton City WSC	Carrizo	587	587	587	587	587	587	587
Devine	Edwards	512	512	512	512	512	512	512
	Carrizo	471	471	471	471	471	471	471
Devine Subtotal		983	983	983	983	983	983	983
East Medina SUD	Edwards	846	846	846	846	846	846	846
Hondo	Edwards	1,465	1,465	1,465	1,465	1,465	1,465	1,465
Lytle	Edwards	46	46	46	46	46	46	46
Natalia	Edwards	136	136	136	136	136	136	136
Rural	Edwards	441	441	441	441	441	441	441
	Carrizo	1,139	1,139	1,139	1,139	1,139	1,139	1,139
Rural Subtotal		1,580	1,580	1,580	1,580	1,580	1,580	1,580
	Subtotal	5,643	5,643	5,643	5,643	5,643	5,643	5,643
San Antonio Basin								
Bexar Met Water District	Edwards (BMWD)	9	9	9	9	9	9	9
Castroville	Edwards	386	386	386	386	386	386	386
East Medina SUD	Edwards	48	48	48	48	48	48	48
La Coste	Edwards	113	113	113	113	113	113	113
Yancey WSC	Edwards	618	618	618	618	618	618	618
Rural	Edwards	175	175	175	175	175	175	175
	Trinity	1	1	1	1	1	1	1
Rural Subtotal		176	176	176	176	176	176	176
	Subtotal	1,350	1,350	1,350	1,350	1,350	1,350	1,350
Total Municipal Existing Supply		6,993	6,993	6,993	6,993	6,993	6,993	6,993

Table C-16
Projected Water Demands, Supplies, and Needs
Medina County
South Central Texas Region

Basin	Source	Total in 2000 (acft)	Projections 2010 (acft)	2020 (acft)	2030 (acft)	2040 (acft)	2050 (acft)	2060 (acft)
Municipal Surplus/Shortage								
Nueces Basin								
Benton City WSC		251	173	83	-2	-74	-150	-218
Devine		153	146	133	127	121	105	87
East Medina SUD		111	13	-98	-202	-286	-375	-464
Hondo		-136	-319	-536	-740	-910	-1,083	-1,252
Lytle*		-17	-16	-14	-13	-12	-12	-12
Natalia		-155	-194	-238	-279	-314	-349	-383
Rural		386	91	-236	-528	-787	-1,055	-1,296
Subtotal		593	-106	-906	-1,637	-2,262	-2,919	-3,538
San Antonio Basin								
Bexar Met Water District*		-6	-15	-24	-32	-38	-45	-51
Castroville		-235	-294	-357	-416	-468	-522	-575
East Medina SUD		6	0	-6	-12	-17	-22	-27
La Coste		-77	-92	-109	-126	-138	-152	-168
Yancey WSC		-50	-214	-395	-562	-710	-851	-985
Rural		146	138	130	122	116	109	103
Subtotal		-216	-477	-761	-1,026	-1,255	-1,483	-1,703
Total Municipal Surplus/Shortage		377	-583	-1,667	-2,663	-3,517	-4,402	-5,241
Municipal New Supply Need								
Nueces Basin								
Benton City WSC		0	0	0	2	74	150	218
Devine		0	0	0	0	0	0	0
East Medina SUD		0	0	98	202	286	375	464
Hondo		136	319	536	740	910	1,083	1,252
Lytle*		17	16	14	13	12	12	12
Natalia		155	194	238	279	314	349	383
Rural		0	0	236	528	787	1,055	1,296
Subtotal		308	529	1,122	1,764	2,383	3,024	3,625
San Antonio Basin								
Bexar Met Water District*		6	15	24	32	38	45	51
Castroville		235	294	357	416	468	522	575
East Medina SUD		0	0	6	12	17	22	27
La Coste		77	92	109	126	138	152	168
Yancey WSC		50	214	395	562	710	851	985
Rural		0	0	0	0	0	0	0
Subtotal		368	615	891	1,148	1,371	1,592	1,806
Total Municipal New Supply Need		676	1,144	2,013	2,912	3,754	4,616	5,431
Industrial Demand								
Nueces Basin		56	67	75	82	89	95	103
San Antonio Basin		0	0	0	0	0	0	0
Total Industrial Demand		56	67	75	82	89	95	103
Industrial Existing Supply								
Nueces Basin	Edwards	963	963	963	963	963	963	963
San Antonio Basin	Edwards	350	350	350	350	350	350	350
Total Industrial Existing Supply		1,313	1,313	1,313	1,313	1,313	1,313	1,313
Industrial Surplus/Shortage								
Nueces Basin		907	896	888	881	874	868	860
San Antonio Basin		350	350	350	350	350	350	350
Total Industrial Surplus/Shortage		1,257	1,246	1,238	1,231	1,224	1,218	1,210

Appendix D, Table 3 (Continued)

County/Water User Group	Demand 2010 (acft)	Demand 2060 (acft)	Need (Shortage) 2010 (acft)	Need (Shortage) 2060 (acft)	Recommended Management Strategies to Meet Needs (Shortages)	Amount from WMS 2010 (acft)	Amount from WMS 2060 (acft)
Steam-Electric	0	0	0	0			
Mining	106	100	0	0			
Irrigation	1,382	836	0	0			
Livestock	1,185	1,185	0	0			
Kendall County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.14**		
Boerne	1,570	4,282	0	276	Municipal Water Conservation	98	816
					Western Canyon WTP Expansion		276
Rural	2,750	7,460	0	3,514	Municipal Water Conservation		264
					Purchase from WWP (GBRA)		3,140
					Western Canyon WTP Expansion		374
Industrial	0	0	0	0			
Steam-Electric	0	0	0	0			
Mining	6	6	0	0			
Irrigation	714	646	0	0			
Livestock	446	446	0	0			
LaSalle County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.15**		
Cotulla	1,407	1,743	0	0	Municipal Water Conservation	118	745
Encinal	110	107	0	0	Municipal Water Conservation	9	14
Rural	282	500	0	0	Municipal Water Conservation	3	42
Industrial	0	0	0	0			
Steam-Electric	0	0	0	0			
Mining	0	0	0	0			
Irrigation	4,791	4,097	0	0			
Livestock	1,687	1,687	0	0			
Medina County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.16**		
Castroville	680	961	294	575	Municipal Water Conservation	53	302
					Edwards Transfers	294	575
					Drought Management	34	
					Purchase from WWP (BMWD)		
Devine	837	896	0	0	Municipal Water Conservation	63	196
East Medina SUD	881	1,385	0	491	Municipal Water Conservation		54
					Edwards Transfers		491
					Drought Management	44	
Hondo	1,784	2,717	319	1,252	Municipal Water Conservation	125	640
					Edwards Transfers	319	1,252
					Drought Management	89	
La Coste	205	281	92	168	Municipal Water Conservation		11
					Edwards Transfers	92	168
					Drought Management	10	
Natalia	330	519	194	383	Municipal Water Conservation	24	73
					Edwards Transfers	194	383
					Drought Management	17	
Yancey WSC	832	1,603	214	985	Municipal Water Conservation	61	316
					Edwards Transfers	214	985
Rural	1,527	2,949	0	1,296	Municipal Water Conservation		244
					Edwards Transfers		1,296
Industrial	67	103	0	0			
Steam-Electric	0	0	0	0			
Mining	130	143	0	0			
Irrigation	54,450	44,015	7,770	0	Irrigation Water Conservation	7,770	
Livestock	1,298	1,298	0	0			
Refugio County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.17**		
Refugio	645	777	0	0	Municipal Water Conservation	44	144
Woodsboro	283	293	0	0	Municipal Water Conservation	5	20
Rural	321	232	0	0			
Industrial	0	0	0	0			
Steam-Electric	0	0	0	0			
Mining	7	8	0	0			
Irrigation	69	69	0	0			
Livestock	623	623	0	0			
Uvalde County	**Table 2-12**		**Table 4A-1**		**Section 4B.2.18**		
Sabinal	407	389	127	109	Municipal Water Conservation	34	145
					Edwards Transfers	127	109
					Drought Management	20	
Uvalde	6,087	6,178	3,172	3,263	Municipal Water Conservation	521	2,652
					Edwards Transfers	3,172	3,263
					Drought Management	304	
Rural	1,572	2,532	0	0	Municipal Water Conservation		137
Industrial	432	538	0	0			
Steam-Electric	0	0	0	0			
Mining	313	418	0	0			
Irrigation	55,791	45,703	0	0			
Livestock	1,284	1,284	0	0			

Municipal (cont.)						
	2010	2020	2030	2040	2050	2060
Boerne						
Monetary value of domestic water shortages	$0.00	$0.00	$0.00	$0.00	$0.00	$0.25
Lost utility revenues	$0.00	$0.00	$0.00	$0.00	$0.00	$0.50
Bulverde City						
Monetary value of domestic water shortages	$6.31	$24.37	$39.17	$59.32	$75.71	$93.29
Lost income from reduced commercial business activity	$2.26	$5.50	$9.19	$12.86	$16.68	$20.77
Lost jobs due to reduced commercial business activity	91	221	369	517	671	835
Lost state and local taxes from reduced commercial business activity	$0.32	$0.78	$1.31	$1.83	$2.38	$2.96
Lost utility revenues	$1.17	$2.41	$3.83	$5.23	$6.69	$8.26
Canyon Lake WSC						
Monetary value of domestic water shortages	$0.00	$0.00	$0.11	$3.17	$25.78	$47.65
Lost utility revenues	$0.00	$0.00	$0.23	$3.95	$8.03	$12.17
Castle Hills						
Monetary value of domestic water shortages	$0.12	$0.10	$0.08	$0.07	$0.05	$0.05
Lost utility revenues	$0.19	$0.16	$0.14	$0.11	$0.09	$0.09
Castroville						
Monetary value of domestic water shortages	$3.63	$4.28	$5.55	$8.93	$9.88	$10.75
Lost income from reduced commercial business activity	$0.94	$1.41	$1.84	$2.22	$2.68	$3.08
Lost jobs due to reduced commercial business activity	22	33	43	51	61	70
Lost state and local taxes from reduced commercial business activity	$0.79	$1.17	$1.54	$1.86	$2.19	$2.51
Lost utility revenues	$0.58	$0.71	$0.82	$0.93	$1.03	$1.14
Converse						
Monetary value of domestic water shortages	$0.00	$0.00	$0.12	$0.51	$0.92	$1.57
Lost utility revenues	$0.00	$0.00	$0.24	$0.81	$1.29	$1.74
County Line WSC						
Monetary value of domestic water shortages	$0.00	$13.95	$20.67	$22.12	$32.21	$41.84
Lost income from reduced commercial business activity	$0.00	$1.99	$2.98	$3.21	$3.89	$5.04
Lost jobs due to reduced commercial business activity	0	80	120	129	156	203
Lost state and local taxes from reduced commercial business activity	$0.00	$0.31	$0.46	$0.50	$0.60	$0.78
Lost utility revenues	$0.00	$1.89	$2.59	$2.91	$3.50	$4.35

South Central Texas
Regional Water Planning Area

2011 Regional Water Plan

Volume II
Technical Evaluations of Water Management Strategies

SAN ANTONIO RIVER AUTHORITY
Water Brings Us Together

September 2010

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Table 4C.1-3 (Concluded)

County Number	Water User Group*	County	Per Capita Water Use with Low Flow Plumbing Fixtures						
			2000 (gpcd)	2010 (gpcd)	2020 (gpcd)	2030 (gpcd)	2040 (gpcd)	2050 (gpcd)	2060 (gpcd)
87	Nixon	Gonzales	169	166	162	160	157	156	156
88	Refugio	Refugio	169	164	161	158	156	155	155
89	Springs Hill WSC	Guadalupe	172	168	164	162	160	159	159
90	County-Other	Caldwell	173	172	170	167	162	159	159
91	Lytle	Atascosa	174	171	167	164	161	160	160
92	Cibolo	Guadalupe	176	172	169	168	167	167	167
93	Helotes	Bexar	176	172	170	170	169	169	169
94	Jourdanton	Atascosa	177	173	169	166	164	163	163
95	Castle Hills	Bexar	178	174	171	168	165	163	163
96	Devine	Medina	179	175	172	168	165	164	164
97	Pearsall	Frio	179	176	173	170	166	165	165
98	Big Wells	Dimmit	180	176	173	170	167	166	166
99	Gonzales	Gonzales	181	177	174	171	169	168	168
100	Hondo	Medina	181	176	173	171	169	168	168
101	Seguin	Guadalupe	181	177	174	171	169	168	168
102	Asherton	Dimmit	182	177	174	171	168	167	167
103	Floresville	Wilson	183	179	175	172	170	169	169
104	Woodcreek Utilities Inc.	Hays	183	179	177	177	176	176	176
105	Somerset	Bexar	185	180	177	174	173	172	172
106	Kenedy	Karnes	194	190	186	183	180	179	179
107	Poteet	Atascosa	197	194	191	187	184	183	183
108	La Vernia	Wilson	198	194	191	189	187	187	187
109	Pleasanton	Atascosa	198	195	191	188	185	184	184
110	New Braunfels	Comal	204	200	196	194	193	192	192
111	Stockdale	Wilson	205	201	197	194	192	191	191
112	China Grove	Bexar	206	201	197	195	194	193	193
113	Castroville	Medina	208	204	200	197	195	194	194
114	Fairoaks Ranch	Bexar	209	207	206	205	204	203	203
115	Windcrest	Bexar	212	209	206	203	200	198	198
116	Garden Ridge	Comal	217	212	208	205	204	203	203
117	Mustang Ridge	Caldwell	222	217	213	211	210	209	209
118	Sabinal	Uvalde	232	229	226	223	220	218	218
119	Alamo Heights	Bexar	244	241	237	234	231	230	230
120	Dilley	Frio	253	250	247	244	243	242	242
121	Gonzales County WSC	Gonzales	264	260	256	254	252	251	251
122	Crystal City	Zavala	270	267	263	260	257	256	256
123	Carrizo Springs	Dimmit	275	271	268	265	262	261	261
124	Selma	Bexar	312	307	304	302	301	300	300
125	Cotulla	La Salle	314	310	307	304	301	300	300
126	Uvalde	Uvalde	363	359	356	353	350	348	348
127	Lackland AFB (CDP)	Bexar	393	389	386	383	380	378	378
128	Shavano Park	Bexar	408	405	402	398	395	394	394
129	Hollywood Park	Bexar	667	664	660	657	654	653	653
130	Hill Country Village	Bexar	731	728	725	722	719	717	717

* Some Water User Groups are located in more than one county and more than one river basin. The county in which the major part of the service area is located is named in this table. However, in later tables, water conservation estimates and costs are shown for service areas located in each county and river basin in which the WUG provides service.

Table 4C-1-10 (Concluded)

County Number	Water User Group*	County	Plumbing Fixtures and Clothes Washers Retrofit Plus Lawn Irrigation Conservation					
			2010 (acft/yr)	2020 (acft/yr)	2030 (acft/yr)	2040 (acft/yr)	2050 (acft/yr)	2060 (acft/yr)
88	Refugio	Refugio	44	94	100	114	130	144
89	Springs Hill WSC	Guadalupe	174	381	477	571	701	877
90	County-Other	Caldwell	21	37	36	31	28	29
91	Lytle	Atascosa	38	72	82	86	96	108
92	Cibolo	Guadalupe	65	176	281	374	499	645
93	Helotes	Bexar	115	345	539	674	832	993
94	Jourdanton	Atascosa	60	123	156	173	195	222
95	Castle Hills	Bexar	61	120	142	144	151	166
96	Devine	Medina	63	127	152	159	175	196
97	Pearsall	Frio	116	223	272	271	294	324
98	Big Wells	Dimmit	11	23	30	30	32	33
99	Gonzales	Gonzales	116	245	325	353	381	414
100	Hondo	Medina	125	289	420	477	551	640
101	Seguin	Guadalupe	377	853	1,229	1,448	1,744	2,131
102	Asherton	Dimmit	20	43	58	59	62	64
103	Floresville	Wilson	136	291	433	504	596	714
104	Woodcreek Utilities Inc	Hays	56	177	337	455	619	771
105	Somerset	Bexar	29	70	110	131	152	177
106	Kenedy	Karnes	58	121	189	216	242	268
107	Poteet	Atascosa	60	116	163	185	198	213
108	La Vernia	Wilson	21	56	105	146	184	227
109	Pleasanton	Atascosa	156	300	448	523	565	615
110	New Braunfels	Comal	815	1,965	3,632	5,433	6,650	8,152
111	Stockdale	Wilson	27	57	93	128	147	171
112	China Grove	Bexar	28	66	116	166	190	217
113	Castroville	Medina	53	111	176	242	270	302
114	Fairoaks Ranch	Bexar	125	246	358	460	481	509
115	Windcrest	Bexar	99	189	270	343	362	385
116	Garden Ridge	Comal	42	103	187	294	379	460
117	Mustang Ridge	Caldwell	10	26	48	74	98	116
118	Sabinal	Uvalde	34	65	92	116	139	145
119	Alamo Heights	Bexar	175	337	488	625	769	865
120	Dilley	Frio	104	229	362	511	652	772
121	Gonzales County WSC	Gonzales	143	312	505	693	858	1,002
122	Crystal City	Zavala	192	364	543	695	850	1,002
123	Carrizo Springs	Dimmit	152	312	464	590	700	777
124	Selma	Bexar	135	344	617	801	966	1,122
125	Cotulla	La Salle	118	248	369	488	615	745
126	Uvalde	Uvalde	521	1,017	1,471	1,882	2,269	2,652
127	Lackland AFB (CDP)	Bexar	268	515	736	934	1,119	1,300
128	Shavano Park	Bexar	73	142	205	265	324	382
129	Hollywood Park	Bexar	212	414	612	798	980	1,154
130	Hill Country Village	Bexar	77	146	209	265	316	365
	Total		13,231	22,742	31,616	40,528	53,925	72,570

Table 4C.1-11 (Continued)

Water User Group *	County *	Area	Cost Per Acre Foot	Costs of Water Demand Reduction from Plumbing Fixtures and Clothes Washers Retrofit Conservation					
				2010 dollars	2020 dollars	2030 dollars	2040 dollars	2050 dollars	2060 dollars
BOERNE	KENDALL	Rural	770	75,359	94,766	96,994	83,172	94,553	105,683
CUERO	DEWITT	Rural	770	76,250	71,240	54,160	36,262	23,812	23,388
EL OSO WSC	KARNES	Rural	770	31,484	31,214	24,813	19,934	17,397	17,957
NIXON	GONZALES	Rural	770	26,707	24,051	20,757	14,356	12,088	12,049
REFUGIO	REFUGIO	Rural	770	33,794	33,923	24,663	18,820	15,642	15,449
SPRINGS HILL WSC	GUADALUPE	Rural	770	134,027	125,745	116,211	98,859	93,199	104,847
COUNTY-OTHER	CALDWELL	Rural	770	16,475	15,163	11,033	5,844	3,043	2,763
LYTLE	ATASCOSA	Suburban	681	26,007	21,984	16,636	10,718	8,791	8,952
CIBOLO	GUADALUPE	Suburban	681	44,008	52,729	62,673	69,656	84,355	100,186
HELOTES	BEXAR	Suburban	681	78,092	108,125	135,550	144,694	163,054	179,383
JOURDANTON	ATASCOSA	Rural	770	46,083	39,236	29,669	22,430	18,779	19,389
CASTLE HILLS	BEXAR	Suburban	681	41,783	35,334	25,722	16,088	9,660	9,664
DEVINE	MEDINA	Rural	770	48,304	41,878	27,459	16,091	12,361	12,622
PEARSALL	FRIO	Suburban	681	78,787	68,416	52,232	29,441	23,800	23,928
BIG WELLS	DIMMIT	Rural	770	8,603	7,647	5,775	3,623	2,836	2,698
GONZALES	GONZALES	Rural	770	89,431	80,028	61,583	48,009	40,447	40,309
HONDO	MEDINA	Rural	770	96,064	89,046	79,441	64,900	58,392	62,260
SEGUIN	GUADALUPE	Suburban	681	256,904	246,183	205,631	174,142	163,537	183,370
ASHERTON	DIMMIT	Rural	770	15,404	13,248	9,636	5,527	4,055	3,855
FLORESVILLE	WILSON	Rural	770	104,780	88,502	70,356	56,059	49,688	54,669
WOODCREEK UTIL INC	HAYS	Suburban	681	38,437	52,854	72,205	84,011	105,424	122,265
SOMERSET	BEXAR	Suburban	681	19,446	18,636	15,111	14,394	13,075	14,032
KENEDY	KARNES	Rural	770	43,289	34,199	25,756	15,601	12,402	12,808
POTEET	ATASCOSA	Rural	770	43,768	35,842	24,385	15,478	12,544	12,662
LA VERNIA	WILSON	Rural	770	15,456	16,271	17,031	16,054	18,976	22,007
PLEASANTON	ATASCOSA	Suburban	681	99,868	77,239	58,731	37,962	31,218	31,837
NEW BRAUNFELS	COMAL	Suburban	681	500,962	459,110	459,149	480,586	482,369	558,126
STOCKDALE	WILSON	Rural	770	18,753	15,068	11,834	9,345	8,221	8,991
CHINA GROVE	BEXAR	Suburban	681	16,571	14,225	12,976	12,454	11,374	12,258
CASTROVILLE	MEDINA	Rural	770	35,911	28,601	21,953	16,871	14,421	15,253
FAIROAKS RANCH	BEXAR	Suburban	681	75,440	71,754	67,697	63,546	59,051	59,536
WINDCREST	BEXAR	Suburban	681	58,848	47,426	35,823	24,056	16,153	16,266
GARDEN RIDGE	COMAL	Suburban	681	23,602	20,713	17,131	16,988	15,839	18,256
MUSTANG RIDGE	CALDWELL	Rural	770	6,223	5,791	5,500	5,574	5,369	6,059
SABINAL	UVALDE	Rural	770	20,545	16,457	12,358	8,244	5,499	5,503
ALAMO HEIGHTS	BEXAR	Suburban	681	87,774	67,455	49,724	31,424	25,420	25,701
DILLEY	FRIO	Rural	770	56,783	52,693	44,154	42,670	39,510	40,639
GONZALES COUNTY WSC	CALDWELL	Rural	770	72,451	59,936	52,958	42,487	36,208	36,208
CRYSTAL CITY	ZAVALA	Rural	770	97,214	73,178	55,518	35,009	28,263	28,518
CARRIZO SPRINGS	DIMMIT	Rural	770	73,272	61,423	46,403	29,114	22,781	21,663
SELMA	BEXAR	Suburban	681	48,106	47,989	47,179	41,383	35,471	35,471
COTULLA	LA SALLE	Rural	770	48,929	41,821	31,727	20,657	17,212	17,899
UVALDE	UVALDE	Rural	770	182,782	145,692	107,214	67,625	40,821	41,007

Table 4C.1-12 (Concluded)

*Water User Group**	*County*	*Area*	*Cost per Acre foot*	*Costs of Water Demand Reduction from Lawn Irrigation Conservation*					
				2010 dollars	*2020 dollars*	*2030 dollars*	*2040 dollars*	*2050 dollars*	*2060 dollars*
CIBOLO	GUADALUPE	Suburban	524	0	51,816	98,913	142,389	196,342	260,882
HELOTES	BEXAR	Suburban	524	0	97,399	178,274	242,003	310,517	382,178
JOURDANTON	ATASCOSA	Rural	524	0	37,996	61,484	75,466	89,582	103,174
CASTLE HILLS	BEXAR	Suburban	524	0	35,623	54,734	63,211	71,492	79,562
DEVINE	MEDINA	Rural	524	0	37,812	61,214	72,119	83,200	94,254
PEARSALL	FRIO	Suburban	524	0	64,025	102,400	119,358	135,850	151,525
BIG WELLS	DIMMIT	Rural	524	0	6,991	11,663	13,390	14,711	15,487
GONZALES	GONZALES	Rural	524	0	74,061	128,599	152,308	172,358	189,630
HONDO	MEDINA	Rural	524	0	90,647	165,889	205,895	248,825	292,895
SEGUIN	GUADALUPE	Suburban	524	0	257,602	485,520	624,663	787,951	975,378
ASHERTON	DIMMIT	Rural	524	0	13,651	23,755	27,067	29,550	30,949
FLORESVILLE	WILSON	Rural	524	0	92,287	178,990	225,850	278,521	336,809
WOODCREEK UTIL INC	HAYS	Suburban	524	0	51,931	121,160	173,953	242,976	309,709
SOMERSET	BEXAR	Suburban	524	0	22,494	46,166	57,657	69,598	81,763
KENEDY	KARNES	Rural	524	1,157	40,323	81,374	102,501	118,198	131,693
POTEET	ATASCOSA	Rural	524	1,661	36,328	69,031	86,564	94,973	103,024
LA VERNIA	WILSON	Rural	524	700	18,174	43,191	65,422	83,628	104,107
PLEASANTON	ATASCOSA	Suburban	524	4,776	97,547	189,459	244,884	272,222	298,012
NEW BRAUNFELS	COMAL	Suburban	524	41,467	676,396	1,550,134	2,476,937	3,113,218	3,842,215
STOCKDALE	WILSON	Rural	524	1,460	19,820	40,681	60,694	71,560	83,393
CHINA GROVE	BEXAR	Suburban	524	1,665	23,729	50,807	77,538	91,009	104,432
CASTROVILLE	MEDINA	Rural	524	3,297	38,684	77,134	115,298	131,675	148,012
FAIROAKS RANCH	BEXAR	Suburban	524	7,198	73,827	135,444	191,995	206,384	220,960
WINDCREST	BEXAR	Suburban	524	6,855	62,656	113,883	160,971	177,182	189,016
GARDEN RIDGE	COMAL	Suburban	524	3,840	38,098	84,551	140,736	186,539	226,960
MUSTANG RIDGE	CALDWELL	Rural	524	1,051	9,819	21,275	35,077	47,820	56,790
SABINAL	UVALDE	Rural	524	3,899	22,627	39,610	54,978	68,897	72,436
ALAMO HEIGHTS	BEXAR	Suburban	524	24,002	124,714	217,667	303,555	383,265	433,317
DILLEY	FRIO	Rural	524	15,950	83,877	159,771	238,655	314,709	376,876
GONZALES COUNTY WSC	CALDWELL	Rural	524	25,508	122,659	228,484	334,391	425,187	500,449
CRYSTAL CITY	ZAVALA	Rural	524	34,475	141,090	246,904	340,108	426,251	505,883
CARRIZO SPRINGS	DIMMIT	Rural	524	29,544	121,886	211,504	289,395	351,226	392,623
SELMA	BEXAR	Suburban	524	33,692	143,319	286,847	387,934	478,718	560,821
COTULLA	LA SALLE	Rural	524	28,597	101,363	172,007	241,630	310,484	378,183
UVALDE	UVALDE	Rural	524	148,458	433,537	697,586	940,315	1,161,021	1,361,657
LACKLAND AFB (CDP)	BEXAR	Urban	524	81,853	223,939	352,439	468,652	573,754	668,805
SHAVANO PARK	BEXAR	Suburban	524	22,274	61,293	98,313	132,951	165,281	195,272
HOLLYWOOD PARK	BEXAR	Suburban	524	83,590	196,260	305,082	408,042	505,270	596,367
HILL COUNTRY VILLAGE	BEXAR	Suburban	524	31,314	69,456	103,951	135,148	163,362	188,878
Total				638,285	4,719,956	8,586,068	13,397,207	20,353,198	27,985,250

Table 4C.1-13 (Concluded)

Water User Group *	County *	Area	Costs of Water Demand Reduction from Plumbing Fixtures and Clothes Washers Retrofit plus Lawn Irrigation Conservation					
			2010 dollars	2020 dollars	2030 dollars	2040 dollars	2050 dollars	2060 dollars
LYTLE	ATASCOSA	Suburban	26,007	43,028	46,879	47,483	52,075	58,584
CIBOLO	GUADALUPE	Suburban	44,008	104,545	161,586	212,045	280,697	361,068
HELOTES	BEXAR	Suburban	78,092	205,524	313,824	386,697	473,570	561,561
JOURDANTON	ATASCOSA	Rural	46,083	77,232	91,153	97,895	108,361	122,564
CASTLE HILLS	BEXAR	Suburban	41,783	70,958	80,456	79,299	81,152	89,226
DEVINE	MEDINA	Rural	48,304	79,690	88,673	88,210	95,560	106,876
PEARSALL	FRIO	Suburban	78,787	132,441	154,632	148,799	159,650	175,453
BIG WELLS	DIMMIT	Rural	8,603	14,638	17,438	17,012	17,547	18,185
GONZALES	GONZALES	Rural	89,431	154,089	190,182	200,317	212,805	229,940
HONDO	MEDINA	Rural	96,064	179,692	245,330	270,796	307,217	355,156
SEGUIN	GUADALUPE	Suburban	256,904	503,785	691,151	798,805	951,488	1,158,748
ASHERTON	DIMMIT	Rural	15,404	26,899	33,391	32,594	33,605	34,805
FLORESVILLE	WILSON	Rural	104,780	180,789	249,346	281,909	328,209	391,478
WOODCREEK UTIL INC	HAYS	Suburban	38,437	104,785	193,365	257,964	348,401	431,974
SOMERSET	BEXAR	Suburban	19,446	41,130	61,277	72,051	82,673	95,795
KENEDY	KARNES	Rural	44,446	74,521	107,130	118,102	130,600	144,501
POTEET	ATASCOSA	Rural	45,430	72,170	93,416	102,042	107,518	115,685
LA VERNIA	WILSON	Rural	16,157	34,445	60,222	81,476	102,604	126,114
PLEASANTON	ATASCOSA	Suburban	104,645	174,786	248,190	282,846	303,440	329,849
NEW BRAUNFELS	COMAL	Suburban	542,429	1,135,506	2,009,283	2,957,523	3,595,588	4,400,341
STOCKDALE	WILSON	Rural	20,213	34,888	52,515	70,039	79,781	92,384
CHINA GROVE	BEXAR	Suburban	18,235	37,954	63,783	89,992	102,383	116,691
CASTROVILLE	MEDINA	Rural	39,208	67,285	99,086	132,169	146,096	163,265
FAIROAKS RANCH	BEXAR	Suburban	82,638	145,582	203,141	255,541	265,435	280,497
WINDCREST	BEXAR	Suburban	65,703	110,082	149,707	185,027	193,335	205,282
GARDEN RIDGE	COMAL	Suburban	27,442	58,811	101,682	157,724	202,378	245,216
MUSTANG RIDGE	CALDWELL	Rural	7,274	15,610	26,775	40,651	53,189	62,850
SABINAL	UVALDE	Rural	24,444	39,084	51,968	63,222	74,396	77,939
ALAMO HEIGHTS	BEXAR	Suburban	111,776	192,169	267,391	334,980	408,685	459,018
DILLEY	FRIO	Rural	72,733	136,570	203,925	281,326	354,219	417,515
GONZALES COUNTY WSC	CALDWELL	Rural	97,959	182,594	281,442	376,878	461,395	536,658
CRYSTAL CITY	ZAVALA	Rural	131,689	214,268	302,422	375,117	454,514	534,401
CARRIZO SPRINGS	DIMMIT	Rural	102,816	183,308	257,908	318,509	374,006	414,285
SELMA	BEXAR	Suburban	81,797	191,307	334,026	429,317	514,189	596,292
COTULLA	LA SALLE	Rural	77,526	143,185	203,733	262,287	327,697	396,081
UVALDE	UVALDE	Rural	331,239	579,229	804,800	1,007,941	1,201,842	1,402,664
LACKLAND AFB (CDP)	BEXAR	Urban	148,874	276,599	390,737	492,589	588,115	683,167
SHAVANO PARK	BEXAR	Suburban	42,938	78,273	109,901	140,332	171,283	201,359
HOLLYWOOD PARK	BEXAR	Suburban	119,187	223,380	325,464	421,117	515,971	607,281
HILL COUNTRY VILLAGE	BEXAR	Suburban	43,077	78,866	111,009	139,853	166,499	192,015
Total			8,568,075	13,704,332	18,470,580	23,148,381	30,431,282	41,051,428

To determine the unit cost for the 10% drought management scenario for Uvalde, the following steps were completed. First, marginal costs for both the 5% and 10% scenarios were calculated. For the 5% scenario, this is simply the total economic impact divided by 5% of the total year 2010 demand (i.e., $3,375 / 304 acft = $11/acft). For the 10% scenario, a marginal cost must first be calculated. This is calculated as the difference in total economic impact between the 10% and 5% drought management scenarios, divided by 5% of the total year 2010 demand (i.e., ($20,263 - $3,375) / 304 acft = $56/acft). To calculate the unit cost for the 10% drought management scenario, the marginal costs of the 5% and the 10% scenario are averaged (i.e., ($11 + $56) / 2 = $33/acft).

4C.2.3 Yield from Drought Management Strategy

The yield associated with drought management is simply the year 2010 projected demand times the appropriate percentage depending upon which scenario is used (5%, 10%, 15% or 20%). These values are summarized below in Table 4C.2-4.

4C.2.4 Drought Management Strategy Costs

For each selected WUG, risk factors for 5%, 10%, 15%, and 20% drought management scenario reductions were calculated (Table 4C.2-5). For the 5% reduction scenario, the risk factors ranged from 0.0005 for the City of Point Comfort, indicating there is very little risk of a higher per capita use rate occurring than what occurred in the year 2000, to 0.1652 for the City of Castroville, indicating a much greater risk of demand being greater than supply. For the 20% scenario, the risk factors ranged from a low of 0.0136 for the City of Point Comfort to a high of 0.3113 for Atascosa Rural WSC. The risk factors associated with the commercial and manufacturing uses in Kyle, New Braunfels, BMWD, and SAWA are 0.0713, 0.0170, 0.1730, and 0.0820 respectively.

As described above, these risk factors were then used to determine an annual cost for a planned supply less than demand for the year 2010 (Table 4C.2-6). For the 5% reduction scenario, the annual cost ranged from $106 for the City of Point Comfort to a cost of almost $5.7 million for SAWS. For the 20% reduction scenario, the annual cost ranged from $4,979 for the

Table 4C.2-4.
Drought Management Yield

Entity	Yield (acft)			
	5%	*10%*	*15%*	*20%*
Alamo Heights	104	207	311	414
Aqua WSC	13	27	40	53
Atascosa Rural WSC	47	94	141	188
Castle Hills	41	82	123	164
Castroville	34	68	102	136
County Line WSC	58	115	173	230
East Medina SUD	44	88	132	176
Garden Ridge	28	57	85	113
Hill Country Village	42	84	126	168
Hollywood Park	116	231	347	463
Hondo	89	178	268	357
Jourdanton	40	80	120	160
Kirby	50	101	151	201
Kyle	137	274	411	548
La Coste	10	21	31	41
Lockhart	123	245	368	490
Luling	53	107	160	213
Lytle	24	48	72	96
Martindale	6	13	19	25
Martindale WSC	9	19	28	38
Natalia	17	33	50	66
New Braunfels	525	1,051	1,576	2,102
Point Comfort	11	22	34	45
Sabinal	20	41	61	81
San Antonio (BMWD)	1,233	2,465	3,698	4,931
San Antonio (SAWS)	9,883	19,767	29,650	39,534
Shavano Park	41	82	123	164
SS WSC	78	156	234	313
Universal City	130	261	391	522
Uvalde	304	609	913	1,217
Water Services, Inc.	48	95	143	190
Woodcreek	12	25	37	49

Table 4C.2-5.
Risk Factors

Entity	Risk Factors			
	5%	*10%*	*15%*	*20%*
Alamo Heights	0.1254	0.1765	0.2280	0.2853
Aqua WSC	0.1439	0.1918	0.2445	0.2924
Atascosa Rural WSC	0.1620	0.2100	0.2631	0.3113
Castle Hills	0.0939	0.1465	0.1976	0.2551
Castroville	0.1652	0.2088	0.2569	0.3090
County Line WSC	0.0077	0.0121	0.0175	0.0287
East Medina SUD	0.0785	0.1245	0.1762	0.2293
Garden Ridge	0.0202	0.0365	0.0573	0.0933
Hill Country Village	0.0162	0.0236	0.0325	0.0462
Hollywood Park	0.0145	0.0250	0.0422	0.0727
Hondo	0.1242	0.1724	0.2250	0.2785
Jourdanton	0.0833	0.1157	0.1519	0.1916
Kirby	0.0473	0.0886	0.1419	0.1990
Kyle	0.0820	0.1332	0.1867	0.2328
La Coste	0.0299	0.0589	0.1077	0.1531
Lockhart	0.1143	0.1711	0.2342	0.2926
Luling	0.0338	0.0632	0.1049	0.1541
Lytle	0.0308	0.0597	0.1024	0.1473
Martindale	0.0229	0.0461	0.0829	0.1237
Martindale WSC	0.0475	0.0780	0.1136	0.1528
Natalia	0.0832	0.1162	0.1535	0.1950
New Braunfels	0.0233	0.0653	0.1243	0.1730
Point Comfort	0.0005	.0..17	0.0067	0.0136
Sabinal	0.0397	0.0574	0.0813	0.1146
San Antonio (BMWD)	0.1449	0.2199	0.2902	0.3089
San Antonio (SAWS)	0.0530	0.1307	0.2037	0.2231
Shavano Park	0.0188	0.0364	0.0650	0.1032
SS WSC	0.0600	0.1048	0.1498	0.1948
Universal City	0.0592	0.1133	0.1762	0.2342
Uvalde	0.0007	0.0038	0.0184	0.0458
Water Services, Inc.	0.0214	0.0491	0.0884	0.1358
Woodcreek	0.0468	0.0863	0.1302	0.1756

Table 4C.2-6.
Total Annual Cost

Entity	Total Annual Cost			
	5%	*10%*	*15%*	*20%*
Alamo Heights	$207,467	$334,603	$492,848	$795,557
Aqua WSC	$39,415	$60,714	$88,873	$127,948
Atascosa Rural WSC	$134,283	$195,817	$277,718	$384,550
Castle Hills	$71,926	$131,986	$206,066	$363,087
Castroville	$110,122	$162,132	$234,565	$353,656
County Line WSC	$9,453	$17,170	$31,834	$95,670
East Medina SUD	$58,052	$104,559	$172,803	$268,225
Garden Ridge	$11,735	$24,473	$44,092	$86,421
Hill Country Village	$13,281	$22,545	$36,933	$65,164
Hollywood Park	$32,969	$65,928	$135,465	$283,804
Hondo	$186,065	$293,119	$444,307	$659,526
Jourdanton	$65,394	$105,840	$164,152	$258,230
Kirby	$37,944	$85,364	$148,882	$269,313
Kyle	$161,234	$305,472	$495,428	$4,106,244
La Coste	$6,279	$14,324	$30,044	$51,436
Lockhart	$212,699	$367,325	$578,264	$981,151
Luling	$30,282	$64,242	$126,289	$218,304
Lytle	$14,479	$34,571	$70,064	$126,262
Martindale	$2,943	$6,839	$14,099	$25,334
Martindale WSC	$9,615	$18,122	$33,911	$83,733
Natalia	$29,368	$47,150	$80,054	$186,586
New Braunfels	$176,029	$574,252	$1,264,094	$6,174,754
Point Comfort	$106	$445	$2,042	$4,979
Sabinal	$16,587	$27,700	$45,067	$76,464
San Antonio (BMWD)	$2,272,791	$4,122,408	$7,207,795	$132,531,960
San Antonio (SAWS)	$5,681,497	$17,092,861	$33,833,350	$627,263,236
Shavano Park	$15,091	$34,067	$73,354	$142,175
SS WSC	$86,255	$168,677	$301,988	$648,445
Universal City	$117,148	$258,925	$462,754	$835,451
Uvalde	$3,375	$20,363	$112,875	$186,182
Water Services, Inc.	$21,809	$57,433	$132,763	$374,501
Woodcreek	$12,309	$26,109	$50,588	$125,279

City of Point Comfort to a cost of almost $627.3 million for SAWS. The two most important factors driving the annual cost are the risk factor and whether or not that WUG supplies water for commercial and manufacturing purposes (at the 20% reduction level), as these uses have high impact factors.

Finally, the annual cost data were used to calculate a unit cost so that comparisons could be made with other potentially feasible water management strategies (Table 4C.2-7). For the 5% scenario (supply equal to 95% of dry condition demand), the unit costs ranged from $9/acft/yr for the City of Point Comfort to a high of $3,239/acft/yr for the City of Castroville. For the 20% scenario (supply equal to 80% of dry condition demand), the unit costs ranged from $111 for the City of Point Comfort to a high of $26,878 for BMWD. Again, the high unit costs for BMWD are primarily due to the high risk factors (i.e., the year 2000 per capita was lower than in many previous years) and the high economic impact factors associated with commercial and manufacturing uses.

The SCTRWPG has found, and the San Antonio Water System (SAWS) has demonstrated, that water user groups having sufficient flexibility to focus on discretionary outdoor water use first and avoid water use reductions in the commercial and manufacturing use sectors may find some degrees of drought management to be economically viable and cost-competitive with other water management strategies. Recognizing that implementation of appropriate water management strategies is a matter of local choice, the SCTRWPG recommends due consideration of economically viable drought management as an interim strategy to meet near-term needs through demand reduction until such time as economically viable long-term water supplies can be developed. Hence, new demand reductions associated with the 5 percent drought management scenario are shown as recommended at year 2010 for each municipal water user group with projected needs for additional water supply at year 2010[1].

[1] In accordance with the SAWS 2009 Water Management Plan Update, 37,622 acft/yr is the drought management supply (demand reduction) shown for SAWS in year 2010. This quantity is between the 15 and 20 percent drought management scenarios presented in Table 4C.2-4.

Table 4C.2-7.
Average Unit Cost

Entity	Average Unit Cost			
	5%	*10%*	*15%*	*20%*
Alamo Heights	$2,004	$1,616	$1,587	$1,921
Aqua WSC	$2,952	$2,274	$2,219	$2,396
Atascosa Rural WSC	$2,854	$2,081	$1,968	$2,043
Castle Hills	$1,754	$1,610	$1,675	$2,214
Castroville	$3,239	$2,384	$2,300	$2,600
County Line WSC	$164	$149	$184	$416
East Medina SUD	$1,318	$1,187	$1,308	$1,522
Garden Ridge	$415	$433	$520	$765
Hill Country Village	$317	$269	$294	$389
Hollywood Park	$285	$285	$390	$613
Hondo	$2,086	$1,643	$1,660	$1,848
Jourdanton	$1,633	$1,321	$1,366	$1,612
Kirby	$755	$849	$988	$1,340
Kyle	$1,177	$1,115	$1,205	$7,493
La Coste	$613	$699	$977	$1,255
Lockhart	$1,736	$1,499	$1,573	$2,002
Luling	$568	$602	$789	$1,023
Lytle	$605	$722	$975	$1,318
Martindale	$471	$547	$752	$1,013
Martindale WSC	$1,017	$959	$1,196	$2,215
Natalia	$1,780	$1,429	$1,617	$2,827
New Braunfels	$335	$546	$802	$2,938
Point Comfort	$9	$20	$61	$111
Sabinal	$815	$681	$738	$939
San Antonio (BMWD)	$1,844	$1,672	$1,949	$26,878
San Antonio (SAWS)	$575	$865	$1,141	$15,867
Shavano Park	$369	$416	$597	$868
SS WSC	$1,104	$1,079	$1,288	$2,074
Universal City	$898	$993	$1,183	$1,602
Uvalde	$11	$33	$124	$153
Water Services, Inc.	$459	$604	$931	$1,969
Woodcreek	$1,001	$1,061	$1,371	$2,546

Table 4C.3-4.
Edwards Aquifer Water Transfers by County
South Central Texas Region

Entity	*County*	*Year*					
		2010 **(acft)**	***2020*** **(acft)**	***2030*** **(acft)**	***2040*** **(acft)**	***2050*** **(acft)**	***2060*** **(acft)**
Lytle	Atascosa	141	152	162	169	179	188
Subtotal		141	152	162	169	179	188
Alamo Heights	Bexar	592	655	657	653	667	691
Atascosa Rural WSC	Bexar	546	717	869	996	1,106	1,218
Kirby	Bexar	335	334	337	331	343	364
Universal City	Bexar	113	421	680	630	606	606
Water Ser Inc (Apex Water Ser)	Bexar	587	723	844	945	1,031	1,116
Windcrest	Bexar	235	235	235	235	235	235
Subtotal		2,408	3,085	3,622	3,790	3,988	4,230
Castroville	Medina	294	357	416	468	522	575
East Medina SUD	Medina	0	104	214	303	397	491
Hondo	Medina	319	536	740	910	1,083	1,252
La Coste	Medina	92	109	126	138	152	168
Natalia	Medina	194	238	279	314	349	383
Yancey WSC	Medina	214	395	562	710	851	985
County-Other	Medina	0	236	528	787	1,055	1,296
Subtotal		1,113	1,975	2,865	3,630	4,409	5,150
Sabinal	Uvalde	127	123	118	113	109	109
Uvalde	Uvalde	3,172	3,209	3,229	3,233	3,235	3,263
Subtotal		3,299	3,332	3,347	3,346	3,344	3,372
Subtotals		6,961	8,544	9,996	10,935	11,920	12,940
SAWS		35,935	35,935	35,935	35,935	35,935	35,935
BMWD		3,000	3,000	3,000	3,000	3,000	3,000
TOTAL Firm Supply (320,000 acft/yr)		**45,896**	**47,479**	**48,931**	**49,870**	**50,855**	**51,875**
IRP Value Permits Needed*		82,039	84,869	87,464	89,143	90,903	92,727
* IRP value of permits needed is 572,000/320,000 times the Firm Supply needed.							

Given the quantities of transfers, as shown in Table 4C.3-4, the quantities of projected irrigation surpluses, irrigation water conservation potentials, and quantities of irrigation water conservation needed to meet projected irrigation needs in Bexar, Medina, and Uvalde Counties (Table 4C.3-5), there is a projected transfer of irrigation water to municipal and industrial uses in Bexar, Medina, and Uvalde Counties of 11,973 acft/yr in 2010, 1,362 acft/yr in 2030, and surpluses of 2,921 acft/yr, 6,416 acft/yr, and 9,696 acft/yr in 2040, 2050, and 2060, respectively (Table 4C.3-5); e.g.; the Edwards transfer water management strategies of the 2011 Regional

4C.6.4.5 Guadalupe County

4C.6.4.5.1 City of Seguin

The City of Seguin is interested in a facilities expansion that includes an interconnection with Texas Water Alliance. The interconnection would require new pipelines, pump stations, and/or storage facilities. In addition, the City foresees the need for additional transmission facilities (pipelines, pump stations ,and storage) for their SSLGC project. Costs associated with the City of Seguin facilities expansion are included in the TWA Regional Carrizo water management strategy.

4C.6.4.5.2 Springs Hill WSC

The Springs Hill WSC is interested in expanding their Lake Placid Water Treatment Plant from the current 1 MGD capacity to 2 MGD so that they can fully utilize their surface water rights. In addition, other improvements may include new pipelines, pump stations, and/or storage. The cost estimate is summarized in Table 4C.6-1.

4C.6.4.6 Medina County

4C.6.4.6.1 City of Castroville

The City of Castroville is interested in an expansion that includes an interconnection with the South Texas Regional Water Alliance. This interconnection would require new pipelines, pump stations, and/or storage facilities. The cost estimate for facilities expansion for the City of Castroville includes a 12-inch interconnection transmission pipeline and is summarized in Table 4C.6-1.

4C.6.4.6.2 Yancey WSC

The Yancey WSC is interested in adding an element to their Local Groundwater WMS that includes an expansion of water transmission facilities such as new pipelines, pump stations, and/or storage facilities. No cost estimates were prepared for the City of Pleasanton facilities expansion projects as they are distribution system improvements and not part of the regional planning process.

Table 4C.6-1.
Facilities Expansion Preliminary Costs

WUG	*Description*	*Total Capacity of Facilities Expansion (acft/yr)*	*Project Cost*	*Annual Cost*
City of Charlotte	(4) 12-in. dia. transmission pipeline connection	11,372	$38,356,000	$3,586,000
Atascosa Rural WSC	(4) 12-in. dia. transmission pipeline connection	11,372	$72,433,000	$6,772,000
City of Helotes	12-in. dia. transmission pipeline connection	2,843	$2,863,000	$269,000
Tri-Community WSC	(2) 12-in. dia. transmission pipeline connection	5,686	$17,584,000	$774,000
City of Castroville	12-in. dia. transmission pipeline connection	2,843	$11,046,000	$1,033,000
Springs Hill WSC	Expansion of Lake Placid WTP capacity from 1 MGD to 2MGD	1,120	$2,277,000	$722,000

4C.6.5 Implementation Issues

The facilities expansions are not expected to have significant implementation issues.

ATTACHMENT E.
CITY OF CASTROVILLE WATER DISTRIBUTION MAP

ATTACHMENT E

CITY OF CASTROVILLE, TEXAS
3 SEPARATE SYSTEMS
MAY 2012

LEGEND:

CITY SYSTEM
AIRPORT SYSTEM
MEDINA VALLEY SYSTEM

KSA ENGINEERS
3 Spicewood Springs Rd. Suite 204
Austin, Texas 78759
T.512-342-6868 F.512-342-6877
www.ksaeng.com

650' 0 650' 1300'
GRAPHIC SCALE IN FEET

M:\PROJECTS\CAS\2020\DRAWE\EXHIBIT 1 SEWER DISTRIBUTION ISOLATION VALVES.DWG - EXHIBIT 1:

ATTACHMENT F.
WATER RATES

ORDINANCE NO. 2012-15

AN ORDINANCE ESTABLISHING RATES TO BE CHARGED FOR ELECTRIC, GAS, WATER AND WASTEWATER SERVICES PROVIDED BY THE CITY OF CASTROVILLE; REPEALING ORDINANCE NO. 2011-15, DATED SEPTEMBER 19, 2011, AND ALL ORDINANCES OR PARTS OF ORDINANCES IN CONFLICT HEREWITH; PROVIDING FOR SEVERANCE; AND PROVIDING AN EFFECTIVE DATE OF OCTOBER 1, 2012.

WHEREAS, The City Council of the City of Castroville, Texas deems it reasonable and necessary to revise electric, gas, water, and sewer service rates to provide adequate revenues to meet the operation and maintenance expenses, the retirement of debt, and other financial requirements deemed necessary by the City Council of the City of Castroville, Texas.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CASTROVILLE, TEXAS:

Section 1. That the following rates for Commercial and Residential gas usage shall be implemented and become effective on October 1, 2012.

Gas usage shall be calculated as follows:

GAS

Usage	**RESIDENTIAL** RATE	**COMMERCIAL** RATE
Monthly Minimum Bill	$9.41	$11.50
Per 1,000 CU FT	$7.21 + CITY COST	$7.21 + CITY COST

Senior Citizen Discount 0%

Section 2. That the following rates for Commercial and Residential water usage shall be implemented and become effective October 1, 2012.

WATER

	RESIDENTIAL	**COMMERCIAL**
Monthly Minimum Bill	$13.59	$16.98
Volumetric Rates:		
0 to 5,000 GALLONS	PLUS $3.20 PER 1,000	PLUS $3.20 PER 1,000
5,001 to 10,000 GALLONS	PLUS $3.42 PER 1,000	PLUS $3.42 PER 1,000
10,001 to 20,000 GALLONS	PLUS $3.77 PER 1,000	PLUS $3.77 PER 1,000
20,001 to 30,000 GALLONS	PLUS $3.99 PER 1,000	PLUS $3.99 PER 1,000
30,001 to 40,000 GALLONS	PLUS $4.21 PER 1,000	PLUS $4.21 PER 1,000
40,001 to 50,000 GALLONS	PLUS $4.43 PER 1,000	PLUS $4.43 PER 1,000
OVER 50,000 GALLONS	PLUS $5.10 PER 1,000	PLUS $5.10 PER 1,000

Senior Citizen Discount 0%

Section 3. That the following rates for Commercial and Residential sewer usage shall be implemented and become effective October 1, 2012.

RESIDENTIAL SEWER

Winter averaging will be used to determine the usage upon which the following rates will be based. The winter averaging formula is as follows:

Actual water use for the preceding months of November, December, January and February is determined. The high usage month is discarded and the remaining three months are averaged to determine the usage upon which the sewer rate is based. Upon determination of the average, the following rates shall be implemented and become effective on October 1, 2012.

SEWER

	RESIDENTIAL RATE	**COMMERCIAL** RATE
Monthly Minimum Bill (up to 2,000 gal.)	$12.54	$17.77
Over 2,000 gallons	PLUS $5.38/1,000 GAL.	PLUS $5.38/1,000 GAL

Senior Citizen Discount 0%

Section 4. That the following rates for Commercial and Residential electric usage shall be implemented and become effective on October 1, 2012.

Electric usage shall be calculated as follows:

ELECTRIC

Usage	RESIDENTAL RATE	COMMERCIAL RATE
MONTHLY MINIMUM BILL	$ 8.00	$21.00
METERED USAGE	$ per KWH 0.1109	$ per KWH 0.1109

Senior Citizen Discount 5%

Section 5. That the following rates for Commercial and Residential garbage collection fees shall be implemented and become effective October 1, 2012.

GARBAGE	**RESIDENTAL** RATE	**COMMERCIAL** RATE
SERVICE FEE PLUS CONTRACT COST	$2.00	$2.50

Section 6. That all other ordinances or parts of ordinances in conflict herewith be and the same are hereby repealed to the extent of such conflict.

Section 7. If for any reason any section, paragraph, subdivision, clause, phrase, word, or provision of this ordinance shall be held invalid or unconstitutional by final judgment of a court of competent jurisdiction it shall not affect any other section, paragraph, subdivision, clause, phrase, word, or provision of this ordinance, for it is the definite intent of this City Council that every section, paragraph, subdivision, clause, phrase, word, or provision hereof be given full force and effect for its purpose.

PASSED, APPROVED AND ADOPTED this 24th day of September, 2012.

Robert Lee
ROBERT LEE, MAYOR

ATTEST:

Debra Howe
DEBRA HOWE, CITY SECRETARY

ATTACHMENT G.
MUNICIPAL GROUNDWATER CONSERVATION PLAN FORM

EDWARDS AQUIFER
AUTHORITY

Municipal Groundwater Conservation Plan Form

Your Municipal Groundwater Conservation Plan Form Is Due: _____. Please submit your completed report to: Edwards Aquifer Authority, Attn: Groundwater Conservation Department, 1615 N. St. Mary's Street, San Antonio, TX 78215.

I. General Information

Permit Holder Name: _____ Regular Permit Number: _____

Permit Holder Address (City, State, Zip):_____

Permit Holder Phone Number: _____ Permit Holder Fax Number: _____

Permit Holder Email Address: _____@_____

Contact Person: _____

Contact Address (City, State, Zip):_____

Contact Phone Number: _____ Contact Fax Number: _____

Contact Email Address: _____@_____

Estimated Per Capita Water Usage (Gallons Per Person Per Day):_____

Brief Description of Water Use (golf course, nursery, athletic field, etc.): _____

Total Number of Connections in Service Area: _____

Total Number of Edwards Aquifer Connections in Service Area: _____

Permit holders utilizing non-Aquifer alternative water in conjunction with Edwards Aquifer (Aquifer) water may be eligible to reduce BMP requirements. Municipal permit holders may achieve smaller system status by replacing Aquifer usage with usage of alternative water. This will be measured by the number of connections that are converted to alternative water supplies. For example, a municipality with 12,000 connections is considered a large system and must meet large system GCP requirements; if that municipality converts half of its connections to alternative water, it now has 6,000 Aquifer connections and is considered a medium system.

If you have acquired a non-aquifer alternative water supply in addition to your Aquifer water, determine the number of Aquifer connections that count toward BMPs by using the following formula: multiply the total number of all connections by the ratio of the amount of water supplied from your Aquifer wells divided by the total amount of water used by the municipality. The calculation will determine your number of Aquifer connections.

[Amount of Aquifer Use] _____ ÷ [Total Water Use] _____ x [Total Connections] _____ = _____
[Aquifer Connections]

II. Municipal Information

Please provide your projected annual water usage for the next ten year period.

Projected Water Usage	
Year	**Acre-Feet**

Please list each customer type within your service area, and number of connections for each type. Provide total water use by volume and by percent for each customer type.

Type of Account	Number of Connections	Use by Volume	Use by Percent
Residential			
Commercial			
Industrial			
Institutional:			
Other:			
Other:			

III. Best Management Practice (BMP) Implementation Information

Municipal Best Management Practices

Muni-1 System Water Audit, Leak Detection and Repair

Note: The System Water Audit portion of this BMP only applies if you have greater than 10 connections or if you're a mobile home community with greater than 50 connections. The Leak Detection and Repair component must be completed regardless of your number of connections.

Muni-2 Metering of All New Connections and Retrofit of Existing Connections

Muni-3 Water Waste Prohibition

Muni-4 Conservation Pricing for Purveyors Only

Muni-5 Public Information and School Education Programs

Muni-6 Landscape Conservation Programs

Muni-7 Conservation Coordinator

Muni-8 Water Use Survey Programs

Muni-9 Residential Plumbing Retrofit, Rebate and Replacement Programs

Muni-10 Reuse of Treated Effluent

Your completion of the above Municipal BMPs must be consistent with your number of connections as noted in the chart below:

Number of Connections	BMP Completion Requirement
Less than 500 - very small systems	Muni 1 through 3 and Muni 4, if applicable
500 to 3,300 - small systems	Muni 1 through 7
3,300 to 10,000 - medium systems	Muni 1 through 8
More than 10,000 - large systems	Muni 1 through 10

Please note: Municipal permit holders with more than 3,300 connections or more may submit an approved Texas Water Development Board Water Conservation Plan in place of an Authority required GCP. However, these permit holders must also include the appropriate BMPs 5 through 10 as specified in the Authority's GCP.

Please check the BMPs below that have or will be implemented and provide the appropriate information. Descriptions should include schedules, goals, cooperative parties and steps taken to avoid double counting of water conservation savings, supporting materials, etc. Attach additional pages if necessary showing estimated water savings and any other supporting documentation and calculation worksheets.

☐ Muni-1: System Water Audit, Leak Detection and Repair

BMP Implementation Date: _____ Completion Date: _____

If you are a purveyor or non-purveyor, with greater than 10 connections or a mobile home community with greater than 50 connections, describe your existing or planned annual pre-screening water audit program. For the pre-screening system water audit include metered sales and other verifiable uses, total supply into the system and if metered sales represent less than 85% of total supply in the system, you must conduct a full distribution audit. Attach copies of documents showing your pre-screening audit results and if applicable, your full scale audit results:

_____

_____

_____

_____

_____

Regardless of your number of connections, describe your existing or planned leak detection and repair program which is used to reduce water losses and repair leaks when detected. In addition please include your method of advising customers of existing leaks if applicable. Unaccounted water losses must be no more than 15% of total water supply into the system:

_____

_____

_____

_____

Estimated water savings: _____ acre-feet annually

For any water loss you may have had, please explain what measures are being taken to prevent water loss in the future:

_____

_____

_____

_____

□ Muni-2: Metering of All New Connections and Retrofit of Existing Connections

BMP Implementation Date: _____ Completion Date: _____

If you are a purveyor, describe your existing or planned method for installing meters on all new connections and existing unmetered connections within the service area. Identify the number of new connections in the service area and the number of unmetered connections within the service area:

_____

_____

_____

_____

_____

If you are a purveyor, describe your existing or planned feasibility study that will show the benefits of installing dedicated landscape irrigation meters on industrial, commercial and institutional (ICI) accounts. Attach copies of documents showing results of feasibility study and indicate the number of dedicated landscape irrigation meters on ICI accounts installed during the reporting period:

_____

_____

_____

_____

_____

If you are a purveyor, describe your existing or planned schedule for testing and replacing meters within the service area. Indicate the number of meters tested, the number of meters replaced and the number of pressure regulators installed on meters during the reporting period:

_____

_____

_____

_____

_____

If you are a purveyor, describe your existing or planned feasibility study to retrofit multi-family and ICI accounts with turbo meters or similar technology:

_____

_____

_____

_____

_____

(Continued) Muni-2 Metering of All New Connections and Retrofit of Existing Connections

If you are a non-purveyor with greater than 10 connections or a mobile home community with more than 50 connections you must install meter(s) by zone(s) for all connections within the service area. Connections per zone cannot exceed ten connections. Indicate the number of new connections metered during the reporting period and the number of existing unmetered accounts within the service area:

_____

_____

_____

_____

_____

If you are a non-purveyor, describe your existing or planned schedule for testing and replacing meters within the service area. Indicate the number of meters tested, the number of meters replaced and the number of pressure regulators installed on meters during the reporting period:

_____

_____

_____

_____

_____

Estimated water savings: _____ acre-feet annually

□ Muni-3: Water Waste Prohibition

BMP Implementation Date: _____ Completion Date: _____

Describe the measures you have taken to prohibit water waste runoff from property, landscape watering between the hours of 10:00 a.m. and 8:00 p.m., and if applicable, water waste prohibition as it pertains to single-pass cooling systems in new connections, non-recirculating systems in new conveyor car washes, non-recirculating systems in commercial laundry systems, non-recycling decorative water fountains, and any other wasteful activities.

In some instances your method of prohibition may include planned adoption and enforcement measures or an ordinance or tariff being enacted. If so, please provide the Authority with a copy of such documents.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Pursuant to § 715.126(a) Landscape Watering of the Edwards Aquifer Authority Rules, the Authority shall not approve a Groundwater Conservation Plan for municipal users, or where applicable, industrial users, that do not prohibit residential or non-residential landscape irrigation between the hours of 10:00 a.m. and 8:00 p.m.

Estimated water savings: _____ acre-feet annually

□ Muni-4: Conservation Pricing (For Purveyors Only)

BMP Implementation Date: _____ Completion Date: _____

Describe your existing or planned economic incentives for billing by metered volume of use consistent with an Increasing Block Rate Structure which provides for an increase in the unit price of water as the volume of water used increases. Include a copy of your Increasing Block Rate pricing structure for each class:

_____

_____

_____

_____

_____

Describe your existing or planned seasonal or excess surcharge imposed to reduce demand during summer months. Rate should be established based upon long-run marginal costs, or the cost of adding the next unit of capacity to the system. Attach a copy of the rates charged in order to reduce demand during summer months:

_____

_____

_____

_____

_____

Describe your existing or planned method for working with sewer agencies so they may adopt conservation pricing for sewer service, in the event you supply water but not sewer service:

_____

_____

_____

_____

_____

Estimated water savings: _____ acre-feet annually

☐ Muni-5: Public Information and School Education Programs

BMP Implementation Date: _____ Completion Date: _____

Describe your existing or planned public information program. An effective public information program includes but is not limited to providing speakers to employees, community groups and the media; paid and/or public advertising, bill inserts, trend comparison information on bills, informational pamphlets and manuals. Include the number of type of public speaking events, media events, paid or public service announcements and written information disseminated during the reporting period:

_____

_____

_____

_____

_____

Describe your existing or planned school education program to achieve water conservation. Your school education program should include but is not limited to classroom presentations, instructional assistance and distribution of educational materials. Educational materials must meet the state education framework requirements. Include the number and type of school presentations and approximate attendance, the number of in-service presentations or teacher workshops conducted and the number and type of curriculum materials developed or provided by the permit holders:

_____

_____

_____

_____

_____

Estimated water savings: _____ acre-feet annually

□ Muni-6: Landscape Conservation Program

BMP Implementation Date: _____ Completion Date: _____

Describe your existing or planned land conservation programs including accounts with dedicated irrigation meters and assigned reference evapotranspiration (ETo) based irrigation schedules equal to no more than 80% of reference evapotranspiration per square foot of landscape area:

_____

_____

_____

_____

_____

Describe your existing or planned steps to market landscape water-use surveys to ICI and residential accounts. Include number of surveys offered and number of surveys completed:

_____

_____

_____

_____

_____

If cost-effective, describe your existing method or planned method to offer financial incentives to customers to convert landscape material to xeriscape, landscape water-use analysis and surveys, installation of dedicated landscape meters and follow-up to water-use analysis and surveys. Include the number, type and dollar value of incentives, rebates, and loans offered to and accepted by customers:

_____

_____

_____

_____

_____

For new customers and change-of-service accounts, describe your existing or planned climate appropriate landscape design and efficient irrigation equipment and management:

_____

_____

_____

_____

_____

(Continued) Muni-6 Landscape Conservation Program

If applicable, describe your existing or planned method for adopting an ordinance that requires all new homes and all new apartment complexes and commercial buildings to install a water conserving landscape:

_____

_____

_____

_____

_____

Estimated water savings: _____ acre-feet annually

□ Muni-7: Conservation Coordinator

BMP Implementation Date: _____ Completion Date: _____

Conservation Coordinator Name: _____ Title: Director of Public Services

Address: 1209 Fiorella St. Telephone Number: (830) 931-4090

Describe the existing or planned role of the conservation coordinator who will be responsible for preparation and implementation of the Groundwater Conservation Plan, preparation and submittal of annual conservation status reports and implementation of BMPs. Include name, address, phone number, date conservation coordinator was identified by purveyor, duties and number of conservation coordinator staff members, if applicable:

☐ Muni-8: Water Survey Program

BMP Implementation Date: _____ Completion Date: _____

Number of Residential Customers:_____ Annual Water Use: _____ acre-feet

Describe your existing or planned marketing of water-use surveys per customer class and the number of surveys completed.

Water-use surveys for ICI customers must include a site visit, evaluation of all water using equipment and processes, a report identifying conservation measures and expected payback and available agency incentives. Annual follow up visits are to be conducted to evaluate water savings improvements.

Water-use surveys for residential customers must include meter checks, leak checks for toilet and faucets, determination of flow rates for showerheads, aerators, and toilets, irrigation system and timer checks and review or development of irrigation schedules. Measurement of currently landscaped and total irrigable areas should also be included. Customers must be provided with information packets including evaluation results and water saving recommendations:

_____

_____

_____

_____

_____

Estimated water savings: _____ acre-feet annually

☐ Muni-9: Residential Plumbing Retrofit and Rebate Programs

BMP Implementation Date: _____ Completion Date: _____

Number of single-family residences in the service area which were constructed prior to 1992: _____

Number of multi-family residences in the service area which were constructed prior to 1992: _____

Describe your existing or future plan to distribute or directly install high-quality, low-flow plumbing devices as needed. Distribution and installation programs must be maintained to achieve retrofit on at least 10% of residences during the reporting period.

_____

_____

_____

_____

_____

Describe your existing or future plan to offer financial incentives to customers that encourage the purchase and use of high-efficiency washing machines. Include the number of high-efficiency washing machine rebates offered and completed during the reporting period:

_____

_____

_____

_____

_____

_____

_____

Estimated Water Savings Devices Planned To Be Retrofitted Annually.

	Quantity	**Estimated Savings**
Shower heads 2.5 gpm of less	_____	_____ acre-feet annually
Faucet aerators 2.2 gpm or less	_____	_____ acre-feet annually
Toilet displacement devices	_____	_____ acre-feet annually
Toilet flappers	_____	_____ acre-feet annually
High efficiency washing machine	_____	_____ acre-feet annually
Ultra low flush toilets	_____	_____ acre-feet annually
	Total Annual Savings	_____ acre-feet annually

☐ Muni-10: Reuse of Treated Effluent

BMP Implementation Date: _____ Completion Date: _____

Describe your existing or planned method of identifying ICI customers according to use and your process of investigating the feasibility of replacing their Edwards Aquifer groundwater use with treated effluent. Include a description of effluent treatment facilities in addition to the number of gallons or acre-feet of previous average groundwater use for customers served by reuse water, number of gallons or acre-feet of current groundwater use and number of gallons or acre-feet of current treated effluent use.

_____

_____

_____

_____

_____

Estimated water savings: _____ acre-feet annually

IV. Certification

I hereby certify that the information given herewith is true and accurate to the best of my knowledge and belief. I understand that I must submit to the Authority triennial Groundwater Conservation Plan status reports, due by March 31 of every third year beginning 2009.

Signature of Permit Holder or Agent: _____ Date:_____

Retrofit Device Savings Table

Device	Initial Savings (gpd per device)	Device Life Span
Low Flow Showerheads	5.5 gpd	3-7 years
Toilet Displacement Devices	4 gpd	2-5 years
Faucet Aerators	1.5 gpd	1-3 years
Toilet Leak Detection	.64 gpd (8 gpd per repaired leaking toilet; 8 percent of toilets leaking)*	7-10 years
Other Household Leak Checks	.5 gpd (12.4 gpd per household repair; 4 percent of households with leaks)	7-10 years
Turf Survey	12.2 gpd	4 years
Turf Survey with Timer	25.9 gpd (12.2 gpd for turf audit plus 14.7 if timer)	4 years
Source	Field Studies	Judgment

*Municipal purveyors that implement conservation programs with household leak repairs are recommended to update retrofit devices based on the device life span as water hardness and age of device will have direct impacts on these rates.

Source: A&N Technical Services, Inc. (1999)

ATTACHMENT H.
REGIONAL WATER GROUP

4833 Spicewood Springs Road
Suite 204
Austin, TX 78759
512.342.6868

KSA ENGINEERS

21 March 2013

Texas Water Development Board
Regional Water Planning
1700 North Congress Avenue
P.O. Box 13231
Austin, TX 78711-3231

Via Mail

RE: **City of Castroville**
Water Management Plan

Mr. Matt Nelson:

The City of Castroville is updating the City's Water Conservation and Drought Contingency Plans in a comprehensive document entitled "City of Castroville Water Management Plan". On behalf of the City of Castroville, KSA Engineers is hereby submitting the City of Castroville Water Management Plan in accordance with Texas Commission on Environmental Quality, Texas Water Development Board and Edwards Aquifer Authority rules. The Plan went before the City of Castroville City Council on April 9, 2013 and was approved on that date.

The Water Management Plan consists of the City of Castroville Utility Profile, the 2011 Regional L Water Plan, the City's Distribution System Map, the City's water rates (Ordinance No. 2012-15), and Municipal Groundwater Conservation Plan Form.

If you have any questions concerning the Water Management Plan, please contact me or Paul Hofmann – City Administrator – City of Castroville. Thank you.

Sincerely,
KSA ENGINEERS, INC.

Stuart W. Cowell, EIT
Design Engineer

Enclosure: Water Management Plan (with copy of cover letter)
Ordinance 2013-006
Utility Profile
2011 Regional Water Plan
City of Castroville Distribution System Map
Ordinance No. 2012-15
Municipal Groundwater Conservation Plan Form

c: Paul Hofmann, City Administrator (w/ encl)
Brent Bassett, Project Engineer (w/o encl)
CAS007.Corr